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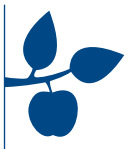

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INTRODUCTION

Industry and public agencies increasingly adopt user-driven innovation and open innovation, as they realise that innovation cannot come solely from within an organisation. Innovation happens in the 'breaking of the waves' between people outside and people inside – because they have different stakes and perspectives. In academia, new breakthrough contributions to understanding innovation – and supporting it – will also emerge in the borderlands between disciplines that traditionally do not collaborate: between languages and design, and between management and anthropology for instance.

The new discipline of Participatory Innovation gathers theories and methods across such academic fields that describe how people outside an organisation can contribute to its innovation. The many papers in this volume have in common that they identify ways for industry and the public sector to expand innovation through the participation of users, employees, suppliers, customers etc. – both on a strategic level, in concrete methods, and in the day-to-day interactions. PINC 2011 is a forum where participants from different disciplines and organisations can meet and challenge each other to develop the field of participatory innovation.

The papers are organised in five chapters corresponding to the five tracks in the PINC 2011 conference. Each of the tracks features a unique combination of disciplines and the papers relate to concrete situations and challenges in real life organisations.

Making Design and Analysing Interaction brings together 'makers' of design collaboration with interaction analysts, who can explain what actually happens, when physical 'stuff' like generative toolkits, tinkering and provotypes is employed to encourage people with different backgrounds to collaborate.

Staging Design Anthropology includes authors who explore new activity formats that blur distinctions between user research and its application (or consumption).

Organising Participatory Innovation is concerned with the management challenge of involving users and other stakeholders in innovation. The authors are practitioners with narratives of actual innovation experiences, and researchers that offer understandings of 'organising' in the face of participatory innovation.

Designing Innovative Business Models combines designers and business experts, who come together to create new ways of innovating business with user participation.

Public Procurement of Participatory Innovation features authors concerned with how public purchasing can encourage innovation in companies: the public agency gets a first rate product and industry improves competitiveness.

The papers in this volume are thoroughly peer-reviewed, although in a participatory rather than in a double-blind fashion. The goal has been to increase quality by rounds of constructive feedback more than by exclusion.

PINC 2011 is organised by the Danish strategic research centre SPIRE. The centre was established in 2008 to investigate how people innovate, and how organisations innovate with users. And 'users' here can mean actual users of products and services, or customers, suppliers, business partners, employees etc. They all have potential contributions to make to innovation, if we can find ways in which they can participate.

I would like to thank the track chairs, all the SPIRE colleagues and the graduate students for their efforts in making PINC 2011 come together. Also, thank you to our sponsors that have helped ease the budget planning.

We welcome you to Sønderborg to three days of mind-blowing participatory innovation – your contribution counts!

Jacob Buur
Research director, SPIRE
University of Southern Denmark

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TRACK 1

MAKING DESIGN AND ANALYSING INTERACTION

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Jared Donovan and Trine Heinemann

KEYNOTE SPEAKER

Lorenza Mondada, University of Lyon

Participatory Innovation banks on bringing a wide range of stakeholders together in a generative space where they can challenge each other's perspectives in a constructive way. An important area of research is into how this meeting of perspectives can be supported by tangible activities of "making", such as for instance, prototyping, provotyping, tinkering, generative toolkits and forum theatre. "Making" should be understood not only as giving form to pre-established ideas, but also as a process through which innovation emerges out of the messy collision of people and stuff.

The aim of this track is to gather together examples from participatory innovation practice that involves "making", so that we can develop an understanding across the diverse range of tangible activities that are currently applied and open these up for (comparative) analysis. This track brings together 'makers' (interaction designers, process facilitators), who are willing to share video shots of their exciting participatory activities, with 'analysts' (conversation analysts etc.), who are able to investigate whether some of these activities serve particularly well in certain contexts or at certain stages of the process.

MAKING SENSE OF BRAINSTORMS: SOME 'NOOTS' TO REFLECT ON

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ABSTRACT

Through video-materials of use-in-practice we present and discuss NOOT, an interactive tool that supports sense-making during creative sessions. The project investigates how 'cognitive scaffolding' may support such sense-making.

INTRODUCTION

We are interested how *sense-making* develops within the situated, embodied practice of a *creative group session* (more on which below). Sense-making, in its most general sense, refers to the process by which human beings create meaning through their ongoing interactions with the environment (De Jaegher & DiPaolo, 2007). Our question is how people's embodied interactions with the physical and social environment may provide 'cognitive scaffolds' for sense-making.

COGNITIVE SCAFFOLDING

Andy Clark (1997) explains how, courtesy of their continuous embodied interactions with the environment, people come to use elements and configurations of the environment as *scaffolds* for thought. Clark thereby expands on the original notion of 'scaffolding', as introduced by Lev Vygotsky, who showed how in a setting of cognitive development the social interactions with parents or teachers provide 'scaffolds' for learning, allowing the child to make developmental steps that could not have been achieved without this social structure present. According to Clark, interaction with physical structure, reliably present in the environment, may also function as a cognitive scaffold (Clark, 1997). For example, the organization of items on a desk may help a worker plan his course of action and certain easily recognized landmarks in a city (the church-tower, a big square) help people navigating without a map (Clark, 1997; Kirsh, 2010).

Clark discusses the notion of 'deictic referencing' as a basic form of scaffolding. When communicating, one may point to certain relevant elements in the environment that are available as a shared visual reference. For example, in figure 1, taken from one of our observations at a product design bureau, the two men at the table have certain opportunities for creating shared meanings that the person at the wall has not, even though all can hear what the speaker says. This is because the verbal utterances of the speaker on the left are scaffolded by his gestures operating on an external prop (here, a product sketch), which are only available for the two men at the table.

David Kirsh (2010) expanded on the notion of cognitive scaffolds showing how people themselves *create*, via what he calls 'epistemic actions' scaffolds for thought. For example, in the scene above, both men might add to the sketch, and such additions would come to serve as scaffoldings in the ongoing conversation. In fact, design sketching is known to be not the mere 'externalizing' of a designer's thoughts: the sketch itself influences further design thinking as well (Van der Lugt, 2002); This is just one example of how, in general, sense-making and cognitive scaffolds co-evolve and become *coupled* in action (Dourish, 2001).

RESEARCH APPROACH

Our approach has been to iteratively design an interactive prototype, called NOOT, intended to support and enhance cognitive scaffolding during creative group sessions. By reflecting on our design process and observing the use of the NOOT prototype *in situ*, we intend to gain a more thorough under-

Figure 1: Deictic referencing in a design meeting. See also Episode 2 in the video.

standing of how scaffolding may aid sense-making.

THE CONTEXT OF PRACTICE

Our collaboration with partners provided access to the following settings in which creative sessions regularly take place: 1) design education (the video sample is drawn from this context); 2) a large product design bureau (figure 1 is drawn from this context), 3) a government 'future-centre' and 4) a company offering brainstorm rooms. We also held collaborative sessions with several professional 'facilitators'.

WHAT GOES ON IN CREATIVE SESSIONS

In the classical brainstorm, the goal is to come up with creative solutions to solve a set problem. However creative sessions are often used with less focus on 'problem solving' and more on exploration of a theme (Yilirisku et al, 2009) often aimed at a better understanding of the user context (e.g. in *context-mapping*; Sleeswijk-Visser et al, 2005). In participatory sessions, multiple perspectives may be contrasted directly through face-to-face encounters. As we observed such sessions are also the place to get to know each other, to create commitment (get people 'on board') or to try and enforce decision making. Creative sessions, therefore, usually contain a pragmatic mix of facts, possibilities, perspectives, stakes and politics.

SENSE-MAKING IN CREATIVE SESSIONS

In creative sessions people do not engage in creative acts alone, i.e., idea-generation proper. At particular moments, somebody might think beyond the problem as stated and wonder: "What is the *real underlying* issue here?". Or when a video from a user group is shown, one might want to know "What are the relevant *meanings* behind these events?". There will also inevitably be moments where the group expresses thoughts like: "Why are we stuck?" or "How move forward from here?". Especially concerning so-called 'wicked' problems (Rittel & Webber, 1984), *analysis* is hard to distinguish from *generation*. Instead, people reflect *in-* as well as *on* action (Schön, 1983) and sense-making is thereby subtly 'woven into' instances of generation and creation (Ingold, 2000), see also (Brouwer & van Dijk, 2011) for a discussion of these issues from a conversation analysis' perspective.

MINIMAL INSTANCES OF SCAFFOLDING

In creative sessions, typical candidates for scaffolding are printed pictures, sketches, writings on post-it notes, carton mock-ups, a whiteboard, the table surface and walls, all used to present and discuss ideas. (See Nevile, 2011, for a discussion on the value of prototypes as cognitive scaffolds). Think of pointing at a post-it while talking in order to get shared focus; creating an overview by listing words on a flip-chart or creating a mind-map on the whiteboard; ordering cards in groups under headings (using colored cards to represent different categories) and so on. Consider also less 'explicit' activities such as putting 'my ideas' close to my body on the table; rejecting ideas by shoving cards 'aside', holding a card up while shouting 'what about this one?' and so on.

The practices we investigated mostly engage in rather conventional brainstorm practices, in which one mostly uses talk, sketch and text, supported by a whiteboard, post-it notes, flip-charts, walls and table. The purpose of this paper and video therefore is to explore *minimal* instances of 'cognitive scaffolding' and discuss how the prototype NOOT may aid in supporting a conventional brainstorm. In the end, however, we shortly discuss how NOOT may also be used (perhaps even with a stronger effect!) for more 'embodied' forms of group work such as tinkering sessions or 'acting out' exercises (see Vaajakallio & Mattelmäki, 2007; Jensen et al, 2005, for examples)

NOOT

NOOT was designed to support cognitive scaffolding during creative sessions. The aim is to *enhance* existing practices. This means we want it to be an integrated part of the existing physical-social space, not create a digital 'virtual world' (as in most systems) that would replace, and therefore be disconnected from, the everyday world we inhabit (Dourish, 2001).

Figure 2. Some NOOTs on a table, connected to paper notes.

HOW DOES NOOT WORK?

From the moment a session starts, a computer continuously records the entire session in audio. With a set of tangible objects called NOOTs (see figure 2), users can literally 'connect' a certain moment in the audio to a physical post-it or sketch. In order to do so, one simply clips a NOOT to a post-it, and at that same moment a wireless signal is send to the central computer, which puts a time-stamp in the audio-recording connected to that NOOT. (See 'episode 4' in the sidebar). When that NOOT is later on touched (not shown in video), one hears the part of the conversation that was actually going on at the time the NOOT was clipped (starting 10 seconds before and continuing 10 seconds after the time-stamp).

NOOT thus offers 'conversation context' to the post-it (and in effect also to the post-it's physical location in space). This way, audio-context enhances the cognitive scaffolding power of the physical configuration of post-its in space. In particular, NOOT may provide access to parts of the conversation that are usually forgotten - parts difficult to jot down on a post-it, for instance. Think of details from personal anecdotes, examples of end-user practices as presented by experts, or a complex discussion of conflicting views, of which only a few participants really understood the essence at that time.

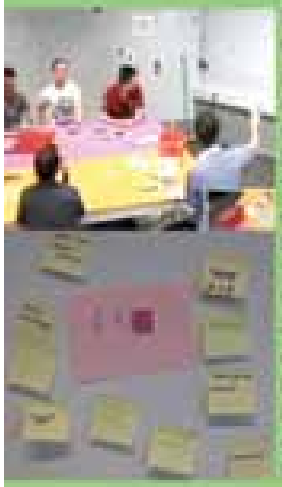
DISCUSSION OF THE VIDEO

Detailed descriptions of the five video episodes can be found in the green sidebars (Figures 3 and 4). We first see how post-its on the whiteboard provide external scaffolds used as an aid for the ordering ideas into categories (Episode 1). We also see the facilitator making deictic references to the walls and table in order to support his speech (Episode 2).

In Episode 3 we see how NOOT *could* have added to the group's sense-making, if it would have been used. Rich content in the verbal discussion is lost in a way typical to most sessions: a

NOOT IN PRACTICE
Conceptspace, Utrecht, Netherlands
May 2010, Session 6 of 7 sessions with NOOT.
Short videosamples from a 1.5 hour session.

ABOUT THE SESSION.
In this video participants discuss ideas for an online game for children, for an external client. The goal of the game is to seduce children into visiting a famous national reserve park in the Netherlands. The participants here had a short workshop on brainstorming. Facilitator F tries to provoke creativity as well as empathy for the target-group in this mostly engineering-oriented group of media-technology students. Meanwhile, F is also exploring the use of NOOT, a new tangible tool linking audio-samples to post-it notes. (see main text for main discussion)



EPISODE 1: External Scaffolding
On the whiteboard, two categories are present in the form of coloured cards, one marking '6-9', the other '10-12'. These represent two age groups of potential users. F. explains some more about the groups: "On the right you have group seven and eight [of primary school], on the left you have group..." the participants fill in: "group 2,3 and 4" [muddled talk]. F concludes: "That's about lower-half/upper-half one could say, right?". From this moment on, the two areas on the white-board 'are' the two user groups, and in order to discuss and contrast the two groups, the physical lay-out on the white-board is often used as a point of reference.

EPISODE 2: Deictic Referencing (shared attention)
Using spatial elements as a reference helps to created shared attention. This episode is quite subtle: A participant earlier mentioned pocket-money. Others think this irrelevant. F. says "Well, when you take what you know of the target group" (points at the wall behind him) "...and use that to create the game" (points at the wall to his right where the ideas for the game are collected) "...in order to get children to come to the park" (focus back on the table: the main design challenge, for the group, has just been stated) "...then 'it' does become relevant" (looks at the participant that mentioned pocket-money, which is what "it" refers to) "... since children don't have that much money and parents have to pay for the entrance fee..."

EPISODE 3: Changing meanings
In this episode WhiteShirt knows something that children like: "Doing Monkey Business". "Good, write down", says F. Then, various participants associate further on this theme. Some are suddenly reminded of their own youth, jokes are made. The group goes on to discuss childrens' emotions and whether they are sensitive to 'hypes'. The phrase 'feelings of anxiety' is uttered. Interesting conversation that for the first time seems to put the participants in touch with the target group. Yet the only thing that gets written down on the post-it is 'Monkey Business'.

EPISODE 4: Marking the Moment
The group discusses kinds of games they loved as kids. Participants are engaged. The age difference between the participants themselves is explicitized using certain games as a reference point. Whiteshirt: " First marbles came, then Flippos".
Ponytail "I never did 'Flippos'"
Whiteshirt "Not? O come on! Well, you did secondary education, so that figures" [meaning Ponytail is younger than WhiteShirt, who attended technical education first]. Ponytail "Yeah, you guys are 'Generation Flippo'"
It would be difficult to write down in one word what this conversation is about. But it does arouse good empathy towards the target-group and focuses on age differences and toy-trends, which are meaningful topics for the ideation phase. The facilitator grabs a NOOT, listens for a bit, and then 'marks the moment' in the midst of a rich part of the conversation.

EPISODE 5: The 'nature' discussion
Long episode. First we hear Whiteshirt again: "Little children like animals more than the older ones do". "Good", says F. "write that down". Then this idea is disputed by the group "Perhaps 10-12 year olds also?". In the discussion that follows, the group settles on a difference between liking (family farm) animals, versus being into 'nature', as in, 'joining the boy scouts'. The conversation itself is not marked with NOOT. A post-it with 'nature' is put with the 10-12 group by Whiteshirt. Blackshirt writes one with 'animal farm' for the '6-9' group. We can see how the post-its do not capture the essence of the discussion when Greyshirt, who apparently has missed part of the talk, sees Whiteshirt put up the post-it and says: [2:52] "Huh, now you put it the wrong way around?". People laugh. "No", says Whiteshirt. "He [pointing at Blackshirt] is doing 'animal farm'. "O", says Greyshirt, unconvinced. "But what's 'nature' then?" [3.01] The clarification from Whiteshirt is minimal: [3.08] "That was, like, 'animal farm', and the other one, like, 'forest'. Only if you already knew what that cryptical explanation referred to, would it be of any help. The fact that Greyshirt doesn't understand what's going on might hinder him in reconnecting to the group process, and it might also cause confusion for others in the group. F was not in a position to reflect and listen, since he was actively involved in clarifying and explaining the topic. We speculate this is why he only grabs a NOOT when the 'dust has settled', at the end of the episode. NOOT is, as we see it, a tool that works well to support a 'reflective stance'.

Figure 3: Details of video of a session where NOOT is used (1).

Figure 4: Details of video of a session in which NOOT is used (2).

post-it hardly captures the richness of the conversation, which is easily forgotten later on, or the post-it is misunderstood (Episode 5).

As explained above, we intended to hook up the NOOT system with the post-its. The 'scaffolding' power of the post-it would then be strengthened with audio-context. Originally we thought NOOT should be used by a person shouting and jotting down an idea and then clipping NOOT to it. In fact NOOT was not used that way. This can be seen in Episode 4, where the facilitator does not try to capture one particular 'idea' in audio, but, while standing aside and listening, captures 'a moment' during a lively discussion. NOOT is not added to a particular post-it, but rather seems to be a scaffold for 'marking *this* moment' in general. This 'moment' is then linked to a physical location only later, in the form of placing the tangible object on the whiteboard or on the table.

Most importantly, marking a moment is something one does while standing outside of the immediate action, taking a reflective, listening role. This can be seen in Episode 5. In that episode we first see how one of the participants has missed an important step in the group's thinking. A NOOT-moment available would have saved a lot of the confusion that follows. The reason that the facilitator did not make a NOOT-moment, we speculate, is because he was himself actively involved in the discussion. Only at the end does he make the mark. We conclude that NOOT may best be seen as a tool that helps in *reflection* on ongoing action (Schön, 1983).

NOOT IN ACTIVITIES OF MAKING

Recently, creative sessions developed to include more 'embodied' forms of group activities. For example, participants are asked to explore themes and concepts through creative engagements with prototyping materials (e.g.Vaajakallio & Mattelmäki, 2007). There have also been various experiments using 'acting out' exercises (e.g. Jensen et al, 2005). We think NOOT may especially contribute to such activities of making, since NOOT may provide an explicit link between *experiencing-by-doing* (the activities themselves) and r*eflective conversation* (participants talking *about* what it means). Using NOOT, one may literally connect discussions around (the evolution of) a certain mock-up, to the mock-up itself. Some of the sense-making that *creating* the mock-up provided, may in this way be preserved for later. Likewise, when users are asked to play-act a scenario the scene may be 'tagged' by the spectators using NOOT, to mark significant events in the spectacle. This way, embodied explorations and reflective conversation may become strongly connected.

THE DESIGN OF NOOT AS A SCAFFOLD

We end by observing how our own insights changed with the evolving prototype. For example, seeing NOOT as a tool for the reflective listener only recently emerged from analysing the current video. In other words, NOOT provides us with a cognitive scaffold for our own sense-making efforts as researcher-designers.

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BRAINSTORMING: TALK AND THE REPRESENTATION OF IDEAS AND INSIGHTS

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ABSTRACT

This article concerns the analysis of a brainstorming session, employing conversation analysis. This brainstorm session is intended as an activity in the process of designing a computergame for children. The session is led by a facilitator, who is instructed by the maker of a prototype of a product (NOOT).The product NOOT is designed to support the interactive development of ideas for products, and it is to some extent used in the brainstorming activity. The brainstorm results in an arrangement of post-it notes on a whiteboard. The analysis discusses different methods for dealing with the task of ensuring that relevant issues end up on the whiteboard and irrelevant ones don't. Implications for the employment of NOOT in such sessions are then discussed.

THE OBJECTIVE OF BRAINSTORMING

One could, initially, ask what brainstorming sessions in a designing process may be good for. Two types of answers would be possible to that question, which ultimately present different views on what cognition is. The one answer would be 'to share ideas and insights' and the other would be 'to create ideas'. The first answer reflects a conception of ideas and insights as being tied to the individual person, and of cognition being likewise. Ideas and insights in this view reside in the person and are subsequently shared with others by means of interactive communication. The goal of brainstorming then is for participants to share ideas and insights which are useful for the design of the product.

Brainstorming in this sense, may be first and foremost a process of retrieval from long term memory in the sense that well-established models of memory describe it (e.g. Baddeley (2003)). In contrast, the other answer conceptualizes ideas and insights as originating intersubjectively, between participants. In this view, ideas and insights do not necessarily belong to one individual but can be created collectively through talk-in-interaction. In other words, people *make* insights and ideas rather than *having* them. This type of answer is associated with a view of cognition as being shared, embodied, and involving physical space, talk, gesture, gaze, body posture and the handling of objects (see e.g. Hutchins 1996). In conversation analysis (CA) researchers have for some time been discussing cognition, taking departure in a conception of cognition as 'shared' (Hougaard & Hougaard (forthc.), Schegloff 1991, te Molder & Potter (2005)). Since the conception of cognition as shared and embodied involves aspects that are directly observable, conversation analytic studies of shared cognition aim at describing how these observable aspects are being employed systematically when participants in social interaction are trying to *make sense*.

The product NOOT is designed to support activities like brainstorming (see for a description of NOOT van Dijk & Brouwer (2010)). The design of NOOT takes as its point of departure that the objective of brainstorming is for participants to develop ideas and insights which are useful for the design of the product. The view on cognition as being shared and embodied has been the point of departure for the development of NOOT. The NOOT product is thus designed to support the joint creation of insights and ideas. Therefore, it makes sense to study the brainstorm session as a process of creating insights and ideas involving talk, body posture, gesture, gaze and the handling of objects, including NOOT, in physical

space with conversation analysis as a methodology.

THE PRODUCT OF BRAINSTORMING

Related to the view that insights come into being in (social) interaction is a conception of ideas and insights on the one hand having the quality of processes that are playing out in time and thus to some extent are abstract or *impermanent*. On the other hand, however, ideas and insights may be seen as *outcomes* of these processes in the form of a record or records of that interactive process, which are material and thus *concrete* or *permanent*. The record may consist of several and different types of materials such as photos, video- or audiorecordings, prototypes, models or different types of written materials. In this article, *record* is used as an overall term for the material outcomes of a brainstorming session. These records, as Heinemann, Mitchell & Buur (2010) show, are constructed by and through interactive talk.

NOOT can be used to link written or drawn materials to an audiorecording of the interactive talk in a brainstorm session. This is done by placing a piece of paper in the slide of a NOOT. NOOT will send a signal to the audiorecording equipment, and make a sound. After a session, one will be able to directly access the recording of talk in relation to the creation of that written material, and thereby access information of how that material came into being. In other words, NOOT is designed to operate on the connection between *processes* and material *records*. The idea of NOOT is thus, that there is some type of direct relationship between the processes and the materials.

AIM

The aim of this article is to explore the relationship between processes and records further. More specifically, the records considered here are the written representations of ideas and insights. The processes concern what actually goes on in terms of talk and other meaningful behaviour in the brainstorm session. An interesting question for the analysis is to what extent, and how, the record of the brainstorming session, in this case an arrangement of post-it notes on a whiteboard, reflects the interactive process of brainstorming and to what extent it can be seen as representative of that brainstorming process.

SETTING

The brainstorm session takes place in a room that facilitates recording of the brainstorm in several ways: There is a square table with bar seats, and the walls around them are whiteboard walls, on which paper, drawings, photo's etc can be hung, and one can also write on these walls. On the table are stacks of post-it notes, other types of paper, writing and crafting materials and tools, and several exemplars of NOOT. There are possibilities for audio- and videorecordings in the room. For this brainstorm the participants are seated in a half circle around the table, with the facilitator opposite of them. The session is recorded on video from two angles, and, additionally, audiorecorded.

OBSERVATIONS - RECORD

The written record of ideas and insights that relate directly to this section of the brainstorm, is shown in the two photographs below.

The arrangment consists of these two constellations of paper and post-its which are place on the whiteboard wall next to each other (the constellation with 10-12 being on the right) with about 15 cm between them. The words on the post-it notes are written with different handwriting and to some extent with different colours. It seems thus that the recording, the actual writing of the different post-its, is demonstrably done by several individuals. No words are written more than once, which also points at some coordination.

Furthermore, this record of the session is not self-explanatory, i.e. in itself it is not easy to understand. The record, in other words, does not only provide a representation of ideas and insights that have come up in the brainstorm, but seems also to be intrinsically tied to the talk that produced that record. In this sense, the record may be helpful for future use for the participants of the interaction but not for 'outsiders'.

Figure 1: Post-it arrangment on the left side.

Figure 2: Post-it arrangment on the right side.

OBSERVATIONS - PROCESS

In the actual process in which the record is produced there is talk almost all of the time. There are in the 10 minute video clip few moments of longer silences. The post-it notes are written during this talk. Obviously, the words on the post-its are only a fraction of what has been said. Again, it is the relationship between what was said and what was written, which seems to be a central issue.

ANALYTIC QUESTION

Based on the observations then, the question for analysis becomes:

How do the participants come to a decision regarding which words will be in the record?

In principle, this question reflects the task the participants themselves face: To make sure that relevant issues end up in the record and irrelevant ones don't. Following conversation analysis, it is assumed that the participants have methods for dealing with that task. The remainder of the article will focus on a few methods that are employed. On the basis of 3 excerpts from the data, these methods are described.

PROPOSING 'WRITEABLES' IN A QUESTION

The brainstorms overall goal in the 10 minute clip is to get an overview of the specifics regarding the age groups that may be relevant for the development of a game. At the beginning of the clip,

the two larger pieces of paper representing to different age groups (6-9 yo and 10-12 yo) are on the board and several keywords on post-its are already grouped around it.
The participants in the clip seldomly just write something down on a post-it, say it aloud and then place it on the board, even though this is basically what they have been instructed to do. Instead, they *negotiate* whether something may be relevant to write or not (see also Heinemann, Mitchell & Buur 2010). The most pervasive form in which they do this is by posing questions and answering them.
The questions can be of different types. They may be designed to r*equest information* that may be written on a post-it as in the following example:

(1) Which grades/Video_NOOT/Jelle van Dijk
01 P: welke groepen zijn dat ook al weer=
=(dat) weet je wel toch?
which grades are those again
you know (this) right?

Excerpt 1, shortened version.

The questioner in excerpt 1 requests information,which the questioner actually may know, but just cannot recall. This is evident from the words 'ook al weer' *again*. By posing the question, a correct answer (if there is going to be one) is already beforehand implicitly proposed as a relevant item to write on a post-it. This view is supported by non-verbal behavior, since the questioner during the posing of the question already has his hands ready to start writing. Interestingly, as soon as a person offers something that can be heard as an answer to this question, the questioner repeats that answer and, simultaneously, starts writing as shown below in the full version of the excerpt:

(1) Which grades/Video_NOOT/Jelle van Dijk
01 P: welke groepen zijn dat ook al weer=
=(dat) weet je wel toch?
which grades are those again
you know (this) right?
02 A: groep zes: [eh::]
grade six [e::r]
03 P: [groep zes]
[grade six]
....[((P starts writing))]

Excerpt 1, full version.

So, in stead of P deciding by himself that it is relevant to note for each age group in what schoolgrades they are and starting to write that down, he seeks interactive support for doing so by asking the question. Implicitly, by providing an answer to that question, A confirms that this may be a relevant item to note down. This is thus one way of interactively seeking and getting support for items to be written on post-its.

PROPOSING 'WRITEABLES' IN AN ANSWER

Questions however, are not all of this type. Consider the following range of questions:

(2) Monkey business/Video_NOOT/Jelle van Dijk
01 J: hoe was jij toen je twaalf was
what were you like when you were twelve
02 (0.4)
03 J: hoe was jij toen je tien was
what were you like when you were ten
04 J: n hoe toen je zes was
n what when you were six
05 D: hh.(hh)e(h)
06 B: .(h)i(h)i
07 (3.1)
08 J: en wat deed je toen vooral.
and what did you do specifically
09 (3.6)
10 A: °oe:ff°
°gee°
11 (0.5)

Excerpt 2.

These questions are much more open-ended. They appear at a point in the session where not many suggestions are coming. The facilitator J has just emphasized that they should find more specifics for the two age groups and the range of questions thus have the objective to get the talk going again rather than that they should produce specific items to write on a post-it note.
Several (types of) answers may be possible. The questioner is seeking information but has not one specific type of answer in mind.
As is clear from what happens after the questions are posed, the other participants do not have answers ready for this type of question (notice the 'oe:ff' in l., which displays that at least one of the participants finds this question difficult to answer). Because of the open-endedness of the question, answers that are offered not necessarily have the status of being 'writeables'. Instead, participants, upon hearing an answer, may *subsequently* negotiate whether that answer is 'relevant to write' or 'not-relevant to write'. From the continuation of the interaction we see that, initially, one answer is received with laughter, thus pointing in the direction of it to be not specifically relevant to be noted down.

(2) Monkey business/Video_NOOT/Jelle van Dijk
12 D: ↓°kattekwaad° uithalen
doing monkey business
13 ((several people laugh))

Excerpt 2 continued.

D provides his answer after a long stretch of time in which nobody has offered anything substantial as an answer to the range of questions that J posed. He structures his answer as something not really serious, in a low pitch and volume. The non-seriousness is picked up by several people, who laugh at this contribution.
However, after/overlapping this laughter, J explicates in several ways that the answer is actually a candidate for being noted down:

(2) Monkey business/Video_NOOT/Jelle van Dijk
14 J: ja ↓goeie schrijf op
yes good one write down

Excerpt 2 continued.

Here J disregards the nonseriousness of Ds contribution and the laughter of the others.
First he produces a reassuring 'yes' then a positive assessment of the answer (goeie - *good one*) and lastly a direct instruction to note it down. Ds starts making movements to start writing as soon as the reassuring 'yes' is produced - taking up on Js assessment of his answer.
The interactants here thus deal with the task of establishing something as a 'writeable' in a very explicit way, J by producing a possitive assessment and a direct instruction and D by acting accordingly to this.
In the first type of question, the q*uestioner* has thought of something to be ratified as writeable, in the second type, it is the *answerer* that has come up with something that may be ratified as writeable. 'Writeables' may thus be proposed either in questions or in answers.

THE ROLE OF THE FACILITATOR

In this brainstorming session, the facilitator J seems to have a special role. This is apparent from the way the participants are seated, most of them fac-

Figure 3: Sitting arrangement in the room.

ing the whiteboard, whereas J is seated a bit away from them, and with his back to the board, in a way a teacher would be placed in a classroom.

Excerpt 2 also conceals this special role. In spite of several participants having laughed at the contribution of D, the facilitator J cuts through with a positive assessment of the offered answer, thereby categorizing it as a 'writeable', and the word ends on a post-it note on the whiteboard.

Also Excerpt 1 reveals that Js contributions are weightier than other participants'. The excerpt is shown below in an extended version. A has given a tentative answer to Ps question (l. 02). However, when in l. 04 A starts to correct his own answer, J gets into their conversation (l. 06) and starts offering what exactly may appear on a post-it note. The offering of information has the nature of a repair (Schegloff, Jefferson & Sacks 1977): it is specifying what P and A have been talking about in terms of which grades the age groups correspond to. By such a specification J to some degree ratifies the type of talk as relevant talk in relation to writing talk on post-it notes. In other words, by offering specifications of what A and P are talking about, J displays that he regards the *type* of thing they are talking about (how the age groups correspond to grades in school) as relevant for writing on a post-it even though the actual *content* (the actual grades) should be specified. This ratification is further supported by Js pointing at the whiteboard from line 06 and on. This pointing is interactively tying what goes on between J, A and P in the sense of talk and A's activity of writing to what is already on the whiteboard.

Note specifically the conclusive nature of Js line 10 and 14. He structures this contribution as the ultimative answer by initiating it with 'dus' *so* (l. 10) and the conclusive intonation in this turn.

Also, the 'repeat' of P's l. 13 can be seen as J not just ratifying the type of talk as 'writeable' but as treating A and Ps talk as merely allusive, while his own contribution is confirming the allusion (Schegloff 1996). Heritage & Raymond (forthc.) discuss answerers repetitions of polar questions (which in principle could have been answered with a yes) as moves that assert more authoritative rights over what is being confirmed than the questioner had conceded, specifically if this repetition is followed by a yes. In the case at hand, we see J making a related, if not similar move, by repeating P 's line 13 and postpositioning the 'ja' *yes*; even though it can be discussed whether l. 13 may be seen as a question, and even though l. 14 is not strictly a verbatim repeat of l. 13. In this excerpt, thus, J is clearly not only ratifying that talk is relevant for writing down, he is also correcting A and Ps talk and claiming authoritative rights over what has been suggested as 'writeables'. That the participants accept this can be inferred from what follows the excerpt. After this, no more versions of an answer are provided by anyone, and P starts writing down, while the talk is moving in a different direction.

(1) Which grades/Video_NOOT/Jelle van Dijk

01	P:	welke groepen zijn dat ook al weer=
		=(dat) weet je wel toch?
		which grades are those again
		you know (this) right?
02	A:	groep zes: [eh::]
		grade six [e::r]=
03	P:	[groep zes]=
		[grade six]=
		....[((P starts writing))] =
04	A:	=nee eh:: groep zes is
		=no e::r grade six is
05		(2.2) ((intervening talk from parallell interaction not transscribed))
06	J:	t:waalf is groep acht [hè:]
		twelve is grade eight [right]
07	P:	[(groep)]
		zes tot negen is=
		[(grade)]
		six through nine is=
08	A:	=twaalf is groep acht ja
		twelve is grade eight yes
09		(0.4)
10	J:	dus .h dus d- rechts is zes zeven acht?=
		so .h so d- right is six seven eight?=
11		en links is e:h
		and left is e:r
12	A:	Groep [drie za k maar] [zeggen]
		Grade three I'd kinda say
13	P:	[vier vijf zes]
		[four five six]
14	J:	[(drie)] vier zes ja
		[(three)] four six yes

Excerpt 1, extended version.

FORMULATION

Specifically if there is some talk on what the answer to a question could be, as in excerpt 1, one may make a distinction between the task of whether something of that talk should be written down and the task of what exactly should be noted down on the post it. This latter task can be subject to negotiation even after something has been written down as can be seen from the continuing of excerpt 1. When P has finished writing he takes his two post-its in his hands, gets up and moves towards the board. Then he turns towards the other participants and asks:

(3) Grades 2/Video_NOOT/Jelle van Dijk

01	P:	vier vijf zes (.) en zeven acht?
		four five six (.) and seven eight?
02		(0.3)
03		↓ehm
04		(0.7)
05	A:	wat?
		what?
06		(0.9)
07	P:	vier vijf zes (.) zeven acht
		four five six (.) seven eight
08		(0.7)
09	J:	ja
10	?	ja
11	A:	drie nee is drie vier vijf
		three no is three four five
12	J:	ja drie vier vijf
		yes three four five
13	J:	((walks to the white board and changes the writing on each of the post-its))

Excerpt 3 - following excerpt 1.

P is trying to make sure, just before his action becomes final in that he puts the post-its on the board, whether he wrote down the correct numbers. At stake is not whether it is relevant to have this type of information on the board, but whether it is correct. Initially, he gets a yes from J and one other person, but A interrupts and repairs orally what P has written. J then repairs the error in writing.

Some talk thus corrects what has been written on the post-it. Again, then, the task that the participants face (make sure that relevant issues end up in the record and irrelevant ones don't) are handled interactively. The content of the post-its, again, is thus tied to the structure of the interaction.

WHAT ENDS UP ON THE POST-IT

In some cases the information written on the post-it is simply the answer to the question (excerpt 2). In others, there is no straightforward correspondance between the answer to a question and what ends up on the post-it,

since the answer is being negotiated, as in excerpt 1.

Furthermore, one may distinguish between questions that ask for *in*formation to appear on a post-it note, and questions that ask for *con*firmation of something that is thought to be relevant. A question asking for *con*firmation is one like the following. J asks the question while both D and S are still writing post-its agreed on earlier:

(4) Sweethearts/Video_NOOT/Jelle van Dijk		
01	J:	en >bevoorbeeld< e::h eh eerste vriendjes en vriendinnetjes? zit dat hier ook al in
		and for example e::r first sweethearts-male and sweethearts-female does this apply here too allready?

Excerpt 4.

The answers J gets to this question are very reluctant:

(4) Sweethearts/Video_NOOT/Jelle van Dijk		
02		(1.4)
03	P:	°mm°
04		(0.4)
05	?	↓ m[mm:::]
06	P:	[tien twaalf]
		[ten twelve]
07	D:	tien tot twaalf=
		ten through twelve=
08	P:	=beetje t begin
		a little the start
09	D:	hang ik m in t midden hè
		I'll hang it in the middle right
10	J:	s heel belangrijk hè voor ze
		is really important right for them

Excerpt 4 continued.

The pause in line 2 is very long and indicates that the confirmation is not going to be prompt. In line 3 is a soft, and in l. 5 a stronger indication of what has been described as a non-preferred answer (Pomerantz 1984). Such answers do not follow what the question is aiming at as preferred answers - in other words, J is not getting the confirmation the question was asking for. P and D (l. 7, 8) both give a type of answer, but it is only partly hearable as confirming, and they produce it hesitanty. D, in line 09 actually leaves this line of thinking and returns to what he was doing just before this question was posed, i.e. placing the post-it with 'kattekwaad' *monkey business* (see excerpt 2)on the white board. This reluctant treatment of the suggestion as being a writeable could well have closed down the sequence here.

Now note l. 10. Here J emphasizes the importance of sweethearts for the agegroup, thereby providing a confirmation for his proposal, although the group as such has reacted very reluctantly on this. His line 10 has consequences for the record, since, possibly because of Js position as facilitator, P deals with it by asking another participant whether he is writing Js suggestion down:

(5) Will you write/Video_NOOT/Jelle van Dijk		
01	P:	schrijf jij dat o:p?
		are you writing this
02	S:	wat
		what
03	P:	°vriendinnetjes° ja wat schrijven jullie op?
		° female friends° yes what are you writing

Excerpt 5 following excerpt 4.

As it turns out, S is writing something else, and shortly after P himselfs starts to write on a post-it. Thus, although the group has not interactively agreed on this item to be on a post-it, and P himself has reacted to the question reluctantly, it becomes part of the record anyway.

Now, in Dutch, the phrase 'vriendjes en vriendinnetjes' may be interpreted as *sweethearts* or *boyfriends and girlfriends*, because it is preceeded by 'eerste' *first* in Js question in excerpt 4, l. 1. It is however, without a specifier such as 'eerste' *first* normally interpreted as the more neutral *male and female friends*. A look at the post-its reveals that what P ends up writing is the phrase 'vriendjes & vriendinnetjes' *male and female friends* i.e. a phrase that does not cover the meaning of the initial suggestion. The post-it thus neither reflects agreement in the interaction (the phrase was written although no participant other than the facilitator seemed initially to regard this as a writeable), nor what actually was said (a much less specific term than the one initially offered was written).

CONCLUSION, ANALYSIS

The analysis of the excerpts has shown that the task the particpants face - to make sure that relevant issues end up in the record and irrelevant ones don't - is managed in several ways. Some of the methods the participants have for dealing with this are explicit instruction, proposing 'writeables' in questions and ratifying these, or proposting 'writeables'in answers and ratifying them. An obvious task for future research is to take these initial insights on these methods and substantiate them further with analysis based on more data and on collections. One aspect that for example could be explored is not only considering what ends up on post-its but also how the actual arrangement of the post-its on the board reflect the talk in which it was produced. There are indications in the data at hand that there is a connection between the talk and the arrangement, but clearer documentation of the process and a larger corpus is needed to support an analyis of that connection.

It has been analysed how participant roles may play out in these methods. It would be interesting to see, whether the same, or other methods are employed dependent on the possible identities that participants bring to a brainstorm session.

Furthermore, it was shown that the actual words and signs on the post-its are directly tied to the talk. In some cases, the record directly reflects particulars of the talk. In excerpt 5, however, the post-it does not reflect agreed upon items nor what actually was said. One can of course question whether it is so important for the record to reflect the proces. On the other hand, records like this are thought to be useful in participatory innovation (Heinemann, Mitchell & Buur (2010)). Records may not be helpful in the process if some parts of it do not make sense, are not self-explanatory or may give rise to discussions on issues that were already discussed.

The analysis thus underscores the principle usefulness of NOOT: Records may deviate from what went on in the talk to the effect of them not being self-explanatory or even subject to be misunderstood. Linking records to processes may not only limit possible misunderstandings, but may also make it understandable for individuals who for some reason were not present in the brainstorm, but still are thought to take part in the participatory innovation process.

Furthermore, the analysis may be informative in relation to how NOOT could be used. If brainstorms by and large work in the way that questions are asked and answers negotiated to appear on a post-it, NOOT could be used for creating links every time a question was asked. A facilitator could

focus on asking questions and creating these links - thus dealing much more with NOOT - rather than directly partaking in the brainstorm. Finally, as the facilitator in this session asserts, it seems to be the case that brainstorm sessions can develop in very different ways. How NOOT is, and can be used will be dependent on what type of brainstorm session it is. This gives rise to further investigate NOOT and its functionality in participatory innovation.

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PARTICIPATORY PROVOCATION?

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ABSTRACT

In this paper I revisit the provotyping approach (Mogensen, 1992), and apply it in a participatory innovation setting (Buur & Matthews 2008). Through a case study within the field of indoor climate I describe the implications for the approach when it becomes part of a participatory innovation process, next to the opportunities it creates.

INTRODUCTION

Ever since the "users" became central to a design process, numerous design research methods have been developed to gather information and or inspiration of, from, and with them. Within the interaction design community, the use of materials to achieve this has been explored since the introduction of mock ups in the beginning of the 90's (Ehn, 1992), but gained in popularity after the introduction of cultural probes in the late 90's (Gaver, 1999). Different types of probes have been explored since then, all with their own foci, as for example empathy probes (Mattelmäki, 2002); technology probes (Hutchinson, 2003); primitive probes (Loi, 2007); and urban probes (Paulos, 2005).

A particular string of methods to gather information and or inspiration of, from, and with "users" through materials have been heavily inspired by the notion of Critical Design. The core idea behind critical design is *"to ask carefully crafted questions and make us think… its purpose is to stimulate discussion and debate amongst designers, industry, and the public"* (Dunne, 2001, p.58), which makes its application in design research understandable. The opinions and reflections of "users" hold the potential to outline design spaces and provide guidelines for design directions. Examples within this string are the Critical Artefact Methodology (Bowen, 2009) and Reflective Design (Sengers. 2005). Within this paper I will build on the idea of provocative prototyping, "provotyping" (Mogensen, 1992), which -though it was already introduced in 1992- has strong commonalities with critical design as well. Provotyping is trying to call forth and provoke people's understandings on a particular phenomenon and can be used to bridge initial phases of investigation and design practice. I will elaborate on the idea of provotpying in the next section, whereafter I will explain how this idea has been explored and demonstrated in a participatory innovation setting.

PROVOTYPING FOUNDATIONS

The idea of "provotyping" was posed by Preben Mogensen in his paper: *"towards a provotyping approach in systems development"* (Mogensen, 1992). Central concern in his paper is how to firstly devise *qualitatively new systems*, and secondly ensure their *usability* in a given practice. He takes the core ideas behind prototyping and activity theory as a starting point to reply to his concern.

Three characteristics of prototyping are described: prototyping is directed to *construction of the future*; it is a "*guess*" at a possible solution, therefore needing iterations; and it provides a *concrete experience* stimulating reflection on issues as usefulness or usability.

Activity theory, as interpreted by Yrjo Engestrom (Engestrom, 1987) is used to create a qualitatively new practice through understanding the current practice. In activity theory, different *levels of human agency* are distinguished: operations (how an activity is performed – for example writing individual letters of a signature), actions (what is being done – writing a signature), and activity (why you do it, including traditions, rules, and meanings in the situation – for example signing a contract). Furthermore, activity theory looks into the *mediated structure* of human action, and how activities are subject to both internal and external *contradictions*.

QUALITATIVELY NEW SYSTEMS

Mogensen's first concern is to develop qualitatively new systems. Typical prototyping aims at construction of the future, which addresses the "new" aspect - it is a sneak preview of that what

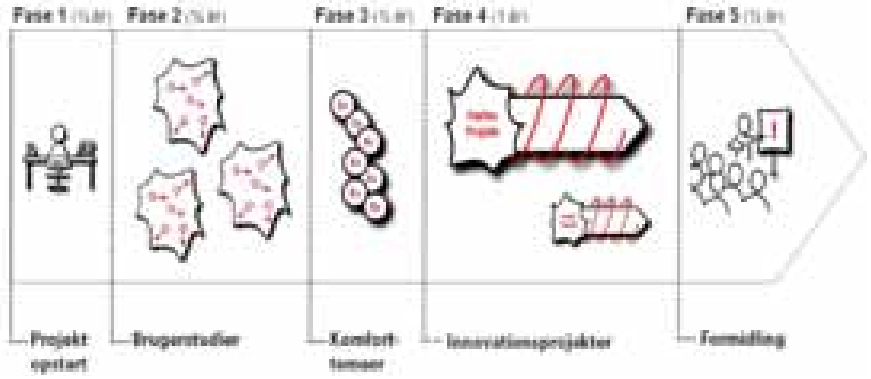

Figure 1: structure of the Indoor Climate project

could be. Activity theory in turn builds on how new activity areas can be discovered through the notion of contradiction. What are contradictions that prompted the development of a particular activity, and how can we elaborate the activity by exposing these contradictions? These elements from prototyping and activity theory can contribute to the development of qualitatively new systems.

ENSURE USABILITY

To develop usable systems Mogensen builds on the element of concrete, hands-on experiences that can be found in prototyping. Providing these experiences is a way to evaluate the usability of the system. Activity theory provides an instrument to understand the relationship between the individuals and the practice in which they are engaged. What, how, and why is the individual doing the practice in this way?

Combining prototyping and activity theory leads to Mogensen's proposition of exposing and elaborating on issues that are inherent to particular activities, in order to provoke, *through concrete experience*, that what is usually taken for granted.

Provotyping is intended to be used in between activities of initial investigation and design of the new; "*to find out what to develop*". It can be seen as a bridge between analysis and design: it uses discrepancies or issues found in the analysis of the current practice as starting points, and by exposing these it facilitates the construction of first 'guesses' in a development process. Through developing and deploying provotypes the system developer can on the one hand come to a deeper understanding of the analysis, and on the other hand provoke reflections on that what is usually taken for granted – and by doing so outline design directions.

Provotyping as proposed by Mogensen was mainly focused on software development and is closely linked to the traditional Human Computer Interaction field.

THE INDOOR CLIMATE PROJECT

The study where the core ideas behind the provotyping approach will be applied is part of the project entitled "Indoor Climate and Quality of Life". This project is facilitated by the SPIRE centre of the University of Southern Denmark (SDU), which has its roots in the "Participatory Innovation" approach (Buur, 2008), an approach that aims to *"overcome some of the practical organizational difficulties encountered when applying user-centred development practices in industry"*. This is illustrated well in the set-up of the Indoor Climate project: it is a collaborative project where 5 companies work together with 2 universities, of which one is SDU. The companies involved all deliver products or services related to the indoor climate, being windows, natural ventilation, mechanical ventilation, insulation, and quality consultancy and assurance of indoor climate. Furthermore, one university is broadly speaking interested in quantitative studies that concern the indoor climate – the scientifically measurable indoor climate, whereas SDU is more interested in qualitative studies concerning this aspect – the daily experience of indoor climate.

The aim of the project is to create new knowledge about people's experience and understanding of "comfort" in homes, offices, and institutions in order to demonstrate innovative indoor climate solutions which can improve people's quality of life and open up new development directions within the building industry.

The SDU conducted ethnographic studies concerning the indoor climate (Jaffari, 2009), and followed 5 families throughout the day at their homes, offices and institutions (more specifically the kindergartens). Interviews and observations were conducted at each of these places. Analyzing these studies led to the development of 6 so called "comfort themes": themes that provide an insight into the relation between indoor climate and a comfortable indoor environment, across the different field sites that were investigated.

One of those themes was *"bringing feeling, observing and understanding in tune"*, which outlines how people's perception on indoor climate is shaped through their experiences with it. The field studies showed that this is through interaction with trusted "experts" concerning indoor climate issues, and through experimenting with the often hidden system and its corresponding indoor climate experiences. It is about

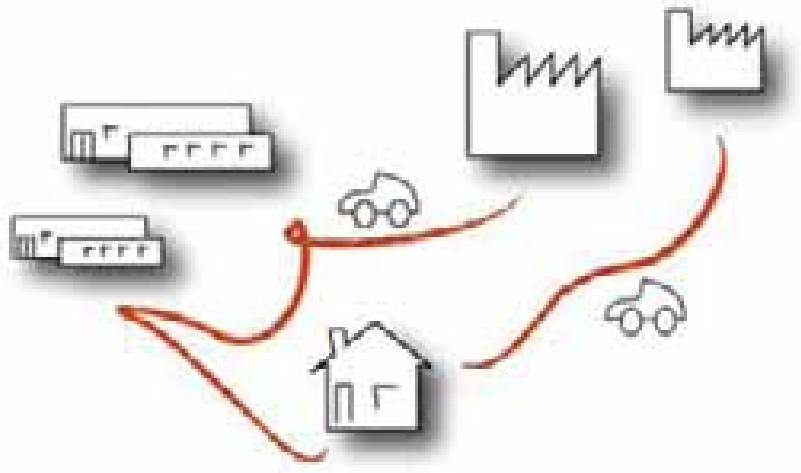

Figure 2: following families throughout the day

Figure 3: Sketch of the lamp with its 5 boxes

developing sensibilities concerning the differences between what is "told" the indoor climate is by for example measurements, and that what is experienced. The "comfort theme" instigated the development of the provotype: *how can the process of bringing feelings, observations, and understandings in tune be exposed and experienced in new and different ways?*

Within this paper I will focus on a case study with a provotype that was brought back to one of the participating families, and was deployed in their home for 9 days. The case study aimed to bridge the "research" part of the project and the part of the project where innovative indoor climate related propositions are demonstrated.

THE PROVOTYPE

One cluster of findings within the comfort theme showed that there appears to be a friction between that what is concretely measured about the indoor climate and that what is being experienced. This can be illustrated by the quote from one of the sites: *"it becomes the thermometer that determines if it's hot or cold"*, where the temperature meter became the point of reference to argue why or why not the temperature should be changed – where your experience of the temperature might tell you something different.

A provotype in the form of a lamp was developed to relate to these issues, and aimed to provide new ways of experiencing indoor climate measurements. What if indoor climate measurements are not presented in a set of numbers, but in one "holistic" view? How would this view be used as reference point? And would this instigate experimentation with the indoor climate in new ways?

The lights in the lamp were chosen to visualize the different indoor climate parameters, where the shape and colour of the lamp itself were minimalistic (white and square), in order to stimulate reflection on the lights rather than the lamp itself.

The core idea behind the lamp provotype is that it measures the most dominant indoor climate parameters temperature, humidity, sound, light, and CO2, and tries to holistically reflect this in the light the lamp shines. The lamp exists of the main lamp and 5 boxes that each measure one of parameter, and couples these to the properties of the light. To be concrete:

- the measurement of temperature is coupled to the colour of the light;
- the measurement of CO2 is coupled to the height of the light;
- the measurement of light in the room is coupled to the intensity of the light;
- the measurement of sound is coupled to the amount of lights that are shining around the height of the light
- the humidity measurement is coupled to the vertical angle in which the light shines

The boxes can be either placed in the back of the lamp, so all boxes sense at one place; or the boxes can be taken out of the lamp and placed somewhere in the room (and wirelessly transmit the measurement to the lamp). In this way exploration of the indoor climate is stimulated, which on its turn stimulates experiencing indoor climate in new ways.

Based on the comfort theme, we were interested in how the family would interpret the light and how they related to it. Would they try to relate the light back to that what is being measured, or would they couple the light to what is going on in the room and how you feel about the indoor climate. The lamp wasn't designed to serve as a moralistic object saying the indoor climate is good or bad; it was rather about the perception of the lights. Especially since people should have concrete everyday experiences with the lamp over a period of time, the lamp should serve like a clock: one view on the lamp shows the status of the indoor climate. What would happen if the light, and thus the indoor climate, *would not* change but the experience of it does? What if the light *would* change, but the experience of it not? Is the relation between the perceived indoor climate and the measured indoor climate fixed? Reflections on these issues by the family could call forth new ways of understanding indoor climate, which in combination with the lamp can be used to develop new design directions.

PROVOTYPE DEPLOYMENT

The lamp was placed at a Danish family consisting of two parents and 4 children for a period of 9 days. The family was involved in the projects' previous ethnographic field studies, so they were

Figure 4: the lamp provotype

Figure 5: the lamp provotype deployed

aware of the indoor climate project in the sense there was research going on about the phenomenon.

When the lamp was deployed, the family was told that the 5 boxes in the lamp each measured one indoor climate parameter, but no explanation was given which parameters were measured. This could increase engagement in exploration. The mapping would be "revealed" at the interview that would be conducted at the end of the trial.

The family chose to locate the lamp in the corner of the sitting area in the living room, in between two couches.

THE INTERVIEW

The interview had a semi structured character, and was conducted with the man of house by the three SPIRE researchers who also developed the provotype. One person shot video, one person conducted the interview, and one person made notes and supported the interviewer.

A set of materials supported the interview. Firstly, a "diary" of the positioning of the lamp and boxes was made: stickers were placed on a pre-made map of the house indicating where and when the lamp and the boxes were located throughout the week.

Secondly, a blank timeline of the week was provided, and the interviewee used it to reflect on the behaviour of the lamp throughout the week. When did which light shine, and what was going on at that moment? After finishing the exercise, a timeline of that week's outdoor climate was provided to instigate a discussion if relations with the indoor climate could be discovered. As a closing activity for the timeline, little text labels with a variety of emotions on them were provided, and the interviewee was asked to relate them to his moods throughout the week. Hereafter was asked if he could see relations between his moods and to the behaviour of the light at that moment.

Thirdly was discussed how the sensor boxes were connected to the behaviour of the lamp. After discussing the guesses of the interviewee the different types of sensors were revealed, and how they related to the behaviour of the lamp.

Fourthly, the reflections on the lamp were used to reflect on the actual indoor climate. Could the interviewee reflect on his understanding of indoor climate "through" the lamp? Were there discrepancies in his experience of indoor climate and the status of the lamp? As a final exercise the interviewee was asked to envision what an "ideal" indoor climate provotype would be like, in order to find out what he believed is of value within the indoor climate context.

RESULTS

The interviewee seemed to be generally interested in the indoor climate aspects and showed to have significant know-how about climate aspects. From the ethnographic studies was known that he part of a project that aims at saving energy, and has a mechanical ventilation system installed that ensures a stable temperature and air flow. The quotes from the interviewee *"I think the last two days the climate inside the house went from humidity about 60, 65 % to 35. And that is because the wind is from the north*", and "*And I can tell you that the lamp uses 13 Watts, as an average all the time, so that's actually not too bad. That's 119 Danish crowns for a year."* indicate the know-how and engagement with energy consumption.

Having the ventilation system installed made the colour of the lamp behave stable. (*"The last four days the colours have been more or less like this"* and *"It is actually 22 or 23 degrees all the time"*). When asked to draw the different lights throughout the week, the response *"you want to have the curves and the colours?"* indicated that the colour and height/position of the light were most noticeable.

Being engaged with the indoor climate seemed to evoke an explorative ap-

Figure 6: conducting the semi-structured interview

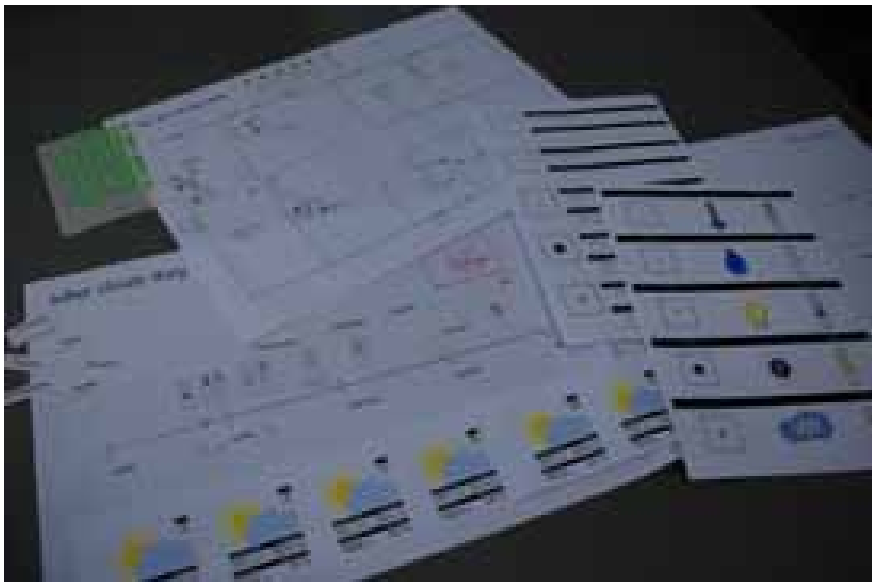

Figure 7: Supporting materials for the interview

proach towards the placement of the sensor boxes. The interviewee numbered the boxes and made notes on where the boxes had been throughout the week. Discovering which box sensed which parameter was perceived as a challenge and appeared to increase curiosity and engagement. During the interview was revealed which sensors were used and how they related to the light, which showed that 4 out of 5 sensors were guessed right, but two not in the right box. Sound wasn't considered as indoor climate parameter: *"Sound has not been an option for me I guess"* and *"Sound, I didn't think about that at all, I didn't relate it to the indoor climate"*. The measurement of sound was related to the amount of lights that were shining in the lamp, leading to an "a-ha" response: *"Of course that explains a lot about this, especially in the afternoon, because the kids are noisy"*.

The provotype was accepted in the home (*"It would actually be nice to have it a little longer"* and *"I wrote down here, in the start we got used to it quite fast"*) and the idea to visualize indoor climate through lights seemed appealing: *"There are so many things regarding comfort in the home space, it's not good to smoke inside and all these things. An indoor climate lamp, I think it is a good idea to let a lamp tell you what the climate is during the day and over a period of time. I would be interested in buying something like that"*. Though, since the interviewee is involved in energy savings he indicated that *"...somehow we could put in the energy factor… Everybody is talking about saving energy to protect our environment"*.

Furthermore it was suggested that further information about the light could be added in the form of for example a PC application, in combination with recommendations for changing the indoor climate.

CONCLUSION

How can the process of bringing feelings, observations, and understandings in tune be exposed and experienced in new and different ways? was one of the questions raised after analyzing the ethnographic field studies, which instigated the development of the lamp provotype. The provotype seemed to provide a new way of experiencing the indoor climate phenomenon by on the one hand providing measurement tools that aren't fixed to a location which stimulates spatial exploration, and on the other hand holistically monitoring the measurements in the form of a light.

During the deployment of the lamp it did not become a reference point for the family to discuss feelings about indoor climate, which on its turn did not lead to tuning understandings with the lamp. This could be attributed to the knowledge that the participant already had about indoor climate; the other points of references to indoor climate that were present in the context (being a humidity and temperature meter); or to the lack of opportunities to do additional experiments once the researchers revealed which sensor box measured which parameter.

Some reflections on indoor climate itself were provoked, for example concerning the sound aspect, but the reflection mainly concerned the new way of experiencing indoor climate. These reflections can instigate the development demonstrators of innovative indoor climate solutions and open up new development directions within the project. For example on aspects such as how, what, and why to communicate indoor climate to people. In that sense it can be concluded that the provotype was a first "guess" at this, and thus providing a bridge between analysis and design.

DISCUSSION

This paper described how the provotyping approach has been applied in a participatory innovation project. In the following section I will first discuss what the implications were in doing this, followed by ideas concerning who is actually provoked.

PROVOTYPING IMPLICATIONS

Some elements of Mogensens proposal were valued differently in this project. Mogensen used the provotyping approach from a system developer perspective. Within the indoor climate project, SPIRE mainly takes the role of facilitator rather than developer. The aim of the project is not to develop a complete qualitatively new system, it is rather to sketch and demonstrate potentials for innovative indoor climate directions. Thus the focus isn't on defining a problem (overcoming unwelcome situations), but on exploring opportunities (enabling possibilities). This means that the role of provocateur is perceived from a facilitator perspective: on the one hand supplying both companies and people from the ethnographic studies with the techniques to explore a range of possibilities themselves, and on the other hand provoke them in order to experience the indoor climate phenomena in a different way.

Furthermore, since Mogensen takes the system developer perspective, he aims at the experience of current practices in new ways to ensure usability. Within the project there is not a clear practice in play, since multiple companies are involved that all have their own products and services which can be practiced. Therefore the focus is on the indoor climate phenomenon as a whole, rather

than a specific practice. This shifts the focus from experiencing current practices in new ways into experiencing a phenomenon in new ways.

Four reasons can be mentioned why this adapted take on provotyping could have been or has been of value within the project: Firstly, it provided a bridge between the ethnographic studies and the demonstration of innovation potentials.

Secondly, taking a questioning approach could have provided a deeper understanding on why and how people are living with indoor climate the way they do. Providing a concrete experience in the context, enables people to reflect in the moment, rather than about moments (as for example in an interview).

Thirdly, climate is always present, which makes it something that is taken for granted. By calling this forth, you are making something "visible" that what was "invisible" before. In this particular project this can be seen both literally and figuratively, since we developed new experiences with the "invisible" indoor climate, by making it "visible".

Fourthly, the name "provotyping" still has strong connotations with prototyping, but communicates as well that its purpose is to "provoke" a reaction. We are in an innovation project where we deal with companies on the one hand, but have our own research agenda on the other hand. Provotyping is a name that has shown to be accepted in both arenas, since it has the practical component of prototyping; and a more theoretical component of provoking a reaction to inform and or inspire a design process.

PARTICIPATORY PROVOCATION?

People with different roles and aims are involved in the Indoor Climate project: researchers from two universities, company partners who all have their different background ranging from engineering to management, and the people where the ethnographic studies were conducted. Being a researcher and developer of the provotypes we can aim the provotypes either at the people that were involved in the ethnographic studies, but also at the company partners.

When we aim to provoke the people that were involved in the ethnographic studies, the starting point for the provotypes will be the findings from the studies. This preferably extends the understandings of these findings. The reflection on the deployment of the provotype, which will involve both the "users" and the researchers, could open up the design space for innovative indoor climate demonstrators and provide information and inspiration for the project.

We could also embody the findings from the field studies in a provotype that provokes the company partners, which could instigate a dialogue about the direction we actually want to go into with the project. An example of this type of provocation is described by Sitorus and Buur (Buur, 2007). Another way to provoke the company partners is by developing a provotype that embodies the discussions that arise when the different company perspectives in the project actually meet, for example the more technically minded with the more socially minded. Deploying these kinds of provotypes at the companies and reflecting on the experience of it in a project meeting could instigate a dialogue about the direction we actually want to go into as well. This application of provotypes is currently in development.

Participatory Innovation seeks to bring different stakeholders from a field together, in order to instigate an innovation process. In this paper I have attempted to show how the ideas behind the provotyping approach could support this process in bridging stages of analysis and design. I showed implications of the method and sketched on the one hand how findings from the ethnographic studies can be taken back to the field in a provocative manner; and on the other hand how these could also provoke company partners.

As researcher and provotype developer I also felt that my understandings were provoked during the provotype studies, since they provided me with new thoughts and perspectives on the indoor climate. In that case, could we speak of a process of participatory provocation between stakeholders of a participatory innovation process?

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A COST OF RELEVANCE PREFERENCES DURING POST-PROVOTYPE DEPLOYMENT INTERVIEWS

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ABSTRACT

This work examines the interaction between a researcher-interviewer and a homeowner at the end of a short provotype deployment at the family home. Particular attention is paid to a period in the interview when the interviewee's contributions temporarily diverge from the interviewer's plan. An interpretation of the incident is offered which accounts for what takes place as an urge towards relevance operating at the narrative level – i.e. making sense of a sequence of interview activities - and at the social interaction level explained in terms of local conversational topic relevance.

INTRODUCTION

This contribution to the *Making Design and Analyzing Interaction* track looks at part of a video recording of a semi-structured interview between a researcher and a homeowner at the end of the (9 day) deployment of a provotype in his family home. The interview is part of a study facilitated by SPIRE which brings together a number of stakeholders in the *Indoor Climate and Quality of Life Project*. During the interview a series of activities, supported by various materials, encourages the homeowner to talk about the provotype itself, the experience of having it in the home, and matters related to the project's general aims. In examining an interview such as this we might say that a line of questioning, and any materials to support elicitation are 'successful' when the researcher-interviewer 'gets back' from the interviewee the information s/he is seeking. If we accept this as a criterion of utility then we see in the video recording a mixed outcome from the interview.

This paper pays particular attention to one part of the interview where, despite the researcher's question and the supporting materials he proffers, the homeowner addresses a different issue from the one raised by the interviewer. The paper suggests a possible way of accounting for this situation, drawing inspiration from a prior study by Matthews concerning the intersection of the rules of engagement for a particular type of interaction (brainstorming) with the rules governing social order. Matthew's insights are outlined below following presentation of the interview data and the approach to analysis of it. This is followed by a discussion of what might account for the route the interview conversation takes as it temporarily deviates from the researcher's intentions. The paper concludes with some comments on implications for the planning of interviews which comprise a series of conversational activities supported by a collection of (different) materials to prompt elicitation.

MOTIVATION, DATA AND METHOD

The motivation for this study is to contribute to the aims of the conference track, namely to inspect some aspect of *tangible activities* of making 'to investigate whether some of these activities serve particularly well in certain contexts or at certain stages of the process'. Tangible activities of making are defined by the track organizers to include prototyping, provotyping, and generative toolkits, amongst others. However the data available for this study, although its context is the deployment of a provotype, concerns particularly the activities and materials combined together in an interview setting to elicit information from a participant at the end of a provotype deployment. For the purposes of this study, therefore, tangible activities are considered to include the materials-supported interactions that together comprise the end-of-deployment interview. The recorded part of the interview provided for analysis covered the activities shown in italics in the interview structure description provided in figure 1. This comprised a 45 minute extract from the 75 minute interview. The complete description of the

interview in figure 1 is taken directly from material supplied by the maker to the analyst to assist understanding the interviewer's plan, the interview structure, and the wider context of the project within which the provotype deployment played a part. The provotype consists of a lamp (referred to in figures 1 and 2), and a set of five detectors, each sensitive to different environmental parameters, e.g. CO2, light and sound levels. These detectors are wireless, independent units that can be placed around the home, each one influences the illumination behaviour of the lamp in some way, e.g. colour, size and orientation of the light emitted. The homeowner has not been told what the detectors sense, nor anything about their separate influences on the lamp (see paragraph 3 in figure 1).

The organization of the semi-structured interview as described by the 'maker'

Firstly, a "diary" of the positioning of the lamp and boxes was made: we brought a pre-made map of the house with us, and placed stickers on the places where and when the lamp and the boxes were located throughout the week.

*Secondly, we made a blank timeline of the week, and reflected on the behavior of the lamp throughout the week. When did which light occur, what was going on at that moment? After a period of time we added the outdoor climate throughout that week to the timeline, and discussed if relations could be discovered. *Hereafter we provided stickers of different moods, and asked if he could relate them to his moods throughout the week; and to the behavior of the light at that moment.*

Thirdly, we discussed how the sensor boxes were connected to the behavior of the lamp. After discussing his guesses, we revealed the coupling of the different sensors that were used, and how they related to the behavior of the lamp.

Fourthly, we tried to bridge from reflections on the lamp to reflections on the indoor climate. Could he reflect on his understanding of indoor climate "through" the lamp? Were there discrepancies in his experience of indoor climate and the status of the lamp?

Fifthly, we tried to envision what an "ideal" indoor climate provotype would be like, in order to find out what he believes is of value within the indoor climate context.

Figure 1 Account of the interview activities, materials and themes for questioning.

In situations such as the set up (maker-analyst pairings) for this themed track, data and orientation towards it precedes choice of method and data analysis. This is becoming increasingly less unusual given the rapid recent growth in enthusiasm in design research for analyzing common datasets and other similar arrangements which attempt to make comparative analysis a possibility (e.g. DTRS7 (McDonnell and Lloyd 2009) and the NSF workshop on studying software design practices (NSF 2010) are two recent examples in which the author has participated). Here, as in the cases of distributing a common dataset, the analyst is presented with the data first and is invited to construct an interpretation of it in relation to some theme(s), rather than commencing with (say) a research question and addressing it by subsequent gathering of data. Thus, the approach to this study was as follows. The author-analyst initially viewed the video recording repeatedly, bearing in mind the track theme. This led to the identification of an incident during the interview where the interviewee's contribution began to diverge from the interviewer-maker's plan for the conversation. A more detailed study of the conversational interaction around this point in the interview ensued. This was supported by some transcription, including that shown in figure 2, which will be referred to in the interpretation below. The incident (the point where the transcription in figure 2 occurs) takes place at the stage of the interview marked with an asterisk in figure 1.

INTERSECTIONS OF 'RULES'

In a recent study Matthews examined the conversations during brainstorming meetings taking place in the early stages of a design project (Matthews 2009). He paid close attention to how the 'rules' of social interaction intersected with the rules of brainstorming which have been devised specifically to support effective generation of new ideas. His analysis focuses particularly on three aspects of how social order is regulated which might interfere[1] with the rules of brainstorming, namely the ways in which, in verbal interaction, relevance/topic shift, interruption/turn-taking, and criticism are handled. It is not possible, or appropriate, to summarise the study's findings here. But in the discussion, Matthews draws attention to the fact that although there are many different forms of interaction - brainstorming sessions and interviews being two - to be recognized by participants as meaningful interaction of any kind, all such forms of interaction rest on shared practices which regulate social order. As Matthews writes, 'there are no time-outs from social order', however this does not imply necessarily that the rules of social order are deterministic (op.cit. p.46). In the account of the interview material below, parallels are drawn (for the form of interaction: semi-structured interview) with these observations from Matthews (given in the context of his study of brainstorming): 'orientations to the rules of social order are not suspended on account of the rules of brainstorming … the rules of brainstorming do have an effect on the proceedings, though it may be a milder effect – and one severely modulated on account of social order – than is typically assumed.' (op.cit. p.46).

What is presented below is an interpretation of the selected incident which looks at the compulsion to relevance at two levels to see how persisting with relevance might account for interference with the interviewer's objectives. In particular, the interpretation proposes to account for the interviewer's response to the interviewee's deviation from what the interviewer wishes to discuss (local topic relevance) and also, operating at a different level of granularity (narrative relevance) to account for the interviewee's (mis) orientation.

INTERPRETATION OF THE INCIDENT

NARRATIVE RELEVANCE

Looking at the description in figure 1 we see the first activity in the interview is about describing (the position of) the lamp. The second is about describing (the behaviour of) the lamp throughout the week, the next is about describing (the behaviour of) the lamp in relation to the weather during the 9 days the lamp was in the home. All goes well until this point . The intention after this point is to shift attention from the householder recalling what the lamp was doing or where it was to what he, and his family were doing, specifically what their moods were during the week, the subject of the recollection task thus shifts from the lamp to the home-dwellers. This is the shift that the interviewee does not make successfully (i.e. interviewer's plan and interviewee's contribution are no longer aligned). What may be happening here is that the interviewee is making (his own) sense of the series of tasks he is asked to undertake – constructing a narrative for himself in the absence of being 'handed' a narrative into which to fit the sequence of activities by the

interviewer. He has to do this dynamically as the interview session proceeds and thus may be making use of local relevance (of next to previous task) as a sense-making strategy. If relevance is operating here it is not of-course at the same level of granularity as that interrogated by Matthews in the work referred to above, it is relevance as a story. We now look at topic relevance at conversational topic level.

LOCAL TOPIC RELEVANCE

The transcript in figure 2 starts at the beginning of the divergence incident. The interviewer, L, at turns 1.2 and 1.4 tells the homeowner, F, about the stickers of different moods he has placed on the table whilst F was absent from the room for a few moments. In turn 1.6 he makes the moods the subject and asks whether the moods relate to the lamp, '*when you think of these + moods ++ does some relate to the lamp*'. F starts the activity before L has finished his turn and does apparently respond (turn 1.7) with mood/activity (as described by L in turn 1.4) related to the lamp, '*+ we are doing a lot of things and I think it also reacted onto the +*', the pause allows L to take a turn (turn 1.8) interrupting F's turn but not his speaking. However once F has placed the label on the timeline (turn 1.9) it becomes clear that he is actually using the mood labels to describe the mood induced by the behaviour of the lamp and not the behaviour of the lamp as a possible response to mood. So that by F's turn at 1.17, '*+ it was very relaxed and calming in the evening*' it is clear that the '*it*' is the lamp, and the homeowner and his wife (turn 1.19) are the ones becoming calmed.

How does the divergence come about? It may be that the interviewer has failed to signal strongly enough that he is invoking one of the 'rules' of the interview format for interaction – namely that the interviewer will change topic from time to time disrupting/overruling the topic relevance rule of conversation. Interestingly, the interviewer shows reluctance to override topic relevance himself in the exchange which follows the point at which it is clear that F is using the mood stickers to describe his mood in response to the lamp's behaviour. Instead of correcting F, L follows the topic relevance rule himself joining in with F's (incorrect) interpretation of the task (conversation topic) by offering a suggestion as to what mood the lamp might have invoked in the homeowners (at turn 2.1) with, *'like for example the opposite would be annoyed'*. From the transcript we can only see that L continues on F's topic we cannot infer his motives or know whether at that moment he is aware of the divergence. It may be he does this consciously – as a politeness - or he may be doing it unconsciously as he exercises his conversation skills (for maintaining social order). However L does appear to be aware that F has gone off plan shortly afterwards, as L does try to return to his planned agenda once (about two minutes after the extract in figure 2) but the moment has passed for collecting this material and after two more minutes it is time to move on to the next activity (paragraph 3 in figure 1).

1.1		[*F returns from an interruption and L briefly summarises what they had just finished doing when F left the room. While F was absent the mood words have been placed on the table beside the timeline of the week. F is looking at the mood words*]
1.2	L	yeah we made these small yeah just + things we thought that could have the situation be like
1.3	F	er [*gaze still towards mood words*]
1.4	L	like energetic for example when the children were playing or + er maybe someone was sneezing or it was busy
1.5	F	uhuh [*gaze still towards mood words*]
1.6	L	or it was + a bit relaxed in the evening and + when you think of these + moods ++ does some relate to the lamp or situations relate /to the lamp\
1.7	F	/I would say that experimenting \ was the first two days it was + we are doing a lot of things and I think it also reacted onto the + +
1.8	L	ok so you /saw\
1.9	F	/how it\ how it changed a lot over |/here\ | [*places a mood label on the timeline*]
1.10	L	/yeah\
1.11	F	how it changed a lot it goes maybe it should be like this | |[*starts to unstick the mood label to place it further along the timeline of the week*]
1.12	L	oh it doesn't work oh I don't think you can get it off + or does it work
1.13	F	[*peels off label*]
1.14	L	oh it does
1.15	F	that's nice + the first two or three days it was like that +
1.16	L	uhuh
1.17	F	again in general I think it was + I would think it was er what did I see |++ |[*looks at the collection of mood stickers*] it was + that it was very relaxed and calming in the evening the first two or three days I would say it was like that if you had six or seven of |these [*referring to the label he has just placed and* | *gesturing over each of the days on the timeline of the week*] I would say
1.18	L	[laughs with other researchers]
1.19	F	and my wife also because she was really sceptical … [*continues*]
		[*L now goes along with this interpretation of the task – as to be to identify the mood induced by the lamp not the reflection of moods in the lamp – which was L's intention*]
2.1	L	like for example the opposite would be annoyed
2.2	F	yeah
2.3	L	would that have been in the beginning or
2.4	F	no I it I would not say annoyed it was curious … [*continues*]

Figure 2: Two transcript extracts: total duration (1.1 - 2.4) approx. 90 seconds.

DISCUSSION

ASSESSING THE INTERPRETATION

The interpretation given above proposes that our essential need to make sense of experiences to the point of creating a coherent narrative when one is not explicitly communicated to us (narrative-level relevance making) and

the topic relevance 'rule' which operates as part of the set of rules governing social interaction are one way of accounting for the divergence, and failure to realign interviewer's plan with interviewee's contribution in the data studied. There are other plausible possibilities. For example, it may be that the cues from the interviewer (turns 1.2, 1.4, and 1.6 in figure 2) do their job effectively but are confounded by some mismatch with the prior uses of the materials being used in the session. At the time of the incident the timeline described in paragraph 2 in figure 1 has been established as the place to reflect on and record the behaviour of the lamp, this may be persisting/ being carried over from the tasks where it is first used to all the ones that follow, and therefore is not seen by the interviewee as also a location for recording reflection on his own moods and activities during the week (alongside the ever present behaviour of the lamp).

Equally plausible is that there is a subtle cue sequencing cause of the 'problem'. It is while F is absent that the mood words are set out on the table. When he returns he begins to look at these *before* and while L begins to explain the next task (at 1.2, 1.4 and 1.6). Perhaps F has already made his own narrative sense of how the new materials fit with the previous activities and this persists 'despite' L's instructions. In other words perhaps F is hearing but not listening (despite 1.3 and 1.5)!

However, despite these alternative possible accounts, perhaps there is enough in the relevance account to prompt a discussion in the workshop. Matthews' work on the intersection of brainstorming rules and the rules of social interaction are certainly recognized by him to have implications for understanding better what actually happens when designed forms of interaction confront the rules of social order that make them possible at all.

By implication, such understanding would inform design of better forms of interaction for specific purposes, and provide guidance about engaging effectively with the ones we already have.

In the situation from which the data used here is drawn, the interviewee is being asked to engage in a series of recollection tasks which are recognized to be sufficiently challenging that a collection of materials has been devised both to support him in doing this and to record what is elicited. Within the collection of activities and the associated materials that together support the interview some may build on others in a sequence, others may not be linked sequentially but may be independent and interchangeable in terms of when in the interview they take place. Whatever may be the interviewer's rationale for the set of activities and the ordering of them, in putting the activities together in a sequence interviewers should be aware, firstly, that interviewees have their own need to make sense of the experience (of the interview as a whole). This may result, inadvertently, in the construction of a narrative by the interviewee that does not serve the interviewer's objectives. Secondly, at the finer level of granularity, as Matthew's more comprehensive and thorough study has shown for brainstorming, the purposes of the particular interaction (here a semi-structured interview supported by activities with materials) may be confounded by the compelling, more fundamental demands of the rules of any social interaction (here local relevance of one turn to its neighbours) unless strong signals are provided which set aside social conversational norms.

CONVERSATION AND INSTITUTIONAL TALK

In studies of talk-in-interaction, much is made of the differences between institutional talk of various forms and what is sometimes referred to as naturally occurring conversation. Definitions are somewhat slippery as natural conversation is often defined as not being something else, e.g. a job interview. Schegloff (1999, p.407) differentiates conversation from other types of talk-in-interaction as, 'talk which is not subject to functionally specific or context-specific restrictions or specialized practices or conventionalized arrangements'. By this definition, the data analysed here is not naturally occurring conversation, on the other hand what is going on is not a conventionalized arrangement to the same extent as, say, a courtroom interrogation or many other formal interview situations. The semi-structuredness of the semi-structured interview based around a series of activities to explore the concrete experience of living with the provotype (lamp) is not a designed form of interaction that fits particularly well the definition of institutional talk. Institutional talk conforms to specialized turn-taking according to institutional context (e.g. the class room, the doctor-patient consultation, emergency call making).

Heritage (2005, p.106) identifies three characteristics defining institutional talk. First, 'the interaction involves goals that are tied to institution relevant identities'; here we might identify these as the researcher/provocateur and the target of the provocation, the 'provokee'/provotype experiencer. Second, 'the interaction involves special constraints on what is an allowable contribution to the business at hand'; here we might say the researcher asks the questions and sets the agenda for the activities, the provokee does his best to answer and to engage with the materials, but in talk-in-interaction terms there is considerable scope within this e.g. for the provokee to ask questions, to volunteer material he is not being invited to produce and so on (again in contrast to a courtroom setting for example). Third, 'the interaction will involve special inferences that are particular to specific contexts'; this one is even less cut and dried for our participants (compare for example with Heritage's example which is the inferences from the marriage ceremony of certain participants saying certain things in a particular setting). The semi-structured interview is something the homeowner has agreed to take part in as a conclusion to the provotype deployment period. Both participants are fulfilling obligations to the context in this talk but it is less clear what they believe the special inferences to be and that these are shared (conventionalised). Heritage describes institutional talk as 'drastically different from ordinary conversation' (op. cit. p.111) and illustrates this with, among other things, examples of how doctors avoid showing surprise as patients supply information (registered as 'okay' in preference to 'oh' for example). Our participants' interaction seems to be somehow in between institutional talk and natural conversation. Looking at the setting, we see that the interviewee, the homeowner is in

his own house, he is comfortable about dealing with an interruption (going off to answer the door), he is at ease – literally on his own home ground.

The participants are sitting in the living room in comfortable chairs at a low table, and so on. The interviewer, unlike a doctor in a doctor-patient consultation, is able to respond to information supplied by the interviewee with surprise without compromising institutional identity (again contrast with surprise as a discouraged response in doctors' training according to Heritage). The provotype set-up itself is entirely about provoking new ways of experiencing that (indoor climate) which is otherwise unexamined, taken for granted. It is a semi-structured interview with someone who has participated in ethnographic studies for the *Indoor Climate and Quality of Life* project; he is technically knowledgeable and well informed. For example, he uses a meter to measure energy use of devices in his home and surprises and delights the researcher with information about the energy usage of the lamp itself. It therefore isn't clear that either party is working hard in the interaction to talk the other into being in an institutional role (as provoker/provokee in a parallel sense, for example, as that described by Oak (2009) in her analysis of the performance of architecture through the construction of the roles of architect and client).

Again, there are parallels with Matthews' study of the brainstorming session. The sessions he analysed were criticised by other analysts as 'not being good examples of brainstorming' (Matthews, op.cit. p34) because the participants apparently did not conform to the specialised rules of that interactional genre, partly complying with the definitions of institutional talk whilst at the same time by no means engaging in natural conversation.

The activity-supported interview concluding the provotype deployment seems to be from a similar genre; neither a natural conversation nor institutional talk. The consequences for designing forms of interaction of which will be unfamiliar, semi-formal *by design* - to meet particular elicitation aspirations - opens up a whole range of interesting questions.

ACKNOWLEDGEMENTS

The author thanks Laurens Boer for making the interview data available for inspection and for providing other materials to explain the broader project context of the video recording including the material shown in figure 1.

NOTES

[1] *Interact would be less pejorative, neither are terms Matthews uses as his study is more nuanced than either of these cruder terms would suggest.*

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INTERSUBJECTIVITY: INTERACTIONAL TROUBLE SOURCING AND 'PROBLEM' PICTURES

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ABSTRACT

This paper deals with the notion of intersubjectivity in workshop activities. The analysis suggests that because participants need not be engaged in the same activities simultaneously, they are unable to monitor each others activities and contributions within the workshop at all times. As a result, misunderstandings, disagreements, lack of understanding and other breaches of intersubjectivity are not necessarily solved instantaneously, which in turn may lead to the forming of fuzzy concepts for design, a fuzziness that then later has to be resolved in order for the participants to reach a joint understanding of the outcome of the workshop.

INTRODUCTION

In institutional settings various types of workshops are often encountered. Whether based on product development, networking, idea generation or the like, one aim of such workshops is to engage all participants in a joint collaboration and a joint process. We somehow expect that at the end of such a process, there will be a result and if the process is collaborative, then the result will also be jointly constructed. Research in workshop activities has shown that participants do collaborate and orient towards a joint collaboration (Heinemann et al 2009) and that such a co-operation is a highly coordinated vocal and nonvocal interaction, which includes both objects and space (Landgrebe and Wagner forth.). A condition for participants to jointly engage in a task, however, is that they have reached the same understanding, or in fact have reached an understanding at all.

This paper illustrates that this may not, in fact, always be the case. Based on the theory and method of Conversation Analysis (Garfinkel 1967; Heritage 1984a; Schegloff 1984), I draw on video data from a workshop activity to show how participants in certain aspects fail to reach joint understanding. Thus, this paper aims to illustrate how this can be traced back to the first signs of potential interactional trouble, and how this failure is ultimately displayed in the interaction. Hence, I follow this trace sequentially to show how the trouble accumulates and how joint understanding is not restored for a certain time span during their workshop activity.

BACKGROUND

There are four participants (referred to in the remainder of this paper as A, B, C and D) in the workshop group. The group' s task is to develop concepts, which focus on new ways of doing school sports. For this purpose, they are building a model, which they divide into three dimensions; the individual, the group and the society, respectively. The individuals are represented in the inner circle, the group in the middle circle and society (what the participants refer to as 'structure') in the outer circle. Figure 1 depicts the model with the three dimensions.

While simultaneously engaging in defining concepts, the participants orient to the physical construction of the model, the task of adding pictures onto the three dimensions, attaching green labels to the cardboards etc. However, the focus for the remainder of this article is the interaction involving the conceptualisations in the latter dimension; society. Within this dimension, four of the concepts are (early on) well defined, whereas no 5 and 6 are (later on) tentatively formulated as illustrated in figure 2.

The first four conceptualisations are introduced by participant A. Simulta-

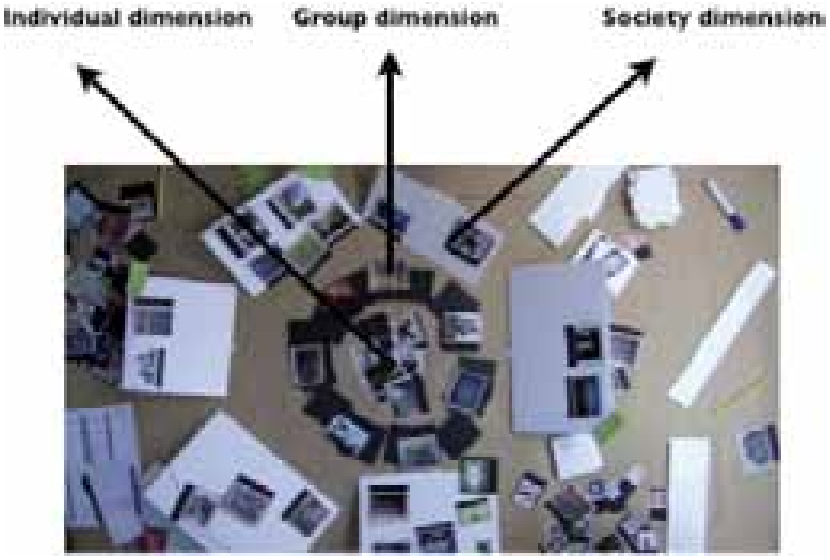

Figure 1: the model, with three dimensions.

neously with an introduction, A places a picture on to each relevant white cardboard. A performs this task while the three other participants are mainly orienting to constructing the physical model and adding pictures. None of those four concepts are later on challenged, which suggests that pictures can be used as resources identical to material objects in workshop activities (Landgrebe and Wagner forth.).

By contrast, cardboard no 5 is introduced (also by A) in a much less precise fashion, as "challeng- this is also something about nature", and without the simultaneous positioning of a picture on the cardboard. At the point at which this is done, none of the co-participants exhibit any trouble with the less precise "something about nature", but as we shall see in the analysis of subsequent sequences within this workshop, cardboard no 5 and its accompanying "fuzzy" concept will turn out to cause problems for the participants in terms of mutual understanding and agreement.

DATA AND TRANSCRIPTION

Kim Sandholdt, Roskilde University, has kindly allowed access to the data for the purpose of subjecting it to a CA-analysis. The transcription conventions employed are originally developed by Gail Jefferson (Jefferson 2004), and adapted to the CLAN transcript system and the CLAN software (MacWhinney 2000).

LITERATURE AND THEORY

The research methodology employed for this paper is conversation analysis (CA), the systematic analysis of talk-in-interaction (Sacks 1984). CA is based on transcripts of naturally occurring interaction on video or audio and is used for the analysis of both mundane interaction as well as institutional interaction (Hutchby and Wooffitt 2008). Institutional CA examines the work of social institutions (Heritage 2004).

Drew & Heritage (1992, p. 22) argue that in institutional interaction, participants orient to a core goal or task. In the pursuit of orienting towards such a core goal or task, the notion of intersubjectivity i.e. achieving common understanding among interactants is vital (Femø Nielsen and Beck Nielsen (2005:111-112). In interaction a breakdown of social order is uncommon, and when it does occur, participants jointly try to solve this matter and re-establish social order at the least cost to all participants (Schegloff 1992; Pomerantz 1984; Emmertsen and Heinemann 2010). Hence, one could expect that the participants in this workshop monitor their co-participants for potential breaches in intersubjectivity (Clark and Krych 2004), be it in terms of misunderstanding, lack of understanding, or disagreement. However, conversational mechanisms and social structures are sensitive to the number of participants in a group (Sacks et al 1974) and the way affiliations are formed (Goodwin and Goodwin 1990; Lerner 1993; Egbert 1997).

With participants of four (or more), the conversation may split up into two (or more) conversations. This practice is referred to as schisming (or schisms), originally coined by Sacks et al (1974). One particular type of schisming is the schisming-inducing turn (a SIT) (Egbert 1997). When initiating a SIT, a participant produces a shift in topic or action, and establishes a new conversation with one or more participants, while others continue the prior conversation. This is a phenomenon overwhelmingly present in the data examined in this paper. And as I hope to illustrate in my analysis, such schisms may result in participants failing to monitor co-participants' talk and actions because they are themselves engaged in concurrent, but divergent activities. First I describe a sequence of the workshop activity in which we see the first signs of potential interactional trouble sourcing after which I describe how multiple conversations (schisming) and activities may cause interactional trouble and how this trouble may accumulate, because the participants do not orient to maintaining, monitoring or restoring intersubjectivity in situ. I will finish by describing a sequence in which trouble accumulates and illustrates a visible break down of intersubjectivity towards which the participants accordingly orient to.

ANALYSIS SECTION

THE FIRST INTERACTIONAL TROUBLE SOURCING

The first signs of potential trouble emerge in the stretch of talk after which A has vocally defined concepts for the cardboards and placed pictures onto some of these (though not no 5).

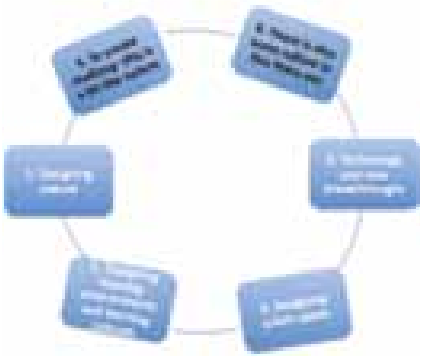

Figure 2: The initial six conceptualisations in the society dimension (the conceptualisations have been translated into English; source language is Danish). The numbering illustrates the sequential order within which the concepts are initially vocally introduced.

While A was engaged in this activity, the three other participants engaged in various other activities such as constructing the model, adding pictures, debating various issues concerning the model, as well as engaging in talk unrelated to the ongoing tasks. While some of B, C and D's activities may thus have been directed at constructing the model, just as did A, the following extract suggests that not all of them have been able to monitor A's activities at the same time. Thus, in line 254, B explicitly asks for an explanation of the different concepts (dimensions).

254 *B: så- de her dimensioner↘ er der noen der li ka forklare→
255 (0.3)
256 *A: jamen jeg tænkt vi ku- å så ku vi begynd å::: gruppere ik≈+
257 +≈fordi jeg har e:n (.) jeg tænker der enlig er en her der
258 handler om at designe naturen↘
259 *B: jaer↗
260 (0.8)
261 *A: å her er en der handler om designe ø:h- læringsmiljø å
262 læringskulturer
263 (0.2)
264 *B: u:hm
265 (0.2)
266 *A: her □er noet omkring (.) d□esigne (0.4) byrum
267 *D: □det designe byrummet ikk□↗
268 (0.4)
269 *A: å her er noet omkring (0.3) teknologi og nye
landevindinger↘
270 (0.2)
271 men jeg ved ik- det er bare mit bud
272 (0.2)
273 *C: ja↗er↘
274 *B: u□:hm□
275 *A: □det her□ op å skabe udfordr- (.) det ligger lidt op a
naturen↘
276 *UNK:°□nå:↗eh□°↘
277 (1.0)
278 *A: ø::h men (.) ku man (0.4) □s::kri::ve□

Translated:
254 B: so- these dimensions here↘ can someone just explain
255 (0.3)
256 A: yes but I thought we could- and then we could start to::
group right≈+
257 +≈because I have o:ne (.) I am thinking there is actually
258 one here which is about designing nature↘
259 B: yes↗
260 (0.8)
261 A: and here is one which is about designing u:h- learning
environment
262 and learning cultures
263 (0.2)
264 B: u:hm
265 (0.2)
266 A: here⌈ is something about (.) d⌋esigning (0.4) urban space
267 D: ⌊this designing urban space right⌋↗
268 (0.4)
269 A: and here is something about (0.3) technology and new
breakthroughs ↘
270 (0.2)
271 but I don't know↗ this is just my suggestion
272 (0.2)
273 C: ye↗ah↘
274 B: u⌈:hm⌉
275 A: ⌊this here⌋ up about creating challeng- (.) it is a bit like
nature
276 UNK: °□**o::↗:h**□°↘
277 (1.0)
278 A: u:h but (.) could you (0.4) ⌈w::ri::te⌉

Excerpt 2: B's (1st) occasioning of restoring intersubjectivity

B's request for an explanation clearly signifies a problem of intersubjectivity: though the participants in this workshop presumably are to construct a joint model, B (and perhaps C and D) is at present not quite aware of what exactly they are doing. A responds as requested, by providing an explanation – or at least a definition – of the first four concepts: designing nature (lines 257-258); designing learning environments and cultures (lines 261-262); designing urban space (lines 266-267); technology and new breakthroughs (lines 269-270).

All four explanations are responded to with acceptance, the first two in the form of minimal acknowledgement tokens (yes, uhm) (Jefferson 1984), the third in the form of a collaborative completion (Lerner 2004) from D and the fourth in the form of a minimal acknowledgement token "yeah", though this is only delivered after A has pursued such acceptance by adding to her turn the epistemic downgrade "but I don't know – this is just my suggestion". By contrast, the fifth explanation, delivered in the same fuzzy form as earlier "it is a bit like nature" is responded to with the change of state token "nå" (oh) (line 276), with which the recipient marks that he/she is now informed where he/she was previously mis- or uninformed (Heritage, 1984).

The different responses to A's explanation of the various concepts illuminate the differences with which these concepts were originally introduced by A, with the first four being precise concepts accompanied by pictures, whereas the fifth concept was described merely as "having to do with nature" and was not accompanied by the placing of a picture. This fuzzyness, is, then, in excerpt 2 displayed by the way in which the participants respond to A's explanations, fairly readily accepting the first four, but marking the fifth explanation as providing with new information. In this way, excerpt 2 retrospectively reveals that the concept for cardboard no 5 had either not been heard, understood, or had even been misunderstood when it was initially introduced presumably because of its fuzzyness. Excerpt 2 thus constitutes a first place in which the participants directly orient to this fuzzyness and, as a consequence thereof, could attempt to solve it before progressing to something new.

Figure 3: A's non-vocal proposal of the green labels.

Instead, however, the participants at this point move on to a different activity, initiated by A suggesting that they write down on the green labels (lines 278-280), while holding these labels out for inspection by the others (figure 3).

At this point, then, the fuzzyness of cardboard no 5 and the consequential trouble this has for the participants reaching intersubjectivity in the form of mutual understanding, has not been solved. In the following section I look at how the participants' shift between different activities and different participation frameworks further contributes to the development of fuzzyness.

DEALING WITH MULTIPLE ACTIVITIES AT A TIME

In the following excerpt, B and C are engaged in a mutual activity, attaching a string to the cardboards. A is engaged with the green labels. At this point, D introduces a picture by holding it up for inspection by the others (figure 6). Whilst B and C sustain their ongoing activity, A responds both verbally and through gesture to this introduction, suggesting that D place the picture on cardboard no 6, which has "something

Figure 6: D introduces a picture.

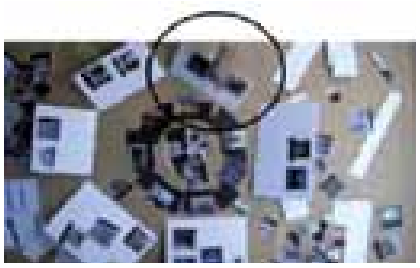

Figure 7: A suggests placing a picture on cardboard no 6.

385	*D:	men det oss noet med at bruge vejret som det nu er↗
386		(0.4)
387	*A:	ja↗ (.) det oss noet ⌈med ø::::h det u::dendø:::rs⌉
388	*B:	□ska de hæng sådan her eller ska de vær på□
389	*A:	det må være her □et eller andet sted□
		Translated:
385	*D:	but it's also something about using the weather as it is
386		(0.4)
387	*A:	yes↗ (.) it's also something ⌈with u::::h the ou::tdo:::rs⌉
388	*B:	⌊should they hang like this or should they be on ⌋
389	*A:	it must be here □somewhere□

Excerpt 3: D's (the 2nd) occasioning of restoring intersubjectivity.

to do with the outdoors" (excerpt 3, line 389 and figure 7). Once A has delivered this proposal, she disengages from this activity and attempts instead to engage with B and C, prefacing that shift verbally three times, first with the beginning of a question "so you want:::" in line 400, see excerpt 4, (only the first attempt is shown in excerpt 4 due to limitations of space).

However, A does two other attempts, one with "u:::::.h" and finally, with a request for confirmation "there was o:ne abou: u::h- designing u:h (0.5) urban space right". Though she succeeds to gain only B's attention in her third attempt, it is clear from her attempts that she is orienting to B and C, rather than to D, who is in the process of placing a second picture on cardboard 5.

According to Clark and Krych (2003) speakers monitor receivers for understanding and if necessary alter their utterances in the unfolding interaction. In return receivers cooperate by displaying and signalling their understanding. It seems that in the above excerpt, the participants are prevented from doing that because multiple activities are going on at the same time. Thus A, because she is currently attempting to engage with B and C, does not monitor D to see whether he agrees with and accepts her proposal.

As figure 8 illustrates, D, does in fact not follow A's proposal (whether this is because he does not agree or because he does not interpret it correctly is uncertain). Instead, he walks to the other side of the table, from where he places his picture onto cardboard no 5. Shortly after, while A, B and C are otherwise occupied, he places a second picture onto the same board so that there are now at least two of the pictures on this board that have not been accepted or even acknowledged by the others and where one in fact was proposed by A to go onto a different cardboard. In other words, because there are multiple activities going on here at the same time, D manages to position two pictures on cardboard no 5, without any of the others monitor this placing. This means that there is no chance for the participants at this point to realize that there may be trouble, yet alone to solve it. In the following, and last, analytic section, we see how this trouble finally comes to the forefront and thus, how the participants eventually have to address and solve this trouble.

396	*C:	ø:::::h ja å så ska vi ha □meget længere snor fordi□
397	*B:	□så ka jeg bare sæt noet snor på der□
398	*C:	vi har enden på snoren her ??et sted??
399	*B:	□ja□
400	*A:	□nå i vil ha::□::
401		(0.3)
402	*B:	ved du hvad skal jeg ik bare sæt selve den dims her på
403		fordi så er det uafhængig af snoren
404	*C:	ja↘
		Translation
396	*C:	u:::::h yes and then we need a □much longer string because
397	*B:	□then I can just attach some string there□
398	*C:	we have the end of the string ??somewhere??
399	*B:	□yes□
400	*A:	□so you want□::
401		(0.3)
402	*B:	you know what shouldn't I just place the actual thing here
403		because then it is independent of the string
404	*C:	yes↘

Excerpt 4: A's attempt of engaging with B and C.

Figure 8: A places a picture on cardboard no 5.

THE ACCUMULATION OF TROUBLE

D's action of inexplicitly placing the 'problem' pictures onto board no 5 has interactional consequences for the ongoing interaction, and the accumulation of trouble in the form of lacking intersubjectivity becomes explicitly apparent in the following excerpt (5), when C points to one of the pictures placed by D earlier and inquires what "it is". As illustrated in excerpt 5, this inquiry prompts three different explanations from the other three participants, which rather painfully illuminates their lack of mutual understanding.

Each version of what the picture represents is faithful to what each of the participants have repeatedly explicated previously in the workshop activity. Such repeats have been shown to be employed by participants to display that they are not responsive to what has transpired in the interaction since the previous saying Schegloff (1996:200-201). Here, this further suggests that A, B and D have not been monitoring each other's actions and as a consequence each of them have different versions of the event so far. This shows that intersubjectivity has not yet been achieved in relation to concept no 5. The fuzziness, however, is now out in the open due to the participants' identical repeats of their own prior talk.

Following shortly after excerpt 5, B occasions yet an explication of one of the problem picture, see excerpt 5, and she does this in a non-vocal manner similar to C's occasioning, namely that of pointing to the same 'problem' picture, but different in formulation. Thus, B's

468	*C:	hva var det her↗
469	*A:	ja::::: det var □noet med nye sport□sarenaer ikk→
470	*D:	□det var å- så brug-□
471	*B:	ja å:: □igen måske det der med□ perspektiv□+
472	*D:	□å så bruge vejret som det er ikk□↗
473	*B:	+□at hvordan- hva sport er□+
474		(0.3)
		Translated:
468	*C:	what was this here↗
469	*A:	ye::::s it was □something about new sport□sarenaes right→
470	*D:	□it was u- to use-□
471	*B:	yes a:nd □again perhaps the thing with□ perspective□+
472	*D:	□and then use the weather as it is right□↗
473	*B:	+□that how- what sport is□+
474		(0.3)

Excerpt 5: C's (4th) occasioning of restoring intersubjectivity by pointing to a 'problem' picture.

Figure 9: B asking about the 'problem' picture.

Figure 10: D defends his picture.

inquiry is explicitly formed as a challenge, initiated with a challenging " jamen" (yes but) (Steensig and Asmuss 2005). Further, non-vocally she visibly turns her face in the direction of D, orienting directly towards him. By doing this she shows that she knows D is responsible for those two pictures and holds him accountable. As a response D utters a third repeat of his utterance " it was- it was something about using the weather as it is", once again producing an identical repeat of his own prior talk. This time he substantiates his utterance by a gesture placing his hand above B's hand, which is still close to the problem picture (see figure 10).

His gesture forces B to retract her hand and she accepts his defence of his picture by uttering "o:h yeah". This functions as a realization token, which is used to remedy problems of intersubjectivity by claiming that its producer has now understood or remembered something, which he/she has previously failed to understand or remember (Emmertsen & Heinemann, 2010). Whilst B and D thus at least on the surface appears to have now reached a joint understanding, C and A still appear to be countering D. C uses a negative interrogative "wasn't it new sport-types" to introduce another possibility for what cardboard no 5 was meant to be. The negative interrogative format has been shown to be used as a type of hostile question, which in fact asserts, rather than questions some matter (Heritage and Clayman 2002), and the initiating "but" in line 501 furthers this impression.

That A is aligned with this take on things is evident from her turn at talk in line 504, where she also claims the cardboard to be representing sports arenas and perspectives. A problem of misunderstanding or lack of understanding, which this initially appeared to be, has thus turned into a problem of agreement, with A and C having one version of a concept for cardboard no 5, a version which is in competition with the version provided by D (and possibly supported by B). Breaches of intersubjectivity that have to do with disagreement are more problematic than those that "merely" have to do with understanding (Pomerantz 1984), and so at this point the participants are more or less forced to solved their problem or else face a full-blown argument. And indeed, as illustrated by excerpt 6, all four participants now, for the first time, orient directly to this problem and finally appear to find a solution.

Thus, B, C and D orient to the (by now) apparently problematic pictures on cardboard 5, whilst A attaches a green label onto cardboard no 5 and stipulates "look here are new sports

494	*B:	hva- (.) den der hvorfor er den xxxxx
495	*D:	det var- det var noet med at bruge vejret som det er
496		(0.9)
497	*B:	°nå: ja°
498		(0.2)
499	*B:	a-
500		(0.3)
501	*C:	jamen var det ikk °nye s°ports°grene°↘
502	*B:	°men-°
503		(0.3)
504	*A:	nye sp°ortsarenaer og persp°ektiver
		Translated:
494	*B:	wha-(.) this there why is this xxxxx
495	*D:	it was- it was something about using the weather as it is
496		(0.9)
497	*B:	°o:h yeah°
498		(0.2)
499	*B:	a-
500		(0.3)
501	*C:	but wasn't it °new s°ports°types°↘
502	*B:	°but-°
503		(0.3)
504	*A:	new sp°ortsarenaes and persp°ectives°

Excerpt 6: B's (5th) re-occasioning of restoring intersubjectivity by pointing to the 'problem' picture.

521	*A:	°se° her er nye °sport°sarenaer
522	*B:	°ja°
523	*A	og perspektiver på hvad sport er↘ °ikk°↗
524	*D:	°ja°°
525	*C:	jow↘ så det vil sige at de her to skal herover↘
		Translated:
521	*A:	°look° here are new °sport°sarenaes
522	*B:	°yes°
523	*A	and perspectives on what sport is↘ °right°↗
524	*D:	°yes°°
525	*C:	yes↘ so it means that those two here has to go overhere↘

Excerpt 7: Cardboard no 5 is conceptualised.

arenas and perspectives on what sport is right". It is uncertain whether D and B respond to this, but C produces a strong accept of A's stipulation by both vocally accepting it and non-vocally she physically moves the two 'problem' picture and places them on cardboard no 6, see excerpt no 7.

CONCLUSION

From the analysis, it suggests that the notion of schisming, i.e. a conversation between 4 (or more) participants, which splits up into two or more conversations, is consequential for the interactants and their orientation to reaching and/or restoring intersubjectivity and thus mutual understanding.

Further to this, multiple concurrent but divergent activities may contribute to the complexity of the interaction thereby hindering the participants in monitoring their co-participants, their talk and actions in full. This again may allow for the formulation of less precise concepts, which then ultimately may lead to accumulation of trouble and a visible break down of intersubjectivity towards which the participants are accordingly forced to orient to in order to reach a joint understanding of the outcome of the workshop.

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TRIGGERING THE STORYTELLING MODE

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ABSTRACT

This paper explores the issue of how to establish an interactive setting in which a 'storytelling mode' may be triggered as a catalyst in a collaborative design activity. On the basis of an interaction analysis of a design project's kick-off workshop the paper identifies four triggers for the storytelling mode: narration, drama, material and interaction. The findings suggest that the storytelling mode may be fostered by intentional facilitation that employs these identified triggers.

INTRODUCTION

In this paper we 'would like to try out an idea that may not be quite ready,' as Bruner, the educational psychologist famous for his narrative research, starts his paper on Life as Narratives (2004). Our interest in storytelling and its potential applications in design and design research has taken us to experiment with it in various ways. A project named Spice - Spiritualising space forms the platform for some of these experiments. The kick-off workshop of the Spice project is analysed in the following paragraphs in an attempt to spell out some of the ways in which interaction in this multi-professional workshop is geared towards the storytelling mode.

THE SPICE - SPIRITUALISING SPACE PROJECT

The Spice project is an ongoing research effort in which storytelling is exploited as a design tool. The study focuses on urban spaces and metro environments that offer experiential contexts. The main objective of the project is to study how storytelling can be applied in the designing of customer journeys in public spaces. The customer journey is conceived as a story-like phenomenon, which includes features of spaces and services that establish a particular identity for the local setting in focus. One of the aims of the project is to clarify the notion of storytelling in a way that is fruitful in designing public environments. The project also aims to create alternative concepts that explore the aesthetic and imaginative experiences and the relationships between people and urban public spaces. At the outset of the project we had already identified three reasons for considering storytelling in space and service design:

- Storytelling is used in user studies for design. Stories or anecdotes of meaningful memories and spaces are gathered from users to inform and inspire design.
- Storytelling can serve as a design tool that connects various details together and creates and prototypes a complex entity.
- Storytelling may be employed to establish a specific image and identity that enables differentiating from others. (More on http://designresearch.fi/spice/)

The project's objectives were approached with a case that focused on a particular locale called Otaniemi, where a new metro route was being planned. The focus of the hereby analysed design activity was around the future metro station of Otaniemi. Currently this location is mainly known as the campus of Aalto University's School of Science and Technology (HUT).

The project team consists of professionals from industrial design, scenography, screenwriting and sociology. The project also features five industrial

partners with their competences and interests. The project plan included aims that were perceived novel by the partnering companies and the project team. It was thus considered important to pay dedicated attention to establishing a common ground at the beginning of the project, which would enable and foster the industrial partners' engagement in the project collaboration. A kick-off workshop, which will be analysed below, was organised for this purpose.

STORYTELLING

Storytelling is a basic form of human activity that is utilised to organise experience, to give it shape and to understand it (Ochs & Capps 1996). According to Abbott (2008, 13) the bare minimum of narrative consists of "the representation of an event or a series of events". Already a depiction of an action, e.g. "I fell down", is a narrative act. Narrative acts may add up to a story, a sequence of two or more events that are temporally bound: a *chrono-logic*. Conveying an event or events may take various forms of a narrative discourse: speech, drama, picture etc. (Abbott 2008, 1, 13, 18-19, 241.)

Bruner (1986) claims that there exist two fundamentally different modes of thought: the storytelling and the argumentation mode. These both provide ways of ordering experience and constructing reality, but the ways in which they convince and are constructed differ fundamentally. (Bruner 1986, 11-13.) Stories also occur in a dual landscape of action and subjectivity (Bruner 1986, 15, 29). This allows for the reading of them both on and between the lines (Pirrie 1999), enabling a convenient intertwining of imagination and the real.

According to Bruner (1986, 11-14) stories, as compared to a logico-scientific argument, represent a mode of thought that may be utilised to convince, because stories are lifelike, imaginative and believable even if not true. In comparison to a logico-scientific mode (Bruner, *ibid*.), then, stories are chrono-logical (Abbott 2008, 16).

Argument	**Story**
true	believable
proven	lifelike
adequate	dramatic
logico-scientific	imaginative
categorising	intentional
descriptive	particular
explaining	experiential

Table 1: Differences between the argumentative and narrative mode (based on Bruner 1986, 11-13).

Moggridge (2008) suggests storytelling as a potential alternative to prototyping in service design: "*When you put all these things together, with elements from architecture, physical design, electronic technology from software, how do you actually prototype an idea for a service, and it seems that really, it's about storytelling, it's about narrative.*"

Mossberg and Nissen Johanssen (2007) describe several examples where storytelling is employed in the design of spaces and services. The examples include hotels where visitors may feel, hear or even see ghosts, and environments that are attractive because of famous books, stories, historical events or people who have been there or wrote about the places. Storytelling is utilised to trigger imagination and guide service experiences.

Storytelling thus appears and can be applied in many ways, also in design. It is about communication. It is engaging. It is open to allow for individual interpretation and trigger imagination. It is about joining individual details together into larger entities. In design contexts the application possibilities of storytelling are vast, but understanding its potential requires sensitivity to the forms it may take, the matters it may address and the scale it may grasp. In the following we will attempt to explain a portion of the area of applying a storytelling mode in design. We focus in particular on a setting in which collaborative activity encourages the emergence of the storytelling mode.

METHOD

We claim that the storytelling mode does not happen accidentally but results from methodical work. More to the point, it takes methods and tools to trigger narrative events that illuminate design objectives. We have used various methods for this design purpose. These methods involve material objects (stuff), social configurations (people in relation to each other) and language (talk that unfolds in interaction). As we see it, innovation emerges out of the messy collision of people and stuff in interaction. This is why we rely on workshops.

As to the analysis of these data, we draw upon conversation analysis (for an introduction, see Heritage 1984; Sidnell 2010). This orientation has three fundamental assumptions as a starting point. For one, it is assumed that interaction is structurally organised. Secondly, every contribution to interaction is contextually oriented. Thirdly, structure and context sensitivity inhere in the details so that any detail may turn out to be (part of) a methodical way to accomplish whatever people set out to accomplish. (Heritage 1984, 241.) We can therefore assume that people do not simply happen to formulate their talk in certain ways, but they design (though often unconsciously) their utterances with respect to the context, recipients, and the things they want to accomplish. Because this design is often beyond speakers' conscious knowledge, analysis is based on naturally occurring interaction and audio and video records of it. These data are closely examined: transcribing is one way of putting the details under a magnifying glass. A key issue is to make pure observations (to see what happens) instead of jumping to conclusions. Starting from observation, the analysis a. traces for repeating patterns, b. describes the formulation, context and what is accomplished, and c. grounds analytical claims in other participants' ways to treat the observed element (Sidnell 2010, 20-29; Schegloff 1996).

We take the workshop video document as a starting point, look into the details of workshop activities manifest in it, and determine whether and how some of these activities trigger stories. In doing so, we proceed from asking at any point of interaction, why this now (Schegloff & Sacks 1973), i.e. what the participants can establish and accomplish at a certain point of interaction by a certain kind of talk, gesture and use of tools.

DATA AND METHODS

Our findings are based on data collected in the Spice project's kick-off workshop. The workshop was video recorded, and the findings are based on this documentation.

The workshop was organised along the lines of a project-in-a-day model developed originally in the 'Luotain – Design for user experience' project (2002-2006, http://designresearch.fi/archive/luotain/) in the University of Art and Design Helsinki. The model is a social design intended to overcome some of the challenges present in the early phases of collaborative design projects. These challenges include participants' limited knowledge about innovation methods, the context of use or the domain of the project, for example "storytelling". The members of a collaborative project team may not be familiar with each other, and they may have quite different expectations with respect to the project. Furthermore, the participating organisations often seem to have hidden agendas of innovation, and a collaborative project should provide new input to these. The project-in-a-day workshop has been proven to address these challenges (Mattelmäki et al. 2009, Hasu et al. 2009).

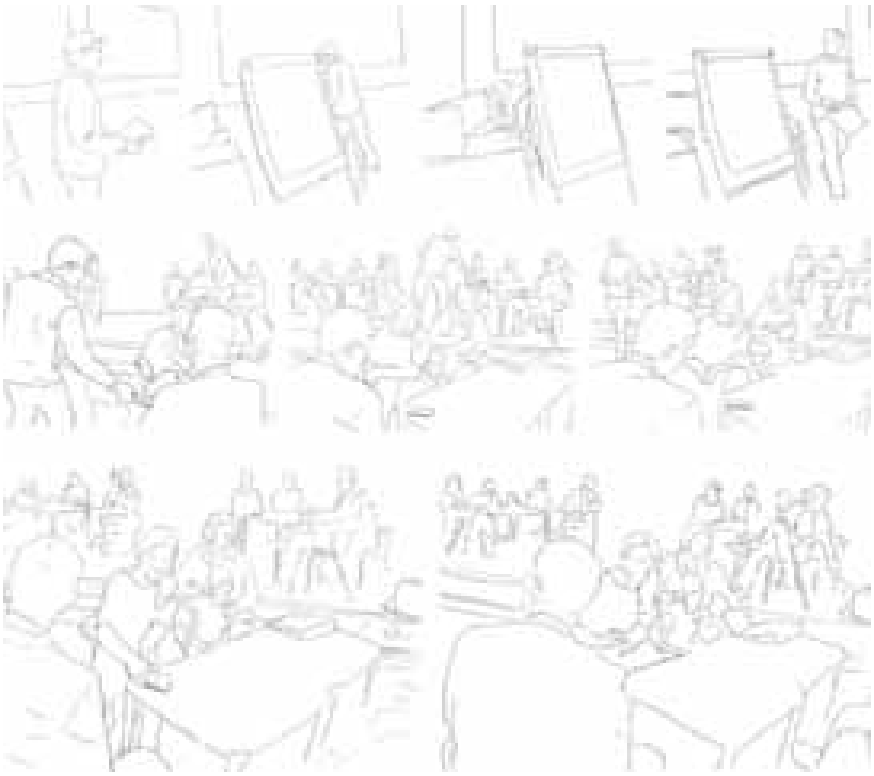

Figure 1: Facilitator's dance.

PROJECT-IN-A-DAY

The workshop's outline was developed in several meetings attended by the research team, and the schedule of the day was as follows:

- 9:00 Introduction (15 min)
- 9:15 Warm-up drama (40 min)
- 9:55 Project plan instructions (15 min)
- 10:10 Forming project plan (20 min)
- 10:30 Project plan presentations (40 min)
- 11:10 Context study (incl. interviews) (3 h)
- 14:10 Review of context studies (40 min)
- 14:50 Envisioning the future (45 min)
- 15:35 Marketing plan (45 min)
- 16:20 Review of the results (40 min)

ROLES AND SETUP

Based on our experience, each workshop participant was given a dedicated role. The workshop was run so that one person was responsible for the facilitation of the workshop and there were no additional roles: no one needed to 'sit as a potential resource'. For example, two members of the local community were appointed to the context study and were available for the teams who interviewed them during that time. In addition, the teams were designed so that people with similar backgrounds, whether professional or organisation, would be placed into different teams. To engage the industrial companies in the project, the team leader role was always assigned to the company representatives.

ANALYSIS

WORKSHOP ORCHESTRATION

The project-in-a-day-model is a way of helping professionals from different fields to collaborate and plan how future collaboration proceeds. As to the story-telling mode, the model provides a playful narrative super-structure: the participants are placed in teams that only exist within the workshop, and they play roles they are not employed in officially. This brings an air of pretend play to their action. Therefore, the workshop resembles a Live Action Roleplay (LARP). Like a LARP, it proceeds along a temporal outline that is pre-written by a design team, and the workshop is managed by a game-master, the facilitator SY.

The facilitator orchestrated the collaboration through the workshop day. He utilised the outline as a scheme. It also contained reminders about what to say. The script was not absolute, but the facilitator could adjust the length of the activities according to the progress of the groups. Hence the facilitator was paying close attention to how the creative progress unfolded in the groups. However, much of the actual progress remained open and to be improvised by the groups.

Initially, let us look into the facilitation work in detail (Example 1, below). Obviously, it consists of talk. The facilitator, SY, is speaking. However, language is not the only semiotic mode upon which he relies. In what Goodwin (2000) calls a contextual configuration, an array of semiotic resources is added as the action unfolds in time.

In the details of his relatively extended

(1)	Spice1/01/Method cards
01	SY: (.) .**mt mm ja: seuraavaks se vaihe mitä lähetään**
	.tch mm a:nd next the phase we will start to
02	**tekee on projektisuunnitelman teko?h ja- ja**
	do is the project plan and- and
03	**siihen projektisuunnitelman tekemiseen on**
	for forming the project plan there will be
04	**ainoastaan kakskytminuuttia aikaa mikä on**
	only twenty minutes time which is
05	**TOdella(p) (.) vähän ja tota (.) sen: (1.0) tekemistä**
	really little (time) and u:hm to help its
06	**helpottamiseen (2.0)**
	*formation **(2.0) ((Figure 1, line 1))***
07	**me ollaan tehty jokaiselle (.) ryhmälle(p)**
	we have made for each (.) team
08	**(0.8)**
09	**tämmöset valmiit työmetodit? (0.8)**
	these available work methods? **(0.8) ((Fig. 1, line 2.))**
10	**joita voidaan (.) pudotella ikään kuin semmoseen**
	you can (.) like drop into a (kind of a)
11	**valmiiseen projektisuunnitelmapohjaan?**
	ready project plan template? **((Fig. 1., line 3.))**
12	**(2.0) ja tarkotus on että suunnitelmassa**
	(2.0) and the point is that in the plan

Example 1: Facilitation script

speaking turn, SY accompanies his words with gaze, pauses, deployment of body, movement in space and handling of material objects. Moreover, the non-speaking workshop participants recognise his work and legitimise it by acting accordingly. This example is an instantiation of the methods used to achieve what is on the agenda.

As a whole, example (1) instructs regarding the task. It consists of three functionally different parts. The first part is constructed as a directive turn-constructional-unit. (l. 1-2). Findings from educational settings suggest that a similar linguistic structure is a method for sequencing instructions but is not understood as the point to start working (Joutseno 2007).The second part is formulated to specify the conditions for the assignment, a narrow time window (l. 2-5). The final part (starting line 5 ja tota sen tekemistä 'to help its formation') is produced in chunks where timing, syntax and embodied action play a role: in mid-sentence SY suspends his talk, turns (mysteriously) his back to his recipients and allows himself a pregnant pause (l. 5-6). During the pause he fusses about with some material stuff obviously waiting for him behind the flipchart (Uppermost row in Figure 1). Turning away seems unexpected and is therefore possibly creating dramatic suspension. The second chunk accounts for his withdrawal for the benefit of the teams with a description of a past event (l. 7). This turn part reads as a narrative event. The construction developed so far projects syntactically more to come, an object constituent. After yet another pregnant pause (l. 8) and having returned visually available, SY delivers (syntactically and materially) an object, the method cards (l. 9).

As soon as the cards are introduced, SY starts to deal them out. First, he places one set of them on the closest team table continuing in a row. The delivery of material cards is accompanied with an increment (add-on) to the preceding, potentially complete turn. (Schegloff 2000, Lindström 2006). This turn part adds to the narrative chrono-logic: he advises the teams to use the cards as a next event (l. 10-11.)

All in all, SY manages to orchestrate different functions: he gives an instruction, he adds drama-like mystery to his own conduct, he packages parts of it in narrative clauses, and he delivers the method cards to each group while explaining how the teams are supposed to exploit them (figure 1., middle row). Meanwhile, the workshop participants have been sitting around their team tables with upper bodies and faces oriented to SY, an embodied token of being an available listener. It is noteworthy that the participants do not display any withdrawal while SY is turned away. As soon as SY finishes the card delivery, many participants start to withdraw from the listening position into taking actions within the groups. They grasp for the cards, they take notes, and they dig in their briefcases. These actions realise a change in the participation framework: the participants play along the workshop script and accomplish the participatory role to which they were assigned.

Example (1) illustrates the messy collision of people and stuff in interaction: how the workshop outline, the material tools (here method cards) and the teams become interwoven into a contextual configuration where a (mysterious) suspension plays a role. The workshop happens as an orchestration of various semiotic fields, not only because it was planned, nor because the participants came in, nor because SY is speaking, nor because there was a room for it and material objects brought to the room. All these are recognised and acknowledged only after pulling them together. It appears that talk-in-interaction is the social glue that has the capacity to join the forces.

NARRATION TRIGGERS

The clearest storytelling episodes during the workshop occur in the instruction and execution of the warm-up drama task that is facilitated and organised by professor of screenwriting JV. He relies on suspense in the instruction: the mystery or uncertainty that hooks the audience (c.f. Abbott 2008, 242). He first introduces codes "DP, CS and FP" (ex. 2, line 1). These codes are prospective indexicals (Goodwin 1996), i.e. "the sense of what constitutes the [in original: problem, here: the codes] is not yet available to recipients but is instead something that has to be discovered subsequently as the interaction proceeds." JV hints to a link to the task (l. 2) (l. 4-6) thereby claiming their relevance but further postpones the decoding. Meanwhile, JV develops a narrative scene where the main character is a researcher who is arriving by metro to a conference at the Aalto University campus.

JV's instruction is most extended and would require several pages of transcription, which is why we have chosen to show only selected details. From a narrative point of view, a main character is introduced to a scene, a series of events takes place chronologically (l.

(2) Spice1/00/DP, CS & FP

01	JV:	kiitoksia. (.)ä: deepee ja ceeäs ja äf pee. (x.x)
		thank you. e: dp and cs and fp
02		tällaset meidän pitäs nopeesti käydä läpi
		these we should go quickly through
03		(x.x)
04		((omitted: background information on writing))
05		ja meidän tehtävä (.) tällä kertaa mihin me
		and our task (.) this time for which we
06		käytetään näitä hienoja kirjainyhdistelmiä on on
		apply these fine letter combinations is is
07		se hyvin yksinkertanen että (2.2)
		very simple such as (2.2) we have a
08		meillä on /tutkija. (.) ja hän on tulossa Aalto-
		researcher. And he is coming to Aalto
09		yliopistoon (1.8) tälläseen (1.0) konferenssiin
		University to this kind of a conference
10		jotka nyky-yliopistojen tapaan on (0.9) tälläsiä
		that as in universities of today there are these kinds of
11		briiffaus presentaatiotilaisuuksia
		briefing presentation situations.
12		((omitted: parenthetical explanation))
13		te ootte tulossa tänne Aalto-yliopistoon metrolla
		you are on the way here to Aalto University by metro
14		(3.8) ja: te hiotte sitä esitystänne vielä. (1.0)
		and: you keep on polishing your presentation.
15		((omitted: details of editing the presentation))
16		ja- Keilaniemen ja Otaniemen välillä te saatte
		and- between Keilaniemi and Otaniemi you get
17		sen niinku sen kulman (.) siihen puristettua siihen
		that like the angle (.) squeezed into that
18		presentaatioon ja siihen esitykseen mis- mistä te
		presentation and to that presentation wher-where you
19		tiedätte että ((nod nod)) sieltä ne niinku kultaset
		know that from there like the golden
20		rahahanat aukes nyt (.) tämän mä pääsen sinne
		moneytaps are open now (.) this I get there to
21		näyttämään tai esittämään tai kertomaan ni
		show or present or tell so
22		((omitted: further details of researchers thoughts))
23		No te nou nousette sit siinä Otaniemen
		Well then you get get up there at Otaniemi
24		metroasemalla te nousette junasta ja ryhdistäydytte ja
		metro station and get out of the train and pull yourself together and
25		siin on ne portaat tuossa (.) ja pitäsi tulla
		there are the escalators there (.) and you should ascend
26		maanpinnalle ja te ootte menossa esittään sitä
		to the ground level and you are going to present the
27		hommaa sillä hetkellä te tajuutte se läppäri on siellä
		thing at the moment you realise that the laptop is there
28		junassa se on menossa kohti Matinkylää siellä
		in the train it is on its way to Matinkylä there
29		metrovaunussa (3.0)
		inside the metro car
30		((omitted: details of the loss))
31		tää on tilanne ja-
		this is the situation and-
32		teillä on niinku mahdollisuus ratkasta se kolmella
		you have like a possibility to solve it in three
33		tavalla ja tutkia sen ratkasumahdollisuuksia ja
		ways and study its solution potentials and
34		ensimmäinen ryhmä olkaa hyvä. kehittäkää dream
		first group please. Develop a dream
35		project eli tällanen (.) unelmahaave miten kaikki
		project or this kind of a (.) dream vision how everything
36		päättyy huomattavasti paremmin
		ends up much better

Example 2. Narration triggers.

8-26), and the events lead to a conflict: the main character loses a key object, the laptop containing the winning presentation (l. 27-30). This is the situation, to quote JV (l. 31), that is given to the workshop teams to resolve by means of a collaborative drama. At this point JV decodes the codes: one team is assigned to work for a "DP", i.e. a dream project; another team sets off to a "CS", a catastrophe scenario; and the third team is assigned to develop an "FP", i.e. a functional plan to solve the conflict.

In this example, storytelling is a method JV uses to create a starting point for a set of collaborative story closures. In doing so, he plays with narrative voice and focalisation, i.e. the point of view (see Abbott 2008, 70-74). He starts with a third-person narration (l. 8-) "We have here a researcher and s/he is on the way to - -." However, JV soon slides into a second-person plural narrative (l. 13-19): "You are on the way here - -." The indexical te 'you' (plural) ties anaphorically to the fictional researcher (singular) but locally to the workshop participants (plural). This decision invites the workshop participants to empathise, to "try out the researcher's shoes". Stepping into these shoes, JV makes a further move to a first-person narration: he starts to recount for the fictional researcher's inner thoughts (l. 20-21): "this I get ('am privileged') to show or present or tell - -"

JV's introductory narration is able to trigger continuation in narrative closures. All the teams replay the narrative and continue to resolve the story conflict according to their assignment. In doing so they exploit different ways to create narrative discourse. The dream project is realised as a (super) naturalistic drama where all the team members play a role. The catastrophe scenario team uses an external narrator and an actor on the stage who mimes. The functional plan is enacted as a series of bound events in a future servicescape.

A powerful tool to trigger stories is to tell stories. This is known from colloquial interaction: a first story tends to trigger a second one, even rounds of stories where participants take turns as narrators (Sacks 1992 [1968], 3-8; 1992 [1970], 249-261; Ryave 1978; Sidnell 2010, 185-187).

Figure 2. The manager roleplay.

DRAMA TRIGGERS

During the workshop a sense of suspension was identified as the previous example already demonstrates. A suspension exploits the methods of drama, one of the forms of narrative discourse that brings about the storytelling mode. Elsewhere, the drama aspects of the storytelling mode become visible in roleplays, a recurrent feature of the data that allows us to regard the workshop as an instantiation of a LARP.

In the following, the project leader plays the role of the MANAGER. In this scene, she wears a black gentleman's hat that represents power. Her task is to review the groups' presentations. She goes out of the room, takes the hat, is invited to enter by the facilitator and enters the stage as the MANAGER. In addition to wearing the hat, she speaks in the pretend voice of a MANAGER. These cues are taken up by the presenters. They start to play along. This too is observable in the use of a pretend voice and in the dialogue that is presented in the formal and literate register (high and standard language) (example 3, Figure 2).

(3) Spice1/02 xxxx/The MANAGER
Man: @päivää@ ((@ indicates pretend voice))
@Good day@
SY: @päivää@
@good day@
HK: @terve tervetuloa kuntelemaan meiän meidän
well- welcome to hear ou- our
projektiesitystä mitä me ajat- ajateltiin tehdä tehdä
project presentation what we th- thought to do
Otaniemen hyväksi.@
For the benefit of Otaniemi
TM: @odotan kiinnostuneessa yleensä joudun sanomaan
I'm expecting in an interested Usually I must say
kaikelle EI mutta tällä kertaa katsotaan nyt sitte.@
NO to everything but let's see what then this time.

Example 3. The manager roleplay.

MATERIAL TRIGGERS

Most of the time storytelling does not occur as clearly and straightforward in a workshop. This is due to the multitude of goals addressed to it; the workshop is not purely about telling (see section Spice - spiritualising space project above). Still, we argue that storytelling is central to the forms of interaction and collaboration that take place.

The workshop strategy is built on the idea of designerly reflection through making (Mattelmäki et al 2009). Many of the material elements in the workshop were considered and planned beforehand. Maps and CD's with photos of the location and templates for reporting and presenting were provided to all the groups. Tinkering materials such as papers, wire, cardboard and crayons were provided to allow experimenting. The participants were also asked to bring along their laptops and cameras.

Some of the materials had application potential in them. Wearing hats were used to support the role-taking and -playing and to create improvised stories, scenarios and comments as anticipated.

Method cards (see ex. 1) introduced in a nutshell a variety of methods that the groups could apply in the project, either in the field study phase or in the interpretation and designing phases. They gave a common focus to the participants when creating a project plan. The participants studied them by pointing at them and addressing questions on how they are or can be linked with storytelling, e.g. *'collages work well in storytelling'* or *'Could we ask the children to close their eyes … or could we ask them to draw and tell.'* According to Melander and Sahlström (2010, 153, 172-173; Salhström in press) a longitudinal orientation is constituted when participants make something relevant from situation to situation, be it a procedure, a content or a tool. In the formation of their activities, the participants are repeatedly geared towards storytelling. They collect narrative events and fragments and try to create stories around their collaboration. Therefore, stories and narrative events constitute a longitudinal orientation in the workshop and project.

Some of the materials had more open potential: e.g. the maps, photos, collage materials and cameras were taken along but they were used in ways that were created more or less on the go. These materials were applied in the user study phase for gathering stories, memories and metaphors from the local people about the location in a rather improvised manner.

A Chinese furry hat also triggered tangible concept ideas. One group started touching the hat. *'If we could shut the lights off… We could make a corridor*

out of those two white boards.' 'We need to stretch the fur hat… and make them walk through the corridor.' 'What about a fur-covered corridor… "a metro with walls that grow hair would be an international attraction'. Finally, a more or less accidentally found hairy carpet and movable white boards were used to create an experiential corridor mock-up for experiencing an environment with tactile qualities. The carpet's structure gave a strong contrast to the smooth surface of the white board to be experienced by the participants. The mockup as such was not a story, nor did it illustrate a story, but aimed at experimenting with a connection between physical design elements and imaginative experiences.

INTERACTIONAL TRIGGERS

In everyday interaction, stories are not fixed products but emerge from systematic interactional practices (Lerner 1991). Prototypically, knowledge asymmetry between participants is a prerequisite for telling a story: it takes a knowing teller and an un-knowing audience to have a case for a story (Linell & Luckmann 1991, 4). Entitlement also plays a role: first-hand knowledge is a teller's ace whereas someone with second-hand knowledge is not likewise entitled to act as the (main) teller (Drew 1991, Sidnell 2010). Nonetheless, in multi-party situations (more than two persons), it is common for different participants to compose stories collaboratively as consociates (Lerner 1992). In the Spice workshop, the situation is even more complicated. The workshop aims at future stories nobody owns at present.

Our next observation is lodged in collaborative information gathering. The workshop organiser has invited two members of the local community to join in as interviewees. Designers, especially within participatory design, value members' insight and are trained in an empathic approach to users' experience. However, the users are not trained to imagine non-existing future worlds. Moreover, it may be difficult for them to share their experiences and feelings with an interviewer they do not know. Sometimes the designers' interests and interviewees' understanding of the expectations build a gap. Design probes provide one solution to bridge these difficulties (Mattelmäki 2006). To serve the Spice workshop, narrative fragments are made to emerge – not out of the blue – but out of an e*xperience elicitation technique* based on talk-in-interaction. The point is that instead of simply asking questions, the interviewer develops a scene where the interviewer is the entitled, knowing participant. In (4) the 'female user' FUS is interviewed in one of the teams. Professor of screenwriting JV is interviewing her.

In example (4), JV combines questioning with describing possible conduct. His turn is constructed of chronological elements: taking the metro, coming to work, being at the station (l. 2-3). He does not allow FUS to answer until in the end of what is constructed as a statement: sä tuut duuniin 'you come to work' (l. 3). We will be considering what JV is doing with this statement in this interactional context.

(4) Spice1/05/To work
01 JV: **no mitä kaikkii hienoja asioita sä haluaisit sit**
w'l what are all the fine things you'd want then
02 **ku sä siirryt m metrolla kulkemaan mitä sä siin)**
when you go to take t- the metro wh' will y'do there
03 metroasemalla (tota) ku aamulla tuut sä tuut duuniin
at the station when in the morning you come to work
04 FUS: **mm >duuniin<**
mm >to work<
05 JV: **duuniin ni mitä- (.) kaipaat sä siel niinku mitä:**
to work so what (.) are you missing there like what
06 **mitä sä kaipaat (.) jos sä oot menossa töihin**.
what do you miss if you are on the way to work
07 (0.8)
08 JV: **ostatsä (.) lehden (tai) aamiaisen siittä vai(*kka)**
do you buy (.) a paper (or) breakfast there like
09 FUS:**no en ainakaa $aamiaista ostas kyllä**
w'l I'd definitely not buy breakfast there
metroasemalta vaik$ se ois minkälaine.
at the station like whatever it would be like

Example 4. Trespassing interviewee's conditions.

First, FUS approves JV's statement with 'a stamp of approval', a continuer *mm 'uhm*' (c.f. Lerner 1991). Second, she confirms JV's vernacular phrasing *duuniin* 'to work' by repeating it. Thereby she comes to accept his formulation. This is of particular interest, because he, as a strange interviewer, has stepped into an area of knowledge where she is the entitled person who has access to her daily routines. The shared word, *duuniin*, appears to legitimise trespassing. The shared formulation manifests the interviewee and interviewer as consociates with respect to the description. Third, we may notice that JV's statement has evoked a setting: a possible starting point for a story. Into this setting JV suggests the possibility of missing something (l.6) and candidate responses as possible events on a narrative line (l. 8).

It is tempting to make yet another observation. Earlier in another team FUS answered very shortly and formally to questions. In (4), JV uses an alternative, more imaginative interviewing technique. Although he starts with an interrogative turn structure he reformulates and offers candidate understandings for experiences owned by FUS. In (4), JV's series of syntactical reformulations give an air of trying to tease out the interviewee – and as if he would monitor very sensitively when FUS is ready to respond. Indeed, she responds to JV's formulations of her experience without a gap. In addition, she confirms them, and they lead her on. During the course of interaction, a change of state occurs in FUS's behaviour. Her voice becomes more animated and her speaking tempo accelerates. Obviously, she becomes more talkative and involved (in 3, lines 9-10).

As to the story triggering techniques, example (4) shows that sometimes the most obvious interviewing technique, i.e. posing questions, may not be the ideal way of getting answers. Instead, playing with access and entitlement, teasing with candidate formulations, may do the trick. What we see here is a method of fishing fragments of imagination and experience. Moreover, depicting a scene may be a point of departure for a story.

DISCUSSION

Storytelling takes form in many ways. The Spice project was initiated with a loose definition of how storytelling appears in the design context. The aim was that through a process of experimenting a better view on the notion is gained. Bruner's view on the storytelling mode that contrasts with the argumentative mode has been useful to elaborate the understanding in the ongoing project. In his view the storytelling mode includes lifelike, imaginative, experiential and dramatic elements.

In this paper we have attempted to develop an understanding on how to establish an interactive setting in which storytelling mode emerges. For this purpose we have analysed video recordings drawn from a collaborative design workshop. Although a general picture of the workshop setting existed

before the analysis it was only through a process of investigation that a more clarified understanding of the details was gained. To illustrate these findings, we were able to point out four phenomena in the workshop conduct.
First, storytelling triggers storytelling. As pointed out by Bruner the argumentative mode and story mode differ. The line of thought in story mode does not follow logico-scientific reasoning but takes imaginative and experiential routes. This line of thought is triggered in the given example.
Second, we realised that the project-in-a-day model constitutes a live action roleplay. It appeared in various dramatic and pretend play scenes. We learned that aspects of drama can even be found in minor details of interaction and creation of suspension.
Third, the material supported the emphasis in stories and story mode. The data show that the participants have a longitudinal orientation towards storytelling. They relate their collaboration to it in many ways, such as in how they approach the given tasks as well as how they, with the help of the material, try to empathise and become engaged in the envisioned situations.
Fourth, in the section on interactional triggers we made observations on how participants can collaborate in constructing imaginative lifelike visions that supported the dialogue.
We were also exhausted by the richness of the data. For the purposes of this article we have focused on only a few phenomena. In future research we aim to dig into how the seeds that were planted or that emerged in the workshop grew to blossom as the project continued.

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THE MAKING OF A MOCK-UP: A STORY ABOUT HOW IDEAS ARE FRAMED USING REALITY AS SCAFFOLD

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ABSTRACT

As part of a research project about user involvement in textile design we have carried out two Design:Labs (Binder & Brandt 2008) engaging different stakeholders in designing textile products for Danish hospital environments. In this paper we follow a mock-up session done as part of the second Design:Lab, where we meet a group working with the intensive care ward.

Looking back at the video recordings from the session it became clear, that the participants continuously drew on elements from reality as they interacted with tangible materials and each other. We therefore claim that reality is an important element engaging in the hypothetical space of the Design:Lab, as it can function as a scaffold for ideas, ease the communication within the group, as well as help communicating ideas to people who have not participated in the Design:Lab.

INTRODUCTION

The research project "*User-driven innovation and communication of textile qualities*" has been running since spring 2008. It is a three year long collaborative innovation and research project with participants from The Technical University of Denmark (DTU), The Danish Design School, Kolding Design School and two Danish textile companies; one fabric producer and one yarn producer.

The main focus of the project has been to experiment with various ways of involving end-users and other stakeholders in developing new textile qualities and new textile products for Danish hospital environments. One of the ways we have tried to involve different stakeholders has been through so called Design:Labs (design laboratories) (Binder & Brandt 2008) in which stakeholders with different backgrounds have been engaged in investigating the possibilities of using textiles in creating the healing hospital environment of the future. Through two Design:Labs we have involved architects and engineers planning a future Danish hospital as well as textile designers and design researchers. In this paper we wish to analyze a mock-up session at the second of these two laboratories.

At the first Design:Lab the participants explored existing hospital envi-

Figure 1: Visualization of the "crying-chair " (in Danish: tudestolen)", a chair in which relatives can hide and cry without being seen.

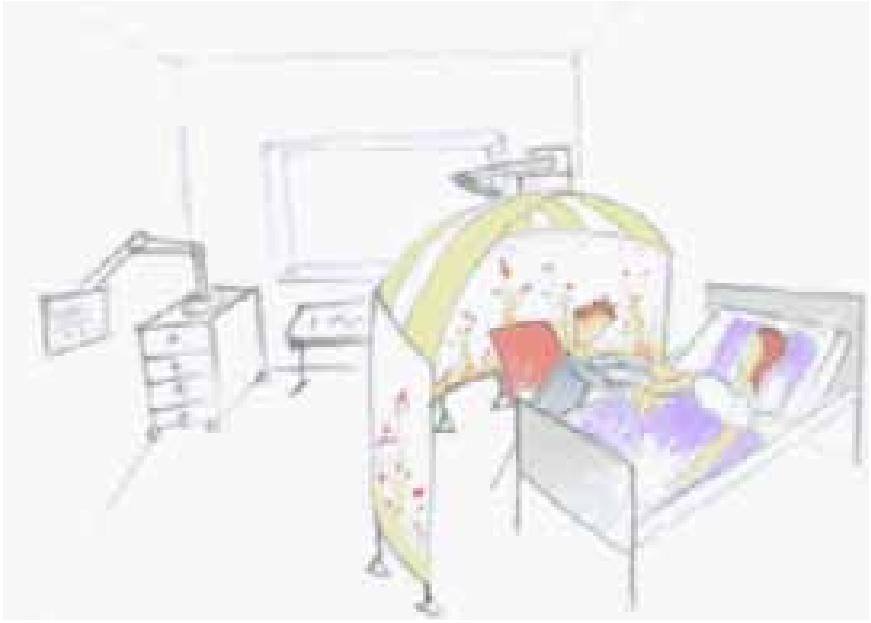

Figure 2: Visualization of the "relative-module" (in Danish: pårørende-modul). A piece of furniture relatives can take with them around in the hospital to make their stay at the hospital more private.

ronments and existing user practices through pictures, scenarios and personas and examined ways to improve this environment's healing capabilities. This Design:Lab resulted in a number of ideas for textiles products which were afterwards illustrated by a design engineer. These can be seen in Figure 1 and 2.

At the second laboratory some of the ideas were developed further among other through a mock-up session. During this session the participants explored tangible materials, such as plasticine, cardboard, pipe cleaners etc. and various textiles supplied by the involved fabric manufacturer. This exploration can be seen as an activity of making, in which the participants visualized their ideas through tangible mock-ups. It is this activity of making and how the participants performed it, we analyze in this paper.

In the following we meet a group of six who during the two Design:Labs worked with the intensive care ward environment. The group consisted of a facilitator (design researcher), an architect, two engineers, a nurse (now working with hospital design) and a textile engineer now being a PhD student at DTU (and second author of this paper). We meet the group during the mock-up session which was the last part of the second Design:Lab. The group chose to create a piece of furniture for patients and relatives at the intensive care ward, through which they tried to merge their two earlier ideas presented in Figure 1 and Figure 2 – the "crying-chair" and the "relative-module".

EMPIRICAL FOUNDATION

The two authors of this paper both participated in the two mentioned Design:Labs, the first author planned the Design:Labs and facilitated a group which is not studied in this paper, the second was a participant in the studied group. Participatory action research (Whyte 1991) has thus been carried out.

In order to investigate the posed problem, i.e. how a mock-up session could be used to develop the ideas for textile solutions generated at Design:Lab 1, an exploratory qualitative inquiry has been made. Video recordings, photographs and created artefacts constitute the empirical data, which has subsequently been analysed. The material have been analysed by three researchers from DTU (the two authors and a fellow researcher) and the video has in addition to this also been analyzed by an interaction specialist in connection with the Participatory Innovation Conference 2011.

The Design:Lab participants were professional architects, engineers, nurses and textile developers who were at the moment either designing a Danish mega-hospital or working with designing textiles for hospital environments. The participants were thus well suited for participation in designing textile products for hospitals and the situation presented in this paper is therefore highly realistic.

EXISTING LITERATURE

Binder & Brandt (2008) have proposed the term Design:Lab to describe a participatory inquiry in which stakeholders engage in open collaboration. They see the Design:Lab as deliberately staged activities during which a controlled environment for exploration is created. They mention, that in the laboratory the participants can negotiate how much of the world outside is taking in or left out of the hypothetical space.

We see the participatory inquiry that we write about in this paper as a Design:Lab and wish to use this term to highlight the controlled nature of the environment created. During the Design:Lab our participants seemed to take elements of the outside world into the controlled environment as Binder & Brandt (2008) mention. Using the Design:Lab term makes it possible for us to analyze the division between reality and hypothetical space and how elements of reality is used in the Design:Lab.

Brandt (2001) has looked at how mock-ups can support collaboration during design processes and sees them as "things-to-think-with" as well as boundary objects. She argues, that design problems are framed and re-framed through the design process and that tangible mock-ups seem to support the creation of a common language game and thereby a common ground to communicate around (Brandt 2005).

In this paper we will also use the term boundary object to emphasize different objects' ability to facilitate communication between the participants. And as Brandt argues, we see how a common language game appears around a mock-up, but what we also find interesting is that the mock-up and the evolving language game has clear connections to reality.

Figure 3: The facilitator shows a technical drawing of the future intensive care ward and asks: "How much space is there for such a chair?"

THE MAKING OF A MOCK-UP

As an introduction to the mock-up session two textile developers from the involved fabric manufacturer made a presentation of a variety of textiles. During this presentation, the participants could touch and manipulate the textiles and ask questions about them. After the presentation, the participants had the opportunity to choose materials for their mock-ups from what we called "The inspiration room". In this room the presented textiles were available as well as a range of other materials such as pieces of felt, foam, colored plasticine, colored paper, colored wooden sticks, pipe cleaners and small plastic dolls. These materials were spread on large tables the participants could walk around and choose from. After selecting a range of materials the participants went back to their respective workrooms and started shaping their mock-ups.

SHOWING REALITY

The group working with the intensive care ward decided to start working on the "crying-chair" and the "relative-module". At first the participants sat shaping a mock-up each, but they soon started talking about what they were working on, showing their progress and sharing their visions. One participant tried to describe her idea using a coffee filter and the metaphor of an oyster and also mentioned the functioning of a roll-front cabinet. She though quickly gave up finishing her mock-up. It seemed like she had a hard time making it look and work as she envisioned and that the other participants did not really understand her visions. Another participant referred to his lack of modeling abilities and finished his mock-up very fast, avoiding showing it to the rest of the group.

As these two participants sat looking at the other participants working, the facilitator grabbed a technical drawing of the future intensive care ward (see Figure 3). The participants knew this drawing from their daily work designing the hospital for which the ward was designed.

The facilitator asked how much space they actually had to work with and where in the room this space was situated. This seemed to trigger especially the two participants no longer creating mock-ups and a participant just finishing his plasticine mock-up. These three participants eagerly started discussing the drawing, showing with their arms how much space the furniture could occupy. One participant sat down in his chair and raised his right arm, showing the position of the surrounding furniture and explained how uncomfortable it would be sitting next to it (see Figure 4).

In this first part of the session we see, how one participant made a connection to reality when trying to explain her idea with principals already of existence; the oyster and the roll front cabinet. She hereby aimed communicating her idea and vision through language game they already had in common. By bringing in the technical drawing the facilitator also tried making a connection to reality (the participants reality, as they knew the drawing), through a tangible material. This instantaneously drew attention and was used as a

Figure 4: A participant is showing with his arm how high the bed is compared to the existing chairs in the intensive care ward.

boundary object which the participants pointed at and drew upon.

FRAMING IDEAS THROUGH A DESIGN ICON

While discussing the technical drawing a participant suddenly mentioned that they could use "The Egg" (see Figure 5), the famous design icon by the Danish architect Arne Jacobsen. One of the other participants immediately reacted to the comment and suggested putting a pole in the top of The Egg and hanging it in the lifting system in the sealing. On this cue the three "available" participants started developing the idea further. One molded the chair, one molded the pole to hang it in, while the last of the three participants sat talking about how the pole could be designed for the chair to turn but still be sturdy.

When the small mock-up in plasticine and pipe cleaner was done the participants showed it to the rest of the group (see Figure 6) and the whole group started verbally developing it further together. They mentioned that a sound system could be implemented into the chair as well as small pockets for magazines and other personal things. They also talked about how the chair could be moved around via the lifting system and how the users could write their experiences on the fabric to make it more personal. They even talked about a fabric for the chair which the patient could bring home when leaving the hospital as a kind of "souvenir" (see Figure 7).

In this situation The Egg is a clear element from reality brought into the Design:Lab and here becomes a boundary object. As all of the ideas suddenly emerging were clearly connected to the day's previous discussions, it seems that The Egg assisted framing the thoughts the participants had had during the day. The participants had e.g. discussed the importance of being able to personalize the intensive care ward, which now, with The Egg to frame the thought, became the idea of a chair fabric to write stories on and pockets for magazines.

CREATING A ROOM FOR REALITY

After the fast development of the hanging chair, one participant started almost whispering to one of the other participants about a suggestion she in reality had heard about on how not yet

Figure 5: The original Egg by Arne Jacobsen

Figure 6: The plasticine model of Hang On receives almost everybody's attention

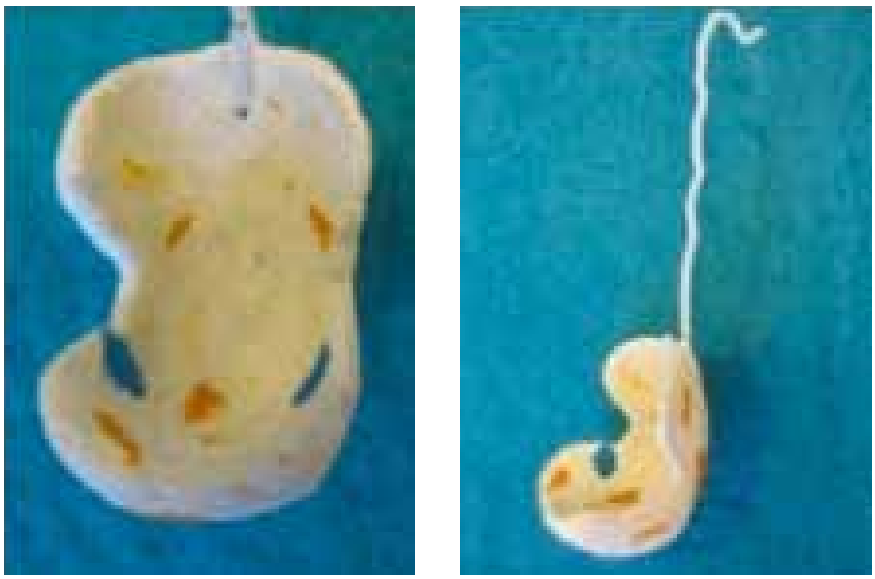

Figure 7 The Egg made out of white plasticine and a pipe cleaner. The blue plasticine represents pockets and the orange represents tags written on the fabric.

Figure 8: Participant sharing a suggestion she in reality had heard about while turning herself away from table and lowering her voice.

established artists and designers could lend their art and designs to hospitals and thereby get it exhibited. She explained how both parties would benefit from this and told that an artist had actually made her aware of this possibility (see Figure 8).

Through her body language and lowered voice it seems, that she thought, that the conversation did not fit into the hypothetical space of the Design:Lab. Instead she created a small room of reality inside the Design:Lab by pulling away from the hypothetical space the table symbolizes (turning away and lowering voice) and engaging in a normal colleague to colleague idea sharing process.

JUST A REPRESENTATION

As the facilitator started summing up which concepts they had, the group tried to give "The Egg" a name. As the group had earlier talked about a "Cozy Corner", the facilitator suggested "Hanging Cozy Corner". One of the participants quickly responded to this by suggesting "Cozy Egg", which did clearly not resonate with the rest of the group. Everybody responded *"No no no"*, one participant said *"we simply do not want The Egg"* and another again said *"The Egg is just to show, that the main element is the pole"*. Shortly after, a participant instead tried to suggest calling it "Hang on", which both symbolized that the chair hangs in the lift system and that it helps the patient and relatives to "hang on" to life. It is a place where they can find comfort, where they can cry and let their emotions run loose. This name, which had a clear element of humor, resonated better with the group and they agreed on it. The humoristic aspect was taken further as the group presented the results of the day to the other two groups and Hang On was presented as designed by Arne Jacobsen's cousin Bjarne Jacobsen from the small city Tilst (see Figure 9).

This situation signalizes that the group members used the reality The Egg symbolizes to portray which kind of chair they imagined hanging in the room, but that they still were very much aware, that The Egg was supposed to be just a representation of the future hanging chair. Giving it a very different name and making fun with designer names shows that the group distances itself from The Egg and acknowledge the impossibility of the real Egg being present at Danish hospitals. They hereby drew a strict line between reality and the hypothetical space of the Design:Lab.

During the mock-up session the participants several times showed that they were well aware that they moved back and forth between reality and a hypothetical space. This is e.g. evident from Transcript 1 below, where one of the participants says *"Then we are almost over in a realism phase…"* (freely translated from Danish).

DISCUSSION

From the mock-up session we see how the participants brought in elements

A:	That's on a good day that it looks like that.
B:	Yes.
A:	You'll often experience that there is more stuff in the ward.
B:	But I don't think that we can expect, that, if there is something that - if they - But now we are almost into the realism fase, then
A:	mmm
C:	Yes, Okay we are.
B:	Erhm because then we have to say that it has to fill as little as possible because the moment it first becomes… too space requiring, then… the tendency to use it will be minimal

Transcript 1 English transcription freely translated from Danish by the authors.

of reality by mentioning oysters, roll front cabinets, showing the technical drawing, re-creating The Egg and leaning away whispering about suggestions from reality to a colleague. Furthermore, the participants seemed to be aware of the difference between reality and the hypothetical space of the Design:Lab. They expressed it verbally, as in the above transcript, but they also showed it in the situation where two participants made a discrete "space" by whispering and by wanting a name for the chair with no associations to The Egg. The Egg was just a representation! Bringing in reality to the Design:Lab was hence done in different ways, through verbal descriptions, different physical artifacts representing reality and through private discussions. When reality was brought in, it was also used in different ways. The oys-

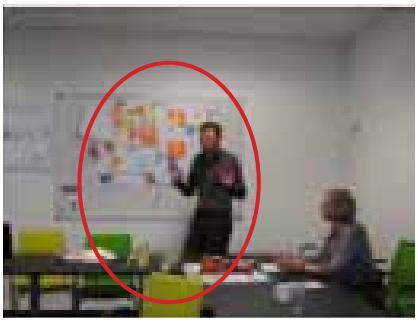

Figure 9 A participant presents the result of the intensive care ward group. The mock-ups are placed on the table in front of him. He lifts them up when he introduces them to show them to the audience.

ter and roll-front cabinet was used to describe a functionality, the technical drawing was used as a common point of reference and The Egg was as a scaffold framing different thoughts they had had during the day. One suggestion from reality a participant shared with another participant was not used as an element in the Design:Lab but turned into a normal colleague to colleague conversation.

Using reality thereby had different purposes and also different effects. The participant bringing in oysters and the roll front cabinets wanted it to assist her explaining her idea which did not seem to work. The other participants did not understand her visions, maybe because the elements of reality were only used orally and not physically represented. It proved to be too difficult for the other participants to mentally transform the words into an understanding of her idea.

The facilitator on the other hand brought in the technical drawing to assist the participants' idea generation by making it more specific in regards to the intensive care ward. This seemed to work very well as it became a boundary object which assisted the participants' communication and made it possible for them to agree on how much space was available for the new furniture. This instantaneously triggered the development of ideas.

The Egg, though probably not intentionally brought into the Design:Lab, became a scaffold for issues addressed during the day which were now turned into concrete ideas. The group had e.g. talked about the possibility of personalizing the hospital and leaving traces in the environment which was made possible through the option of "tagging" the chair.

It was obvious, that the chairs' reality element got the groups attention as they seemed very eager with the idea making jokes with the designer name, suggesting that it could be used on a monorail etc. Actually Hang On received a lot more attention than the oyster idea which was skipped before it had been developed and also more attention than the three other mock-ups created during the mock-up session. .

Using reality as a scaffold to frame ideas also seemed to make it easier to bring ideas out of the hypothetical space of the Design:Lab and share it with others. The familiarity of Hang On made it easy for the intensive care group to communicate to the other groups at the end of the Design:Lab day. The mix of reality and fiction in Hang On made it easy to joke about it, which made the other group participants as well as us as researchers remember Hang On long after the Design:Lab.

CONCLUSION

Binder & Brandt (2008) mentions that the participants in a Design:Lab can negotiate how much of the world outside is taking in or left out of the hypothetical space of the Design:Lab. In the mock-up session described we see how the participants bring in reality in different ways, for different purposes and with different results. Our experience with this mock-up session has therefore refined our understanding of how reality can be used and which role it plays in a Design:Lab. Primarily we have acknowledged that reality can become boundary objects which can assist the communication. Also we have seen, that the communication is best facilitated if reality is brought into the Design:Lab through physical elements such as a technical drawing or a mock-up of The Egg.

With regards to The Egg we have seen that reality not only can work as a boundary object, but also can become a scaffold on which thoughts and ideas can be framed and through which they can be communicated both internally and externally.

Reality is an integrated and important part of participatory encounters where hypothetical spaces are created – such as a Design:Lab. Rather than trying to create the perfect hypothetical space we therefore believe it can be beneficial to use reality to assist communicating (through boundary objects), framing thoughts and ideas and make it easier to communicate these thoughts and ideas out of the hypothetical space.

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FIRST CAME THE EGG: THE POSITIONING AND SHAPING OF COMPETING DESIGN PROPOSALS

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ABSTRACT

This paper explores how two competing design proposals formulated and proposed within a single mock-up session take very different routes through the process. Using the ethnomethodological method of Conversation Analysis, I illustrate the differences with which participants offer, shape (physically as well as verbally) and position each of the proposals and how these differences eventually appear to influence the final outcome of the design process and the participants' evaluation of this outcome, so that one proposal is preferred over the other.

INTRODUCTION

When participants engage in the design process, they frequently work through and propose a number of different alternatives for the resulting design. These alternatives are then typically evaluated based on either pre-determined criteria (for instance specifications) or criteria applied after the process has been completed (Pugh 1981; Thurston 1991; Hung et al 2007). Research that focuses on the actual design process have however argued that evaluation of design in reality takes place during the whole of the process (Bucciarelli 1988; Brissaud et al 2003) because the participants during the process will make assumptions that influence the final design (Matthews 2010). Moreover, as argued by Brereton et al (1996), the social interaction that goes on in a design process shapes the end-result because the participants continuously evaluate, ignore, compare and negotiate each budding design proposal, so that only some are carried to fruition, whilst others remain hidden in the dire of the process. In this paper, I focus on some of the interactional processes and practices that may be of consequence for the final design outcome. Specifically, I explore how these processes and practices are employed in a single mock-up session in which participants propose and construct two different designs for a chair that can be used in the intensive care unit of a hospital ward. Using the ethnomethodological method of Conversation Analysis, I explore the different routes taken for each of the two design alternatives, illustrating how the participants use different practices (both verbally and physically) for proposing the two alternative designs and position these proposals in sequentially different places in the mock-up session. These matters, I argue, serve to shape the final outcome so that the design proposal that is eventually deemed the most relevant and important of the two proposals is done so, not simply because it is the smartest design, the most realistic design, the cheapest design to produce, the most marketable design or so on, but also because the route taken by each of the design alternatives throughout the process ultimately serve to shape the participants' own evaluation.

BACKGROUND AND METHOD

The data on which the following analysis is based consist of a 20-minute video recording of part of a mock-up session in which 6 participants attempt to make mock-ups of a chair to be used in the intensive care unit of a hospital ward. The mock-up session is part of a larger participatory design project and the video recording on which this analysis is based recounts only part of the mock-up session, beginning at a point at which the participants appear to have been engaged in the process for a while and ending before the session is concluded. The video-clip has been kindly provided by the researchers engaged in the larger participatory design project and a fuller description of the project and the particular process investigated here can be found in Rosenqvist and Heimdal (2011). The current analysis is thus impeded by the fact that I do not have direct access to the knowledge generated by the participants at earlier stages of the process. However this "lack of access", rather

than being a hindrance per se, merely results in the analysis delivering a different perspective on the process, one that is not guided by pre-existing criteria such as why was the mock-up session organized in this way, what is the purpose of the session, who the people involved are and so on. Whilst not all, obviously, agree that such matters are irrelevant, the method of Conversation Analysis, which is employed here, is based exactly on the assumption that what matters is what is treated as relevant by the participants themselves. Conversation Analysis is thus an ethnomethodogical approach that focuses on members' own methods (Garfinkel 1954) with the presupposition that issues such as activity context, social roles and relations are constructed and negotiated through interaction rather than being a priori categories to be identified in a transcript or a video. In addition, and contrary to other methods that investigate for instance design processes from a discursive angle, CA is not concerned with content (i.e. what people say) (cf Brereton et al 1996), but with action (i.e what do people do), practices (how do people do what they do) and sequential organisation (where do people do what they do) (for other studies of making following this approach see for instance Nevile 2011, Mortensen and Lundsgaard 2011). As a consequence of my methodological approach, I do not in the following discuss matters such as who the participants are, what their individual expertises might be, nor do I investigate the thematic or topical progression of the process, count the number or type of contributions from the different participants nor do I measure how much time is spent discussing each alternative design proposal. Rather, I identify some of the actions that the participants engage in, illustrate how and where they do that and thus attempt to highlight how differences with regards to action, practice and sequential placement may all be matters that ultimately play a part in determining the outcome of the mock-up session in question.

ANALYSIS

The practical, physical outcomes of the mock-up session described above consist of two alternative design proposals for a chair, a hanging chair called "the egg" and a moveable chair called "the compartment". Both of these proposals end up on the "summary board" from which the participants presumably are to present their proposals to other members of the project. However, as noted by Rosenqvist and Heimdal (2011) one proposal, "the egg" appears to claim a dominant role both during and after the session, in that it is given much more attention by the participants, is remembered best by the participating researchers after the session was concluded and is developed in detail with regard to functional features. They argue that the dominant character of "the egg" is based among other things in the fact that this design proposal is scaffolded by reality, thus making it easier for the participants to relate to it. Whilst their analysis thus focuses on why one design proposal is given a dominant position in the session, my analysis will focus on how that dominant position is accomplished, interactionally. In the following, I will thus explore how a number of aspects of the design process differ in relation to the development of the two proposals, paying special attention to a) where the proposals for each of the design concepts are positioned; b) how these proposals are shaped and receipted and c) how the participants engage with the alternative design proposals.

POSITIONING A DESIGN PROPOSAL

We begin with comparing how and where the two different design proposals are introduced. In order to do so, however, we first need to look at the very beginning of the video clip, where a number of the participants engage in establishing a crucial criterion for their design, namely its possible size. Extract (1) thus begins with E inviting the others to help determine how much available space they will have in the intensive unit for their chair. As we can see, the others initially appear to accept this approach to defining criteria for size and begin a negotiation of how many square meters are realistically available for the chair, with D, C and A insisting that a maximum of two square meters is available (lines 03, 04, 38-40) despite E's attempt to expand that space to three square meters (line 37).

```
01 E:  =Jerh.=å' hvor meget (.) khar vi å' gøre
       =Yeah=and how much (.) space do
02     godt me'. >al'så h[va' hva',<
       we have. >well w[hat what,<
03 D:                    [t↑o kvadratmeter.
                         [t↑wo square meters
04 C:  Ja højest,
       Yes at the most,

35 A:  Du fylder jo mere, end den der.
       You take up more room, than that one.
36     (1.2)
37 E:  To te' tre kvadratmeter?
       Two to three square meters?
38 D:  Ikk' tre.
       Not three
39 A:  *Nejh:*
       *Noh:*
40 D:  Je-ahmen det' ikk' realistisk.
       Well it isn't realistic.
```

Extract (1).

The negotiation over how much space is available for the group's design continues in the following way, where yet another participant, B, aligns with A, C & D in being realistic and thus minimizing the design as much as possible. Thus, in extract (2), both B and C work to convince E that by aiming for the maximally available space as their outset criteria, the resulting design will run the potential risk of being discarded in actual use, because it's size will make it either impractical to use (lines 68-70) or, even worse, because the maximum size will mean that the chair on many occasions will have to

```
59 B:  Det' på en go' dag. a' det ser så'n der ud.
       It's on a good day. that  it looks like that.
60 ?   Ja.
       Yes.
62 B:  Du ve' ofte komme ud for a' der' mere på
       You'll often experience that there's more in
63     stuen.=
       the unit.=
64 C:  =>.hh< .hh Mæ' jeg tror ikk' vi ska' regne
       =>.hh< .hh But I don't think we can expect
65     me' >Al'så hvis det' no'et der sk-  hvis de-
       >Well if it's something that sh-< if it-
66     v- sk- vi-  Nu' vi jo næsten over i
       v- sk- vi- Now we're almost in the
67     realismefas[en så
       the realistic [phase then
68 B?:               [°Ja= j[a°
                     [°Yes=[yes°
69 E:                      [JErh,  Ok[ay det er vi.=
                           [Yeah, Ok[ay we are.=
64 C:                                [ikk',
                                     [right,
65 C:  =ev- [ev- fordi- at at så- så må man sige at
       =ev- [ev- because then- then you must say
66 E:       [Jerh.
            [Yeah,
67 C:  den skai- den ska' fylde så lidt som muligt
       that it sh- it should take up as little space as
68     for det øjeblik at den først bli'r .hhh for
       possible because the moment it becomes too
69     pladskrævende så vil (.) tilbøjeligheden te' å'
       demanding of space then (.) the tendency to
70     anvende den være (0.2) m[inimal.
       use it will be      (0.2) m[inimal
```

Extract (2).

be removed to make room for more necessary equipment in the intensive care unit (lines 59-63).

Extracts (1) and (2) illustrate how a crucial design criteria such as size is negotiated and constructed *during* the actual process of making. In addition to this, however, the establishing of design criteria at this point in the design process (i.e after the process has in fact begun) turn out to be relevant for the possible weighting of the two competing design alternatives, "the egg" and "the compartment". Thus, it is at this point in the process that the design proposal that ends up playing the dominant role in this session, "the egg", is introduced for the very first time, as illustrated in extract (3).

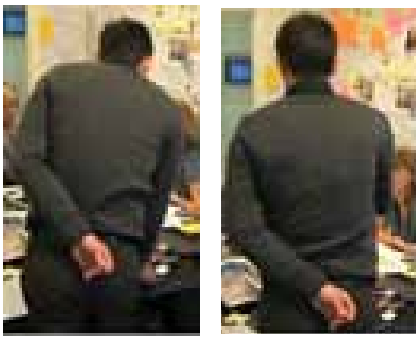
Whilst C has been arguing for the most minimal design (lines 67-70), A has picked up a mock-up of a chair made earlier and introduces that as a design that meets these criteria, criteria that now appear to be accepted by A, B, C and D. The positioning of this introduction thus ties the proposed design together with the design criteria, something which is accomplished both verbally, by A's introduction "There we've designed the ultimate ( )", as a response to and in overlap with C's argument for working on as small a design as possible, and physically, by A grabbing and then holding up the mock-up of "the egg" for inspection again as a response to and in overlap with C, as illustrated in Picture 1, below.

A also establishes this connection more explicitly, by claiming "the egg" to be "the ultimate" solution or design in this context (line 72).

What A manages to do in his turn in line 71 is both to circumvent any further discussion of the design criteria

69 C: pladskrævende så vil (.) tilbøjeligheden te' å'
demanding of space then (.) the tendency to
70 anvende den være (0.2) m[inimal.
use it will be (0.2) *m[inimal*
71 A: [Der har vi
[*There we've*
72 designet de[n ultimative [( )
designed th[e ultimate [( )
73 D: [↑Mm,
74 C: [J↑a.
[*Y↑es.*
75 C: Ja. M' det var jo faktisk den jeg havde
Yes. But that's actually the one I had
76 fors[øgt å' lave her.
atte[mpted to make here.
77 A: [(A) Ja præcis. ( )
[*(Yes) Yes exactly ( )*

Extract (3) .



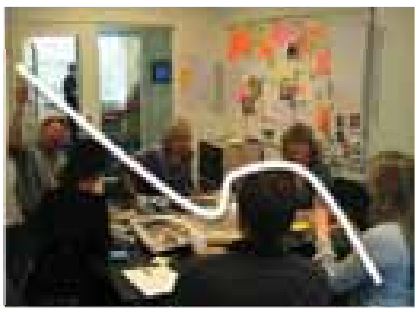
Picture 1: A picks up a mock-up of "the egg" while C says "være" (line 70), then holds it up for inspection while uttering "designet" (line 71).

for physical size, in effect establishing the criteria to be that they aim for "as small as possible" even though E has not (at least explicitly) agreed to this, whilst at the same time proposing "the egg" to be the design alternative that meets these criteria in the best (ultimate) way. In one sweep, then, A has managed to both propose a particular design proposal and to establish this as meeting certain criteria on which the final design is dependent. In contrast to this, the competing design proposal, "the compartment", which is in fact already in the works as F has been moulding a mock-up of this throughout the discussion in extracts (1)-(3), is not included as a potential alternative at this point, but is, in fact, effectively ignored by anyone but F who continues working on the mock-up. The significance, not only of where "the egg" is proposed as a design solution, but also that it is proposed at all, should be evident from the other participants' receipt of A's proposal. As can be seen in extract (3), at least two of the other participants (D and C) receipt A's proposal with something like enthusiasm, as indicated by the pitch (the upward arrow) with which the minimal response tokens "Mm" (line 73) and "Ja" (line 74) are produced. C further seeks to support A's proposal by pointing out that he himself created an earlier mock-up of "the egg", from which A's mock-up is a further development. C thus not merely receipt and accept A's proposal, but claims some ownership to it. Whilst the activity of doing a mock-up of "the compartment" thus, at this point, continues to be done as a unilateral activity by F and is not offered to the other participants for assessment, the alternative proposal, "the egg" now has two participants claiming ownership to it and one participant expressing enthusiasm. In the following section I will illustrate how these differences between the two proposals are further developed by the participants, so that "the egg" is treated as a joint project that all can participate in developing, whereas "the compartment" remains very much F's project to which the others can at best contribute upon invitation.

PARTICIPATION IN THE DEVELOPMENT OF DESIGN PROPOSALS

One of the most fundamental features of interaction is that the number of participants matters and that as soon as more than three parties are present, schism may occur (Schegloff 1995). Schism means that the people who are co-present and even parties to the same activity may split up into several different interactions. For an activity such as designing which is clearly very much a joint activity, the occurrence of schism can obviously become a crucial aspect of the activity. In our case, a schism occurs almost immediately after A has introduced "the egg" as a design proposal. Thus, while A, B & C engage in further discussions about the development of "the egg", D, E & F initially focus on the other design alternative, "the compartment".

At this point of the process we thus have two concurrent interactions, each focusing on their own design proposals. Picture 2 illustrates this split by capturing how the participants physically orient themselves towards one of the two interactions, with A, B & C creating one triangle of interaction, D, E & F creating another triangle. We



Picture 2: A, B & C forms an interaction triangle (lower left corner of picture) and D, E & F form another triangle (upper right corner).

102 C:	Jahmen ve' du hva' hvis du nu- Hvis man nu
	Yes but you know what if you n- If one now
103	tænker den helt færdig ikk', >Så prøv li'
	think it all the way through right, >Then just
104	tænk< .hhh så er der en eh (.) Der er eneh
	think< .hhh then there is a eh (.) There is a eh
105	>eh hva' hedder< de:t e:hm: (0.6) *e:h*
	*>eh what's it called< e:hm: (0.6) *e:h**
106	>Hva' hedder så'n en lofter?<
	>What's one of those lifters called?<
107	(0.7)
108 A:	J↑[a
	Y↑[es
108 C:	[en kran=
	[*a crane=*
109 A:	=Ja,
	=Yes,
110 C:	>Hva' a det nu det hedder,<
	>What's it called again,<
111 A:	Ja=ja, men;
	Yes=yes, but;
112	(.)
113 C:	så'n en ikk'?=
	one of those right?=
114 A:	=Ja=
	=Yes=
115 C:	=den [(sætter du)] så de- >Ja en
	=you [(then put that)] so the- >Yes a
116 B:	[>en patientlift<]
	[*>a patient lift<*]
117 C:	patientlift å' den< dækker hele stuen.
	patient lift and that< covers the whole unit

Extract (4).

begin by taking a look at the interaction going on between A, B and C who are now jointly working on developing "the egg" further, as illustrated in extract (4).

Having agreed with the basic idea of the form of the chair (similar to a Danish design icon, hence the name the egg), they go on to discuss and develop the *functional* features of the chair, with C suggesting that they attach the chair to the patient lift already in the intensive care unit. Though C has problems finding the right term for the patient lift and thus has difficulties in finishing his proposal, the responses produced by both A and B display their understanding and ready engagement in this activity and in the further development of "the egg" as a design proposal. Throughout C's extended attempt to formulate exactly what he means, A thus continuously displays not just that he is listening, but also that he is understanding and agreeing with C's proposal. When, for instance, C for the third time makes an overt inquiry for the term (patient lift) that he is missing (line 110), A responds with what has been termed a "multiple response token" (ja=ja "yes =yes"), i.e. a combination of two or more response tokens (such as yes, no) within one intonational unit, with which the speaker can show that the prior speaker is persisting beyond the necessary (Stivers 2004). Thus, A indicates that C's persistence in finding the right term is unnecessary because he has already understood what C means without the use of the "proper" term and has agreed with the general gist of the proposal. This is further underscored by the "men" ("but") , which serves to challenge the relevance of the ongoing activity (i.e. the search for a "proper" term) (Steensig and Asmuss 2005). Other ways in which A clearly participates in the discussion of the further development of "the egg" as a design proposal is evidenced in the two collaborative completions (Lerner 2004) he produces in lines 120 and 125, showing C (and us) that he knows exactly where C is going with his proposal and that he agrees. B's involvement in this activity or sequence is also evident, though she takes on a slightly different role than A at this point in the process. Whereas A's responses and contributions cast him as an active participant in the actual development of the proposal, B's contributions are mainly of the supportive kind, which treats C as the driving force behind the process. Her only (verbal) contributions are thus the provision of the term "patient lift" in line 116 in response to C's inquiry for that term and an evaluation of the proposal at the end of the sequence (line 137). This evaluation ("not at all a bad idea") may to some appear a somewhat weak and low-grade, hence unenthusiastic, type of assessment, but in Danish assessments of this kind are generally considered to be high-grade and enthusiastic by participants in interaction (Lindström and Heinemann 2009). In the case in point, B's enthusiasm is further emphasized by her adding the adverb "slet" (at all), which upgrades the assessment to an "extreme case formulation" (Pomerantz 1986).

At the same time as this interaction about "the egg" is going on between A, B & C, the following takes place in relation to the second design proposal, "the compartment", between D, E & F. Here, as noticed earlier, F has been working on a mock-up for "the compartment" for quite a while but has not, as yet, *proposed* the design to the others. At this point, however, F holds up the mock-up as if to present it for inspection and noticing this, E explicitly invites the others to inspect it. This is accomplished both verbally, with "Nej, se li' der" (Oh look at that) (line 108 extract 5) and non-verbally, through pointing to the mock-up as illustrated in picture 3.

118 B:	Mm,=
119 C:	=så- å' ha' (.) e:n [eh
	=then- and have (.) a: [*eh*
120 A:	[en (kant en æg stykker)=
	[*an (edge an egg piece)=*
121 C:	J↑a, Æ[gget.
	Y↑es, Th[*e egg,*
122 A:	[Ja.
	[*Yes.*
123 A:	J[a.
	Y[*es.*
124 C:	[e:h=
125 A:	i hænge,=
	in a hanging,=
126 C:	=Ja, der li- der >simpelthen< >>du ved<<
	=Yes that ju- that >simply< >>you know<<
127	>(den ka' du li') te'< å' køre ned,=
	>(you can just)< pull it down,=
128 A:	=J[a
	=Y[*es*
129 C:	[å' så hænge på det samm[e aggregat å' så
	[*and then hang on the sam*[*e aggregate and*
130 A:	[Ja
	[*Yes.*
131 C:	ka' du sidde derinde [>.hh< e:h e:h i den=>å'
	then you can sit there[*>.hh e:h e:h in it=>and*
132 A:	[°Jerh°
	[*°Yeah °*
133 C:	den ku' du< faktisk >.hh< den ka' hænges
	that you could< actually >.hh< it can be hung
134	frit hvo:r (.) al'så der hv[or der a' plads.
	free whe:re (.) well whe[*rever there's room*
135 A:	[Ja=ja *(
	[*Yes=yes *(*
136 A:	[[ ) *gets up and looks for material
137 B:	[Det' slet ikk' nogen dårlig ide.
	[*That's not at all a bad idea.*

Extract (4) continued.

The interaction between D, E & F around "the compartment" in extract (5) shows some similarities to the interaction between A, B & C around "the egg" in extract (4). In both cases, one person takes on the role of proposing the design whilst the others join in by accepting the proposal in various ways. In extract (5), the proposal is done non-verbally by F proffering the mock-up to the others and acceptance

Picture 3: E points to the mock-up held up by F while making the verbal noticing "Nej se li' der" (Oh, look at that).

108 E:	Nej se li' der,
	Oh, look at that,
109 D:	Ja.
	Yes,
110	(.)
111 D:	( )
112	(0.2)
113 D:	>Det' så'n den skal laves (å' så ska'
	>That's how it's made (and then
114	ma[n)< Y↑es,
	yo[u)< Y↑es,
115 F:	[Hvis man nu har den [ikk'?
	[*If you have that* [*right?*
116 E:	[hhhe[hhhh
117 D:	[J↑o,=Å' så ska'
	[*Y↑es.=And then*
118	vi ha' en eh: (.) så ska' vi ha' skærmen. Å' det
	we need a eh: (.) then we need the screen. And
119	ska' være buet ås'. Det ska' al'så ås' være (råt).
	that should also be arched. That should also be()
120	(1.0)
121 D:	Ja,
	Yes
122	(3.0)
123 F:	Men denne her ku' ås' dække det hele ikk',
	But this one could also cover the whole right,
124 D:	Jo.
	Yes.
125 F:	(ka' den ikk' bare)
	(can't it just)
126	(1.0)
127 F:	Nu må vi så ikk' klippe i den her men;
	Now we're not allowed to cut this one but;
128 D:	Må vi klippe i dem her, ( )
	Can we cut these one, ( )
129 F:	Nej.
	No.

Extract (5).

is done in the form of evaluations from both D & E, D with the noticing in line 108, E through stating that "that is how it's made" in line 113 and with her enthusiastic "Yes" in line 114. But this is where the similarities between the two interactions end. Firstly, while in extract (4), the participants engage in developing ideas for the function of "the egg", the participants in extract (5) appear to focus on the appearance of "the compartment". In this, they treat "the compartment" as a nearly finished product, where only the finer details are up for negotiation, something which is in fact already implied from the way in which F offers the mock-up up for inspection, as if it was ready to be evaluated already. Moreover, "the compartment" at this point of the process is already shaped as a "high-fidelity prototype" (Preece et al. 2002), a mock-up that looks very much like, and is made of the same material as, the final design. The mock-up of "the compartment" is, in addition already very detailed when F reveals it to the others, something which might result in "fewer comments and a more focused communication" (Brandt 2005: 37). By giving the appearance of being almost done and to a certain level of detail, "the compartment" might thus not as readily invite other participants to join the development process, and if they do, to do so mainly at the level of appearance, rather than function. This focus on the details of appearance is evidenced also in the remainder of the extract, where F and D now concentrate on finding the right material to use for the remainding parts of the mock-up. Secondly, the proposal of "the compartment" is proposed after the competing alternative, "the egg" has been proposed and accepted by (some of) the other participants in the session, as illustrated in extract (3), thus coming in as a second proposal, which in itself renders it a quality of being an alternative. Thus, Brissaud et al (2003), for instance, argue that once participants in a design process move forward with a potential solution or proposal, this proposal is "afforded a status of irreversibility", where a new proposal "has to be very strong to reverse the one already accepted" (164). Because "the compartment" is furthermore proposed at a point where schism has already occurred and three of the participants have entered into an interaction about the development of the first proposal, "the egg", they have in a sense excluded themselves from considering any other alternatives (at this point at least), as this would require them abandoning the activity that they are currently engaged in. At the point at which F holds up the mock-up of "the compartment", there is thus little chance of having A, B or C even acknowledge its existence, yet alone engage in a more expanded discussion and development of it.

Extracts (4) and (5) together illustrate how the participants in the mock-up session have split into two groups, each focusing on alternative/competing design proposals. This split is not pre-agreed or in any way organized, but appears to be a result of the ongoing interaction. Nevertheless the split is at this point symmetric in so far as there are an equal number of participants in each group, which renders some degree of symmetry between each of the alternative design proposals in so far as each, at this point at least, should have the same number of promoters. However, schisming as an interactional phenomenon is fragile and shifting, and participants may move between participating in different interactions. Such a shift occurs in extract (6), where E joins the activity around the development of "the egg", leaving F & D to find suitable material for "the compartment". Thus, at the same time as B is assessing the proposal made by C to hang "the egg" in the patient lift, E formulates the upshot of this proposal, namely that they are now focusing on something that can hang (lines 138-139). She then goes on to suggest that they need to mock-up that part of the proposal (line 145), here using the inclusive pronoun "vi" (we), thus showing that she regards herself as being part of this group now. The others' acceptance of this shift is evidenced by A's response in line 148, where he shows his willingness to comply with E's suggestion.

A CA analysis cannot provide any solutions to why E "abandons" the interaction with D and F and instead join the group working on "the egg". What we can see, however, is the kind of consequences this has later on in terms of the respective participants' "ownership" of the different proposals. Thus, though E subsequent to the interaction in extract (6) shifts from one group to the other repeatedly, the participants themselves clearly see D and F as the only two participants who are not sufficiently informed about "the egg" as a design proposal. This is evident from extract (7), where B holds a more finished version of a mock-up for "the egg" out for inspection, specifically to

137 B:	[Det' slet ikk' nogen dårlig ide.
	[*That's not at all a bad idea*
138 E:	[Så li' nu a' vi ude i noget der
	[*So now we're into something*
139 E:	b[li'r hænger- der hænger ned?
	t[hat hangs- that hangs down?
140 A:	[Så'n en laver jeg li'.
	[*I'll make one of those.*
141 B:	Det var slet ikk' no'en dårlig i[de.
	That wasn't a bad idea at a[ll.
142 C:	[Nej.
	[*No.*
143	(.)
144 C:	Den a' de[r jo i forvejen d[en der. >den
	It's there [to begin with that one. >it
145 E:	[Så'n en må vi lave
	[*We have to make one of those*
146 B:	[Ja
	[*Yes*
147 C:	dækker hele rummet-<
	covers the whole room<
148 A:	Jeg laver så'n en i modeller.=
	I'll make one of those in putty paste.=

Extract (6).

Picture 4: B holds up the mock-up of "the egg" for inspection, inquiring of D and F whether they "got it".

D & F. While holding the mock-up towards D & F (as illustrated in picture 4, B simultaneously inquires of them whether they "got it", then goes on to explain the concept in further detail (not shown here).

231 B:	Fik i den,
	Did you get that,
232	(0.2)
233 C:	Ja.
	Yes,
234 B:	Så'n en te' å' hænge op i: e:h=
	Like one to hang in: e:h=
	(continues describing the function of "the egg" to D & F)

Extract (7).

DISCUSSION

In the preceding analysis I have attempted to illustrate at least part of the route taken by two different design alternatives, "the egg" and "the compartment", in a mock-up session, with a view to explaining how it comes about that one design proposal ("the egg") receives a more dominant role in the process than the other design alternative(s).

I have pointed to two aspects of interaction that may influence this matter, sequential positioning and schism. In terms of positioning, I have sought to illustrate that both where and how a design alternative is proposed might have consequences for its subsequent uptake and development. Thus, "the egg" was proposed at a point at which it could be treated as a *solution* to certain deign criteria, thus rendering the proposal a large degree of relevance. By contrast, "the compartment" was proposed at a point in which half the group were already engaged in developing "the egg" further, leaving little space for any receipt, yet alone development of "the compartment" at this point. In terms of schism, I have illustrated how, as a natural consequence of the turn-taking system for interaction, the co-presence of more than 3 people who are engaged in a collaborative activity will eventually lead to schisms, i.e. to people splitting up into two or more groups engaging in different activities. This, in the context of the mock-up session of design proposals, meant that there may be several alternative proposals in play at the same time, but also that each of these proposals may thus be treated differently, not necessarily because of any inherent (lack of) quality, but simply because one proposal might have been worked through by more people than the other proposal. It takes no great analytic skill to realize that participants are more likely to remember, support and be enthusiastic about a proposal which they themselves have taken part in developing. Whilst my analysis has thus sought to illustrate how one design proposal becomes domineering, it does not give any clues as to why this happens, something, which I believe would be of more interest from a design perspective. However, the analysis does suggest that the fact that "the egg" in this session is the dominant design proposal has nothing to do with it being a better, more suitable alternative, nor has it anything to do per se with one or more participants initially preferring this proposal over the other. Rather, "the egg" is turned into a better and hence preferred proposal through the way in which the participants interact around it, including, the way in which they manage to scaffold this proposal in reality, as illustrated by Rosenqvist and Heimdal (2011).

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DESIGNERS AND STAKEHOLDERS DEFINING DESIGN OPPORTUNITIES "IN SITU" THROUGH CO-REFLECTION

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ABSTRACT

This article proposes co-reflection as a workshop to situate design practice in its context of application and presents a case study done at the eLearn Center of the Open University of Catalonia. Co-reflection is a reflective practice. In the half-a-day workshop developed, co-reflection was specifically tailored for group dynamics in situ. The workshop was the kick-off meeting of a design research project and involved both designers and stakeholders. The project focused on how to communicate and disseminate relevant information between members of the eLearn Center. The aim of the kick-off meeting was to define design opportunities by framing both collaboration and a design space. This double aim has been achieved by: a) exploring and framing a design space by reflecting on short design activities in situ, and b) motivating stakeholders to collaborate in the design research project by making them reflect on the expertise and interests they can share and gain. Participants' evaluations have been used as feedback and treated as insightful considerations for further action research.

INTRODUCTION

Generative design research allows designers and everyday people to generate, experience and reflect on design opportunities in order to transform current situations. Generative design research is driven by design action and has a participatory approach based on the use of generative tools (Sanders 2006). Generative design tools have been widely developed over the past years. Experience prototyping allowed Buchenau & Fulton Suri (2000) to understand existing experiences, explore design ideas and communicate design concepts. Make tools were developed by Sanders (2000) and empowered everyday people to express their ideas and feelings. Drama and props were used by Brandt & Grunnet (2000) to evoke the future. Cardboard mock-ups were used by Säde (2001) in multidisciplinary design projects to provide a common language and facilitate conversations.

In recent years, research on generative design tools has focused on situating generative design tools in real life contexts. Iacucci & Kutti (2002) developed SPES (situated and participative enactment of scenarios) for trying out emerging ideas, discerning important contextual information, collecting creative contributions from participants and communicating realistic and authentic scenarios. Howard et al. (2002) used endowed props to increase stakeholders' sense of immersion during participatory design sessions by making real the possible interrelationships between the prop and the physical, social or technical context. Anderson & McGonigal (2004) developed place storming in order to allow engineers, designers and strategic marketers exploring new directions and applications for consumer electronics performing new technologies in context. The in-situ play provided a common language and experiential reference. Vaajakallio & Mattelmäki (2007) explored the situated used of make tools for setting the stage for co-design in collaborative design explorations. They carried out exercises to think about future opportunities with end users in their everyday work context.

This article builds upon previous research in order to integrate generative design practices in real life settings. It proposes a repertoire of generative design techniques that can be used in a workshop setting to define design opportunities through framing both collaboration and a design space: exploring and framing a design space by

reflecting on short design activities in situ; and motivating stakeholders to collaborate in the design research project by reflecting on the expertise and interests they can share and gain. A workshop done during a kick-off meeting at the eLearn Center of the Universitat Oberta de Catalunya (UOC) is used throughout the article to exemplify the workshop activities, to point out the implications of situating the process of defining the design opportunities; and to reflect on its additional pedagogical, exploratory and user research aims. The following sections introduce reflection and co-reflection in design practice as the theoretical framework that provided the structure to the workshop, describe in detail the workshop phases, analyses the feedback obtained from the participants and discusses about the implications of running the workshop in situ.

REFLECTION IN DESIGN PRACTICE

Reflective practice has now been widely accepted and used in the field of design. Schön (1983) defined designing as reflective conversation with the materials of a design situation. Dorst & Dijkwis (1995) compared design as a rational problem solving process with design as a process of reflection-in-action. Valkenburg & Dorst (1998) analyzed reflective practice in team design and identified that reflection occurs related to a choice to make for the next activity or to the design task itself and the team's progress. In the reflective transformative design process of Hummels & Frens (2008), reflection occurs in the transitions between envisioning a new reality, validating in society, analyzing, making prototypes and tinkering with technology, and integrating the knowledge created.

Reflective research can be of four types: frame analysis, repertoire building research, research on fundamental methods of inquiry, and research on the process of reflection-in-action (Schön 1983). Frame analysis puts emphasis on the process of perceiving and making sense of social reality. Frame analysis in the design field is of special importance. Considering design as a situated and constructive making of meaning (Ylirisku et al. 2009), makes framing activities key to deal with the complexity of design action and define design opportunities. Ylirisku et al. (2009) define three framing actions: exploratory, anticipatory and social framing.

This paper proposes reflective techniques to be used at an early stage of the design process to support explorative and social framing of design opportunities. Explorative framing functions as a guidance to support collaborative experimentation, ideation and exploration. Social framing focuses on understanding a number of aspects regarding how people act together, relate to others in relation to their interests. The authors developed and applied a co-reflection workshop to support designers and stakeholders in defining design opportunities by framing a collaboration space (social framing) and a design space (explorative framing). Framing a collaboration space is about making explicit what possible projects could be done between stakeholders and designers, and making them aware of value that they will bring. It stands for clarifying the motivations and defining boundaries. Framing a design space means exploring what possible directions the project can take based on interests and expertise of stakeholders and designers, and managing expectations and discussing about them.

CO-REFLECTION

Yukawa (2006) defines co-reflection as a collaborative critical thinking process involving cognitive and affective interactions between individuals who explore their experiences to reach new inter-subjective understandings. According to Yukawa (2006), co-reflection exhibits three interactional characteristics: it supports sharing experience, information, and feelings; the achievement of inter-subjective understanding through collaborative meaning making; and synergy between co-reflection and relationship building. These three interactional characteristics (sharing, inter-subjective understanding and relationship building) make co-reflection especially interesting for the involvement of stakeholders during the design process as it fosters co-operation (Boujut & Laureillard 2002) and reflective practices (Schön 1983).

Co-reflection has been previously applied during the design process as a user involvement session in order to constructively confront designer's rationale with society (Tomico et al. 2009). In a design context, co-reflection can be defined as an inductive process, a dialogical inquiry between designers and users used to build upon their transformative visions (designer´s vision or societal vision based on users needs, desires and fantasies) (Tomico et al. 2009). Co-reflection sessions in design practice use both tacit and active co-reflection views defined by Yukawa (2006). During tacit co-reflection, participants engage in inquiry without directly seeking feedback during the process. During the active co-reflection participants engage in inquiry through explicitly seeking feedback in an interactional and discursive manner. Co-reflection sessions start by getting users acquainted of the societal context in order to envision a new reality (tacit co-reflection stage). This new reality comprises the motivational aspects of the users' vision of the now, making them able to reflect on designers' vision (active co-reflection stage).

Co-reflection sessions can be developed in three parts: exploration of the current situation, ideation through a discovery process and confrontation between users and designers. Each part builds upon the next. The exploration of the current situation is used as the basis for an ideation process. At the same time, this ideation part is used as an empathy tool (Koskinen et al. 2003) to make users more aware of their own motivations and desires in order to confront them with the ideas that the designers have. This article presents how co-reflection was applied as a methodological approach in a workshop intended to design in situ with multiple stakeholders.

CO-REFLECTION WORKSHOP ON SITUATED BOOKMARKING

The present co-reflection workshop took place at the eLearn Center. The eLC is the center for research, innovation and training on e-learning at the Universitat Oberta de Catalunya. The eLC community constitutes a network of experts both from within and outside the UOC, who are organised in teams and get involved in projects whose aim is the improvement of the

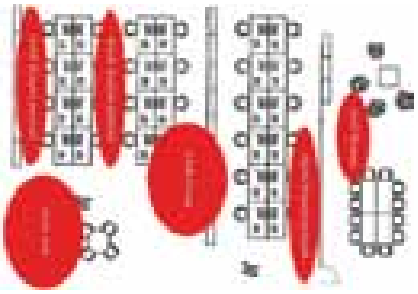

Figure 1: Working, library, open and meeting spaces in the center.

quality of virtual education and training. The eLC was currently starting a project on the improvement of the flow of information between members of the eLC community with the support of ICT. The goal of the project was finding new ways to connect people through their interests, the projects they are taking part of, the resources they are using, the outputs they produce, etc.

Situated bookmaking has been used in this project as a strategy to articulate the processes of information sharing, searching and knowledge building. Situated bookmarking is about re-contextualizing digital tagging of information in the same place where meaningful actions occur (physical and social domains). One of the first tasks of the project was to identify the kind of activities that could support the eLC needs in terms of information sharing and dissemination in different working situations and specific physical spaces. Starting from there, our purpose was to determine the right method and media to create, search and retrieve this information. In this sense, the activities of the workshop were meant to support designers and stakeholders in the definition of design opportunities during the kick off meeting of the situated bookmarking project. More precisely, the workshop lasted about three hours and it was realized in the real life context. It used one of the meeting rooms, personal working spaces, an open space and the library space of the eLearn Center. Figure 1 shows the distribution of the spaces used.

In total it counted with 14 participants: 3 designers (an assistant professor and 2 design students) from the Eindhoven University of Technology and 11 stakeholders (employees of UOC). The 11 stakeholders were all related to the eLearn Center (homogenizing characteristic) but with different expertise valuable to the project like psychology, education, sociology, innovation, engineering (heterogeneous characteristics). Moreover, there were members of the center that were not familiar with the topic but worked in the space (users) and other members that were the clients or tutors of the research project. Four groups were made combining profiles with different expertise. Results from the first group (researchers on instructional design, digital libraries, and learning technologies) will be presented throughout the article. The core guidelines and structure of co-reflection sessions allowed developing specific techniques for the exploration, ideation and confrontation phases for a workshop setting in situ. Autoethnography, group intervention, paper-prototype safari and wall of fame where the techniques developed for the kick of workshop on situated bookmarking.

AUTOETHNOGRAPHY AS EXPLORATION

Autoethnography (Reed-Danahay 1997) focuses on researchers experiences, feelings and reflections. Autoethnography is a reflexive account of one's own experiences situated in culture (Hayano 1979). It focuses on the researcher's subjectivity rather than trying to prevent it (Ellis & Bochner 2000). In the field of design, sensitizing packages by Sleeswijk-Visser et al. (2005) or empathy probes from Mattelmäki (2005) are small playful exercises done by means of disposable cameras, workbooks, diaries or postcards. These packages trigger participants involved in the design process to reflect on their experiences and provide a visual inspiration source for designers.

In the exploration phase of the co-reflection workshop, sensitizing packages were filled, analysed and applied directly by the stakeholders as in autoethnography. Stakeholders were challenged to do in depth observations on a specific topic by constraining their explorative actions through specific techniques. They grew their understanding on their surroundings by reflecting on their personal experiences and analysing them. Autoethnography through diary-tables was the technique developed with this specific aim. Diary-tables focused on one specific situation and were meant to be filled

Figure 2: Photo from the library at the eLearn Center.

out in groups in situ. They helped to describe what, where, when, why, with whom and how each situation happened. In order to get the participants into the mood, role-playing techniques were be used to re-enact the situation to analyse in a similar way it is done in place storming (Anderson & McGonigal 2004). Diary-tables described each situation by activities, context and observations. They made a specific separation between the physical, digital and social domains. Other fields could be added in relation to the purpose of the workshop.

During the exploration phase of the current workshop, stakeholders focused on what, where, when, why, with whom and how they bookmark resources. In groups, participants had to make a short introduction (who you are, what you do in relation to research, documentation and resources). Later on, they had to choose one situation common for all them that happened at the eLearn Center (e.g. wandering around, project meetings, working in their personal space, looking for resources in the library space) and analyse it based on the diary-table. In this case the fields to describe for each situation were actions that happened, context where it happens, content shared and observations of critical aspects. Special attention was given to analyse physical, digital or social domains separately. Designers used the exploration phase to present themselves to each group, explain what kind of work they do and, more specifically, about the project they are collaborating on (the reason of the workshop). During the exploration session designers acted as facilitators, they gave support and guided the autoethnography process done by the stakeholders. At the same time, they used their process and results to reflect on their own process and analyze their own ideas (tacit co-reflection).

	Actions	Context	Content	Obs.
Physical	Observation (topics, distribution) Classification	Table with ordered & unordered books.	Books & journals	Books are complex to organize
Social	Discuss about interest or quality	Sounds of conversations	Book subjects, classifications.	Help for classifying. Share knowledge
Digital	Take pictures	Mobile phones		

Table 1: Diary-table resulting from group 1's autoethnography.

Table 1 shows the diary-table from group 1. In order to fill this table, they had to agree upon a situation first. The situation they finally chose was reading in the small library at the eLearn Center (see figure 2), which consists of an array of 5 bookshelves and 5 empty tables. Tables were currently used to pile, classify and read books. Shelves were used to store the books and journals in order. Because group 1 described a situation in a different room from where they were located, it was difficult for them to frame the situation. They planned and remembered how they would use it based on their past experiences but they did not explore, nor re-enact the situation first. Observing and re-enacting their everyday activities in situ afterwards made them change part of their findings (e.g. they thought that all the books were laying on an array of tables and not in the shelves). Their main observations were: books are complex to organize, they would like to meet people that help them identifying interesting books, and have support to share knowledge with others. These observations were taken to the next phase of the co-reflection workshop, the ideation phase.

GROUP INTERVENTION AS IDEATION

Group interventions in a real life context were used as the ideation phase of the co-reflection process. Group intervention, like other generative techniques applied in the design field, was used to catalyze, capture and collect dreams and aspirations (Sanders 2000). It situated the use of projection in the real life context of the eLearn Center to let ideas arise, tapping into the social imaginary (Howard et al. 2002, Vaajakallio & Mattelmäki 2007). Group intervention was an application of exemplary design research developed by Binder & Redström (2006): research through design driven by program, experiment and intervention. In the current workshop, a design program acted as a frame for various design experiments. Experiments were conceptual design proposals. Examples served as alternatives to frame the design space and at the same time provided suggestions for design practice (Gaver & Martin 2000). In group intervention, design action was done in groups and in the context where the outcome was meant to be used. It changed existing situations into preferred ones (Schön 1983) by using role-playing and paper prototyping techniques.

The aim of group intervention was to: set the expectations between stakeholders and designers, define the boundaries of the design research project on situated bookmarking and define the design space. Group intervention used a framing program based on the research done on situated media (Güven & Feiner 2006). Situated media refers to multimedia and hypermedia that are embedded in the environment (Güven & Feiner 2006). The framing program on situated media defined how the consumption and creation of digital media would be transformed by the inclusion of the social and physical domains as part of the content. These specific directions for the transformation were based on constructivist learning tasks for computer mediated learning environments: discussing, seeking, organizing, generating and manipulating (Gros 2002). The situated bookmarking design research project was a specific case study under the situated media framing program.

During the ideation phase of the current workshop, stakeholders had to choose one activity to support (discussing, seeking, organizing, generating and manipulating), discuss what it meant for the group, how it related to the situation chosen and actions described in the autoethnography. Then, they had to re-enact these actions and relate them to the critical observations defined in the autoethnography table. Later, they had to envision how the ideal experience should be and transform the space to support this desired behaviour. They used paper prototyping as a tool to physicalize the required transformation (see figure 3 for the materials used). In this phase designers acted as facilitators. They supported and guided the stakeholders' group intervention by explaining how the design process works. At the same time, designers carefully observed stakeholders' process and outcome. They reflected on their own design process and how to support decisions taken (tacit co-reflection).

The concepts developed by each group were related to social reading, supporting pre and post meeting activities, enhancing inspiration behind the computer, and posting informal questions during free time. Group 1's concept was about social reading. Its value was that it supported discovering new books and new interesting topics. The starting point (based on the exploration phase and the observations they made) was to classify books and journals in a certain way useful to each of them. They chose organizing actions from the situated media framing program as their personal take on how the situation should be transformed (fig-

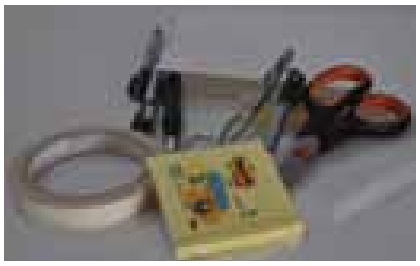

Figure 3: Material used during the group intervention.

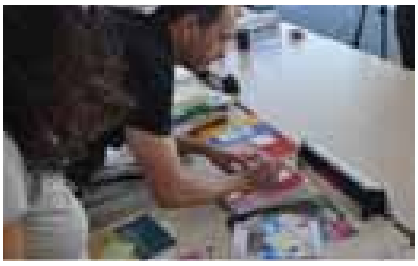

Figure 4: Photo taken during group intervention done by group 1.

ure 4 presents the group intervention done by group 1). They wanted to first organize and classify: organize books by tagging them in terms of their interests, classify them in a way that is common to all of them making them easy to retrieve and use. In the desired situation, when they find a book that it is interesting they tag it with their name and explain why it is interesting for them. They use a colour code to do it and an exclamation mark to set priority (that was necessary for them for a specific task for a week). Then, every member of the team put his or her opinions and priority to use it. Opinions will become a code that will evolve and adapt based on their needs. During group intervention, questions arose like: how could the use of a book be arranged when two persons are interested, and how could the code be enhanced to show priorities to use it. Their main comments revolved around the usefulness of their concept. They described how they could go to the table and see who is interested in specific books and why. The designers pushed group 1 to move beyond discussing how things should be in general by asking them to focus on specific things related to the group. The designers also encouraged them to get inspired and constrained by the context, and use the material provided (e.g. paper of different sizes and colors, post-its, transparent tape, scissors) to tinker, experiment and communicate. In this way the designers shared their way of working with the stakeholders, who also experienced it to show its value, its advantages. Afterwards the designers asked for the reasoning behind stakeholders' actions. The designers also helped the stakeholders to broaden up their situation by adding new users, new functionalities to their concept (e.g. asking how the information will be presented to someone that passes by, asking for the role of the physical context for their concept) in other to prepare them to the next phase of the co-reflection workshop: the confrontation phase.

PAPER PROTOTYPE SAFARI AS CONFRONTATION

The design field has a tradition of design critique that serves as a form of reflection, evaluation, reuse of knowledge and accountability (Wolf et al. 2006). Design critique allowed designers to stay open and recognize multiple and conflicting interpretations (Sengers & Gaver 2006). During the confrontation phase of the co-reflection workshop, design critique was transformed into a safari by presenting paper prototype concepts in their natural habitat. Like informances (Burns et al. 1994), scenarios were rendered as plays and interactive environments by role-playing with simple paper prototypes.

Figure 5: Photo from two members of group 1 role-playing.

The paper prototype safari was a presentation technique that allowed designers and stakeholders to compare, discuss and comment on the design outcomes in the context of application (Buchenau & Fulton Suri 2000, Iacucci & Kutti 2002, Howard et al. 2002). Stakeholders had explained the existing situation to improve, role-played the new desired situation with their prototypes and described how their concept would help to bookmark research activities, documentation and resources (based on activities, time, people and purpose). Each group had a two-minute presentation and a two-minute session of comments and constructive critique. During the latter session, designers actively asked questions, proposed directions and explained their proposals in relation with their personal vision on the subject (active co-reflection).

Figure 5 presents the role-play and presentation from group 1 in the library space. During their presentation group 1 first explained the process to get to their concept. Then, they explained the concept by re-enacting the new situation they envisioned. Afterwards, they proposed possible uses for other members of the center. During the presentation, a designer built upon the stakeholders' ideas and confronted their proposals (based on possible implementations of their ideas). A designer commented that the coding scheme could grow with time. New codes, functionalities and other communication streams would be added if needed. Moreover, stakeholders were confronted with a scenario where books were classified in a bottom up approach in order to create an emerging taxonomy and where other people could use their private search information.

WALL OF FAME AS RESULTS

The resulting paper prototypes and transformations of the space were shown as trophies in a wall of fame setting. The wall of fame used paper and cardboard prototypes to promote comments and discussion (Säde 2001) during the following weeks after the workshop. Photos and prototypes were arranged in an exhibition setting at the eLearn Center. Situating the exhibition in the real life context helped to broaden the scope of the workshop and to create conversations between members of the center that did not participate in the workshop. The wall of fame stayed in the space for a few weeks. It gave continuity and physical presence to the design research project on situated bookmarking. It acted as a reminder of what the design space would be, the set expectations, and the defined opportunities.

Figure 6 shows the four concepts developed based on the four situations chosen by the groups: social reading (first on the left), meeting history (second on the left), inspiration behind the computer (second on the right), and informal questions while wandering around (first on the right). In the wall of fame, a photo of books with tags on Post-Its represented the social reading concept. In other cases, concepts were displayed by 2D or 3D paper prototypes created during the group intervention.

Figure 6: Framed paper prototypes and transformations of the space.

Figure 7: Situated bookmarking webpage.

A digital version of the wall of fame was created to disseminate the outcome of the workshop and expand the possibilities for feedback outside the eLearn Center. Visitors could watch the safari presentations from the four groups, read through the concepts that were generated during the workshop, leave comments about what they liked from the concepts, envision what they would like to have in the future, and read the comments from other visitors and participants. Figure 7 shows the tab developed for the reading situation. Each situation had a tab with a picture taken from the wall of fame, a description of the concept taken from the safari presentation and a space to comment.

FEEDBACK

The current workshop presented one of the first attempts to situate the process of defining design opportunities in a real life context like the eLearn Center. Improvement areas like group dynamics with real coworkers, detachment from everyday reality, and managing creativity and expectations emerged from framing the design and collaboration spaces in situ. Group dynamics with real coworkers related to what roles group dynamics played in the session and on the results. Detachment from everyday reality related to how the generative design tools (materials and the processes of making) supported stakeholders during the workshop. Managing creativity and expectations related to the confronting situation of designing for unlikely futures. The following paragraphs comprise some of the comments the stakeholders gave to the designers during a feedback session after the workshop in order to exemplify the areas of potential improvement.

GROUP DYNAMICS WITH REAL COWORKERS

The group sample was one of the topics commented by the stakeholders: *"choosing the group sample is very important: the amount of people, the background, the gender. A bigger group would have been more useful, four people in each group instead of 3. It might have changed the dynamics inside each group. A triad is a very specific kind of group."*

Although it is an important consideration, for the current workshop it was relevant to come with more than one solution. Participants saw their concept as just one of many. It was important to communicate that there was not just one solution to the same situation. Each proposal enriched each other's ideas instead of getting into a discussion on which concept was better. With less groups competition becomes harder. It was important to avoid having winners and losers inside the same working environment. Future research will explore how stakeholders can best be divided into groups and be motivated to work together considering preference (what one wants) and competence (what one can bring in).

DETACHMENT FROM THE EVERYDAY REALITY

Autoethnography was an important topic that the stakeholders mentioned: *"By using autoethnography we are asked to detach from the situation, to objectivize their own work and this is the kind of task that is really hard to get done. It is not something you can do without training. We were forced to observe, analyze, objective and desire. Sometimes it is not easy to split the different activities. People are not trained on doing that. Sometimes is better an external observer who may contribute to make things easier."*

This comment emerged because not all the stakeholders did the autoethnography during the exploration of the space and role-playing (already commented in the autoethnography as exploration subsection). Done before the exploration, the filling the diary-table is based on how they will plan the actions. Done after the exploration, the filling the diary-table is done by reflecting on the actions done. As a reflection, it would have been better to give diary-tables afterwards they had observed the space and re-enacted the experience in situ. Then it truly would have become a reflection on a personal experience. It will be taken into account in future workshops.

MANAGING MOTIVATION AND EXPECTATIONS

Frustration was another topic that stakeholders commented on: *"If you are fostering subjective creativity you are putting the objective limits aside. This might create frustration. If you are pushing people to be creative and there are objective limits then the reaction is frustration. And frustration is the worst friction."*

This is a really critical point for designing in situ. The current workshop created confrontations in a personal level. Forcing stakeholders to be creative during the exploration and ideation phases made them to directly push management rules, privacy policies and hieratical structures that hardly could be changed. However, defining design opportunities through role-playing and paper prototyping had a gaming component. It helped to find interesting topics, find critical aspects, and create relations between concepts in a playful way. Research on playfulness and generative design tools will be taken into account in future workshops.

DISCUSSION

This workshop was set up with the aim of defining design opportunities by applying co-reflection practices in a workshop setting in situ. Its results had been used to define a 3-stage implementation program towards a open knowledge culture at the elearn Center. It showed the importance of the workshop to support the work of designers into the real context and closely together with the community that will potentially become the user of the designed objects and processes. Moreover, the interactional characteristics of co-reflection (sharing, intersubjective understanding and relationship building) broadened the scope of the workshop. The current workshop presented was used with a pedagogical aim (to let participants experience the work of a designer), an exploratory aim (work together with multiple

stakeholders through group activities in situ), a design aim (physicalize the desired scenarios through concepts) and a user research aim (to understand critical issues encountered by people in their ordinary work).

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ABSTRACT, CONCRETE OR HYBRID PARTICPATORY TOOLKITS

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ABSTRACT

The paper describes the use of three-dimensional generative participatory toolkits for modelling different transportation device configurations in a participatory design activity. The activity was carried out with two different kinds of model kits viz. abstract and concrete in four different combinations 1) abstract-only, 2) concrete-only, 3) abstract-concrete and 4) concrete-abstract. The paper aims to enquire into different ways that these toolkits operate and attempts to highlight the significance of each type of toolkit for future design endeavours.

INTRODUCTION

Participatory Design research at the early stages of the Design Process reveals deep tacit (Polayni 1983) knowledge of users and issues surrounding the use of product, to inform and inspire designers in the conceptualization stage (Schuler 1993). A participatory design research typically is composed of: Participatory prototyping (to gather collective user knowledge) and Context mapping (for designers' use for concept generation). Bødker (2000), (Hekkert and VanDijk 2001), (Grudin and Pruit 2002). The participatory prototyping through the use of three dimensional generative participatory toolkits is found increasingly significant for accessing aspirations and expectations for a new product design and development process (Sanders 2000). Through the use of 3D visualization toolkit, users elicit responses by making various configurations of the modules and components of the toolkits. Careful design or selection of the participatory toolkit is important to ensure effective user response elicitation. Therefore, appropriate toolkit with naturalness of use, would be required to align with company's goals and objectives for a particular future product launch.

Author through the case study - *'Participatory research to design a new vehicle that bridges the huge price gap between two wheelers and cars in India'*, illustrates four types of participatory toolkits viz. concrete, abstract, concrete-abstract hybrid and abstract-concrete hybrid for near-future, moderately-futuristic, futuristic and very futuristic design projects. The paper describes the use and implications of use of four different toolkits (abstract-only, concrete-only, abstract-concrete and concrete-abstract) in participatory prototyping sessions.

CASE STUDY

Gap between cars and 2 wheelers in India: In 2008–2009, around 7.5 million two wheelers were sold in India and that accounted for 79% of the total vehicles sold (SIAM 2009). There are mainly compact cars and account for 60% of the total passenger car sales in India (Technology Roadmap 2006). The general price of two-wheelers in India range from 30,000INR-80,000INR and the cheapest car starts from 2,25,000 INR. There has been a long felt gap between a two-wheeler and the car. Over the years in India, two-wheeler manufacturers perceived this gap as an opportunity to launch expensive scooters & motorcycles and the car manufacturers with stripped down cars, both with a limited success.

BRIDGING THE GAP

There is an opportunity to design a vehicle that would bridge gap between cars and two-wheelers in India. But, in the increasingly dynamic, diverse and complex environments like India, the challenge to innovate and develop new personal transport vehicles demands a deep knowledge of the users and issues surrounding the use of personal transport products. It has become increasingly important to understand people's aspirations and expectations and to utilize these insights in the vehicle design undertaking. Therefore participatory approach is adapted in this case study to get deeper user insights for

3	Mohan	See, in Rickshaws, two people can sit easily
41	Devekar	Abhi 2 wheeler hai par chaar log baith jaate us mein..
…		*In the two wheelers(scooters and motorcycles) 4 people manage to sit…*
82	Mohan	two seater hai….abhi close kar sakte hain…doosra kidhar hai…?bas..close ho gaya…ok..?
		Two wheelers…you can close…where is the other component…see it is closed now…Ok..?
91	Devekar	3 wheeler hai na..
…		*This is 3 wheeler..*
92	Mohan	then what you can do, you can make jeep after this..same with four…
…		*(Jeep as brand)*
115	Ruchin	yeha achcha hai…par yeh car nahi hai..
…		*This is nice….but this is not a car..*
121	Nancy	gypsey car hai..
…		*This is a Gypsey car (Gypsey as brand)*
123	Ruchin	yeh bada adventure type vehicle lagta hai..
…		*This looks like adventure type of vehicle..*
126	Mohan	yeh mahindra & mahindra jeep hai…abhi latest.. jungle mein jata hai na… ok…ho gaya…abhi chota jeep bhi bana sakta hai..
…		*This is Mahindra and Mahindra jeep….this is the latest…it can go in the jungle…ok…it is done…now we can make small jeep (Jeep as brand)..*
153	Mohan	4w jeep ho gaya…
		This is 4 wheeler Jeep (Jeep as brand)..
154	Mohan	car jaisa hona chahiye..
…		*It should be like a car…*
210	Devekar	what I find…once I travelled in this veh. WAGON R…bahut chota space hai….comfortable nahi hai…bcause of packing and material…I prefer it should be less
…		*what I find…once I travelled in this veh. WAGON R…space is too small…not comfortable…because of packing and materials…I prefer..it should be less(Wagon R as brand)*

Transcript Excerpt 1 – Participatory Prototyping 1: Concrete only.

near future, moderately futuristic, futuristic and very futuristic designs.

PARTICIPATORY PROTOTYPING

Participatory prototyping for the case study was conducted with four groups of user participants. Each group of users was diverse in terms of age and socio-economic status. Each group was given different toolkit. Prototyping was moderated by the author. Participants were asked to collectively design a vehicle that can potentially bridge gap between two wheelers and cars in India through the toolkits provided.

PARTICIPATORY PROTOTYPING 1: CONCRETE ONLY

CONCRETE PARTICIPATORY TOOLKIT

When all the elements viz. wheels, chassis/body, passenger and luggage are replicas of actual product elements. It has a transparent base frame with slots to place wheels. Various vehicle configurations like Two-Wheeler, Three-Wheeler, and Four-wheeler can be made by use of toolkit.

Fig 2: Abstract Participatory Toolkit

PROTOTYPING APPROACH

Intent of step by step prototyping is explored in this prototyping activity. It would normally start from the wheels, as wheels need to go into slots followed by body/chassis, passengers etc. Key words used in the conversation were normally familiar and had the precedence (Refer Transcript Excerpt 1). These key words were names of vehicle brands, wheel configurations, features, type of vehicles etc. This form of toolkit helps elicits more concrete and definitive responses in its natural use.

Fig 1: Concrete Participatory Toolkit

APPLICATION

This form of toolkit can be used for *near future design* endeavours like redesigning or re-styling existing products.

PARTICIPATORY PROTOTYPING 2: ABSTRACT ONLY

ABSTRACT TOOLKIT

When all the elements viz. wheels, chassis/body, passenger and luggage are abstract or indicative in their appearance. This allows users to devise any form of vehicle product. The blocks could magnetically join with the help of button magnets. Thus gives users easiness to quickly join and visualise.

APPROACH

The start is not defined and the kit modules are not well defined. This kind of toolkit allows users to choose their own start and also allows them to interpret results in their own way. Solutions that emerged were more systems oriented and very futuristic. Keywords were not familiar and

22	Touseef	Us lane mein… gaadi ki speed girne ..suppose sab gaadi 80 ki speed se ja rahi hain aur tum 60 se ja rahi hain ….toh kuch announcement ya indication hona chahiye… tum left mein aa jao
…		*In the lane…if vehicle speed drops…suppose all vehicles are running at 80kmph and you are running at 6kmph…then some announcement or indictaion is required…so that you could be on left side*
29	Anupama	We can take an example of fan and mixer..abhi hum housewives…ghar ka kaam karte hain to wohi speed mein masala banake hain na…abhi zzyaada soft cahiye to jyada speed..thoda medium chahiye to medium….to buttons ho to new logon ko problem nai honi chahiye.. ye mein mereliye bol rahi hun ....
…		*We can take an example of fan and mixer..see, I am a housewife…the way I do masala for cooking need I should be able to drive the cars also similarly…three buttons for soft, moderate and coarsly masala…So for new people..just few buttons to drive car…so that there is no problem..*
38	Yatin	mein aisa soch raha hun ki ye ek rahega individual… yeh yeh ek aur rahega ..aur agar tumhe ye join karna hai…you can just family ke liye ….connecter ..se connect kar diya …yeh join hoke …join ho gaya…..to familyk ki family ja sakti hai ….
…		*I am thinking that there is this one individual..there is one more..and you have to join it…so for a family …you can just connect with the connecter …then whole family can move…*
99	Rajan	mera idea hai ki height mein zyada hona chahiyye to upar bhi …so sakte hain to space zyaada ki zaroor nahi
…		*My idea is that car should be high so that …in the upper berth one can sleep also...*
100	Yatin	to ek bada… sa engine isko wheels …bade bade ..yeh main,,mera dost yahan pe khade hain…..to mera vehicle hai wo isko chipak jayega…ye chipak gaya …aur gaya
…		*So one big engine…and its wheels…big ones…see if my friend is standing here…and his vehicle can just stic to my vehicle…see… like this…*
121	Touseef	ye samaj le apna train type ho gaya badasa engine…aur yeh battery powered chote chote vehicles hai….kanjur tak aa gaye , kanjur se IIT aana hai to apni battery vehicle se aa jao…kanjur se battery itni charge rahegi ki idhar aa jayega
…		*Suppose…this is our train type vehicle…and these are small battery powered vehicles…we came to Kanjurmarg in this big vehicle…From Kanjurmarg to IIT we can use these small battery operated vehicles…you will have enough charge to reach here…*

Transcript Excerpt 2 – Participatory Prototyping 2: Abstract only

Fig 3: Concrete-Abstract Hybrid Participatory Toolkit.

mostly had no precedents. These keywords were about modularity, multilevel design, sleeper berths, touch-button controls etc (Refer Transcript Excerpt 2). This form of toolkit helps elicits more abstract responses in its natural use.

APPLICATION

These responses through this kind of method may be used for very futuristic design projects where thoughts through actions flow freely and can take any direction through the use of any module of the toolkit.

PARTICIPATORY PROTOTYPING 3: CONCRETE-ABSTRACT (HYBRID)

CONCRETE-ABSTRACT (HYBRID) TOOLKIT

When the artificial world is concrete and man world is abstract. In this case artificial world like base plate and elements of wheels and body are from concrete toolkit and man world like passengers and luggage is from abstract toolkit. Vehicle configurations begin by placing wheels in the slots and then manipulation with abstract and concrete elements is done.

APPROACH

Dual way is intended to regulate start and then freely use abstract elements for man world to get more insights. Keywords were familiar and solution oriented towards current vehicle problems. These keywords were space efficiency, safety, storage space, vehicle footprint etc (Refer Transcript Excerpt 3). This form of toolkit helps elicit controlled abstraction in its natural use.

APPLICATION

The response generated through this kind of toolkit may be used for design of *moderately futuristic* projects where practicality is more important.

15	Patkar	Advantage over existing bike or…
…		
16	Laxmi	Two wheeler which is covered
…		
18	Laxmi	Three wheeler to personal... wheel ...mage…..boots space..You must take a rickshaw to the station ….
…		*Three wheeler for personal use…in front there should be bootspace…you should be able to take it to Railway station…*
32	Laxmi	Two wheeler where three people can sit comfortably
…		
38	Rahul	lots of accidents in Bombay…regular accidents
…		
51	Rishi	This is one mono wheel, you an join one side by side or can joined together to be a family
…		
53	Rishi	Haan …….Haan Two people are going in the same route A….B common location kitna to join karlo taki ka engine to doosra ka engine sir ketch rah hen
…		*Yes…..two people are going in the same route…from A to B…They can join together and use one engine instead of both…*

Prototyping 3: Concrete- Abstract

3	Triveni	main kya soch rahi thi ki,two wheels hota , to yahan par ek pahinya aur laga kar…. To may be jagah kam lagegi our passengers bhi zyada ho sakte hai
…		*What I was thinking was…in this two wheeler, if we have one more wheel…we can have better space and accommodate more passengers…*
31	Vinay	ek aadami ke liye ho sakta hiai…magr space jyada lega…
…		*This can be done for a single man but will take more space…*
114	Devanuj	suppose I am not carrying four people.. I want to make it for one person… jab zaroorat nahin ho to the person ke liye kitna__kiya ja sakt ahi… kitna infrastructure…
…		*Suppose I am not carrying four people…I want to make it for one person…whenever there is a need…what can be done and how much can be done in terms of infrastructure…*
136	Vinay	detach ho sakte hain… only thing is ki… yeh space nahin hona chahiye
…		*This can be detached…but the only thing is space should not reduce…*
148	Devanuj	haan… yeh 1/ 4 length hai iska.. Aise lagate hain … lets play with forms… iska counter part kidhar hai?
…		*Yes…this is 1/4th of it length…lets play with forms… where is its counterpart?*
173	Devanuj	one more thing … chalo theek hain…. Can we have better protection against accidents? .. In some way?waise to yeh hota hi hai aapka crumple zone itna bada …. Lekin kya hai aadmi ko yahan bitha sakte hai..
…		*One more thing…that's alright…can we have better protection against accidents? ..In some ways? This anyway heppens to be a big crumple zone…but can we make a person sit here…*
214	Devanuj	4 log baith gaye to aaramse.. Plus storage space bhi aa gayee.. They can divide into woh… kya..

Prototyping 3: Concrete- Abstract

PARTICIPATORY PROTOTYPING 4: ABSTRACT - CONCRETE (HYBRID)

ABSTRACT - CONCRETE (HYBRID) TOOLKIT

When the man world is concrete and artificial world is abstract. Abstract blocks of wheels & chassis/ body and concrete elements of passengers & luggage were used.

APPROACH

This dual way is indented to first allow users to freely choose any starting point and then control it with concrete elements. Keywords emphasised on passengers, issues surrounding comfort & safety, accidents, personal mobility etc (Refer Transcript Excerpt 4). This form of toolkit yields more free-flow creativity with practicality in its natural use.

APPLICATION

The responses generated through this kind of toolkit may be used for *futuristic* design projects, where free flow creativity is more important

CONCLUSION

Depending on design lead time and business goals, four types of participatory toolkits viz. concrete, abstract, concrete-abstract hybrid and abstract-concrete hybrid can yield concepts for near-future, moderately-futuristic, futuristic and very futuristic design projects in prototyping activity. Step by Regulation is possible with concrete elements for more practical responses. When used with all types of toolkits,

Fig 4: Abstract-Concrete Hybrid Participatory Toolkit.

designers/researchers can map possible directions for near-future, moderately-futuristic, futuristic and very futuristic design projects and further use in the design process.

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INVESTIGATING USER COLLABORATION IN MUSIC BASED GAMES

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ABSTRACT

This study uses a combined method for the analysis of social interplay/interaction among users (or players) in a multimodal interaction and musical performance situation. The combined method consists of a) realtime interface data analysis for the description and interpretation of player actions detected by the system and b) video analysis used to describe and interpret the interaction situation and the context in which the social interplay takes place. This combined method is used in an iterative process, where the design of interactive games with musical-sonic feedback is improved according to newly discovered understandings and interpretations of joint user action. For example: How do two people play together if they play music with a pen tablet interface? Can a sound based computer game encourage two players to co-perform and co-create music? This study investigated two players' joint performance in relation to their mutual play speed, synchronization and mirroring of play styles when 'drawing with sound'.

IN SEARCH OF 'INTERPERSONAL DRAMA'

Rock Band® and Guitar Hero® are two examples of music based games where users act like players in an ensemble situation. These games are designed to entertain people by creating a social situation where players can bond through their joint performance in a rock band setting. Players collaborate as a team to compete with other teams (or themselves) about "best performance". Rock Band and Guitar Hero have paved the way for a new form of entertainment, where the experience of each player's performance is key: These games potentially offer users the possibility to express themselves together with others. The good thing about these games is that each player is offered a limited set of expressions, so that it becomes relatively easy to learn how to 'play music'. Also, the gameplay is recognizable: The Rock Band® screen interface shares the typical 'car lane' layout that is seen in multiple computer games. Players navigate along a small selection of paths at a set speed, and they are to collect points in the shape of 'tones' or 'beats' coinciding with a precomposed piece of music. Each player in the band has his/her own separate path to navigate. You could say that their joint play is theatrical: Players mimic the image of a band. However, it is not dramatic in the sense that the players actually create the musical content. Players don't co-create, or improvise together. They do not have mutual influence each other's content, play styles and phrasing.

VISION

In the type of music-based games that encourage open-ended play and improvisation, we find it important that sound feedback is not too dominating or controlling. In many music-based games a sequenced rhythm often eliminates possibilities for phrasing, speed change (accelerando / ritardando) and expression variability in general. Players end up trying to 'fit in' with an in-

flexible musical parameter. In the development of "intelligent" gameplay, we wish to categorize and quantify aspects of individual and joint action, so that a computer can be programmed to recognize some of them. In order to put the computer in the loop of interaction, it is essential to build a music-based game upon the most important social interaction and musical improvisation parameters that can be measured by a computer. When allowing negotiation of musical performance through co-action, it is important that a computer can respond to the players' idea of what is happening. By using quantitative and qualitative methods, we can investigate what players do, if they are to share expression on a 'white canvas'. The improvisation experience should be the 'goal' of the game and players should have access to a wider palette of possible participation frameworks than the typical 'winner-looser' framework. (Goodwin, 1990). When two players enter a participation framework while playing music based games they engage in a specific way of joint expression. For example, when a player plays a melody, the other player may accompany with rhythmical strokes: a solo-accompaniment framework. Within each momentary participation framework, players impose additional rules as of how to play together. Participation frameworks can change as players continuously negotiate what to do in relation to each other while they play.

In this study we have investigated how players engaged in joint play with simple draw styles when using a pen tablet interface (see figure 1).

With draw styles, we mean that players could either draw dots and lines, circles or scratch movements resulting in different forms of musical expression. Players could engage in participation frameworks with combinations and variations of these draw styles. Examples of variations of a draw style would be to change the speed of one of the draw style. Other changes could be change of scratch angle and the size of the lines, scratch movements and circles. The two main hypotheses about the game design for a pen interface sounded as follows:

1) If there was only additional sound feedback, when players used the same draw style combinations (for example if both players drew circles), then players would only use the draw style combinations that resulted in additional sound feedback, once they had discovered how to bring that forward.
2) Two players would also start to mirror each other's speed and timing in the draw movements, if they got additional sound feedback on that.

Figure 1: Wacom Intuos4 pen tablet interface®.

In general, we had the following research questions:

- What if a music-based computer game can provide users with a musical setting, where different kinds of player collaboration is supported and challenged through available types of participation frameworks?
- Can a computer play an active and positive role in the player-player relation?
- Does it make a difference that there is additional sound feedback as a result of joint improvisation, or is it enough to 'just' provide users with some electronic music instruments?
- How do players establish a mutual understanding of the available means of expression?
- How do players react, if a music-based game only gives sound feedback on selected forms of joint action?

HOW DO PEOPLE PLAY TOGETHER?

In this paper, one music-based game is presented that reacted to specific combinations of draw styles, synchronized timing and speed. The goal of this study was to find out if players would mirror each other's movements and stay in sync, when the sound feedback 'rewarded' this kind of behavor. In nine game sessions, teams of two individuals played together. The teams were either male or female teams consisting of university students. Based on the findings from both the video and pen data analysis, it has been possible to pin point some important aspects of joint interaction and come up with some design directions for further development of music based games that support co-performance and co-creation. In a short summary, the characteristics of joint expression were as follows:

1) First players needed to 'find each other' and establish a participation framework. They needed to realize what each other did, so that they could relate to each other: they established musical and social 'grounding'. This happened through many other ways than mirroring and staying in sync with each other.
2) Then, players started to expand a participation framework by exploring variations of joint play. Players did not continue to stay in sync or mirror each other, once they received sound feedback on that.
3) If both players succeeded in following each other, they would guide each other into new participation frameworks.

THE ROLE OF THE COMPUTER

How can a music based computer game support joint player action? We propose that a game design can contain three types of sound feedback that support joint interaction and encourage co-performance:

1) Players need individual *reactive* sound feedback for orientation purposes. They also need some reactive feedback of their joint expression, so that they can orient themselves towards each other. In this paper, we investigated how players understood reactive feedback.
2) The computer can *adapt* to two players' found participation framework by rewarding them with additional layers of sound that expand the characteristics of this relationship and also provide extended joint expression possibilities. The sound feedback could adapt to two players' variations of a participation framework.
3) If a participation framework becomes monotonous or trivial, the *adaptive* sound layer may become *pro-active* in that it can push into new participation frameworks or inspire players to make variations of play style within a found participation framework. For example, if players make fast repetetive moves, a *pro-active* sound feedback may contrast this by being slow.

ELECTRONIC MUSIC INSTRUMENTS

There have been several examples of prototypes of new multimodal interfaces that have mapped user gestures to sonic and musical content. Blaine, Fels and Weinberg have discussed mapping of joint user action in networked interfaces (Blaine and Fels 2003, Weinberg 2005). Althrough the interfaces described are very imaginative in their physical/hardware design and gesture-to-sound mappings, none of these interfaces have been studied in order to evaluate the quality of joint user interaction futher than 'proof-of-concept'. In this paper, we present studies of 'how people play together' with a simple music based game application designed for the commercially available pen tablet interface. With the pen tablet players express themselves through fine motoric movements in a well-known setting that resembles drawing activity with pen on paper.

LITERATURE AND THEORY

The music-based game designs that we continue to study are developed through an iterative design process, where some music improvisation principles presented in the field of music theory are considered for the design of multiple music-based games. In "Improvisation. Methods and Techniques for Music Therapy Clinicians", Wigram presents several techniques that can be used to support, guide and expand a client's musical expression. All these techniques involve creative uses of rhythm and tempo, phrasing and harmonic structures (Wigram 2004). Furthermore, Bruscia describes various types of client-therapist relationships such as in what he calls "improvisation assessment profiles" (Bruscia 1987). Of course there is a big difference between the dyad: therapist-client and the dyad player-player, whose relationship is triangulated by a computer that can only provide a limited set of expression possiblities for improvisation. While the goal of a music therapist's musical engagement with another person is treatment, the goal of a music-based game is entertainment through focussed social engagement among players.

MEASUREMENTS OF USER EXPRESSION

In order for the computer to be able to respond to levels of social and musical engagement, the computer needs to measure only limited aspects of complex player action: individual as well as joint actions. These limited measurements can be mapped real-time to a musical output that players interpret as 'inspiring'. By 'inspiring' we mean that the sound feedback becomes an open-ended game element that guides players in their joint improvisation, focuses their joint attention and supports players in their attunement to one another.
In the field of systematic musicology and computer music there has been several examples of how a computer can measure music related gestures through means of sensor technology, electronic music interfaces, video cameras and data processing (Godøy et al. 2010, Godøy et al. 2009, Jensenius et al. 2008 and Leman 2008). However, this kind of research often relies on technology that can be invasive and data processing may be too slow in a game play setting. Realtime gesture analysis, performed on signals from an accelerometer and a gyroscope, has been developed for the purpose of music pedagogy. Here a simple physical interface performs fast interpretation of user gestures (Bevilacqua et al. 2007).
In order to simplify gesture recognition in the game design, we chose to measure very simple gestures that users can make with a pen tablet interface (see section 3.2). Users needed to get realtime sound feedback on their actions in order to orient themselves, give rapid response to each other's actions and maintain flow of action. When working with reactive feedback, we wanted the soundfeedback to be present no later than up to 200 milliseconds after a specific gesture type had been detected. However, in later development, when designing sound feedback that adapt to joint player action, more complex and time based gestural relationships can be measured and mapped to sound feedback that evolves over time.

PLAYERS' MUTUAL UNDERSTANDING OF SOUND FEEDBACK

In order to answer the research questions posed in section 1.1, we decided to look at player action through ethnographic video analysis. In further analysis, we could use conversation analysis to see how two players engaged in joint play. With the sound feedback seen as an 'encouragement' of joint improvisation, how did players establish a 'participation space' and what did players regard as a relevant next action? Why did players pause? (Goodwin 2000). Did pauses indicate congruence or accommodation? (Crown and Feldstein 1985). How were pauses valuated in a musical setting? (Tannen 1985). Did players hesitate, because they had difficulties, or did they think about where to find the next focus? (Chafe 1985). Did players direct each other through 'shifts in physical alignment'? (Goodwin 2007). What was the sequential organization of the players' sonic utterances like? (Goodwin 1990). Was there any 'interactional synchrony'? (Kendon 1990a; 1990b).

DATA AND METHODS

In this section we describe the design of a music-based game that was used in this study. This particular game introduced some premises for joint play: Mirroring of movement and syncronization. Similarly, the experiment procedure influenced how players negotiated joint play. In the analysis of joint expression these interaction premises are discussed and evaluated.

EXPERIMENT SETUP AND PROCEDURE

In nine games sessions with two players in each game session we documented how two players played together. The teams consisted of either two females (4 teams total) or two males (5 teams total). The documentation happened in two ways: A video camera filmed the team of two players, and pen interaction data was logged into the computer that also ran the game (see figure 2).
A note about the setup: On each side of the table, next to each player, there was a speaker that played the individual sound feedback of each player.

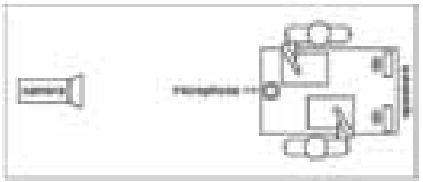

Figure 2: Experiment setup: A camera filmed two players from the side. A microphone was placed on the table to record what the two players said. Speakers next to each player played sounds as a result of individual and joint actions.

The additional sounds that appeared as a result of selected joint action were centred between the two speakers or panned between them. In the beginning, the two pen tablets were positioned so that the players would face the camera while they played the game. However, when the two players sat down, they adjusted the pen tablets, so that they faced each other and not the camera. The video of the test setup can be found on the following link: http://www.vimeo.com/16822793, password: AMSH5research.

At the beginning of each game session, the two players were briefly introduced to the game. The experimenter asked the two players to 'find additonal sounds' when playing together. Players were told that they could draw dots and lines, make scratch movements and circles. First, each player got to try out his/her individual pen tablet instrument. Then followed a joint play session, where the players could explore the game as long as they wanted. In other words, players had to agree on how to end their joint play session. After the joint play session, the two players participated in a semi-structured interview about their game experience.

GAME DESIGN

We have chosen to design a game that consisted of measured x and y pen positions translated into simple draw styles: dots/lines, scratch movements and circles (see figure 3-5). It did not matter where on the tablet these draw styles were drawn. In addition some features connected to the draw styles were detected: Size and speed, line and scratch degree (360) and circle drawing direction (cw/ccw). It was relatively simple for a computer to detect the draw movements in realtime (within a sample rate of 20 to 200 milliseconds). In addition to pen x and y positions, we measured pen tilt data.

We limited the sound feedback to regard only parts of the possible interactions that players could perform with the above mentioned draw styles: First, the players got individual feedback on their chosen draw styles. A limited amount of tones were activated along the lines and curvature of a circle. Single tones occured when players made dots and at the peak points of a scratch movement. Tones changed depending on the size, degree and direction of the movement. The amplitude and tone length changed according to the x and y tilt of the pen. The two players had each their own 'instrument sound'. One instrument sound (string instrument) was based around high frequencies (HF), and the other instrument (also a string instrument) around low frequencies (LF). The tones were fixed along a Balinese Pelog scale, so that any combination of tones would sound relatively nice. The bigger the drawing area, the more pitch distance there was between the activated tones. Also, different tone combinations would be activated, depending on line or scratch directions.

When two players chose to use the same draw styles (dots/lines, scratch, circles in pairs) and if two players agreed on drawing the same draw styles at the same speed, they activated an additional sound layer: Piano chords were played back at the mutual pace of the two players. If the players kept drawing at the same speed, the rhythm structure of the piano chords changed, however it stayed within the same speed. This design was made in order to present some material that two players could interact with without being dependant on doing something together. They could express themselves perfectly fine through the means of their individual expression possibilities. However, they were 'rewarded' by piano chords, if they mirrored each other's play style and played at the same speed. If the offset times between scratch peak points and circle top points were low, the two players would activate high pitch chime tones.

ANALYSIS OF JOINT EXPRESSION

Although the players gave some interesting ideas for further development of music based games in the interviews, we will focus on the video and data analysis of joint play in each game session. In order to get a rough idea of how players expressed themselves, we present some overall statistics about the player action that the game design allowed:

1) Most popular draw movement combinations,
2) Player activity (pens on and off the tablets)

Through the video analysis we found a large variety of participation frameworks among players. This is also seen in the data in that players chose play style combinations that did not result in any additional sound feedback (see figure 6). In order to look at how the game design worked with the players' joint play, we have divided the video documentation up into five rough groups with the headlines: 1) player explorations, 2) negotiation in joint play, 3) successful joint play, 4) interruptions and difficulties, 5) differences between male and female teams. In addition to providing overall statistics, the logged interaction data also provided a detailed report of how the

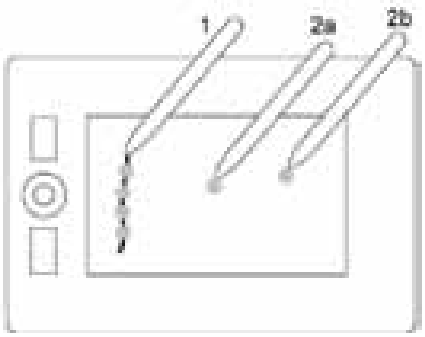

Figure 3: Dots and lines. The grey dots are tones activated along a line (pen 1), or tones activated when the pen touches the tablet (2a and 2b).

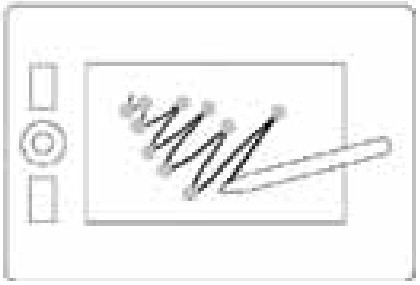

Figure 4: Scratch movement. Grey dots are tones activated at the points of direction change. Here the scratch direction is 45°.

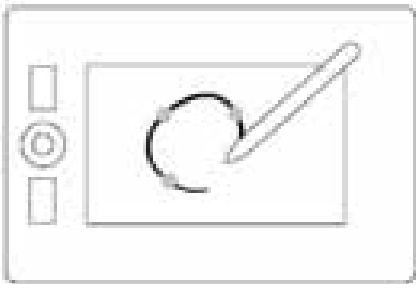

Figure 5: Circle movement. Grey dots are tones activated along the curved line of the circle. Here the draw direction is clock-wise.

particular game design interpreted player actions: draw style combinations (dots/lines, scratch and circles), pen position and tilt, size and angle of movements and patterns in mutual timing and rhythm. The data sample rate was every 20 milliseconds. In comparison, the video ran at 24 frames per second.

EVALUATION OF DATA

Video data provided material for qualitative analysis of individual and joint player action in music-based games: It showed how players perceived and interpreted the sound feedback that happened as a result of individual and joint action. The logged data provided a quantitative analysis of specific aspects of individual and joint action. When logged data was seen in relation to the video, it was possible to get an idea of which aspects of the individual and joint action that the game design captured, and which it could be designed towards capturing. The logged data could also be used to display details of interaction that it was impossible to see on the video and the other way around.

RESULTS: 'A JOURNEY OF MUTUAL EXPRESSION'

Results showed that two players found many other participation frameworks than the game design suggested. When recalling that the players were asked to find 'additional sounds' together, we saw variations of draw styles that the game design did not account for. In fact, even when the two players realised that they had found 'additional sounds' they were not encouraged to 'stay in touch' with these additional sounds. Instead they revisited them briefly as a starting point for new exploration. In the sections below, there are examples of how the sound feedback on individual action was used as a means of expresson, while the sound feedback on joint expression fell into the background or in some cases interrupted joint play. The sections also valuate video and data results according to each other: Since future designs are to rely on a continuous stream of interaction data, it is important to select the most characteristic interaction data for future action to sound mappings. The selection will be supported by the video analysis.

Pen activity	All game sessions
Both pens off tablet	23%
One pen active	30%
Both pens active	47%

Table 1: Pen activity during all nine game sessions.

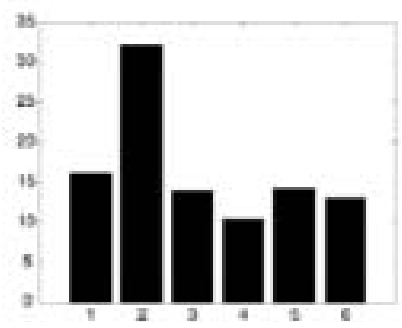

Figure 6: Most popular draw style combinations of all nine teams. Y-axis = percentage of all total game session times. X-axis = draw style combinations: 1= players played circles at the same time. 2 = dots and lines at the same time. 3 = scratch movements at the same time. 4 = one scratched, the other played circles. 5 = one drew dots/lines, the other scratched. 6 = one played dots/lines and the other played circles.

EXPLORATIONS IN JOINT PLAY

When two players managed to establish a participation framework, they immediately started to explore variations of this framework. Typicaly one player stayed with one way of playing, while the other player made variations (see video: 00:00-00:35, titled: "variations of scratch movements"). The logged data showed that even though the players only got sound feedback when both made the same draw movements, they also explored other draw movement combinations (see figure 6). Note that dots were not registered in a separate category, but as small lines. The most popular draw style combination was the line-line combination. The results may indicate that dots should be separated from lines in order to get a more even distribution of draw style combinations.

When looking at the player activity (pens on or off the tablet), there was a tendency towards both players being active at the same time (see table 1).

In further analysis, variations of draw styles could be described by looking at the video from the play sessions that deviated from the mean. Some examples are seen in figure 7, how the most popular draw style combinations from game sessions 2 and 7 deviate.

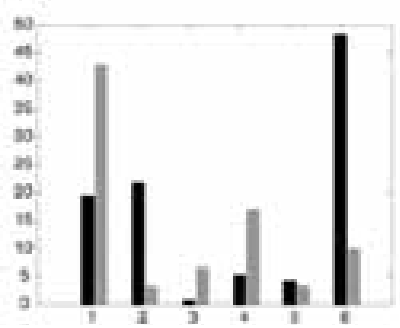

Figure 7: Deviations of most popular draw style combinations. Session 2 = black, session 7 = grey. Y-axis = percentage of total game session time. X-axis = draw style combinations: 1= players played circles at the same time. 2 = dots and lines at the same time. 3 = scratch movements at the same time. 4 = one scratched, the other played circles. 5 = one drew dots/lines, the other scratched. 6 = one played dots/lines and the other played circles.

Pen activity	Session 5	Session 9
Both pens off tablet	28%	9%
One pen active	35%	27%
Both pens active	37%	64%

Table 2: Pen activity in game session 5 and 9.

In game session 2 and 7, there was a relatively even distribution of draw style combinations. The data showed that one player team was much more active on the tablet than the other player team (see table 2). This indicates that player exploration happened in two different ways. This is also seen in the video (see "00:35-01:12, titled: "two different ways of exploring").

JOINT PLAY NEGOTIATIONS

When players negotiated joint play, they would sometimes negotiate verbally or use mutual gaze. Often one of the players would look at the other player's pen and tablet in order to relate to his/her playstyle or copy it (see video 1:12-1:30, titled: "turn taking... attunement"). In other cases, one player would direct the other player into a participation framework by using head movements and by tilting his/her body backwards and forwards, side to side. In other cases both players would gaze frequently at each other and smile (see video 1:31-1:53, titled: "opposite movements" and 1:53-2:13, titled: "melody negotiations"). In the video section

(The two players: LF = Low frequency instrument/right
HF = High frequency instrument/left)

01 LF: lægger ... du lægger også din ned som en pen?
lay ... you also lay your's down as a pen?

02 HF: ((looks at LF with lifted eyebrows and smiles))

03 LF and HF: ((Both players tilt the pen for a while.

04 HF looks at LF's pen movements,
and LF leans to the left and purses her lips as if she expects a changed sonic outcome. Leans back, lifts the pen and looks briefly at HF and then down))

05 LF: Nå ... ja?
ok(??) ... yes?

Example 1: "opposite movements" (1:31-1:53).

titled "opposite movements" one of the players used the pen metaphor in order to suggest a play style based on an observation that she made (or a desired participation framework?) (see example 1).

The reason why players used gaze and postures rather than gestures could be that communication happened so fast that gestures were too time consuming or required too much effort to decode. Perhaps mutually agreed upon gesture conventions, not unlike those musicans use, are necessary if players are to use gestures in a play situation.

SOME JOINT PLAY CHARACTERISTICS

The characteristics of successful joint play were that two players managed to guide each other through variations of a participation framework and furthermore transfer each other into other participation frameworks. Players continuously had to agree on paths to take in their 'journey of mutual expression'. A journey consisted of variations of play style combinations, pen positions, pen tilt, size of movement, speed and timing. In further analysis we could quantify how many times two players explored these expression possibilities and position them into a hierarchy. When looking at the following video clips (2:13-2:33, titled: melody and tempo change and 2:33-2:50, titled: joint "pen tilt" and 2:50-3:06, titled: "... then he tilts the pen" and 3:06-3:49, titled: "different kinds of scraching") it seems like there is a hierarchy in that players needed to first agree on play style combination before they started to engage in an exploration of e.g. pen position, pen tilt and play speed. In "... then he tilts the pen", players agreed verbally on a participation framework, where after one of the players made a variation of this framework (see example 2).

(The two players: LF = Low frequency instrument/right
HF = High frequency instrument/left)

01 HF: hvad nu hvis man laver en cirkel inde på midten?
What if you make a circle in the middle?

02 HF and LF: ((Both players draw circles and look at each others pen movements. They get the additional sound feedback))

03 LF / HF: Hmmm / Ja ja.
Hmmm / Yes yes.
((Both players look at each other, smile and nod. While HF continues is playstyle, LF starts to tilt the pen))

Example 2: "... then he tilts the pen" (2:50-3:06).

Even though the game design favored simultaneous play and synchronization, the individual sound feedback for each player encouraged players to switch between turn taking and solo and accompaniment. Players easily switched between participation frameworks once they had defined them (see 3:49-4:11, titled: "solo - accompaniment to simultanous play" and 4:11-4:35, titled: "from turn taking to solo-accompaniment").

INTERRUPTIONS AND DIFFICULTIES

In the game sessions it was clear that the game design in many cases caused interruptions and difficulties in terms of play fluency. By play fluency we mean that one or both players actively improvised with the available sounds, because they were inspired to do so. In some cases the additional sound layer was in the way of continued play when it indicated mirrored movement and syncrony in timing and speed. In other cases, players did not take note of the additional sound layer (see 4:35-4:59, titled: "they do their own thing ... ") Often players reacted to the additional sounds with mutual gazes, utterances, pauses and laughter. These same reactions also happened as a result of successful joint play, so in further analysis similar types of player reactions to additional sound layers need to be valued in different ways.

GENDER DIFFERENCES?

It was difficult to do a rough estimation of differences between men and women. We would need to look more into details in the logged data in terms of pauses and pause lengths in individual and joint play. Also, we would need to study gaze directions in the video more carefully. In general, the video showed a tendency that female teams engaged more in mutual gaze than male teams. This seemed to have resulted in reduced play fluency. In further analysis of the logged data, female and male teams could be compared according to pen activity, and how many times there were individual or mutual pauses above a cetain length. Currently, it has been difficult to separate play fluency into individual and joint play fluency. A hypothesis about gender differences could be that the 'play fluency learning curve' is higher for women than men, because of the mutual gaze issue. However, mutual gaze may be an advantage when female players have become more skilled in switching between and varying jointly explored participation frameworks.

DISCUSSION

This study investigated how two players reacted to additional sound feedback as a result of limited aspects of their joint play: mirroring of play style and syncronized speed and timing. With this experiment it was clear that it was enough to provide two players with electronic music instruments in order to encourage joint improvisation. With the means of individual expression possibilities the two players managed to improvise together. The hypotheses presented in section 1.1 were that two players would 'stay in touch' with additional sounds by only performing those actions that resulted in additional sound feedback. The two players did manage to find the additional sounds, but as soon as they were found, the players engaged in other participation frameworks that did not result in any additional sound. Perhaps the premise of the game "find additional sounds" demanded players to move on? In general, players were very inventive in that they continuously explored variations of participation frameworks. In this regard, the sound feedback became trivial to them, and it sometimes interrupted them in their further explorations of joint play. It held them back from making a 'journey of mutual expression'. In order for the game design to give sound feedback on a wide variety of participation frameworks, we suggest that the total amount of expression possibili-

ties should be narrowed down. In this way it is possible to have a music-based game account for the majority of all possible joint expression possibilities.

We suggest that a game design should support levels of joint play, so that players can be confirmed and challenged in all their play negotiations. For example, if we look at the play style characteristics described in section 5.3, we see that there was a hierarchy in how players explored joint play. Levels of sound feedback could support levels of exploration. In the case of the pen tablet interface, musical and social grounding took place through pen position and play style combinations. Reactive sound feedback would be relevant for all possible pen positions and play style combinations. When players rather quickly started to vary a found participation framework, they needed sound feedback that would adapt to fluctuations in pen tilt, draw area, draw positions and draw directions. Yet another sound layer could be dedicated to adapt to tempo changes, timing variations and indvidual and joint pauses.

The video documentation was divided into five categories in order to characterize different kinds of play flow that happened as a result of individual and joint sound feedback. Further video analysis could look at the following: When do players laugh, talk or pause? How do players signal to each other what to do interms of gestures, postures, headmovements and gaze? Further data analysis could look at details in individual and joint action in order to find interaction patterns. With the experiences from this study, we can argue that only when the sound feedback of joint expression is something that players can use as a means of expression, the players will find it meaningful. Sound feedback as a mere indicator of joint action can in worst-case scenario interrupt joint player action or influence player actions so that the joint play quality is reduced. More detailed studies of play fluency should be accomplished in order to find out when exactly players find the individual and joint sound feedback meaningful.

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HEARING AIDS WITH NO BATTERIES

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ABSTRACT

This short paper offers an account of ongoing research into hearing. I offer a characterization of 'skilled practitioners' from an Ethnomethodological perspective. The skilled practitioner in question is a generic 'hard of hearing' person. The ambition is that such a characterization, both in its making and its final state, may be an intrinsic part of design practices concerning the development of hearing aids.

INTRODUCTION

Within design studies, the idea of a skilled practitioner has a host of brothers and sisters all prefaced with the family name 'skilled'- skilled users, skilled workers, skilled employees - but the basic idea is the same for all. Those for whom a design process may ultimately bene-fit in the form of a product, taken broadly, are or have been skilled, a priori, in a set of practices for which the product is intended. The idea of a skilled practitioner is also prevalent on other areas of study, for example in Activity Theory (Engström 2005), the notion of com-munities of practice (Lave & Wenger 1998), and most importantly for our concerns here, Ethnomethodology (Garfinkel 2002).

LITERATURE AND THEORY

Currently, one recommendation is that Ethnomethodol-ogy, with its focus on the 'practical activities through which actors produce and recognize the circumstances in which they are embedded' (Maynard & Clayman 1991: 387), and design, at least those varieties which prioritize ethnographically derived design materials and user involvement, be coupled into a 'hybrid' program (Button & Dourish 1996; Crabtree 2004). Such a hybrid program implies

> *'the constructive involvement of ethnometho-dology in processes of innovation in design, the results of which may subsequently be subject to the rationalities and constraints of product de-velopment.' (Crabtree 2002:1)*

Or as Button & Dourish (1996) note *'design adopts the analytic mentality of ethnomethodology, and ethnomethodology dons the practical mantle of design'* (ibid:22).

The recommendation then is to supply EM-derived con-cepts to the design process. which should be seen in contrast to the idea that ethnomethodology should in-form or critique design, for example by offering ac-counts of the 'real' world of users or consumers. Dourish & Button (1998) for example, demonstrate how the EM understanding of accountability - briefly the notion that social action reflexively establishes the conditions of its relevance - might be used in designing how a computer's actions are represented to a user.

Crabtree advocates observing the introduction of novel technologies as breaching experiments, an ethnometho-dological technique to make visible the ordinary through its disruption, so as to make it available for ethnomethodological inquiry (Crabtree 2002). Through this, insight is offered into how objects of design are made sense of in courses of practical action which are then rendered into topics of further design relevant inquiry.

My humble attempt below to follow this line of work does not use breaching experiments, rather it attempts merely to illustrate skilled practice and practitioners as ordinary. Rather than thinking of the skilled practitioner as exceptional, in the sense of 'key users', it attempts to illustrate how a problem with a possible solution in a particular designed product, i.e. a hearing aid, is practi-cally solved without it. These solutions, I maintain, are examples of 'making' activities from ordinary life, akin to our everyday understanding of expressions such as 'making do', 'making adjustments', 'making out'. I am thus proposing that skilled practitioners can be seen not only as proficient in making their world accountably and recognizably ordered, but also as practical designers of solutions to

overcome disorder, in this case hearing impairment. In this way, then, I wish to expand the idea of a skilled user even further to include the skilled designer.

DATA AND METHODS

The data for this study consists of mainly of self-reflective observations of, mostly, my own practices as a mundane hard of hearing person. By self-reflective, I mean the observations were retrospective noticings, accounts for, and even analytic wonderings over my own daily life. It might be nice to say that I observed myself dispassionately, neutrally, and without analytic influence and that these observations were then sub-jected to rigorous analysis. This was not the case here, if it is ever the case anywhere. To some extent my practic-es were ordinary in the sense that they were part of my ordinary routine, eg. being at home with my wife, but on occasion they were analytically motivated practices, eg. brainstorming the things I think I do, or could do, to improve my hearing. Finally, being more acutely aware of my own self due to the project made me all the more aware of others who I either knew or I suspected were hard of hearing, my father-in-law for example. Thus, the data is not is not only of me, but of others in my everyday life.

As such, the data are to be seen as deriving from the method of Systematic Self Observation (SS0) as put forward by Rodriguez and Ryave (2002). SSO attempts to confront an empirical problematic, forwarded by Polyani (1967), emanating from the practice of everyday life, namely 'a numbness to the details […] required for the competent achievement of socially skillful behavior' (Rodriguez & Ryave (2002: 4). SSO is characterized as an 'event-contingent method' where informants are required to take note of the natural emergence of the topic in question and, immediately thereafter, write up a report of the event. This is, to a large extent, what I have done. As noted above however, my being in the project pushed me into analytically motivated activities of relevance to the project, and thus their natural emergence in a sense were pre-mediated by me, and I also became more acutely aware of others for whom I believed the study's topic was of some relevance.

I view these departures from SSO as the necessary em-bracing of the Hawthorne effect. Surely, one can not expect informants to be oblivious to their participation except when a topic relevant event occurs. Nor should we believe that their self-observations are not, on at least some occasions, analytically motivated, given they are to account for them to a researcher at some later date. My claim here is simply that the observations are from my 'ordinary' life, but that 'being in the project' is unavoidably part and parcel of that life.

RESULTS

The results thus far of this study are as varied as the observations I have made, and the analytic renditions I have made of them. They include two unmotivated observations, entitled below as 'I hear fine when I'm alone' and 'The Space Negotiation Principle', and a more motivated observation of my own brainstorming, 'Methods to improve your hearing', where I both noted my own practices as well as imagined possible practices.

I HEAR FINE WHEN I'M ALONE

I am at home, alone, on a weekday, alternating between sitting in our study and popping up every now and then just to move around and away from the text on the screen in front of me. I hear the fridge and freezer humming, the dish washer sloshing and come to the realization that I hear perfectly well when I'm alone.

A great deal is made of the interpersonal social handicap which hearing impairment may cause. I'm sure that's true, but the hearing impaired person is also a singular individual in a physical world, and being so, one would think, must deal with all sorts of possible physical threats by occasionally 'tuning in', just as with a radio, to the soundscape of that world. It's nice to be able to hear the traffic when crossing the street, or the alarm when the freezer is on the blink.

But I seem oblivious to all this. Of course, we are en-dowed with, at least, 4 other senses with which we may compensate a dysfunction in hearing. We look before we cross the street and the freezer alarm is also a blink-ing light. This may be why I' haven't been hit my a car or suffered food poisoning from eating previously fro-zen food that's gone off. But think there's more to it.

Another reason why I believe I hear perfectly well when I'm alone could be because I've forgotten how well I'm supposed to hear, and there's no one around to remind me. I thus have no benchmark of how loud cars on the street or freezer alarms are supposed to be. When I hear them nowadays, they are JUST that loud. If they're not loud ENOUGH, then either they are exceptionally quiet or not working properly.

Hearing loss of the sort I suffer from, i.e. age related, develops slowly, so slowly, I suspect, that we forget how we are supposed to hear, or rather how loudly things around us are supposed to sound. And there is perhaps an analogy of this in reports from disenchanted hearing aid owners who note that they've grown quite accustomed to a quieter world, and that the hearing aid forces them to learn how to hear anew. Old dogs, new tricks?

METHODS TO IMPROVE YOUR HEARING?

What follows below is a categorized list of methods I either myself practice or could envisage myself practic-ing in order to hear better.

A first, very broad, category for a host of methods are those which enable the person to come closer to a sound source which he or she wants or needs to monitor.

Method 1 - get closer to the source

Examples:

Move closer to the television

Stand under the speakers at the train station

Stand in the doorway between the kitchen and the living room while your watching TV and your wife is talking to you from the kitchen

Turn your head so that your ear is closer to the per-son who's speaking to you

Move closer to to the person you're speaking with, ie. closer than 'normal'

Make sure you always sit beside your boss at meet-ings

Method 2 - get the source closer to you

Examples:

Hold the telephone headset tightly against your ear

Tell your kids to come into the room you're in if they want to talk to you

A second very broad category is

to amplify the sound source or increase one's own capacity to receive sound

Method 3 - amplify the source

Examples:

Turn the TV/radio/telephone etc. volume up

Tell your wife to stop mumbling

Method 4 - increase your receptive capacity

Examples:

Cup your hand behind your ear

Make sure clothing doesn't cover your ears (like a stocking cap)

A third, not so broad category, is to change modality, to change the medium to something else.

Method 5 - make sound light

Example:

Attach a light to you alarm clock, doorbell, fire alarm

Method 6 - make sound tactile

Example:

Always have the vibrator on your mobile phone on

And a final category concerns the various ways one can use another person as a hearing aid – an ear proxy of sorts.

Method 7 – Have your wife repeat what someone has said

Method 8 – Check your wife's reaction to what someone says to you

These are then 7 methods which I employ, and have witnessed others employing, to improve hearing, with method number 5 being the 8th method I personally haven't yet tried. At first glance, one readily recognizes that, in distinction to the first observation, the social side of hearing has more readily come into play. To the extent this is the case for a particular method, there is a significant number of interesting questions not answered by this rather simple list. To take what is perhaps the most extreme example, consider using my wife as a 'proxy ear'. We know at present very little about simple one on one interactions between people where one of them is hearing impaired. The scenario where there are at least 3 interlocutors and one is using one other as a 'hearing aid' would add exponentially to the complexity an analysis must deal with.

Nevertheless, such a list does bring to the fore some useful insights. Most interesting in my opinion is that not only does it portray our skilled practitioner managing his way through a heard world, but also as an actively engaged designer of that world. It is not just a hearing impaired person adapting to a ready made world, but also actively retro-fitting the world to his own ends. I, for one, have a hard time seeing a hearing aid doing this, so perhaps this is a challenge for hearing aid design?

PRINCIPLES FOR SPACE NEGOTIATION (PSN)

This final observation relates, to an even greater extent, hearing within a social context. And because of this, its analysis gets rather complex, requiring the working out of a host of a priori assumptions, but first the observa-tion.

I'm sitting in one room, say the living room, while my wife is in another room, say the bedroom. My wife says something to me. She gets no response from me, so she then must either speak more loudly and/or move closer so that on a second attempt, I do respond. This creates friction between us. My wife gets angry, which I either feel guilty about being responsible for, and/or I get an-gry with my wife for not being sensitive to my needs.

I propose that the situation of living and communicating in a household, or more generally sharing a space with someone, is easily recognizable as a mundane bit of everyday life. Further, sharing a space with someone implies some degree of mutual accessibility to each other. Thus we can say that my wife assumes the accessibility of me as a potential interactive partner, and makes an attempt to engage me in some joint endeavor. The recognizability of this, I submit, is very much a part of our sociality and common culture if we can agree with the following ethnomethodological assumption: A fundamental part of being together with others involves the the collective sensemaking of our world as a recognizable and ordered world.

Returning to the observation, my silence indicates our failure at this. What my wife does next is quite simply repair. She 'hears' my silence as a hearing problem - giving me the benefit of a doubt concerning my accessi-bility and willingness to enter into the joint endeavor- as indicated by how she formulates her next move. She increases the amplitude of her locution and/or reformu-lates her first attempt and/or moves closer to where she believes me to be. And of course this may recur until either I respond or my wife gives up.

One part of ordering collective life in a household means recognizing

1) the relationships between one's position in space and the other's position in space,
2) the value of distance between them in relation to
3) the activities either may be undertaking, and
4) the responsibilities concerning those activities in relation to changing one's position and/or ones actions.

A mundane example: The phone rings,. Who is most responsible for changing their position such that they answer it? What sorts of things can they be engaged in which might override the simple rule of 'closest to the phone answers'? Let us shorthand this part of the collec-tive ordering of life, Principles for Space Negotiation, PSN.

Keeping this very rough take on this slice of life as an example of how my wife and I 'collectively make our world a recognizable and ordered world', let's look again at the action described and see what we can make of it: My wife's anger can be seen as involving her having to move/disrupt her activity to engage with me as I don't respond to her initial locution. For her, I have succeeded in 'passing' as 'normal', as someone, for all practical purposes, without a hearing impairment. Thus, I am allowed no exception from the PSN, which renders me in violation of it in this instance. Now I get angry with my wife because she's angry with me. What's my take? Either my wife has got the PSN wrong in this instance, or she should know that my 'passing' is not in play at this time.

There are lots of alternatives to the sense-making here and I'm sure a lot more 'sense' can be made of this here, but it's a start.To carry on I think very mundane ques-tions concerning the PSN are in order. I would not be interested in finding out the 'real' reasons for our actions, probing into our subconscious, hearing our life stories (in 1 hour or less), connecting our propositions to relevant hegemonic discourses of late modern capital-ism or similar sorts of things. I would just want to know who answers the phone, and

what sorts of punishment one should get if one doesn't when one should., or more academically, the sorts of things which are part and parcel of the social contract, with its moral bindings, my wife and I sign, metaphorically, when we enter the so-cial life of this household.

I noted that my wife could raise her voice and/or refor-mulate and/or move closer to me when she gets no re-sponse. I contend that raising one's voice and/or refor-mulating are the same, in their effect, as moving closer. If the TV is too loud, we either turn it down, or move further away, or both. If it's too low, we either turn it up, or get closer, or both. We can also fiddle with the bass and treble of the TV's sound, thus 'reformulating' the sound, making it clearer given our desired distance from the TV set.

The PSN concern the negotiation of space between sound source and designated hearer, a negotiation that, when successful, supplies sound loud and clear enough to make sense of. And maybe, this negotiation of space is a fundamental kind of thing for people who don't hear well? Hearing impairment is, after all, very much a physical problem – the world isn't loud or clear enough. An idea like the PSN, with its point of departure in the physical world and our positions and movement within it but nonetheless very relevant for social life in the world, may be useful.

DISCUSSION

The three observations above make three points worth moving forward with in the design of hearing aids.

1) People not only lose their hearing, they may al-so lose their memory of how to hear.
2) Hearing impaired people may not only be skilled at adjusting to a heard world, but also active designers of that world to serve their own ends.
3) Social contexts of hearing are complex, but in may be worthwhile to remember that social contexts are also physical contexts.

The next question is how such insights might be made to stand for something other than ' accounts of the 'real' world of users or consumers', for it is clear they can certainly be understood that way. Recall from above Crabtree's call for "the constructive involvement of eth-nomethodology in processes of innovation in design' (Crabtree 2002:1) as an important element in technoethnomethodology.

One remedy would be to take them into a design process not as resources for, but as topics of further design-relevant investigation. 'Turning resources into topics is but a more colloquial expression for the Ethnomethodological technique of 'respecification'. The basic idea is to take findings of common sensical inquiry (resources) and explore the methodical practices which give rise to them. In an earlier pilot project on hearing aid design, stories of 'significant moments' were collected from folks with hearing impairment. The stories related, for example such things as when someone informed their workplace colleagues of their impairment. In a respecification, the stories can be heard as explorable topics. What circumstances motivate the telling of such stories? What sorts of social order are story-tellings being used to manage? Given that such stories were collected as part of a design project , they will most directly inform our understanding of that project. A tact more in line with exploring the ordinary world of the hearing impaired could be, for example to look at support groups for the hearing impaired and explore how 'signficant moment' stories might be used in the 'socialization' of new members. What does this socialization have to say about topics put forward in in this study?

I also believe the ethnomethodological method of 'breaching experiments' might be usefully employed. For example, we could explore how various hearing aid stakeholders deal with space and people in intentionally 'disrupted' spaces designed to foreground the interface between the physical world of things, the social inhabi-tation of that world and hearing. Even better perhaps, we might allow them to make their own 'disrupted' spaces, and inhabit them as they like. In this way, we might bring to bear more perspicuously the idea that the hearing impaired are not only 'skilled practitioner ex-emplars', but also skilled designers, whose sensibilities towards design, and not to just their handicap, are worth exploring.

Finally, I wish to make a methodological point. My study has been conducted by me, someone with some training in ethnography and ethnomethodology, yet also a bona-fide candidate, eventually, for a hearing aid. Could the study have been carried out by someone without the training ethnography and ethnomethodolo-gy? With some training, I believe so. SSO, in fact, is designed for 'normal' folks. The observations I make above are mundane to the point of banality, an appre-ciated quality in EM for the ordinary, in all its generali-ty, is actually quite mysterious and worthy of explora-tion. And we can all do it.

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MAKING FOR PARTICIPATION

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ABSTRACT

This paper describes a making activity in a stakeholder session, facilitated by industrial design students. The purpose of the activity was to enable the stakeholders to gain insight into a particular issue of their concern. The paper reports on questions that arose from the reflections of both the students and the organisers of the module within which the students conducted their activity. Here, we explore: how can stakeholders be reassured and led in a making activity? And how important is it that stakeholders actually make, or are their verbal contributions just as valuable? The paper focuses in detail on an 18 minute segment of the described making activity that is also analysed by Nevile (2011) in order to facilitate a discussion between our and Nevile's perspective.

INTRODUCTION

This paper reflects on a particular activity of "making" that was part of a participatory design session organised by industrial design master students. The session was the students' core activity in the elective module "Prototyping for Interaction and Participation" (PIP). This module was set up and run for the first time in 2010 by the authors of this paper. The module serves the authors as a research opportunity regarding the effectiveness of design activities as a means for gathering insights into stakeholder perspectives. This paper first presents the motivation and context for the set-up of the module. It then describes one case tackled by the students. The reflection on the activities pursues questions that are of relevance in understanding design-inclusive stakeholder activities and in improving the module for its next edition. They are: how can stakeholders be reassured and led in a making activity? And how important is it that stakeholders actually make, or are their verbal contributions just as valuable? To investigate these questions, the authors monitored the course activities from an action research perspective (as laid out by e.g. Robson, 1993). The action research activities are described in more detail in Boess et al. (2010). This paper zooms in on an 18-minute segment of making activity that is also being analysed by Nevile (2011). The focus on this segment is intended to facilitate a discussion between our and Nevile's perspective on the activity.

CONTEXT OF THE FEATURED ACTIVITY

The goal of the module PIP is that the design students learn to reflect on the things they make in terms of how these things behave as actors in a particular situation in which they are inserted. The purpose of this is to enable the students to engage with the new challenges product designers face nowadays: people interact with products, systems and services in new and complex ways. This makes it necessary to prototype such interactions early in design, enabling users and other stakeholders to experience (part of) future situations before design concepts have been developed. This in turn requires a more flexible attitude on the part of designers on how their designs are used, interpreted and changed by users. Designers have to be able to make today's and tomorrow's digital and complex artefacts, services and systems amenable to human interaction and lifestyles (Suchman, 2007; Stolterman, 2008; Davidoff et al, 2007), "encouraging social arrangements that provide for the necessary time and resources needed to incorporate unfamiliar artefacts effectively into relevant forms of practice", as Suchman (2007, p. 182) advocates. While design is often promoted as good for innovation and hence new business opportunities, it can also

contribute to more participation in societal developments (e.g. Krippendorff, 2006). Designers are (supposedly) good at observing, analysing and manipulating the qualities of things, be they physical or virtual, because these skills are important elements of design education. However, designers are not necessarily good at describing and interpreting how people then interact with the things the designers have created. Although usage observation is in some form incorporated in most design courses, the in-depth analysis of such observation is not so widespread. Engaging designers more in such in-depth analysis may have benefits. It may enable them to develop a better sensitivity for the interactions of people with objects. It may also enable them to recognise more possible avenues for adapting designs to user needs and actions. Finally, it may equip them better to organise stakeholder participation in bringing about future interactions.

So how could educators help design students observe, interpret and reflect better? For a start, the attention should not just be on qualities of the things involved. That would carry the risk of throwing designers back on looking just at the objects, at "the aesthetics of appearance of [what we perceive as] behaviourally passive objects" (Djajadiningrat et al, 2007). Objects and any kinds of expressions should be seen as open to interpretation, as has been advocated in the Scandinavian participatory design tradition (e.g. Mattelmäki et al., 2010). The challenge is to understand that an object can take on different roles in an interaction. Interaction adds a highly variable "material without qualities" (Löwgren and Stoltermann, 2004, p. 3) to objects. An object can influence the dynamics of a situation in various ways, and it can be of more or less influence in a situation. The PIP module described aims to make this variability apparent to the students, by making them engage with it.

THE LEARNING MODULE: PIP

The broad goals we are striving towards are better sensitivity of designers to interaction, and an enhanced ability to adapt designs to needs and to organise stakeholder participation. The module PIP was set up to explore how these learning goals can be facilitated for design students. In the module, the design students used their design skills to facilitate insights and future directions rather than generating solutions. The 10 week, 3 ects elective module focused on creating insights into the use of prototyping with stakeholders:

- at an overall level, in which the students reflect on their work as a whole: on how effective their chosen design and research techniques are in facilitating insights about, with and for people;
- at a topic level, in which the students generate and communicate insights for the case owners and stakeholders on the views and discoveries of the various stakeholders on possible future interactions.

The students worked on cases in which several stakeholders might have conflicting interests. The students organised a participatory session in which the stakeholders should become aware of each others' perspectives, needs and concerns by exploring future interactions together. The module has been described in more detail in Boess et al. (2010) and some starting points for it in Pasman and Boess (2010).

STUDENT ACTIVITIES IN THE MODULE

After initial lectures and small exercises, the students started their work in the module with a practice session on a case that was provided, to explore prototypes and prototyping as a tool for gaining insights (Figure 1). As the main activity of the module the students then worked on a case that had been organised for them. They conducted an initial exploratory research into their particular context, then organised and set up a stakeholder session in the context. After this participatory session, the students reflected on the activities in a structured way and produced two deliverables: a final report and presentation to the case owners, and a research paper about the overall level goal of reflecting on their chosen design and research techniques.

THE STUDENT CASE FEATURED HERE

While the module contained various types of prototyping and artefact making, this paper focuses on a particular excerpt from the making activities of the students. It is from the case "My first toaster", tackled by a team of three students. Electric household products are increasingly directed at children through child-appealing design, making them attractive to children as young as 2 years old. A well-known example is the Hello Kitty toaster, which has a number of depictions of this popular character integrated into its design. While this toaster thus has a highly toy-like appearance, it is actually a fully functional electrical appliance. The Food and Consumer Product Safety Authority (FCPSA) assesses the risks of products to consumers and advises the government on how to deal with those risks, for example through legislation. The challenge for the PIP student team is to devise a participatory session in which they enquire how parents and other educators deal with the risks their children face in daily life, particularly with regard to the new child-appealing electrical appliances and other appliances. The results of the

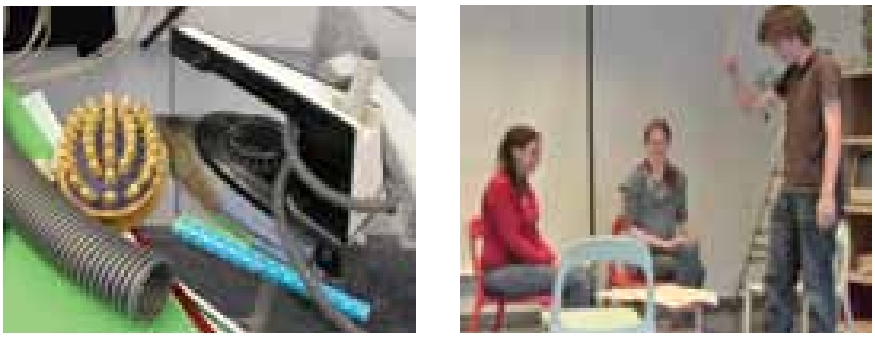

Figure 1: The practice topic. Students devise scenarios and prototypes reflecting stakeholder concerns using simple materials, then act out a scenario: a guest designer, asked for creative input by a company, converts their grey ideas into colourful ideas (prototype: turning white sheets into glossy colour sheets) using a magic pen trick (prototype: a movement with a stick in his hand). (Photos: Mariska Rooth)

students' work should be recommendations to the FCPSA for their policy advice. Stakeholders in this context are the children, parents, other educators, the FCPSA, and the companies that make and market such products. Having researched the perspectives of other relevant stakeholders in advance, the students devised a participatory session for four (separate) parents of young children and one child psychologist. The session consisted of several activities: a meal together during which everyone discussed a fictional catalogue containing children's toys and household appliances, mixed together. A role-playing activity where parents acted out a pre-set scenario corresponding to their daily life with their children, in a real kitchen environment. A discussion on family rules and rituals during which tea lights were presented as props representing dangerous or non-dangerous products with and without child-appealing styling elements, and finally an artefact making session in which a toaster was used as an example and also as an artefact to be modified and redesigned. The artefact making session is discussed in more detail in the following.

THE FEATURED MAKING ACTIVITY

The 'making of an artefact' section of the students' session is an 18-minute segment at the end of the session. The participants were presented with a cardboard version of a toaster and invited to make the product child-safe, while remaining child appealing (Figure 2). A range of tinkering materials was provided, such as clay, paper and markers. A real toaster with child-appealing elements was also present during this making activity as an example of the kinds of products that are already on the market. A lively discussion ensued, but the participants were reluctant to modify the toaster model. Eventually, the student who led the session resorted to herself noting the comments on post-its and sticking those to the toaster model, as a visual representation and record of the comments (Figure 3).

Figure 2: the artefact making session with a cardboard toaster. The real toaster is in the foreground.

Figure 3: the manipulated cardboard toaster with stuck-on post-its.

REFLECTION

Having run the module just once, it is hard to draw conclusions on whether it fosters better sensitivity of designers to product use as well as an enhanced ability to adapt designs to needs and to organise stakeholder participation. The module in its present set up was thus only suitable to assess how much awareness the students gained as a result of participating in it.

How important was it that stakeholders actually made something, or were their verbal contributions just as valuable? The session and particularly this segment provided valuable insights for the students at the topic level. For example, the participants discussed in detail what makes appliances child appealing and how risks can be prevented, for example by designing hot surfaces in such a way that they cannot easily be touched. The students also learned about the parents' efforts to teach their children what is dangerous and what is not, and how child-appealing appliances subverted those efforts. These insights were valuable, and the supplied artefacts certainly helped in provoking those discussions, even though the participants did not manipulate or modify the cardboard model provided as a basis.

How successful were the students in reassuring and leading the stakeholders in the making activity? The students speculated on several possible reasons for the participants' reluctance to modify artefacts:

- because there was only one model to 'share' among five participants
- because the model was made by the researchers – suggesting ownership
- because the amount of tinkering material provided was overwhelming.

Having only one cardboard toaster hindered the participants' expression in terms of hands-on doing, but facilitated a lively discussion. The students' motivation to provide only one model had been to encourage shared discussion rather than individual silent tinkering. The unexpected effect, the students concluded, was that the five participants were reluctant to make changes to the model that would be irreversible, thereby taking away another participant's opportunity to make other changes they in turn might want to make. Likewise, the participants did not make any adaptations to the actual toaster that was also provided as a reference product. As has been found elsewhere, it seems that here too, this 'finished' thing was seen by the participants as something to discuss, but not to interfere with (e.g. Sleeswijk-Visser, 2009). While the toaster and toaster model were not entirely useful as participation tools in for example Sanders' (2001) sense of co-creation, they did serve as tools for communication, as 'things to think with and talk about'. Both student groups reported that presenting things resulted in lively and insight-giving discussions among the participants. So it seems that there was some sort of barrier in place for the participants to interfering with the things that were provided in the session.

DISCUSSION

An interesting issue that emerged from this first edition of the module is that participatory sessions need careful attention to the way artefacts are presented. The students succeeded well at preparing the stakeholders for engagement in a role-playing activity (not featured in the video segment presented here): they first played a scenario themselves as an example, then provided careful instructions that made it easy to get started. They did not do this to the same extent for the artefact making activity (featured in the video

segment). So, which kinds of preparation and tools are needed to successfully engage non-designers in making activities?

Stakeholders may also have certain ideas in their mind on what these artefacts represent and why they are being presented. Did the participants of the toaster session think they were being asked to explore their perspective on the topic of child appealing products or that they were being asked to redesign a thing? The toaster was partly a representation of a design, and partly a tool for communication, with room for confusion for the participants between these aspects. This needs to be addressed better in future iterations of the module. Types of things need to be paired up with types of interactions and it needs to be explored and tested which work best with which and what kinds of insights each combination produces.

For example, finished things would be used to enact and explore existing interactions, whereas clearly unfinished things could be used for generative exploration of new interactions. Also, finished things might be considered more as 'conversation pieces', facilitating a discussion of the current context, while unfinished things leave much more room for exploring and interpreting future contexts. This means that explicit attention needs to be given in the module to the exploration of various combinations and configurations of [things+interaction]. Which combinations facilitate which kinds of active participation from stakeholders? Students should thus be able to understand and play with these combinations and accordingly, design the right combinations for either discussion, exploration or communication. This would provide them with multiple means to explore the same issues, thereby enriching the insights into the context at hand, and more specifically, into the point of view of the various stakeholders in this.

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THE REAL THING: ARTIFACTS, ACTION, AND AUTHENTICITY IN A STUDENT-LED STAKEHOLDER SESSION

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ABSTRACT

This paper analyses video recordings of a student-led prototyping session to consider stakeholders' use of artifacts, a cardboard prototype toaster and a real toaster. Its focus was prompted by an observation that stakeholders treated the toasters very differently. Stakeholders handled the real toaster more frequently and for particular interactional value. Unlike the prototype, it could be physical and visible evidence to authenticate actions for design discussion, such as claims, descriptions, and demonstrations. The real toaster could be a resource to coordinate with talk relating to actual toaster features, functions, and uses, or to participants' actual past experiences, or to make suggestions for specific design innovations.

INTRODUCTION

This paper examines participants' use of artifacts in an artifact-making activity, which was conducted as part of a student-led participatory design session (Sanoff 2007). The aim of the session was to prototype a product called 'My first toaster', as an appealing and safe appliance for children. As Boess et al. (2011) ask, child-appealing electrical household appliances are a new phenomenon, but how might they figure in ordinary family life? How might parents and relevant professionals deal with the risks which such appliances can pose to children? The student designers provided stakeholders with a cardboard prototype toaster which they had prepared earlier (see Figure 1), and also a real brand name toaster. In the narrower and more literal sense of 'making' as giving form to ideas, for example to produce something tangible, the session's outcome was not fully as the students had intended. This despite that the students had provided a variety of tinkering materials, such as marker pens and paper, and modelling clay, and had briefed the stakeholders on their task to make (or transform) the prototype into a 'safe toaster'. Early in the session one student designer also demonstrated a making activity by folding some paper over the toaster's opening.

However, in the broader sense of 'making' as emerging innovation, the session was highly successful. In a vibrant and open discussion the five stakeholders used the toasters provided to identify a range of potential dangers for children, especially relating to heat and electrocution, such as touching the sides, inserting hands or objects, or handling hot food. Stakeholders made design safety suggestions, including a cover for the toaster's opening, limiting access to controls (e.g. hiding buttons and dials, blocking lever movement), and making metallic parts more visible.

This paper analyses video recordings and associated transcriptions of the session, with an initial open interest in uncovering what the participants did, and how they did it. The approach taken follows a fundamental tenet of studies in ethnomethodology and conversation analysis that in any social situation the participants face the ever-present task of determining what is happening, what it is that they are doing, and what happens relevantly next. The nature, progress and outcome of any social situation, either in ordinary interaction or in institutional settings, emerges from the participants' own

Figure 1: The cardboard prototype toaster, prepared and provided by the design students.

talk and conduct, right there and then. Analyses begin from the participants' understandings and interpretations, as evident in their talk and actions relative to the evolving contingencies of the immediate circumstances.

The starting point for a closer look at the data was an observation that the stakeholders treated the two toasters, the real one and the cardboard prototype, very differently. Notably, although stakeholders gestured at and around the prototype, they mostly did not handle it. Both toasters were equally available, however whereas the prototype remained in the centre of the table, the real toaster was moved all around. Also, whereas one stakeholder slightly shifted the prototype at the session beginning, and two stakeholders touched it, the real toaster was handled many times throughout the session, and by all stakeholders. It was picked up, passed from person to person, tilted, and turned around and upside down. Stakeholders held its plug, pressed its buttons, turned its dial, and moved its lever.

In short, the paper shows how stakeholders used the real toaster as a source of physical and visual evidence for authenticating social actions for design activity, such as claims, demonstrations, descriptions, tellings, and explanations. Through their embodied conduct, by gesturing and by handling the toaster, the stakeholders directed attention to the real thing, and incorporated it relevantly with elements of their emerging talk. Further, stakeholders exhibited an orientation to the possibilities and value of the real toaster for such authentication, relative to the prototype toaster. Within a single stream of talk stakeholders switched with precision their embodied engagement between the two toasters. The paper's findings may increase appreciation of the subtle differences in the ways participants understand and use artifacts in interaction for design activities.

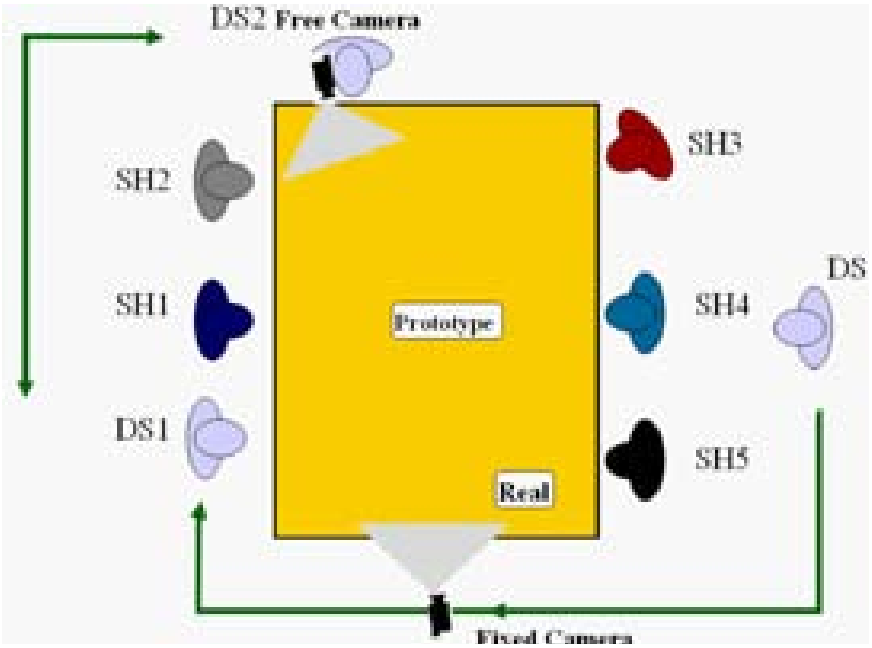


Figure 2: Locations of the participants and the prototype and real toasters (DS refers to Design Student, and SH refers to Stakeholder)

LITERATURE AND THEORY

The paper's approach draws primarily on the interests and methods of ethnomethodology and conversation analysis (EM/CA) for analysing recordings of naturally occurring interaction to examine in detail the resources by which people create and understand the order and intelligibility of activities for social life (see Have 2007). EM/CA studies have considered both ordinary conversational interaction, for example amongst friends and family (e.g. Goodwin 1981), and also interaction for work and institutional settings (see Arminen 2005). Significantly, studies have revealed the intricate ways by which participants build their contributions and understandings, moment-to-moment, by coordinating talk with other resources, including language, embodied conduct such as gestures, gaze, body posture and movement, as well as objects and features of the spatial and material environment (e.g. Schegloff 1998).

Analyses here are informed particularly by studies of how participants draw on features of the material setting, and objects (or tools), in consequential ways for the social actions in which they are involved, and so establish what is happening, and who is doing what. Such research is well exemplified in the work of C.Goodwin, across a huge range of situations, for example from handling cutlery while telling a story during a meal (Goodwin 1984), to using a trowel or colour chart for archaeological field work, or touching and attending to displays for establishing forms of joint seeing and activity (Goodwin 1994, 1995, 1997).

The paper furthers generally research on design as a social activity and process, the sociality of design, and especially studies interested in details of communication and interaction (Bucciarelli 1988; Bowers and Pycock 1994; Coughlan and Macredie 2002; Matthews 2007). It meets the call of Coughlan and Macredie (2002:59) for real-world research on user-designer interaction, on the contexts in which such interactions are embedded, and on the behaviours involved in particular communicative activities.

DATA AND METHODS

The data are two video recordings and transcription excerpts of a participatory prototyping session, conducted in English, led by two design-students and involving five stakeholders. Boess et al. (2011) describe the aims and context of the session within the students' overall program. Stakeholders represent possible users or interested parties for the product, a toaster which is safe and appealing to children. Four stakeholders are parents of young children, and one is a child psychologist. One stakeholder is a native English-speaker (from England), and four are of different language backgrounds (Dutch, Icelandic, Spanish) but are apparently sufficiently competent to discuss freely in English, as appropriate for this session. The arrangement of participants around a table is shown in Figure 2. 'SH' indicates a Stakeholder, for ex-

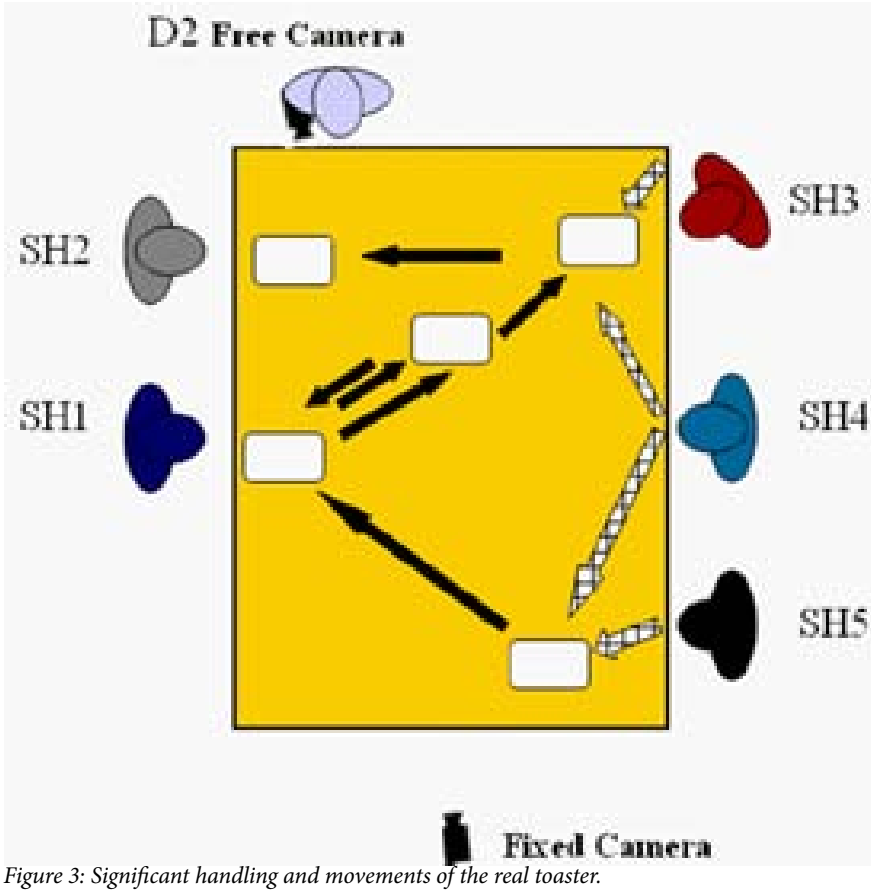


Figure 3: Significant handling and movements of the real toaster.

ample 'SH1' is Stakeholder 1. 'DS' indicates a Design Student, for example 'DS1' is Design Student 1. DS1 gives the briefing to explain the session aims and what stakeholders should do. When the activity is underway DS1 sits beside SH1. One recording was made with a fixed camera, and the other with a mobile camera controlled by DS2. Both design students occasionally offer input, by asking or demonstrating. The fixed camera shows all participants, and on the table the cardboard prototype toaster (made and provided by the students), a real toaster, and various making materials.

The video recordings were transcribed by the author using common conventions for conversation analysis, as originally developed by Gail Jefferson (see Have 2007). Transcriptions include details of both talk and embodied activity as indicated in double brackets ((LIKE THIS)). Moments when embodied activity coincides with talk are marked with symbols #, $, %, @. For convenience only, line numbering across examples is consecutive.

The data are appropriate for examining in their naturally rich details the actual talk and embodied conduct of participants for social activity in particular settings. They reveal the practices and understandings of which participants are generally unaware, to produce insights into processes of collaborative design activity.

ANALYSIS

The analyses begin from the observation that while stakeholders made gestural movements around the prototype, or briefly touched or placed their fingers inside it, they mostly did not move or pick it up. It remained stable in the centre of the table. By clear contrast, the stakeholders frequently moved and handled the real toaster. Figure 3 shows moments when the real toaster was handled (light arrows), by SH5, SH4, and SH3, and handled and moved to another location (dark arrows), by SH1 (twice), SH3, and SH2.

We start with a simple example, occurring early in this part of the prototyping session (time 5:17). The stakeholders have been discussing the possibilities of having a cover over the toaster's opening, so children could not place hands or objects inside and burn or electrocute themselves.

SH1's talk concerns cutting off power

01	SH1	>so yeah< if it is possible to make, (0.3) °a
02		covered thing°.
03	DS1	yea:h [just um::
04	SH1	[#because I like (.) I rea:lly like your idea of
05		some kind of, (0.4) switch# that just [(0.2) turns
06		it off.
07		((#SH1 MOVES HAND AND HOLDS TO THE SIDE OF THE PROTOTYPE, REMOVES HAND FROM PROTOTYPE, MAKES WAVING GESTURE))
08	SH5	[$with this
09		thing.
10		(($SH5 PICKS UP PLUG OF REAL TOASTER, HOLDS IT HIGH))
		
11	SH3	(yeah) that's what I was ↑wondering.

Example 1: This thing (Fixed05:17).

to a toaster, returning to an earlier comment by SH3 (lines 04-06). SH5 uses this as an opportunity to join in. She returns to earlier talk by SH3 by mentioning a relevant feature of the toaster, the plug, the point at which a toaster is connected to a power source. SH5 ties her talk explicitly to the trajectory of SH1's with "with this thing" (lines 08-09), building on SH1's "turns it off". SH5 simultaneously picks up the plug of the real toaster and holds it up to attract others' attention (line 10). The real toaster is at her end of the table, and so by picking it up and raising it above the table SH5 orients to the others' field of vision, and so makes the plug maximally visible. SH5 uses the real toaster to make visible the relevant feature which is the subject of SH1's talk, offering her support for an earlier suggestion. The prototype toaster has no cord or plug, and so the real toaster allows SH5 to physically demonstrate the feature in a way which the prototype cannot.

In the next example, SH4 furthers earlier discussion of the danger of metal within the toaster, accessible through its opening. She initiates new talk on the metal as a possible risk of toasters by noting that it might not be visible to children. The metal can be an unseen risk ("they don't see the risk", line 33). She claims that children can be tempted therefore to put their hands into the toaster and can tip it over to see inside. She says this problem applies specifically to the real brand name toaster on the table here. Accompanying her talk, she reaches for and handles the real toaster.

Although the prototype toaster is di-

12 SH4: ((REACHES FOR REAL TOASTER))
13 SH4: #( ) it's too closed
14 ((#SH4 LOOKS TOWARDS DS1, GESTURES WITH HANDS APART, AWAY FROM TOASTER))
15 DS1: hmmm
16 SH4: I think the other ones that I saw er in the: (0.2)
17 the shop¿
…SOME UNRELATED TALK BY OTHERS OMITTED…
18 SH4: they are (0.2) you can see the me:tal.
19 (0.2)
20 DS1 [yeah.
21 SH4: [( ) the metal.=but this [one #you cannot see (.) th-
22 SH5 [oh yeah?
23 ((#REACHES AGAIN FOR REAL TOASTER, MOVES HAND OVER OPENING))

24 DS1: [oh yeah.
25 SH4 th-m you cannot see [the METAL because
26 SH1 [it *already is a bit high*]
27 ((*SH1 POINTS TO REAL TOASTER))
28 it's] already %high¿ (0.2) so (0.2) it's also yah for
29 °for (.) [(children)°
30 ((%MOVES HAND ABOVE OPENING OF REAL TOASTER))

…SOME TALK OMITTED…

31 DS1: [yeah because they don't see the risk.]
32 SH4: [because for children¿] (0.3) they don't risk¿ (0.2)
33 they don't see the risk an' they don't understand
34 [(the: the:).
35 SH3 [mm ( )
36 (0.3)
37 SH4: because they want #to::: maybe to come: an' (.)
38 ((#SH4 PLACES HAND ON REAL TOASTER))
39 an' $look¿ an' look¿ so::[: (0.2) an' then they can
40 (($SH4 TIPS TOASTER TOWARDS HERSELF))

41 SH5 [oh:: yeah.
42 SH4 [jus' put their ha:nds [here you know,
43 SH1 [yeah.
44 SH1 [because it really does look like a toy.

Example 2: Too closed (Fixed09:15).

rectly in front of her, SH4 leans and reaches for the real toaster. Her talk concerns what she claims to be a specific potential danger of this toaster ("this one" line 21), that the metal parts are not visible. As a source of available evidence for her claim she directs attention to the real toaster by placing her hand on it, and moving her hand over the opening as she describes the feature and potential danger. She authenticates her claim by physically demonstrating that the outside case is "high" (line 26) and that the metal cannot be seen. To demonstrate the possible danger she simulates the possible action by a child by tipping the toaster to look inside: "they want to::: maybe to come an' look an' look so an' then they just can just put their hands here" (lines 37-42).

Handling the real toaster, and not the prototype toaster, allows SH4 to make visible the specific dangers and potential activities which are the subject of her talk. The prototype has no metal parts, one cannot tip it over to see them inside. SH4 is able to use the real toaster to authenticate her talk, made now not in the abstract but as embodied and tied to an artifact immediately present.

In the next example a different stakeholder, SH2, uses the real toaster to explain his understanding of its functioning. The explanation involves the heat setting dial which he apparently thinks has a role in turning the toaster on. His initial comment refers to the 'plug' being on, but he has his hand on the heating dial, and this prompts no immediate response from other stakeholders (lines 50, 52, 54). They point out his misunderstanding (not shown), with SH5 then commenting that "you're obviously not a toaster owner" (line 61). SH2 continues by noting the possible relevance for the toaster of a safety design feature used on containers for medicines, which cannot be opened unless the user squeezes the cap while simultaneously turning it.

45 SH2 no but I-I think as well that #something like that
46 (0.3) th't thi- this device just works when the-
47 ((# REACHES FOR REAL TOASTER, PLACES IT IN FRONT OF HIMSELF))

48 SH2 when the:,%(0.5) plug %is on.
49 ((%PLACES FINGERS ON HEATING DIAL))

50 (0.7)
51 SH2 otherwise (0.2) it doesn't work,
52 (0.5)
53 SH2 correct me °if I'm wrong.°
54 (1.1)
55 SH2 $°so° (0.6) this jus' works (0.4) like this doesn't
56 (0.3) but (0.2) *like this (.) sounds like errrrr.
57 (($TURNS REAL TOASTER SO THE SIDE WITH THE BUTTONS AND DIAL IS FACING OTHER PARTICIPANTS))
58 ((*HAS FINGERS ON HEATING DIAL))

59 (1.3)
60 or not,
…SOME TURNS OMITTED…

61 SH5 [you're obviously] not a toaster owner.
62 ((general laughter))
63 SH2 #no that's right I don't have one so- (0.2) .h but
64 ah:: as far as I rem(h)ember (0.2) this i(h)s just ah
65 (0.2) it w's a matter of okay you want ah oh one
66 minute, two minutes [( )

67 ((#SH2 POSITIONS REAL TOASTER FOR OTHERS TO SEE, SIMULATES TURNING HEATING DIAL))
68 SH4 [( )
69 SH2 so the longer: ( ) the the- the- (0.2) the darker.
70 ((general laughter))
… SOME TALK BY OTHERS OMITTED…
71 SH2 but then eh: as as there are ah er caps on the:::-
72 u::m (0.2) er (cha-) chemic stuff like ah laundry
73 stuff and the (.) children cannot open that you need
74 to push [to ah::::
75 DS1 [mm hm
76 SH3 oh yeah.
77 SH5 oh::: yeah.
78 SH2 to stri- (.) .hh (.) #i- i- it could be ah
79 ((#SH2 AGAIN SIMULATES TURNING HEATING DIAL OF REAL TOASTER))
80 SH5 th't you have to pull it out a bit.

Example 3: Plug is on (Fixed18:15).

As SH2 sets out to describe what he believes to be details of when and how toasters work, he reaches for the real toaster, and then displays it to the others and manipulates its controls (the dial). His talk concerns not general matters, but specifically "this device" (line 46), and how it "works". He orients it physically so others can easily see its buttons and dial, he turns the dial while describing what he believes to be its function, and even simulates a toaster sound ("sounds like errrrr", line 56). By selecting and handling the real toaster, SH2 treats it as relevant for authenticating his emerging talk, as providing tangible and visible evidence. The prototype toaster does not 'work', it does not have a real dial, and it makes no 'errrr' sound. The real toaster can be used for authentically demonstrating how toasters work, what they do, and how one uses them.

Throughout his talk he holds the real toaster. He has his hand on the heating dial and simulates turning it to demonstrate his claims. He suggests that like 'child safe' medical bottles the toaster's dial could be simultaneously squeezed when turned to be more challenging for children to operate. To authenticate his talk he again simulates turning the heating dial.

The next two final examples highlight well the participants' embodied orientation to the different possibilities of the two toasters, and especially for the potential of the real toaster to draw

attention and authenticate emerging talk. Participants switch their embodied engagement between the toasters to coordinate precisely with the nature and timing of talk. That is, participants handle the real toaster, or gesture towards or around it, at precisely those moments when talk concerns details applicable only to real toasters.

Example 4, next, occurs as the very first response from a stakeholder to the opening introductory and briefing comments from the design student (DS1). DS1 ends by asking the stakeholders to consider possible specifications for a toaster to be "child safe". SH1's reply begins with a suggested modification, to make the toaster "extra deep". In her embodied conduct, SH1 switches from the prototype to the real toaster, and then back to the prototype. The switching is closely related to the substance of her emerging talk.

In order, SH1, SH5, and SH3 suggest ways to make a toaster child safe, and

81 DS1: wh- what kind of specifica- (.) specifications
82 sh'd the product ha:ve .h (0.2) to be child safe.
83 (1.5)
84 SH1: .hh maybe it c'd be (0.2) #kind of (.) somehow
85 ((#SH1 TURNS THE PROTOTYPE SO ITS SIDE FACES HER, SHE PUTS HAND IN OPENING))
86 SH1: (.) extra deep (0.3) because [um and
87 DS1: [↑ah yeah
88 SH1: then not ha::ve (0.2) metal °around [top°
89 DS1: [on the top
90 SH1 $b'cause you know if you poke a fork into a
91 toaster >you electrocute yourself,<$
92 (($MOVES HAND RIGHT, POINTS TO REAL TOASTER$))

93 SH5: ye:::s.
94 SH2: #>°exactly°<.
95 ((#SH1 RETURNS HAND TO ABOVE PROTOTYPE))
96 SH1: but maybe it could be somehow::, (0.8) %I'm not
97 sure exactly but jus' some way of- if you p:oke the
98 fork in a little bit (.) it doesn't (0.2) hit,%
99 ((% SH1 HOLDS HAND OVER OPENING, PLACES HAND INTO OPENING, MOVES HAND AWAY %))

100 SH5: that it's dee::per.
101 (0.2)
102 SH5: [@and ( ) maybe that it doesn't get war::m on the
103 (((@SH5 PLACES HAND INTO OPENING OF PROTOYPE))
104 SH1: [yah:::
105 SH5 top@ even. =
106 SH1: =yah: some kind of way of: (.) a-making it
107 #more difficult to (0.5) to electro#cute [yourself
108 ((#SH1 POINTS WITH FULL HAND TO REAL TOASTER))

109 SH3: [you can just
110 $make a top where you c'n$ just close it ([ )

Example 4: Extra deep (Fixed4:02).

they gesture around the physical space of the prototype. SH1 suggests that it could be "extra deep" and to "not have metal around top", so that if someone were to poke a fork in a little bit it "doesn't hit". Throughout her talk referring to what might be changed, SH1 holds her right hand over the opening of the prototype toaster, at one point forming a fist, and sometimes she places her fingers into the opening. SH1 appears to simulate potential physical interaction with the appliance, and as she projects change she gestures around the prototype toaster. Similarly, SH5 joins in and also suggests a change such that the prototype "doesn't get war::m on the top" (line 102). She moves her hand over the opening of the prototype and places fingers inside the opening. Lastly, SH3 suggests a "top" to "just close it". During this talk she points to the prototype. In making their design suggestions, each of these stakeholders has some form of embodied engagement with the prototype toaster.

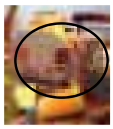
Note however, in contrast, that SH1 at two points moves her hand away from the prototype to point to the real toaster. Having made her design suggestion for the toaster to be deeper and not to have metal, she appeals to shared common knowledge of potential danger associated with toasters: "b'cause you know if you poke a fork into a toaster you electrocute yourself," (lines 90-91). For this talk SH1 points to the real toaster, to the very toaster, a real one, by which it is actually possible to electrocute oneself. The cardboard prototype toaster is not capable of electrocuting anybody. SH1 can authenticate her claim of potential danger by making visually salient through gesture the artifact of which this is claimed to be so. SH1 draws attention to the available toaster which does have such potential. As a real toaster it can be seen to approximate, to stand in for, the kind of appliance with which participants here may actually have had experience.

The significant point is that it is exactly at the point where SH1 shifts in her talk from suggestions, from projecting change, to existing knowledge based in past experience (if not one's own, then awareness of others', assuming that nobody here has actually been electrocuted), SH1 switches her embodied engagement from the prototype to the real toaster. Talk for projected design changes is accompanied by embodied conduct directed towards the available toaster, the prototype, which represents the site for possible changes. The real toaster is however a resource for embodying talk for the possibility of electrocution, as a real experience and event, and a real danger.

Indeed after returning her hand to the space of the prototype toaster while making further suggestions for design modifications, SH1 again switches to gesture by pointing, this time with an open hand, to the real toaster. SH1 suggests a possible dangerous action ("if you p:oke the fork in a little bit", lines 97-98) and the outcome of a design remedy ("it doesn't (0.2) hit,", line 98). While talking she holds her hand over the prototype. She stops as SH5 contributes with support and another suggestion (lines 100, 102). After apparently accepting this ("yah:::" line 104) SH1 returns to talk for a general design safety goal, a way to make electrocution more difficult. For this talk SH1 again points to the real toaster, the toaster which can actually be a source of electrocution (line 108). It is the real toaster, not the prototype, for which the this talk is relevant, in terms of tying the talk to participants' awareness and of real-life experience of use of the appliance.

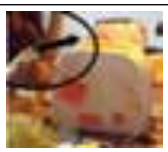
The last example shows embodiment for authenticating design talk in a variety of ways. The stakeholders have been discussing the possible danger to children of handling hot bread as it emerges from the toaster, concluding that it is not serious risk.

111 SH1 you'd r- kind of rather it didn't happen [to
112 the kid]
113 SH5 ( ) they're not gonna have (0.5)
114 [per- (.) a permanent injury.]
115 SH2 [they will not (s-) >well they will survive< b't it
116 will be really really harmful #ah when they#
117 ((#MOVES HAND TOWARDS PROTOTYPE, PAUSES HAND WITH FINGERS CURLED IN BEFORE REACHING PROTOTYPE))



118 $touch the ah ah metallic a- part [( )
119 (($MOVES HAND BACK TO TABLE))
120 SH3 [%I guess it's
121 only the outside it's hot already%
122 ((% TOUCHES SIDE OF PROTOTYPE))

123 @when it's on@
124 ((@ POINTS TO REAL TOASTER))



125 (0.2)
126 ((SH4 PLACES HAND ON OUTSIDE OF PROTOTYPE TOASTER, THEN REMOVES HER HAND))
127 ((SH5 PLACES HAND ON REAL TOASTER))

128 SH5 *this, (.) and he::re as we:ll.
129 (0.2)
130 SH5 this 'specially and this,*
131 ((*SH5 MOVES HAND BACK AND FORTH FROM SIDE TO ABOVE THE OPENING OF REAL TOASTER))

Example 5: Metallic part (Fixed08:10).

First, SH2 makes a claim about the potential harm of the metallic parts of the toaster (" …it will be really really harmful ah when they touch the … metallic part", lines 115-118). He gestures with his talk. As SH2 begins his turn, he moves his right hand towards the prototype toaster. However, just as his hand approaches, before saying "touch", his hand stops, the fingers curl into his palm and the hand returns to the table. Note that his talk is about a definite feature of toasters, "the metallic part". The talk makes a claim about the danger of metal parts. However, the prototype 'toaster' to which he is now reaching actually has no metal parts. There is a form of disparity between his talk and the target of his embodied activity. He cannot point to or touch any metallic part, so the prototype does not allow him to authenticate his talk by demonstrating physically and visually. By curling his fingers in and retracting his hand back, just before saying the key word "touch", and when 'touching' is a next possible event, he ensures a kind of integrity for how gesture, artifact and talk combine to form his claim (Nevile 2004).

Following SH2, SH3 then notes the danger potential of the outside of the toaster becoming hot, and like SH1 in Example 4, we see here that she switches between the toasters in her embodied engagement. She begins by touching the outside of the prototype, which is close to her, when saying "only the outside it's hot already" (line 121). She locates by touch the physical site to which she refers. However, she adds "when it's on", and coinciding precisely with this she points to the real toaster at the far end of the table from her. So, she points and draws attention to the real toaster which can actually have the status of being 'on', as the relevant artifact for that part of her claim.

Her pointing prompts both SH4 and SH5 to respond by reaching simultaneously to touch the two toasters. SH4 moves a hand to the side of the prototype, in front of her, but says nothing and then moves her hand away. SH5 moves a hand to the side of the real toaster, which is in front of her, saying "this, (.) and he::re as we:ll.". SH5 verbalises and identifies physically the definite sites on the real toaster ("this", "here") which can actually get hot. She continues to do so with "this 'specially and this,", while moving her hand to and from the toaster's sides to the top opening. So through her embodied conduct, touching and moving her hand around the real toaster, SH5 authenticates her claim about the toaster's potential danger for children.

CONCLUSION

Bowers and Pycock (1994:299) noted the challenge for design researchers to "explicate how – in detail – design is a social activity, how exactly participants coordinate their actions when they do…". This paper provides some of this 'exact' detail by examining how stakeholders in a prototyping session use artifacts for social actions, such as demonstrations, claims, and descriptions. The paper analysed video recordings of the session and showed how, and for what interactional value, stakeholders handled and gestured towards a real toaster. Through embodied engagement with the real toaster, stakeholders authenticated their actions. Stakeholders touched, positioned, manipulated and pointed to the real toaster as physical and visible evidence when coordinating talk and non-talk activity for their contributions. Stakeholders drew attention to the real thing to identify and describe its actual features, functions, uses, and potential dangers, and related these to their own authentic experience. Stakeholders realised publicly and moment-to-moment their understandings of the varying potentials for the different toasters for generating design ideas: the real toaster had features and possibilities which the prototype toaster did not. This paper supports attempts to address Bucciarelli's (1988:160) earlier concern for a "failure to attend to the artifact" in design research. Talk, embodiment, artifact and attention, mutually informed each other, so"[m]ind and hand, thought and object are wrapped up together" (Bucciarelli 1988:163).

The paper furthers our understanding of the body, and the hand and gesture, as socially and materially situated in ongoing courses of activity, as tied to, being-in, or engaging with the world. Goodwin (1997) suggested that gestures can reveal "a way of knowing" (p.128), and the hand is "an agent of experience in its own right, encountering specific phenomena in the world within which it is working" (p.128). We explored something about such knowing for design as a social process.

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PRELIMINARY NOTES ON 'GROOMING THE OBJECT': THE EXAMPLE OF AN ARCHITECTURAL PRESENTATION

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ABSTRACT

In this paper we analyse the use of a particular gesture during the presentation of an architectural drawing – a gesture, which we refer to as 'grooming the drawing'. On the one hand, it is related to a practical concern of the activity at hand; during the presentation the architect works with the drawing itself and a transparent manifold paper on top of the original drawing, which enables him, and the co-participations in the presentation, to comment and draw graphics "on" the drawing in and through the manifold paper. As the manifold paper is not glued to the drawing, the architect needs to make sure that the manifold paper doesn't move relative to the drawing underneath. He therefore often 'grooms' the manifold paper to straighten it out. On the other hand, the analysis reveals that although this (also) is of a practical purpose it occurs in specific positions and to serve an interactional function. The paper argues that the manipulation of objects in interaction is not just of a practical concern within an institutional practice, but is embedded within the socio-interactional organization that constitutes the ongoing activity.

INTRODUCTION

An intrinsic part of the architect's work consists of overlaying visual images, floor plans and other sketches with manifold paper in order to adjust, correct or make new sketches. The paper's transparency allows previous features to be traced and used as a resource for the new drawing. When architects present their work to various business partners it is often through a Power Point presentation. This is a very closed and definite way of showing ideas and solutions without encouraging partners to bring in their point of views or ideas. In order to do so the manifold paper may come in hand as it enables participants to see the architects drawings underneath and to write on the manifold paper without 'destroying' the original drawing.

However, when using manifold paper as overlaying it is not always tight to the drawing underneath and may bend and curl during manipulation. The user therefore has to make sure that the manifold paper is properly adjusted to the drawing so as to make sure that comments etc. are placed properly on the right spot on the drawing. A common practice in doing so is to move the (back) hand in a sweeping movement over the manifold paper, which then 'pushes' the bends away from the current point of attention. In this paper, we look at this practice of sweeping, or as we will refer to it as 'grooming the architectural drawing'.[i] We will focus especially on the sequential placement of the gesture and the interactional function it plays and is being oriented to by the co-participants.

PRESENTATION OF DATA

The data used for this (preliminary) study comes from a workshop organized by the research project Workspace Design II. The project aims to develop and test methods and practices for architects and consulting engineers to involve employees and their working environment early in new constructions and major renovations. As part of studying an architecture company's current design practice, this workshop seeks an insight into the architect's intentions with a completed building project. Prior to the workshop the project team prepared the framework for the session and the materials to be used in the process. Based on a floor plan with an overlaying piece of manifold paper, the architect was

asked to draw and tell about the building from a city- and home-metaphor; if the building were a city, where would the shopping mall, the playground, the homes be and so on. To complete this task he was asked to choose 3 important places on the drawing, which he felt needed more attention in a following evaluation of the building. The goal of this workshop was to get another form of presentation of the construction project than the traditional Power Point presentation, and a way to get the architect to reflect on the construction project during his presentation.

The present study does not attempt to present an exhaustive analysis of touching objects, but to provide some initial observation from the data made available for the present purpose. At this point, we want to mention a few limitations. First of all, the study relies on approximately 10 min of video recording. Although the analyzed phenomenon occurs regularly (18 times within 7 min 30 sec) a more thorough analysis would require a larger corpus with more occurrences, alternatively involving different architects (or other institutional presentations using sketches, drawings, grids etc.). However, although the present paper is based on a relatively small collection of the studied phenomenon it nonetheless presents a preliminary analysis of a specific social practice, which is oriented to by the (co-)participants as a specific social practice. That means that the participants 'recognize' the interactional function of the phenomenon *in situ*, as a specific social "action-in-interaction". Secondly, the architectural presentation was not (video) recorded with the intended aim to study the inclusion of the drawing in interaction, nor the overall participation framework and the participants' physical positioning *vis à vis* each other. Rather, the aim was to make an overall documentation of what happened doing the whole session, and how the participants managed the metaphorically framed interaction. As a consequence, the recording was done with one camera only that changes the perspective during the recording from including all participants and the architectural drawing to zooming in on the drawing. At times, therefore, the camera's focus on details (e.g., on the drawing) impedes an adequate view of the participants. This is not a critique of the recording since any recording inevitable will be done under the influence of theoretical and methodological assumptions. But it does mean that we cannot satisfactory account for all facets of the *interactional* use of the grooming gesture.

USING OBJECTS IN INTERACTION

The use and manipulation of objects plays an important part in a range of everyday interactions in institutional settings as well as in ordinary conversation. From bedtime reading (Goodwin 2007) to high-tech control rooms (Heath and Luff 1992) our social interactions with other people often occur around and with the inclusion of physical artefacts such as books, maps, computers, pens, hammers, screwdrivers and so forth that are used to structure the surrounding interaction. These tools are socio-cultural artefacts that have been shaped and reshaped by man, often over generations, to serve often quite specific purposes. As such they have been part of a reflexive relationship with human beings and have constantly been re-modified to fit the changing demands of their users, and have at the same time been part of changing human practices. Think for instance of the telephone, via mobile phones to iPhones (well, and other smart-phones as well!). Going wireless made physical size and weight important aspects as a practical issue for the user. With internet access and access to remove servers we are now able to show or send our at-the-moment holiday pictures to family and friends – just by clicking, and the various apps for every possible purpose change the very way we think of and use the (former) telephone. Indeed, changing our needs.

Recently, research in interaction has shown how tools have an impact on the organization of the interaction itself. For instance, C. Goodwin (e.g.2000a, b) shows how archaeologists use an institutional specific grid, the so-called Munsell chart, in order to determine colour and texture in the dirt. He shows how the classification is not only done interactively around the chart, but also how the chart structures the interaction of the participants using it. A slightly different line of research within interactional approaches to language has described how tools themselves are embedded within the accomplishment of social practices (e.g., Mondada 2006, 2007; Schegloff 1998). These approaches depart in the sociological tradition ethnomethodological conversation analysis, which also serves as the main methodological framework in this paper (see e.g., C. Goodwin and Heritage 1990; Gülich and Mondada 2008 for an introduction).

ANALYSIS

In this paper we focus on a specific gestural touch of an architectural drawing. In the sections to follow, we will describe the grooming gesture in terms of its sequential position, "semantics" and interactional function.

An initial observation is that the groom appears to be intimately related to the monologue phase of the presentation; during the approximately 10 min clip all 18 instances occur during the first 7 min 30 sec, during which the architect, "Martin", presents the drawing. Example 1 shows a typical instance of this.[ii]

1 Ma: I det her tilfælde er det så (0.2) femhundrede
In this case there are (0.2) five hundred
2 Ma: mennesker så det er s:ådan lidt
people so that's a bit
3 Ma: anderledes {men (0.3) men eh der er i hvert fald en
different but (0.3) but eh there is in any case a
Ma: {*Gaze to drawing -->*
4 Ma: ad- en adskillelse her
bo- a boundary here
5 Ps: {(1.1)}
Ma:{*Grooms the drawing with RBH*}
6 Ma: Det vil sige man (0.3) man ved også hvor er det
That is to say you (0.3) you also know where it is
7 Ma: henne man taler fortroligt
you can talk confidentially

Example 1: Groom in non-transition relevant positions.

Note the (1.1) second pause in line 5 during which the groom is done.[iii] None of the co-participants take this as an opportunity to initiate a turn-at-talk at this point, and thereby redefine Martin as the current speaker and display their understanding of the current activity – 'monolog presentation'. Similarly, Martin withdraws the gaze from his main recipient, Julie during line 3, and turns the gaze towards the drawing on the table between them. In this way, he projects a continuation of his presentation and projects that the drawing holds a prominent position in it.

Following the (monologue) presentation, the remaining 3 min are more dialogic in nature and can roughly be described as a series of more specific questions from the main recipient of the presentation, Julie, and Martin's answers to them. During this phase no instances are found. This seems to suggest that the grooming gesture is linked to a certain rhetorical function – a type of body movement that are performed for the presenter himself. Although the groom indeed may serve a 'personal' rhetorical function, the following analysis suggests that it (additionally) is oriented to by the co-participants, and therefore can be described a serving an *interactional*, or interpersonal function.

A "SEMANTIC" DESCRIPTION

Before we continue it might be useful to provide a description of the 'semantics' of the groom to facilitate the recognisability of the reader. A rough description divides the grooms into two categories: an explicit groom and an embedded one. Let's start with the explicit groom, which constitutes the largest portion of the analysed instances (16 out of 18). In these cases, Martin moves his backhand, normally the right one, over the drawing in a sweeping movement from left to right (when he uses the left backhand this movement is from right to left). His hand is straight and palm up. Figure 1a and 1b show the beginning and end of the groom.

The embedded groom is done with the fingers only and seems to be more sensitive to the immediate sequential context (see the description of the sequential position below). Indeed, it may be more accurately described as indexical 'pointing', but with the inclusion of physical touch of the drawing. This is made visible in example two and the accompanying frame grabs in figure 2a and 2b.

Figure 1a: The beginning of the grooming gesture.

Figure 1b: The end of the grooming gesture

1 Ma: Eh: (0.9) {og hvis} man lissom ta'r (0.6)
Eh (0.9) and if you like take (0.6)
Ma: {*Removes the top of the pen*}
2 Ma: {basisenheden her}inde som- som hjemmezonen
the basic unit in here as as the home zone
Ma: {*Moves fingers over drawing*}
3 Ma: .Hhh >så ka man sige man< har et (1.4) primært
.Hhh then you can say you have a (1.4) primary
4 Ma: opholdsområde
living area

Example 2: Embedded grooming.

In this example, Martin moves the fingers on the right hand over the drawing. The movement is done co-occurring with the word "*basisenheden* (the basic unit)" and extends into the indexical "*herinde* (in here)". Indeed, the fingers point to the 'basic unit' on the drawing, whose boundaries only seconds later are highlighted with the pen. The gesture is indexical as it co-occurs with the referent ("the basic unit") and the indexical ("herinde"). However, at the same time he straightens the manifold paper so that the section corresponding with the "basic unit" on the drawing is sharpened (i.e. the manifold paper is 'flattened'). As opposed to the explicit groom, the embedded groom is performed as a *secondary* action or at least co-occurring with an interactionally based action, in this case indexical pointing.

SEQUENTIAL POSITION

As we noted earlier, the grooming gesture is exclusively found in the monologue part of the presentation. This part of the presentation is constructed as a series of multi-unit turns, and the co-participants' actions consist of receipt tokens such as *mm* and *yeah* (e.g., Gardner 2001; Jefferson 1985; Schegloff 1982) and nodding (M.H. Goodwin 1980b). Indeed, its function seems to be an internal part of the particular turn-taking organization during this section. Any type of interaction is organized around an exchange of speakership, but this organization varies according to the type of interaction at play. Fundamental to all exchange systems is the organization of turns-at-talk, and a turn is constructed

Figure 2a: Beginning of embedded groom.

Figure 2b: End of embedded groom

of smaller units, which Sacks, Schegloff and Jefferson in their classical (1974) articles referred to as *turn-constructional units* (TCUs). In ordinary conversation, they argued, speaker change may be relevant at the end of each TCU, and the projection and recognisability of possible completions of TCUs are crucial to the organization of interaction since these are positions in which a current non-speaker may self-select as next-speaker. In order to project possible completions of TCUs co-participants rely primarily on the emergent grammatical construction, on intonation and on the pragmatic action being performed.

Returning to our data, we observe that the grooming gesture overwhelmingly occurs in three different positions: in *gaps* between TCUs as in example 1, and in *turn-beginnings*, which may be in pre-speech activities such as in-breaths or hesitations as in example 3, or in TCU-beginnings as in example 4. These positions suggest that the grooming gesture is intimately tied to turn-taking organization and that it particular occurs just prior to or in the beginning of a new TCU. In the cases where the gesture occurs in gaps between turns it fills the silence by an interactionally meaningful activity. As such, these instances are not gaps

1 Ma: Og det ka jo altså skifte (0.3) fra dag til dag men det
And that can change (0.3) from day to day but it
2 Ma: ka også skifte fra time til time
can also change from hour to hour
3 Ps: (1.1)
4 Ma: .H/hhh {ehrm} så derfor e:r det rum man tilbyder i:
.Hhhh ehrm so that is why the room you offer in
Ma: /Moves both hands towards drawing
Ma: {Grooms the drawing with LBH}
5 Ma: i hjemmezonen supervigtig for den (0.3) eh:
in the home zone is super important for the (0.3)
6 Ma: arbejdsdag (.) ma:n (.) tilbyder den enkelte
eh working day (.) you (.) offer the individual

Example 3: Grooming gesture in pre-speech position.

1 Ma: De:t selvfølgelig sår´n noet som at (0.5) ta e:n (.) en
Of course its something like (0.5) taking a (.) a
2 Ma: eh privat samtale med lægen men det er osse
eh private conversation with the doctor but its also
3 Ma: simpelthen sætte sig ned og læse en tekst eller .hh
simply sit down and read a text or .hh
4 Ma: ska skrive en svær tekst eller .hhh (0.3) et møde på
have to write a difficult text or .hhh (0.3) a meeting
5 Ma: tomandshånd ehrm: de:t ka jo være eh det kan
together ehrm: it can also be eh it can
6 Ma: sagtens være en en ledermedarbejderforhold man
also be an employer employee relation you
7 Ma: osse: ta´r i- i sår´n et stillerum
discuss in such a quiet room
8 Ps: /(0.4)
Ma: /Moves right hand towards drawing
9 Ma: {Så den ha:r} utrolig mange funktioner
So it has really many functions
Ma:{Grooms the drawing with RBH}
10 Ps: (0.2)

Example 4: Grooming gesture in TCU-beginning.

of activities, but gaps of *verbal* contributions to the ongoing activity (see e.g., Schmitt 2004). Additionally, we find a few instances of the gesture in mid-turn as in example 5, but in these cases it co-occurs simultaneously to a re-start, i.e. that the emergent TCU is abandoned mid-turn in favour of another TCU-beginning that projects a different trajectory of the turn-in-progress (Fox et al. 1996; Schegloff et al. 1977).

1 Ma: .Mthh ehrm: (1.2) nu vi næsten herover i sår´n
.Mthh ehrm: (1.2) now we're almost into
2 Ma: noen ehrm: {(0.6) vi ska til}bage til halvfjerserne
these ehrm (0.6) we have to go back to the
Ma: {Grooms the drawing with the RBH
3 Ma: og leve i kollektiv
seventies and the collectives

Example 5: Grooming gesture in re-starts.

As such, the gesture in example 5 can still be said to occur in the beginning of a TCU as the previously initiated TCU is abandoned and the turn is re-started with "*vi skal tilbage* (we have to go back)" following a hesitation and a (0.6) second pause in line 2.

Our collection presents only two examples that do not occur in the pre-turn positions presented in the above. And both of these cases follows closely after another instance of the grooming gesture. The grooming gesture in example 6 follows only a few seconds after the one we described in example 3 above (line numbers correspond to example 3).

4 Ma: .H/hhh {ehrm} så derfor e:r det rum man tilbyder i:
.Hhhh ehrm so that is why the room you offer in
Ma: /Moves both hands towards drawing
Ma: {Grooms the drawing with LBH}
5 Ma: /i hjemmezonen supervigtig for den\ (0.3) eh:
in the home zone is super important for the (0.3)
Ma: /Circulates with the pen of the drawing
6 Ma: arbejdsdag (.) /ma:n (.) {tilbyder den} enkelte
eh working day (.) you (.) offer the individual
Ma /Lifts left hand from drawing
Ma: {Grooms the drawing with LBH}

Example 6: (Repeated) grooming gesture in mid-turn position.

Here, Martin grooms the drawing in line 4 and thus prepares the physical space and projects that the groomed space holds a prominent position in the incipient activity. Indeed, he does so by circulating with the pen on the section of the drawing that corresponds with the home zone, and the gestural circulation is initiated exactly with the co-occurrence of its lexical affiliate (Schegloff 1984). However, touching the paper with the pen results in a renewed curl of the manifold paper. Martin is now not only faced with a non-groomed drawing that is central to the ongoing business, but this happens in a mid-turn position. This is reflected in a section of rather disfluent talk with pauses, sound perturbations and hesitation markers. He then projects another grooming gesture by moving his left hand back towards the curled part of the manifold paper, grooms the drawing, and brings the current TCU to a completion. In this way, the grooming gesture in line 6 seems to have a more "practical" character since the curled manifold paper limits the clear vision to an object that is the current focus of attention of the participants.

INTERACTIONAL FUNCTION: PROJECTING A(NOTHER) TURN-AT-TALK

In the previous paragraph, we described that by and large the grooming gesture in focus in the present paper overwhelmingly is found in *turn-initial positions*, either in TCU-beginnings or just prior to TCU-beginning. In this position, Schegloff (1996: 92-93) notes that various elements including "the onset of a gesture deployment and often its full realization" are used to "project the onset of talk, or the beginning of a (next) [TCU], but are not yet proper recognizable beginnings". A range of studies has analyzed how hearable in-breaths (Jefferson 1984), reorienting the gaze towards a potential recipient (C. Goodwin 1980a) and gestures (Mondada 2007; Streeck and Hartge 1992) are interactional ways of projecting or contextualizing the incipient turn-at-talk, and claiming recipiency even before the (projected) turn has been properly initiated. The grooming gesture is yet another way, by means of visual resources, through which a speaker can project a TCU, or as our cases come from a monologue presentation, *another* TCU.

1 Ma: Hvis vi så ska bevæge os op ja (0.4) >s:å ka man
If we then move upstairs yeah (0.4) then you can
2 Ma: si´e så< kommer man jo op ti:l (0.4) til sine
then you come up to (0.4) to your
3 Ma: hjemmelige vandte omgivelser
homely familiar surroundings
4 Ma: />Man ka si´e< det er jo {allerede e:+n} s:om som
You can say there is already a like like
Ma: /Moves RBH towards drawing
Ma: {Grooming drawing with RBH}
Ju: +Removes pen from drawing
5 Ma: det er når man kommer til sit hjem (ikk) en .hh
there is when you come to your home (right) a .hh
6 Ma: e:n en adskillelse me:d låse og slå
a a boundary with a lock

Example 7: Grooming gesture as projecting talk.

In example 7, Martin initiates the gesture in a pre-TCU position, i.e. during the discourse marker "*man ka si'e* (you can say)", and the stroke of the gesture (McNeill 1992) occurs only later. However, during the grooming gesture, the main recipient, Julie, removes a pen that lies on the drawing. Indeed, it lies close to the place that Martin grooms. She thus orients to the gesture as preparing a physical space (on the drawing) that is being projected as *relevant* to the projected activity, and she *participates* in preparing the "domain of scrutiny" (Goodwin 2003).

Throughout the (main part of the) presentation Julie takes up the role of primary recipient to Martin's presentation. However, the camera man is not

only present as a recipient who manages the camera, but through the ways in which he manipulates the camera through changing foci, zooms etc. he displays his understanding of the ongoing activity and in particular the current focus of attention. And, indeed, through his use of the camera he too orients to the grooming gesture.

1 Ma: +I det her tilfælde er det så (0.2) femhundrede
In this case there are (0.2) five hundred
Cam: ->+"Zoom out" focus on Martin and Julie
2 Ma: mennesker så det er s:ådan lidt
people so that's a bit
3 Ma: anderledes {men (0.3) {men eh der er i hvert fald en
different but (0.3) but eh there is in any case a
Ma: {Gaze to drawing -->
Ma: {Bends over table
4 Ma: ad- en ad+skillelse her
bo- a boundary here
Cam: +Moves focus to table
5 Ps: {(0.8)+(0.3)} ((1.1))
Ma:{Grooms the drawing with RBH}
Cam: +Zooms in on drawing
6 Ma: Det vil sige man (0.3) man ved også hvor er det
That is to say you (0.3) you also know where it is
7 Ma: henne man taler fortroligt
you can talk confidentially

Example 8: Co-participants' orientation to projected focus of attention.

In example 8[iv], which is the last example we present here and an extension of the already presented example 1, we see that the camera closely follows Martin's postural alignment; as he leans over the table, the camera follows his spatial movement (lines 3-4). And as Martin grooms the drawing the camera zooms in on the drawing and more precisely on the groomed section. In this way, the camera (man) orients to the grooming gesture as projecting the groomed section as a relevant focus of attention in the upcoming turn-at-talk, and through his vision and lens provides a crucial perspective (or in more analytic terms 'understanding') of the action being performed in and through the grooming gesture.

CONCLUSION

In this paper we have discussed a social practice that we have called 'grooming the drawing'. The term was chosen with reference to *self-grooming* (e.g., C. Goodwin 1986) in the sense of its (i) relation to physical appearance and (ii) preparatory aspects. On the one hand, we have described the grooming gesture as a recognizable institutional practice with the practical purpose of flattening the manifold paper relatively to the underlying drawing. As such, the analysis has presented what might be termed a professional groom; although the analysis was based on a single case analysis of a 10-minute video recording involving just one architect this appears to be a more or less common way of manipulating paper (cf. Luff et al. 2010). On the other hand, we find the bigger part of our examples in specific sequential positions, i.e. in TCU-beginnings or just prior to TCU-beginnings, which suggests that it embeds an interactional function of projecting the drawing as a relevant focus of attention in the upcoming talk additional to the practical purpose. Again we paraphrase the term self-grooming as Martin's groom of the drawing serves a practically based aspect of appearance, which interactionally is used to project the upcoming or incipient activity; an activity, which includes the sketch as a primary actor in the projected participation framework.

As a final issue we want to touch upon a few perspectives of the analysis presented in this paper. The results have a number of consequences to *interactional* studies. The first implication adds to studies of the inclusion of physical artefacts (including schemas, grids and other graphical objects) in and for social interaction, and in particular to how (the use of) artefacts are used to perform specific social action (e.g., C. Goodwin 2003; Greiffenhagen and Watson 2009; Mondada 2006, 2007). It emphasizes how the gesture projects the inclusion of the drawing, and indeed a specific section hereof, in the upcoming talk, which then reorganizes the participation framework. Secondly, it adds to studies on *workplace interaction* (e.g., Heath and Hindmarsh 2002; Heath and Luff 1992; Luff et al. 2000) by analyzing the interactional function of an institutionally relevant gesture towards a complex semiotic drawing. The grooming gesture is institutionally specific in the sense that it is recognizable for the participants present as serving both a practical purpose and an interactional function. Although we can only speculate here, it appears to be the kind of practice that is an inherent practice of architects during this type of presentations, but which is not explicitly taught. As such, it seems to be the type of practice that is an inherent aspect of what it means to be an architect in an ethnomethodological sense, i.e. as something that is done in and through social practices.

This brings us to the final point – the implication for the *architect*. The use of manifold paper in presentations like the one presented here, although this is not a common procedure, provides participants with certain affordances, to use Gibson's (1977) term. In particular with comparing it to a virtual presentation with e.g. Power Point the manifold paper affords a high(er) degree of participation from co-participants, and is flexible in terms of adding information due to its tangible character (see also Luff et al. 2010). On the other hand, the recurrent curling of the manifold paper relatively to the drawing underneath could appear to be a constraint; as an 'annoying' consequence that has to be dealt with for practical purposes as smoothly as possibly. However, the present analysis has revealed that although this may be seen as an unavoidable consequence its use is both highly systematic and serves an interactional function. As the completion of a TCU may mark a position in which it is relevant for a co-participant to initiate a turn-at-talk the current speaker can fill the gab between TCUs with relevant actions. In this case, the relevant action, grooming the drawing, maintains the speaker-hearer relation by re-orientating the participation framework through a projection of a next-action that includes the architectural drawing. The use of manifold paper entails a practical issue, and the management of this practical issue performs interactionally relevant jobs. It is indeed the successful interplay of these two aspects that results in a smooth presentation with and around the drawing.

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NOTES

[i]*The description of 'grooming' follows descriptions of 'self-grooms' in social encounters as in e.g., Goffman (1963) and C. Goodwin (1986).*

[ii]*Transcription conventions follow Jefferson (e.g., 2004). The grooming gestures and other information about Martin's visual conduct are surrounded with curled brackets { }. The beginning of the grooming gesture in focus is indicated with /. Visual information from a co-participant is indicated with +. All names are pseudonyms.*

[iii]*In the transcripts, we use the abbreviations RBH to refer to right backhand, and LBH to refer to left backhand.*

[iv]*The transcript in this example includes an additional symbol (adopted from Mondada 2007) to capture the movements of the camera. ->+ refers to an action that is maintained until the + is repeated in the transcript.*

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TRACK 2

STAGING DESIGN ANTHROPOLOGY

CHAIRS

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KEYNOTE SPEAKER

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Participatory Innovation highlights alternative ways of organizing and participating. It explores the tensions inherent in an open-ended process where people are brought together in a space of possibilities. Innovation can be considered as an unfolding rather than as a foreclosure, where objects and concepts emerge from the processes within sets of relationships, the interweavings of those involved. Tensions and shifts are engendered through an interplay of the hopes, dreams and aspirations of those involved and the inherent constraints of the present. At a time when the field and practice of design anthropology is at its infancy, this track invites professionals who relate their work to design, anthropology, and their combination to demonstrate what it involves to draw on the human experience as a means of shaping the future.

In the service of innovation, fieldwork has commonly been viewed as something that is done at the beginning with end users of products and services to inform a future-oriented development process. The goal has been to fetch the complexities of social behavior in its natural setting and bring it back to be put to good use. Increasingly, however, we see professionals and researchers who blur the boundaries and explore new ways of combining "research" and its "application", and find new

ways of engaging those involved. These explorations are not merely an attempt to find a new method, tool or theory to solve a problem, but rather they challenge how innovation processes are organized, who is involved, and where work is done. In this collection of papers, the authors report from a wide variety of projects and project set-ups, demonstrating various ways of bringing value of the people involved into a working relationship, a dialogue, with the future. We see that an ethnographic sensibility can no longer be confined to a specific role, such as ethnographer, nor to a specific phase in the life of a project, or in a specific location. Design is similarly brought into play in different ways, in different locations at different times. The relationship between theory and practice is left open for debate with new relationships offering new value. The ways projects originate and are carried out are shaped by a variety of disciplinary traditions and professional practices, which changes the dynamics of those involved.

STORY TELLING AND RIDDLE GAMES: AN ETHNOGRAPHIC ENQUIRY ABOUT MUSEUM GUIDED TOURS

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ABSTRACT

This paper presents the initial phase of a field study, conducted to study social interaction mediated through objects as a learning practice in museums. The guided tour (highly regarded by museum staff) was selected as a starting point to understand how interaction and learning are entangled between guides and young visitors in relation to the exhibition content. Drawing on anthropological studies about play and object mediated interaction in different contexts, the paper argues that the guided tour is a form of objects-mediated interaction itself, where a narrative is being created through play. Museum artefacts can then be interpreted as boundary objects, creating transition zones among the participants' different competences and needs.

These data will also be used to experiment with the creation of new boundary objects together with a group of 9-10 years old children.

INTRODUCTION

Learning and play are at the moment quite popular topics, several researchers are studying how to create an engaging learning experience for children starting from different approaches. According to Prensky it is vital to consider that nowadays children may be very different from adults, as early exposition to digital technologies have radically altered their way of learning (Prensky 2003). Hence he suggests to exploit in learning, the motivation children have in playing computer games, by designing special digital games for this purpose (Prensky 2003).

At the same time museums are undergoing a significant change, as traditionally they focused on collection and preservation of artefacts, nowadays they are also concerned about the experience they offer to their visitors, in terms of knowledge and engagement (Crowley and Jacobs in press, Fleming 2005). They seem especially worried about school children, as they are often dragged to museums by adults (parents or teachers), who have an idea about what they should get from the visit, but the children may not have any personal interest in museums.

Being interested in investigating objects-mediated interaction as a learning tool, the museum seemed a particularly promising context as the knowledge they want to convey is quite complex and strictly related to the objects they display. Moreover, many studies have been conducted on the subject from different perspectives. Some researchers like Crowley are even questioning the validity of the museum as a learning context (Crowley and Jacobs in press). Others are instead trying new interactive designs to enhance learning and engagement in museums (Dindler and Iversen 2009; Pierroux and Kaptelinin 2007).

Drawing on existing literature and initial data collected during my field study, I will analyse the guided tour as a form of objects-mediated interaction from the perspective of museum staff, who considers it as a valid learning tool to access the knowledge embodied in the exhibition content.

In the next two sections, I will introduce related research and the context of Ribe museum, together with data from the field study conducted so far. In the third section a qualitative analysis of the guided tour is proposed, in order to build a theoretical framework to support my ongoing research project, based on the notion of story telling and knowledge games formulated by Huizinga in his book *Homo Ludens* (Huizinga 1950). Afterwards the guided tour is analysed as interaction mediated through physical objects

Figure 1: Children at the permanent exhibition.

(archaeological artefacts, interactive installations, and explicative signs), focusing on the role of these objects; finally conclusions and future works are presented.

LEARNING AND MUSEUM STUDIES

At the moment many interesting studies have been conducted on the topic of playful learning and museums. Many of these studies seem to accept, sometimes just implicitly, Prensky's stance that children nowadays are "digital natives", as they were exposed to digital technologies since a very early age, and this fact has deep implications on their way of learning (Prensky 2003). He in fact claims that by playing video games and interactive digital media children have more facility to access information quickly and without guidance, learning by doing on an independent basis (Prensky 2003). Interestingly a museum guided tour follows the opposite pattern, it is based on step by step guided access to information, where kids are supposed to listen more than doing.

Many researchers are in fact experimenting with digital technologies to enhance the museum experience through learning-playful activities (Pierroux and Kaptelinin 2007), and by drawing parallels between present and past (Dindler and Iversen 2009).

Other researchers are studying the shifting role of museum from a learning perspective, for example by evaluating the impact of government initiatives on learning in the museum (Hooper-Greenhill et al. 2004). An interesting case is provided by Crowley and Jacobs, who actually questions the museum as a learning context. According to their data, analysis of family conversations in museums revealed that children eventually learn before going to the museum. But it still provides a valuable contribution to their learning, allowing them to see the real "things" and providing them an arena to perform with their parents (Crowley and Jacobs in press).

Similar issues emerged several times while conducting my field study, museum staff seems very concerned about what children gain from museum visit and they were very interested in my project. Despite the many interesting technological applications provided by researchers, the museums I have visited in Denmark adopt low-tech interactive settings, offering guided tours, cabinets with hidden artefacts, reproductions of clothes, weapons, and toys to play with, as in Ribe, the context of my field study. I found this situation very interesting, hence I have started my field study by trying to analyse the museum experience from their perspective and the values behind it. So far it seems as the guides think that it is their performance in making the exhibition more engaging, so that the children could learn about artefacts, their relations with the culture who created them and the values they embody.

ETHNOGRAPHIC STUDY: THE VIKING MUSEUM IN RIBE

The enquiry proposed in this paper represents the first step toward a theoretical investigation of object-mediated interaction as a learning social practice. My starting point is to create an understanding of learning-social practice in museums and create new opportunities for enhancing this learning practice, so to examine it more in depth. This enquiry is conducted in cooperation with the Viking museum in Ribe. This museum, despite the small size of its collection, has a special meaning for Viking Age history, Ribe is in fact the oldest town in Denmark. The town started as an international seasonal market place, it belonged in fact to the big circuit of Scandinavian markets, including sites like Birka in Sweden, Hedeby in Germany, and Kaupang in Norway (Graham-Campbell and Valor 2007). Since the 8th century there is evidence of a systematic organization of the market place under King Godfred, who started to set physical boundaries to delimit lots of land to be rented to merchants, who had consequently to pay taxes to the king. Furthermore, in the 9th century Ribe became officially a town, under the kingdom of Harald Bluetooth, who had fortification walls built around the settlement.

The museum is quite active in proposing new exhibitions, but also conferences and publications. Particularly interesting from the perspective of my research are *Rolf and Christine and Why Ribe*[1]. The first exhibition was created a few years ago to provide a vivid picture of childhood during the Middle Ages to children visiting the museum. The exhibitions display tangible reconstructions of toys, clothing, weapons, kitchen wear, and even a toilet with which children can freely play. *Why Ribe* has started in summer 2010 for the 1300th anniversary from the town foundation. The aim of the exhibition is to convey notions related to the historical reconstruction process, through free interaction in a new "hands on" space (as explained by the director of the museum). This exhibi-

tion will run for three years and my project will be run at the museum in connection to it.

A part from these two exhibitions, the rest of the museum offers more traditional settings, and is organized in rooms with glass display cabinets showing artefacts, supported by textual descriptions, maps or scale models (Fig. 1). Individual visitors can browse the exposition as they prefer, but groups usually are guided through it in a specific order by museum guides.'

INITIAL DATA COLLECTION

At the moment my field study is at its initial stage, so far I have conducted 5 semi-structured situated interviews and one ethnographic observation of a guided tour, with two classes of children around 10 years old. The first interview I have conducted was in December 2009 with the director and the head of the museology division of South-West Jutland Museums, an institution responsible for the administration of several local museums, including Ribe. Afterwards I have interviewed the coordinator of guided tours and two guides.

Following the method of situated interviews (Yliriksu and Buur 2007), I interviewed museum personnel in their working context. However, as a guided tour is a performance, it seemed impossible to interview guides during a tour without spoiling it. Hence I started with a participant observation, filming what was going on, then I formulated a focus for the questions based on reflections on the video material. The interviews started in the museum cafè, that is often used as a coffee room by the staff. I asked them general information about their job, what they want to convey the children and how they do that through examples. Afterwards I invited the guides to stage a tour for me, so that I could ask them questions while they showed me what they usually do. Each interview took around one hour and they were all video-recorded to support further analysis.

TELLING "THE TRUTH", MUSEUM DIRECTOR AND MUSEOLOGIST

The initial interview with the director and the head museologist revealed that the context of South-West Jutland Museums is quite active, specifically in organising new activities and exhibitions. All these initiatives are motivated by their concern particularly about children's experience of the museum and its learning implications. This last aspect emerged through the interview as particularly important and was behind the conceptualisation of the new exhibition *Why Ribe*.

Figure 2: Teachers and children looking at a cow stool, trying to guess what it is.

The traditional assumption behind museal exhibitions, according to the director and head of the museologist, is that the scientific personnel knows "the truth!". The permanent exhibition (Fig. 1), they say, is based on this assumption and it represents an opportunity to share this knowledge with the public. They intend instead to create an awareness about the actual uncertainty related to the process of historical reconstruction. Hence the assumption behind the new temporary exhibition, *Why Ribe*, is that historians and archaeologists do not really know the truth they can only theorise through an uncertain, tentative process.

TELLING A GOOD STORY, GUIDES AND TOURS COORDINATOR

Interviews with 2 guides and the guided tours coordinator revealed that from their perspective the guided tour is the most effective way to acquire knowledge about the content of an exhibition. They claim that the exhibition is not intelligible enough in itself, so that visitors could gain meaningful knowledge just by looking at it, unless they are already knowledgeable in history, and according to them it is vital that school children gets some guidance. This statement is particularly interesting as it expresses their perception of the guided tour as an important element of museum experience, and probably the reason for their desire to be guides.

Interestingly a clear common goal emerged from the interviews, they all would like to provide children with a "nice experience" under the form of "a good story", that could be memorable, fun, and educational. Moreover, according to one guide a good story should hopefully have the effect to elicit a certain curiosity in the children, so that they may become inquisitive about the story of their family and so of their own identity.

According to the guide I followed in the tour, a man around 60 years old who was once a school teacher, to provide a good story it is better to present only a few interesting objects. He usually avoids to show maps or coins, which do not seem appealing to the kids. He prefers instead to engage with everyday life artefacts, like pottery or clothes, and a small reconstruction of the original market place.

The second guide I have interviewed is a woman also around 60 years old, with a background in management and a passion for history. She is also selective about objects, but she believes that a good story has to draw meaningful parallels with the present.

Figure 3: Feedback installation, Why Ribe.

Hence she would show coins, to tell the children that craftsmen had to change their money if they wanted to trade in Ribe, like we still do nowadays when travelling abroad.

Two artefacts from the Viking Age seem particularly popular, a smooth bone used as a skating blade and a cow stool, which has been transmuted through time into something similar to a grey round rock (Fig. 2). The curators feel also that these two objects are special, hence they are preserved into an open cabinet, to be available to the visitors.

Furthermore, to avoid that the children may "fall asleep" the guides try to involve the children by asking questions about recognising a particular artefact. For example during the guided tour, the guide showed the skating bone and asked "what do you think it is?", since none was able to answer, he provided a meaningful cue by singing a song and placing the bone under his foot, then they all understood that it was a skating blade. Another way would be to ask the children to identify a sword, or other object, among the fragments displayed.

However, as it emerged during interviews and the observation I did, each group and each individual has different needs. Some children are in fact eager to participate, often raising their hands to answer the questions; other children may be too shy or not interested in talking. In that case, the guides may try to directly ask to the shy children to answer or to "look at what they are looking at", to start a new more interesting story, but of course this issue has no simple solution.

In conclusion museum staff seems genuinely interested in communicating to their younger visitors, but it seems as strategies to collect their feedback may be improved. An attempt of feedback collection was made for the new exhibition, by inviting visitors to insert coloured stones in an installation with three transparent plastic pipes (Fig. 3), to indicate what part of the exhibition had to be improved, as in a kind of a tangible bar chart. But when I participated to the tour, the guide did not stop in that area and the children just ignored it.

DISCUSSION

Analysis of data collected through interviews and video recordings, provided an initial picture of the guided tour from the perspective of museum staff. Interesting elements seem to emerge, defining the guided tour as a form of an objects-mediated interaction, that unfolds as story telling and riddle games, entangled with objects as starting point and illustration for the story being told.

In the next subsections I will discuss this perspective, starting from the emerging discourse and the quality of interaction, and then I will analyse the role of objects.

STORY TELLING AND RIDDLE GAMES

Telling a good story seems to be the guides' goal, in terms of providing a nice experience, but analysing the data available the articulation of the story assumes the form of a complex verbal-physical interaction. This story is in fact willingly turned into a dialogue with the children, in this way it seems as the story is intended to be built by the cooperation of guides and children. Furthermore, the construction of this dialogue has an improvisational nature in the terms expressed by Ingold and Hallam, so that the participants have to be responsive to each other in order to build the story (Ingold and Hallam 2008). This certainly requires an effort from both sides, for example as said by the guide in saying that it is important to follow the children's look, to discover what they are interested into. An interesting implication regards the participants' emerging roles, the guides act as narrators who perform a learnt script each time for their listeners, the children. The role of the listener, analysing the interviews and the observation, is in fact an active role deeply affecting the interaction process (Baktin 1989, Suchman 1987). The children can also communicate through non-verbal hints, such as directing their look somewhere else or to a certain object (an information that the guides attempt to use), they raise their hands to answer, they can approach the guide or the object under examination, but they may also go away. If the guides can make good use of all these hints, then they should be able to reshape their narrative according to the children's needs, even if not verbally expressed. As a consequence, further observations should show that the story being created is an original event each time (Ingold and Hallam 2008), even if based on the same objects.

Furthermore, the act of asking questions introduces an element of riddle game, that deeply affects the story telling process. Riddle games according to Huizinga are one of the oldest forms of games reported both by mythological and poetic sources. They are also a vital element in social interaction, since they adapt to all sorts of literary and rhythmical patterns of discourse (Huizinga 1950). Furthermore, riddle games were originally a form of sacred play, hence they are said to be positioned in between seriousness and play. But as soon as civilisation progressed riddle games lost their duality, branching into mystic philosophy and pure recreation (Huizinga 1950). My impression is that the riddle game is perceived by guides as significantly contributing to the emergence of their story. They in fact use riddle games instrumentally to keep the attention of the children alive and elicit a learning process, acknowledging the game communicational and recreational value. In this sense during guided tours riddle games re-compose their duality of play and seriousness, as the museum visit is essentially a serious matter, but the play element is introduced to make it more engaging.

THE ROLE OF THE OBJECTS

The main focus of a museum exhibition are objects: archaeological artefacts,

explicative signs providing information about them, tangible installations providing contextual information about archaeological objects and entertainment for children. In this sense the guided tour can be analysed from the perspective of an objects-mediated interaction (Henare 2007), where the objects represent the culture and time in which they were created and used. On a different level, these objects also embody decisions and knowledge of historians and curators. Furthermore, they contribute significantly in shaping the interaction occurring during the tour, as they require physical proximity to be explained and seen. As a consequence a complex form of verbal and physical interplay emerges. The demand for physical proximity can create an opportunity for communication bringing guides and visitors closer. The guide communicates where to go and where to stop, turning toward the children, pointing at the object they want to talk about and starting their story. On the other hand, the guide can actively try to spot objects children are looking at, in order to re-shape the story. In this case the object works as a sort of unintentional signal from children to guides, who have to interpret it in order to effectively communicate with the children. However, in some conditions the need for proximity can hinder communication: for instance in a large audience the most distant visitors could feel marginalised. In such cases, like during my observation, the children left behind went around to see other things or chat with each other. Actual dynamics of a group of visitors, whether close or distant from the guide, might be more rich or complex than they appear at this stage. Therefore, it might be necessary to dedicate them further observations and reflections.

Objects can also be starting points and tangible illustrations for the story, as it happened when the guide invited the children to seat inside the reconstruction of a Viking ship, to tell them a story about the raids. He also added that a travel to the British Islands lasted around 10 days, without a roof or a proper toilet, and with scarcity of fresh water, showing a reconstruction of the small barrel in which the water was kept. Through this story he provided a temporal frame to better contextualise how the ship-object was lived while travelling at sea (Fig. 4).

Figure 4: Guide telling about travelling at sea as a Viking.

Archaeological artefacts are the hardest to approach, as they are displayed behind glass and are often fragments of actual everyday objects, so alienated from their context and transmuted through time, that they become impossible to recognise. These artefacts also embody notions related to the culture responsible for their creation, that are difficult to grasp just by looking at them. Hence the belief of the museum staff, that guided tours are fundamental to enable the visitors to gain some actual knowledge.

Furthermore, museum objects shape interaction and contribute to knowledge sharing (or are supposed to) among visitors, guides, curators, and historians, in so functioning as *boundary objects*. By boundary objects I refer to the notion formalised in the social sciences to study organizational context, as physical or conceptual objects used to facilitate cooperation and communication among individuals with different backgrounds and values, engaged in the same activity. This communication is made possible through the plasticity of boundary objects, in the sense that the meaning they embodied is conveyed "across sites", through individual interpretations. This means that abstract concepts, embodied into boundary objects, can be more easily approached by different people from their own perspective, through the emergence of "trading zones" of interaction, which allow for a negotiation of meaning (Levina 2005, Star and Griesemer 1989). Adopting this perspective, the narrative emerging during the guided tour represents a trading zone enabling exchange of knowledge among different people, with different values and competences.

CONCLUSIONS AND FUTURE WORKS

The discussion presented in this paper is a first step toward an understanding of social interaction mediated through objects as a learning-social practice in museums, aimed at conveying abstract knowledge. The starting point for my project is represented by the guided tour, as it is an objects-mediated interaction and it is considered by museum staff as the best way to convey knowledge to the visitors.

At this stage I tried to analyse the guided tour from the perspective of museum staff, what are the positive values they see in it and why. According to the data collected so far, curators and guides are very concerned with the experience they provide to their visitors, especially school children. Hence they are regularly experimenting with new exhibitions and new interactive settings, so to tell children a "good story", that could elicit a process of learning.

Interestingly the story is not just told and listened, the guides try in fact to involve the children in contributing to the story, constantly asking them questions about the artefacts as in a riddle game. Through this game dynamics the children assume the role of active listeners, contributing to the story telling through verbal and non verbal interaction. However, the guides are conducting the process, selecting objects and performing for the children.

Drawing on literature about objects-mediated interaction in anthropology and in organisational practice, the role of the objects is analysed in relation to the way they contribute to the shaping of interaction and the learning process. Such objects can be interpreted as boundary objects, creating transition zones among the competences and the needs of the participants involved in the guided tour, facilitating the sharing of knowledge.

At this stage of my project there are still many open questions, the next step will be to test this representation of the guided tour, from the children's perspective. Furthermore, I will cooperate closely with a group of children, we will visit the exhibition and experiment with a new set of boundary objects. Thus new data and reflections should allow me to gain new knowledge about objects-mediated social interaction as a learning tool.

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NOTES

[1]*Original Danish title is Hvorfor Ribe.*

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PROPS TO EVOKE 'THE NEW' BY STAGING THE EVERYDAY INTO FUTURE SCENARIOS

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ABSTRACT

The use of design artifacts throughout the design process is widespread, but they differ in purpose and use. In this paper, we focus on the use of technological probes in creation of scenarios of the future. The props are used as a central actor in a co-design workshop to evoke the future and open up the space of possibilities. We analyze the role of the props in the collaboration between senior citizens and project partners. Illustrated by different snapshots from the workshop, we show how the props make the participants enact and traverse between the known everyday and the transcendence of the future. Finally, it is illustrated how props play a central role in introducing the technology to the senior and how it makes them reflect upon the possibilities in relation to their own everyday.

PROPS AS EVOCATIVE TRIGGERS

Many before us have explored the use of design artifacts as props, prototypes and tangible models in co-design to initiate improvisation in prototyping sessions and development of scenarios (Brandt & Grunnet, 2000). One example of applying prototypes is the rough "cardboard computer" as suggested by Ehn and Kyng (1991) to simulate future products' appearances.

The digital artifacts play diverse roles and are brought into the design work at different times and with different purposes. In the following, we will outline some of the different types of design artifacts, starting with prototypes and prototyping as an activity; it has been widely used as a process of developing and refining ideas and concepts of products. The artifacts' tangible presence makes it possible for different participants to partake in the process by reacting and responding directly with the prototype. Prototypes come in many variations from the two-dimensional diagrammatic representations of what could be, to more rich and detailed forms of possible directions. The materials of the prototypes are often easy to manipulate and change. The forms are simple and often ambiguous and the material is cheap or easily available. This indicates and requests appropriation, adaption and modification like cutting, drawing, adding or removing. Bill Buxton (2007) differs between prototypes and sketches, where the former are the design artifacts closest to the final product.

However, even closer to the final product is the design artifact called Mock-ups. Compared to props and prototypes, it has often been used as more realistic representations of what to come. The mock-ups can be useful to interact with and can also have a great variety with different levels of details (Brandt 2006). Mock-ups could be used to explore more specific issues of size, form, functional principles or interaction.

Probes also deserve to be mentioned in this range of design artifacts. Mattelmäki (2006) emphasizes how probes address a recent shift in focus from plain products to experiences. Probing kits are carefully designed to embrace and contain the responses from participants regarding a specific topic. One of the aspects differentiating probes from the prototypes and mock-ups is their more individualistic use. Probes are primarily used in relation to the inquiry part of the design work and are defined as self-reporting tools. The outcome of the interaction with the probes works as inspiration material for the design work (Gaver et al. 1999).

"Provotyping", a term defined by Mogensen (1991), explores the notions of provocation through concrete experience by 'provoking' everyday practice by exposing current problems, calling forth what usually is taken for granted. Similar artifacts are critical design artifacts, which have been used to sparkle

discussions, challenge assumptions and twist the familiar everyday to raise awareness, often of political or technological issues. Researchers as Dunne and Raby (2001) have designed artifacts that look like existing products, but have more ambiguous functionalities. The provotypes and critical design artifacts are not user oriented in the sense of accessibility. They are static objects made with a high degree of finish, in genuine materials.

Finally, props, which are design artifacts that are designed to manifest enactments as a representation of the properties of actions. It relates to a heritage of performance and can be central in role-playing. Brandt and Grunnet (2000) have described how props and drama together can be used not only as "things to think with" but also as "things to act with". Iacucci and Kutti (2002) have reported from their experiences with props as "magic things" to sparkle imaginations and open up a space of possibilities where users are defining usage according to certain situations. The props are not manipulated themselves since their intentions are the means of "prototyping actions" rather than "prototyping objects". With a prop like a magic wand the issues regard where and for what purposes the wand is used - not how it appears in the hand. The props are used in the collaboration to balance the relation between science fiction and plausible fiction. They provide the performance with constraints and at the same time they can trigger innovative ideas (Howard et al. 2002).

EXPLORING TECHNOLOGICAL FUNCTIONALITIES

The props dealt with in this paper are about exploring technological functionalities. Howard et al. (2002) have described props as *"physical instantiations of intended form factors. Like the artist's blank canvas, they have a physical form that constrains their function in general terms. However they are stripped of detail and just as the artist creates the painting in the interaction between sensibility, skill and materials so the actor and the designers discover the detail of the prop in the interaction between scenario, actor and designer."* (Howard et al. 2002, p. 2)

When we make use of the term prop and not mock-ups or prototypes, it has to do with the aim of our co-design workshop of prototyping new ways of technological possibility into new service models and not only the technological solutions itself. Prototypes and mock-ups are visualizations of a product whereas props support and trigger the performance of possibilities of the future. We draw on a definition described by Binder (1999) where *"dramatizing use scenarios with various 'props' taking the role of 'the thing we yet don't know how to design."*

The term "prop" also relates to a performative heritage of drama and acting that is significant in role-playing and improvising scenarios. A prop used in a theatre play supports the actor both in expressing the actor's character and behavior, but also more specifically in the actions that are important to explain and enact the story convincingly to an audience. In our case, the props are acting as mediums for exploring and giving directions regarding possibilities of the technologies to a reflective dialogue, and to open up the space of possibilities. The props we will introduce in the following have the aim of scaffolding and staging the dialogue for evoking enactment of possible futures.

NOTIONS OF PERFORMANCE AND PROCESS

Bridging the gab between the anthropology of the known and designing for the future has long been a topic for discussion. Within the tradition of participatory design, the notion of design-anthropology has encouraged blurring of the boundaries and exploring new collaborative ways of engaging participants in enacting and rehearsing the future (Halse et al. 2010). Looking at performance literature can support this fruitful connection and the journey between the known everyday and future possibilities. Resent design researchers as Iacucci (2004), Clark (2007) and Halse (2008) have been using a performative perspective to look at co-design processes. The performance process with time and space sequences can provide a focus at the different levels of the process. Schechner (1985) divides the process into a three-phase sequence consisting of proto-performance, performance and aftermath. Proto-performance is the initiating phase where participants leave behind their everyday setting and rehearse the possible enactments. Performance is the event and the session itself as the play at the stage. Aftermath in general embraces reflection and lead participants back to their ordinary lives with a memory of the experience.

PROPERTIES OF PROPS

The props in our case where brought into play in the creation of scenarios. There were to versions of each prop. The maxi version of the technological props consisted of three different forms – a cardboard cylinder, half round ball of polystyrene and a paper frame. It was the messenger, the seeker and the screen. The mini versions of the props had the same form, but were all made out of paper. The props had the openness to be defined and used in the way it suited the actors, but their names, which were made up by some of the seniors before the workshop, indicated some kind of functionality. Another concept brought into play in the workshop was The Super Dots. It is foam dots in different color and the concept is about being connected to each other in different ways and with different purposes. The abstractedness and openness of the design made it possible for the performers to add their own interpretation of how the community around the Super Dots worked.

One of the parameters we find interesting to look further into is the span in scale from using a mini-size to a maxi-size. By means of scaling (changing size) it is possible to manage the level of attention to for instance details. By using sizes that apparently do not match natural scale the impression of the props are not misinterpreted as representing real artifacts. At the same time as we will see in one of the snapshots – the size matters and it is being taking seriously in the performance.

Another parameter is "the conceptual and mediating use of props" contrary to a more "concrete naturalistic representation". The space of the more conceptual mediating usage is left more unexplored than it's opposite. The prop becomes a medium for dialogue and trigger the stories, which is outcome of the interaction.

Other interesting details not comprehensively dealt with concern how the

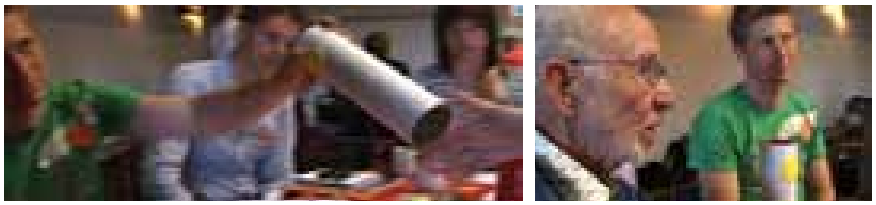

Figure 1: Bo receiving the messenger and placing it in front of Robert

props are brought into and stimulate the action. There seem to be some interesting division of roles where props can invite all participants into the process. The turn taking with the initiations of the authors - the designers of props – can be compared to the role and movement of probes going from author to receiver, like from performer to audience.

CASE SENIOR INTERACTION

The empirical basis for this paper is snapshots from a workshop within the Senior Interaction project. The 3-year long co-design project focuses on developing technology and new services to support seniors in maintaining and extending their social networks. We engage with different people like seniors, people working with seniors e.g. from the municipality, and the project partners. The workshops are central in the research of the project and contain a dialectic process between exploration of the known everyday and designing of "the new". It is the second workshop in the project, which is central in this paper. Before creating the scenarios and performing with the props, the participants have made a landscape of everyday networks for each of the senior participants. The landscape and the story of the landscapes are being use in the following exercise with the scenario and the props.

The following part outlines the introduction of the props and the concept of the Super Dots provided for the workshop participants. The introduction had the aim of providing a common understanding of what we were all going to work with. Following that part of the paper comes a a series of snapshots of how the props were brought into the play in the collaboration. Here we focus very specific on how the props are being used in the interaction and what this give rise to. We end the paper with some concluding remarks of what the props entails in the collaboration with the seniors.

INTRODUCTION TO THE CONCEPT OF SUPER DOTS AND THE PROPS

The visual introduction of the concept of Super Dots and the props presents still images of a doll scenario, commented with short narrative texts of an everyday story mixed with explanatory introductions of the different tangible props – the seeker, the messenger and the screen - and their functions. The story introduces how people who are in the same community can communicate and be in touch with each other by using the Super Dots. It is a way of marking that you are in a community, and that you can be part of different communities with a new color for every dot representing a community. By presenting the props in relation to an everyday story about shopping, meeting friends and exercising, we are trying to make it more present and easier to relate to for the seniors. In the introduction, all the props are being introduced one by one in relation to the action in the story and it provides an overview of the concept's ideas and possibilities. The style of the presentation with backdrop images from the senior's own context and the small dolls is something familiar to the participants since they all worked with doll scenarios and the same material at the previous workshop. The new elements are the tangible props, which are presented in two versions; a mini size to fit the dolls and a maxi size that is presented and shown as part of the presentation. At the end of the presentation a slide explains how the Super Dots work. The Super Dots is an open concept and provides many different possibilities – it is just a matter of asking "what if…?".

EMBODIED EXAMPLES WITH THE PROPS

Informal chatting is evolving in the group where seven people are seated; Robert, Amy, Jytte, Bo, Pernille, Markus and Signe, where the first three are senior participants and the last four are project partners. Signe is placing the maxi-props so everybody can reach them. After some initiating talk about the dots and the props around the table, Bo suggests Robert to use the Super Dot in his sailing club, so he creates a sailing community and refers to the conversation he has just had with Robert, while patting the dot he has placed on his chest, like everyone else around the table. Pernille leans forward and looks excited at the collage that Bo and Robert have made together: *"Which color is Robert's sailing club network there?* (Pointing at Robert's landscape of networks). Bo replies *"Yellow"*, Pernille grabs a hollow cylindrical prop – the messenger – and add a yellow dot. *"What if this yellow dot represents your sailing community with your friends and you can send messages to the people in this community with the messenger?"* She explains while shaking the messenger and hands it over to Bo, who places it in front of Robert. Pernille is tapping her finger on the prop, while looking at the others and explaining how Robert could receive information about activities in the club by using the messenger. Robert reacts to the comment: *"I actually come there almost every day. And there's a bulletin board just inside the door, where you can read what is happening"*. Markus looks at Jytte, who has been talking to Robert about the sailing club: *"you've told that many are sitting at home, so what if we address the people that don't come in the club that often?"*. Markus takes the messenger in his hand *"one could imagine; what if they got this?" "Yes exactly! Those who don't get out, that could be good!"* Jytte exclaim. Pernille continues about how Robert could be the one telling the others about the activities in the club. She is pointing from Robert to Markus who

Figure 2: Signe and Amy holding the screen

Figure 3: Signe taking the seeker from the table.

both have a messenger in their hand. They continue by introducing the screen as a way for friends in Robert's community to get messages.

Signe is now holding a screen and adding a yellow dot while involving Amy sitting next to her. Signe and Amy present themselves as Bent and Kirsten – two of Robert's friends from the club. They pull a yellow string from the yellow dot at the screen to the dot at the messenger to represent the connections and the channel of communication between the props.

FAMILIAR EXAMPLES TO EXPLAIN THE PROPS

The tangible props are used by the project partners in the embodied conversation to explain and manifest the possibilities of the props. The project partners are trying to make the introduction of the props more familiar for the seniors around the table by using he maxi-props and the Super Dots in relation to Robert's everyday network – the sailing club. The props are circulating around the table, but mostly in the hands of the project partners and are brought into play whenever they have a role in the story. The seniors' stories inspire the performance, as Robert's sailing club and Jytte's story of people not getting out much, and the props are becoming solutions of technology to enhance the communication. The seniors, though, mostly comment on the performance going on and do not directly relate to the props at this moment.

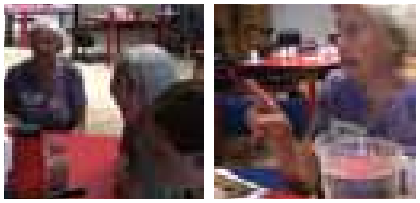

Figure 4: Jytte and Amy commenting on the scenario.

A SKEWED INTERCHANGE IN THE PERFORMANCE WITH THE PROPS

The next session is starting up after the lunch break. Still placed around the table, the group is going to perform a doll scenario. There is a dialogue and negotiation going on along with the performance. The story of the doll scenario is in short about Bo, Amy, Robert and Jytte (the three seniors and one of the partners) meeting for a trip in Valbyparken – a park in the area of Copenhagen. The group is discussing how they can find each other in Valbyparken, when they are going on their trip. Signe is asking if they could use one of the props, and she picks the almost round maxi-prop – also named "the seeker" - from the table.

Jytte, who is sitting on the other side of the table, reacts to the action: *"But we can't bring the big ones"*. Pernille suggests that they use the mini-props instead and picks one of the small ones from the table. Amy continues by saying: *"But everyone needs to have them turned on, so we can find each other and points around the table."*

Everyone agrees and the conversation continues about how they can find each other when they arrive at the park from three different places. They decide on using the prop called the seeker and a practical problem arises. They only got two mini-props of the seeker in the workshop material the group have accessible, and they need three. Jytte emphasizes that she really needs one because she is getting there by bus and the three others are biking. Pernille addresses the problem by making a new seeker of some of the material provided to the group in this exercise.

A MORE EQUAL INTERCHANGE ARISES

The props are slowly becoming a part of the story, also in the awareness of the seniors. The tangible presence and performance with the props evoke reflection. Like Amy's thought of the seeker being turned on, and Jytte's opposing reaction when Signe is taking the maxi-seeker, because the size does not fit the small dolls. Furthermore, the negotiation of who should have a seeker when they realize they only got two makes Jytte argue for her sake as if there is something at stake in the performance. They are taking turns; moving from exploring issues of everyday stories into staging them in future scenarios of what this could be. The improvised stories are initiated by "what if" and the performance of what this could be leads to new issues for exploration. The first snapshot showed how the project partners were bringing Robert's everyday life into the "what if" question by performing it and using the props to add something new, twisting Robert's story with elements of the future. The experience from the project partner's performance with the props feed into the everyday life of the seniors and later make Amy and Jytte conscious about the props in the performance of the trip to Valbyparken. There is a time lag in the interchange and the response from the seniors, which can illustrate their reflexivity on the things going on with the props.

Bringing in props as examples of technology adds a twist of the future to this part of the performance "meeting in the park". A twist that is initiated by Signe and Pernille performing with the props and Amy and Jytte following, and asking questions. The props facilitate a transcendence of the seniors' everyday life. The first two snapshots illustrate how the interchange slowly finds a balance. In the beginning, it is primarily the project partners playing with the props and performing the story. It changes slowly into a more equal interchange, where the seniors are following and the props are becoming a part of their story as well. They are conscious about their presence and their possibilities. It naturally takes time to adopt the props and to be able to appropriate them to your own everyday life. The props are new elements in the collaboration between the seniors and the project partners and their presence need some adaptation.

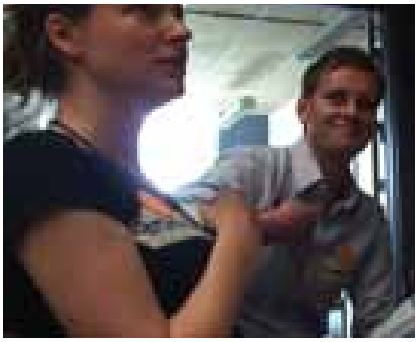

Figure 5: Pernille and Markus connected with a blue string.

Figure 6: Signe holding the maxi-messengers and Bo sitting beside.

FULL-BODY PERFORMANCE AND MINI-SCALE PROPS

The scenario of the trip to Valby is still in progress, and in this snapshot there is an unexpected twist in the story: more people wish to join the trip. Pernille and Markus are playing the role of two new people coming from an activity center called Madam Blå.

They have heard about the trip to Valbyparken. There is some discussion about who these new people are and how they can get in contact with them and agree on where to meet up in the park.

Signe is standing up touching the two maxi-messengers on the table with her hands. They are connected with a string from the earlier performance about Robert's sailing club. She lifts one of them and asks the others: *"if you should tell the people from Madam Blå where you are and how to meet, should it be with the messenger?"* The others agree on the messenger and decide that it is Amy and Bo on the tandem bike that has the messenger. Pernille hands over a mini-messenger to Bo, who tries to put it in one of the dolls on the tandem. Amy's doll is now on the tandem bike with a seeker in one hand and a messenger in the other, so Amy tells Bo to drive carefully. Amy continues: *"So can we read the messages on the screen?"* and points to the maxi-screen on the table. *"But do we all have one of these?"* Jytte asks and Signe replies: *"Yes, we can say that you all have one in your home?"*. This makes Amy react and add that they need to have some portable ones in this situation, if they should be able to talk to the people from Madam Blå. *"Do you wish to speak or write to them?"* Signe asks. Amy thinks it is easier to talk, and Pernille hands over a mini-messenger to Signe, who gives it to Amy.

While holding the small prop, Amy starts to speak into it. She performs the session of the play where Amy and Bo invite the people from Madam Blå to the park, and tell them where to meet. After speaking, she looks at Pernille and Markus. Pernille is holding a mini-screen in her hand, she pretends to read Amy's message and type a new one on the small paper screen with her fingers. Amy is still holding the mini-messenger up to her lips, ready to speak into it again.

HIT A DUCK

The props are exchanged between the participants, and the snapshot shows how they are now more convincingly used in the performance. The seniors primarily comment on how they like to use the technology represented by the props in the different situations, and when Amy is handed a mini-prop from Signe, she uses it in the embodied performance of the given situation. In this snapshot, there is a blend of the full-body scale with the mini-scale props in the performance of the participants. They are playing full-body but are using the mini-props, which in size fit the dolls better. Their positions around the table make especially Pernille, Amy and Jytte distanced from the dolls and the stage placed on the other side of the table. At the same time, it is perhaps more straightforward for the participants to make an embodied performance. Despite the full-body performance, they are referring to the dolls and maybe therefore using the small-scale props, even though they are very small to hold in their hands and to show things with. The full-body approach is also distinguished in the following part of the story. Here, Jytte intertwine with the stage of the doll scenario by playing against the backdrop.

The performance of the trip continues. They have all had lunch and are now discussing if the should do something else or if they are too tired. After some talk about how tired they are, the group comes up with the idea of "hit a duck" as a small activity, so they at least exercise their arms. Jytte seems a little ambiguous about it; she tries to convince herself and the others that it does not hurt the duck. Pernille encourages her to try. *"I've never been good at hitting, but ok I'll try"*, Jytte throws a small piece of tulle after the ducks at the picture on the backdrop: *"oh, it was upset by the bread but it wasn't injured"* she exclaims, referring to the duck.

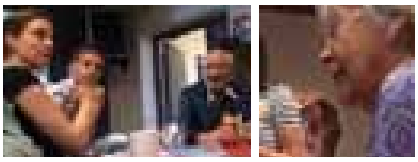

Figure 7: Amy and Pernille performing with the mini-props.

Jytte's embodied interaction with the scenario provides us with an insight into how she relates to what is going on at the table. The relation and use of the maxi- and mini-props is indefinite throughout the snapshots. The maxi-props are mostly used in the beginning when the project partners are trying to make a local embodied example of the use of the props in relation to Robert's everyday. In the following, they are mostly used when the project partners want to exemplify or enhance something in the story being performed. But the more they get into the doll scenario the more the mini-props are brought into play. As mentioned earlier, it leads to a blend of full-scale body performance with the mini-scale props, which is distinct in this snapshot.

AMY'S AFTERMATH: WHAT WOULD IT MEAN FOR ME – IN MY HOME?

The creation of the scenario is finished and there is a cooling-off atmosphere around the table. There is chit-chat going on, but suddenly Amy looks serious and directed towards Signe she asks *"but couldn't we use the screen, so we can see each other"* referring to the screen they have just decide to have in their home, so they can share pictures after the trip. Jytte laughs loudly and shouts to the other side of the table *"Did you hear that, Robert? Amy wants to see what you are doing at home after the trip"*. Robert replies *"But I will just take a nap, so at least I'm not doing something private like singing"*. Jytte

Figure 8: The aftermath: Signe and Amy's conversation.

and Robert are both laughing, but Amy is still serious in her conversation with Signe, who in the meantime has asked if she would like to be seen by others through the screen.

They continue the conversation on how Amy would like to use a screen to let her daughter know she is all right, so the daughter does not have to call her everyday. Because Amy is not interested in being monitored all the time, they have a reflective dialogue on how she would prefer to use the screen: send text messages, still images or live streaming as communication possibilities. They decide on the screen being something Amy can turn on and leave a daily video message to her daughter, who can then log on to the screen and see the message whenever she wants.

NEW THOUGHTS EMERGES WHILE COOLING DOWN

This dialogue reveals some openings of possibilities after the staged performance is over. Amy has begun wondering how she could use the props and hereby the technology in her everyday life. Signe already knows about Amy's daughters' daily routines and can easily understand Amy's request.

The participants' performance is cooling down and they are moving to a juncture, where the scenario has just ended and the aftermath has just begun. The props are still present on the table, but are not an active part of the conversation anymore. They are all discussing the consequences as if the narrative of the story continued, initiated by Amy who projects reflections from her own everyday life. An important issue of surveillance, which is being acknowledged by the rest of the group, is raised in the light of using especially the screen and camera of the props. The experience is that the aftermath gives rise to new considerations and ideas upon the performance with the props. The performance with the props and the creation of the future scenario have evoked new ideas and reflection among the seniors, which is made explicit in the conversation around the table in the aftermath.

CONCLUSION

The embodied enactment by the participants gives an indication of their relation to what is going on. Following the scenario, they gradually enter the performance and put themselves in the position of not only talking and referring to the props, but also acting with them. The props make the participants reflect on the use of the technology in their lives and how to appropriate it to their everyday. The focus on the interaction with the props in the collaboration in the group has provided us with an understanding of the role of the props. The props become a smooth way of introducing the technology part of the project without letting questions like accessibility and knowledge about the use of technology block the dialogue, which we have experienced earlier in dialogues with the seniors about the use of technology. At the same time, the open form of the props provides a possibility of performing and reflecting upon the functions. The seniors end up defining how they want to use technology in relation to their everyday. The performance with the props has opened up a space of possibilities for the future – and a dialogue about technology and their everyday lives, which we have not experienced earlier.

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PARTICIPATORY VIDEO AND DESIGN: EXAMPLES FROM THE BESPOKE PROJECT

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ABSTRACT

As anthropologists work to enable the participation of "subjects" in the co-creation of ethnographic insight, participatory media has increasingly been used in order to creatively produce and disseminate experience. In this paper we draw on both design and anthropological literature to contextualise the experience of the Bespoke Project, a community-centred design project in the UK.

As part of Bespoke, community members in two disadvantaged areas were asked to contribute videos about life in the area, which was in turn viewed by a design team who used the material for contextual information and inspiration to create bespoke designs. Here, we consider the contribution that participatory video can make to the process of design ethnography, and the challenges and benefits of this methodology.

INTRODUCTION

Within anthropology, the use of film[1] to both produce and reflect ethnographic insight has a long and much-theorised history (Banks 2001; Crawford & Turton 1992; Hockings 2003). Building on ethnographic filmmaking and facilitated by changes in technology, visual anthropologists over the past three decades have increasingly explored the use of participatory filmmaking as a means of co-creating meaning with ethnographic informants (Ginsburg 1991; Michaels 1986; Turner 1991). As design ethnographers, interaction designers and Human Computer Interaction professionals consider different modes of sharing and reflecting on ethnographic insight within design processes, film has emerged as a rich multi-sensory and uniquely expressive methodology (Brun-Cottan & Wall 1995; Raijmakers et al. 2006; Raijmakers 2007). Acknowledging the distinctive features of filmmaking that particularly lend themselves to design – in particular its sensory, multi-vocal and reflexive qualities – in this paper we consider the possibilities for incorporating participatory filmmaking into design practice.

To demonstrate the lineage for participatory film work in design, we draw on both anthropological and design literature. Accepting that film is both a process and a product that not only *exhibits* but also *creates* insight (MacDougall 2006) we explore how participant-produced moving image can not only be incorporated into the process of creating design ideas, but can also facilitate reflection during a prototype or deployment stage. In order to illustrate this discussion, we discuss the specific example of the Bespoke Project (www.bespokeproject.org), which is currently underway in Preston, UK. A multi-disciplinary research project conducted in partnership between five UK universities, Bespoke is specifically testing the method of using community-generated video as a way of not only informing design ideas, but also facilitating processes of community-centred design throughout multiple iterations.

FILMMAKING AS ETHNOGRAPHY

Margaret Mead was one of the first proponents of using filmmaking as a tool for ethnography. Mead saw moving image as an ideal recording device,

able to collect a vast amount of objective ethnographic data that could be "repeatedly reanalysed with finer tools and developing theories" (Mead 2003: 10). Mead's husband and sometimes research partner Gregory Bateson, however, was more transparent in his discussion of the process of selection inherent in the use of visual methods and saw film less as an objective device and more as a relational and partial process (Jacknis 1988). Bateson acknowledged that through framing a composition, or even in choosing to film one interaction or moment in favour of another, the person capturing the image implicitly prioritises and organises the world of the participant being filmed. As John Berger later commented, this process of mediated "looking" is inherently partial, for when we look at a captured image later we are subtly aware of the selection of "that sight from an infinity of other possible sights" (1972: 10).

Rather than reducing the utility within ethnographic practice, acknowledging the inherent subjectivity of filmmaking is increasingly seen as a benefit of the medium. As anthropology has developed, there has been mounting calls for incorporating new methods like filmmaking which allow for experimenting with different forms of communicating ethnographic understanding beyond text (Grimshaw 2001). Film, in particular, has been viewed as offering a unique potential for reflexivity, in revealing aspects of the ethnographic process itself (Ruby 2000) and in fundamentally creating not just an objective "copy of the world out there but someone's statement about the world" (Worth 1980: 20). Film is not simply an all-seeing eye, a meta note-taking device as Mead initially conceived of it, but a subjective and inflected process of arbitrating and communicating meaning, both in making and viewing. Key to this is understanding filmmaking both as a *process* and a *product* – relationships are formed and insight is gathered both in the putting together of a film (in shooting and in editing) as well as in later viewing and discussing it.

One of the unique properties of moving-image, as opposed to still photography, is this relational quality, in particular the capacity for multi-vocality. In addition to laying bare the filmmakers own presence in the creation of the film, films are able to facilitate what Marcus and Fischer termed "ethnographic poetics" through an interweaving of voices, experiences and viewpoints in accordance with the collaborative nature of ethnography (1986). As anyone who has ever tried to film a group discussion or even family meal can attest, using film in the place of written text allows for the preservation of the messy cacophony of daily life, or as Raijmakers et al. (2006) describe, to keep the "erratic, elusive fabric of the everyday intact" (229). Equally, multi-vocality can be extended to not only reconcile multiple voices of subjects, but also the ethnographer's own commentary or narration (the films of David and Judith MacDougall or Jean Rouch are good examples of this).

In preserving a multiplicity of metaphorical and literal "voices," films are able to operate on several sensory registers simultaneously. While taste and smell are not generally incorporated into filmmaking (1960s smell-o-vision and John Waters experiments notwithstanding), audio and video are essential interwoven aspects of both filmmaking and film viewing. The video camera is an extension of the sensory engagement of both the filmmaker and the subject, as MacDougall writes, "we see with our bodies, and any image we make carries the imprint of our bodies" (2006: 3). Films allow us to focus and direct our embodied sensory engagement. Rather than simply "being-in-the-world" (Merleau-Ponty 1962) the act of filmmaking, through its selectivity, focuses attention on specific aspects of the world around us.

THE GROWTH OF COMMUNITY MEDIA

Anthropologist Sol Worth and filmmaker John Adair conducted arguably one of the first "experiments" in indigenous media with the Navajo Nation in the late 1960s (Worth & Adair 1972). They gave film cameras to their Navajo informants in order to see whether a different form of filmic lexicon would emerge to correspond with the Navajo language and grammar system. Since then, studies of how and why indigenous groups use forms of media has become a central concern within visual anthropology. In particular, anthropologists have examined how media can act as a new avenue for "internal and external communication, for self-determination, and for resistance to outside cultural domination" (Ginsburg 1991: 92). A key finding has often been that processes of media cannot be divorced from the social context in which they are performed, and that "media worlds" are deeply embedded and culturally inflected at the same time as they can be globally referential (Ginsburg et al. 2002).

Although Indigenous Media has received significant attention in anthropology over the past thirty years, processes of participatory media have by no means been limited to indigenous groups. Halleck (2002) and Boyle (1997) both chronicle the vibrant community media movement in the US which grew out of the activist politics of the 1960s. Informed by the educational philosophy of Critical Pedagogy (Friere 1993), media activists began to work with communities in order to use media as a collaborative process through which, ultimately, structures of power could be questioned.

Over time, community media came to be seen as a "the means *of* expression of the community, rather than *for* the community" (Berrigan 1979 quoted in Carpentier 2003: 426), premised on the idea that if people were collaborators in choosing how and where they were to be depicted, that the results would be more accurate and nuanced than the process of outsiders coming in. There has been increasing interest in using participatory media as a means of inviting participation, both within academic research (Loizos 2000; Pink 2007) as well as in applied settings ranging from international development (Frohlich et al. 2009, Lunch & Lunch 2006) to human rights activism (Gregory 2005).

Institutionally, even large-scale cultural organisations like the BBC in the UK have incorporated participatory media, for instance in the examples of the BBC's *Video Nation or Capture Wales* projects which asked viewers to contribute content about their daily lives (Carpentier 2003). A similar emphasis on participatory content creation using visual media is used by advocates of "digital storytelling" (Lundby 2008). Outside of facilitated research and institutional contexts, "ordinary

people" are creating and sharing their own "content" without necessarily being invited or told to do so. Allan and Thorsen (2009), for instance, describe the rise of "citizen journalism" which is changing the nature of how news information is created and disseminated, and participatory media outlets such as YouTube are seen as fundamentally altering the ways in which individuals create, consume and circulate media (Burgess & Green 2010).

However, while considerable enthusiasm has been generated around community media, Thumim (2007) sounds an important note of caution. In her study of two large-scale participatory media projects she notes that while there are wide claims made for self-representation avoiding, or at least lessening the "pitfalls of mediation," nonetheless, "self-representations are always mediated… [and] exactly how they are mediated is of crucial importance: (2007: 52). Thumim's research on the representation of "ordinary people" cautions against viewing community media overly triumphantly, as if giving people video cameras to own or operate themselves somehow magically mitigates against power relationships or researcher/filmmaker control.

These theoretical and empirically-grounded studies of video as both researcher-led and participatory *processes* and *products* provide important context to understanding the use of participatory video within the Bespoke project. In the following section, we turn to the specific example of Bespoke and suggest how the use of video within Bespoke provides an opportunity to see both the unique benefits and challenges of participatory video at work within a research context. The project is still underway, so this discussion will give shape to some of the further research activities as we enter into the final stage of completion.

CONTEXT OF THE BESPOKE PROJECT

The history of community and indigenous media outlined briefly above provides important context to the Bespoke project. While designers have begun to incorporate filmmaking into their praxis, Bespoke is exploring whether participatory media can be utilised within a design process. Bespoke is funded through the UK national Economic and Physical Sciences Research Council, under the *Digital Economy* strand, and has as its wider objective the exploration of how digital design can benefit under-resourced communities. To that end, we are pursuing a process of community-centred design (as opposed to individual user-centred or small-group centred design). Here, community-centred design is defined as *a design philosophy and process in which the differing needs, wants and limitations of community members are given extensive attention at each stage of the design process.*

Community-centred design is a design methodology that requires attention to the specificity of a local environment, and a detailed knowledge of the key stakeholders, issues and debates. Importantly, community-centred design requires a different form of methodology than traditional user-centred design in that we need to move past requirements of specific users and towards and understanding of the community-level use ecology that the designs will eventually become part of. This includes not only questions of metaphorical "power" within the community but also more prosaic questions of "power" – for instance in considering how we will access electricity in public spaces to power our designs. Of equally central importance is acknowledging and resolving the sometimes competing and even conflicting needs of different stakeholders.

The specific context of the Bespoke project is the area of the Fishwick Ward in the city of Preston, a post-industrial city in the North of England. Within the Fishwick Ward are two contiguous neighbourhoods called Callon and Fishwick, Callon was built in the 1930s and mainly comprises semidetached housing controlled for the most part by two housing associations (Contour and Community Gateway) but there is some private ownership. Fishwick is directly next to Callon but is composed mainly of 19th century terraced housing and has a more ethnically diverse resident community than Callon which is largely "White British."

Bespoke was located in Callon and Fishwick for several reasons. Primary amongst these was the fact that the research centre at one of the partnering universities, the University of Central Lancashire, had previously worked with community associations successfully in the area. Equally, there was an interest in media representation pre-existing in the area – locals had been depicted quite poorly in the past (for example being featured in the *Neighbours from Hell TV* programme and being labelled "race hate capital of Britain"). Importantly, for a community-centred design project, there was an identified *need* for further development of the "digital economy" – according to the most recently available UK Home Office statistics people living in Callon and Fishwick were considered as among the 10% most deprived in the UK. Though the situation in these areas has improved in part due to ongoing regeneration projects, it was felt that there was ample scope to develop a project in this area, and strong contacts to build upon.

The project developed a methodology of participatory media that we entitled "community journalism." Led locally by a team of two researchers with applied backgrounds in journalistic practice, it was felt that this title encapsulated the documentary and investigative ethos of the media process to be included within Bespoke. Equally, the term "journalist" called up the emerging practice of "citizen journalism" and of local residents depicting their own realities through film. The project team therefore includes designers from a variety of disciplines (including craft, electrical and product design, interaction design and Human Computer Interaction) as well as two journalists and one anthropologist.

This paper is indicative of this multi-disciplinary methodology. Primarily, the findings are a result of ethnographic "action research" on the Bespoke project itself, based on methods including participant-observation in project sessions, focus group discussions and interviews with designers, journalists and local residents, and analysis of the videos created during the project. However, the other researchers have been given an opportunity to comment and to shape the perspectives presented here based on their own areas of expertise. This paper specifically explores the method of using participatory media (here called interchangeably "com-

Figure 1: The Bespoke website with a map of the local area and embedded text and videos

munity journalism") as a way of creating and sharing ethnographic insights as part of a community centred-design process. Ultimately, this process will result in the construction of bespoke digital designs for use by the Callon and Fishwick communities. As the designs are still in progress, and the scope of this paper is methodological, we will therefore spend little time on the actual designs here, but will give some indication as to the direction the designs are taking.

THE BESPOKE PROJECT METHODOLOGY

The Bespoke project is a pilot initiative developing the method of community journalism as a means to conduct community-centred design. We have been working with residents and users of the Callon and Fishwick areas over a period of eighteen months, and have adopted a flexible methodology in order to capitalise on new contacts, local events, and partner initiatives in the area. The Bespoke project has involved two stages, in the first year while the community journalism was being set up, the design team adopted a process of using more traditional design ethnography and workshop-based community engagement to produce three prototypes that have been deployed in the local area. Here, we concentrate on the second year of the Bespoke project which has piloted the process of using community journalism to create ethnographic insight. This has resulted in a more efficient process for the design team, but less direct community engagement.

Figure 2: Interviews with local residents (video still)

In this time, Bespoke has worked with community members to produce a range of "old" (a local newspaper) and "new" media outputs (a series of videos presented on a website tied very specifically to the local area). For the purposes of this paper, we will concentrate largely on the videos produced as part of the project, as these have featured more heavily in the design process. While the designers have read and engaged with the newspaper, this has provided more of a background context whereas the videos have been the subject of more detailed project conversation.

Initially, we asked local residents to contribute a text or video about life in the area with little preconditions. However, as the process has evolved we have worked more closely with a designated group of "community journalists" who are participating in a paid scheme for long-term unemployed Preston residents. These journalists have been given training and are part of a facilitated and supported scheme led by the Contour housing association. This targeted approach has garnered more substantive and consistent content, whereas the more general approach initially undertaken didn't produce a significant response. The more specialised engagement has greatly benefited the project in producing a more substantive amount of journalistic output and in linking with a highly-relevant community scheme, but also has its limitations in presenting a limited range of voices, and in reflecting the priorities of the housing association.

Thus far, the methodology for developing journalism to feed into the design process has been as follows:

1. Community journalists produce video stories about life in the area
2. Designers watch the videos and talk to journalists about their experiences
3. Designers think of questions about the area which are fed back to an "editor" who designs briefs for the journalists
4. The journalists produce further material following the briefs
5. The designers come up with design ideas
6. The journalists produce further reports in relationship to the design ideas
7. The designers create selected digital product prototypes for deployment
8. Journalists report back on prototype deployments

Table 1: Bespoke community journalism methodology

The designers watched, read and listened to the initial round of community journalism outputs and discussed some of the recurring themes that were raised across many of the different outputs. For instance, many of the journalists' videos, articles and interviews focused on the lack of communication between community groups in the local area, the importance of local green spaces, worries about crime, or the fact that many residents felt disenfranchised from formal politics because they didn't feel listened to. As a result of viewing and discussing the journalists output, the designers produced five initial design ideas. These included: the *Log-a-jog* device for recording run-

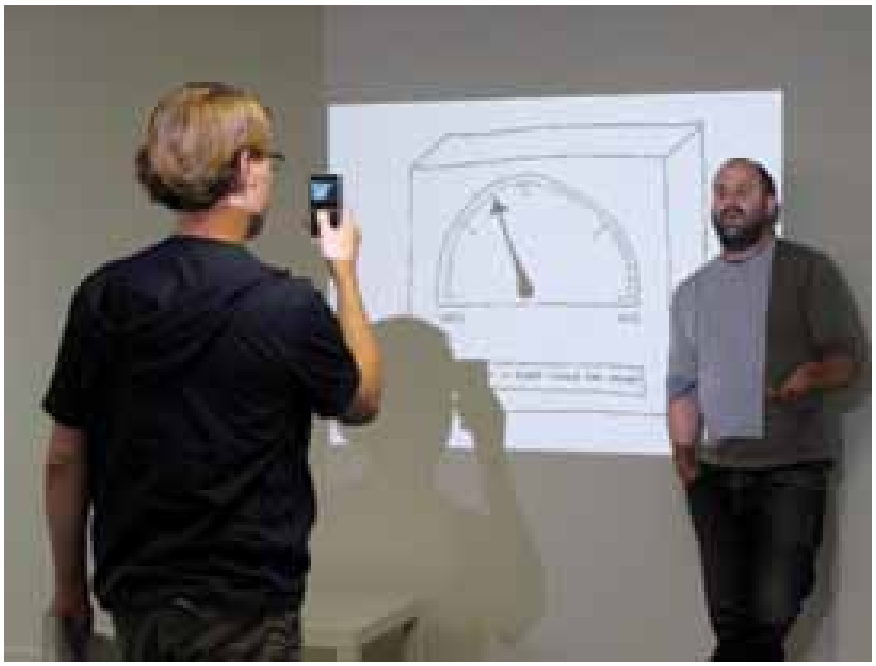

Figure 3: Community journalist interviewing a designer at the press conference

ning times in the local park using RFID readers, the *Viewpoint* which enables residents to input into local issues, the *Wayfinder* which advertises local events and geo-locates them, the Home Screens that act as a portal to connect households in the local area, and an interactive *Community Radio*.

The designers then held a press conference for the community journalists, to explain the ideas and invite questions and clarification. The journalists subsequently contributed to a "design special issue" of the local newspaper and conducted a series of audio and video interviews about the design ideas. The designers gathered together again to review this material and decided to prototype two of the ideas based on this feedback, the *Viewpoint* and the *Wayfinder* (described below). As the designs are prototyped and later deployed, the journalism process will also be used to feedback on the designs themselves, and how they fit within the wider ecology of users and services in the area.

REFLECTIONS ON COMMUNITY JOURNALISM

In this final section, we describe some of the challenges and benefits that have been suggested by this unique methodology in light of the theoretical and empirical work on video in design and participatory media described above. These findings are based on ethnography of the project process, incorporating the experiences of both designers and journalists.

The challenges of using community journalism as a means of conducting community-centred design have been both practical and epistemological. Although participatory media has sometimes been lauded as a way of ameliorating some of the power differential between researcher and researched (Kindon 2003), the complicated relationship between the Bespoke project staff and the community journalists has nonetheless inflected the working practice of the project. In speaking extensively with one of the journalists, he repeatedly stressed how he'd "lay down in the street for Bespoke, you've done so much for me." While he exhibited a strong sense of ownership over and investment in the project itself (referring often to the designs as "our" designs or what should "we" do next) this sense of involvement also lessened the critical distance that the designers had hoped for from the journalists. For instance, the design team had anticipated that the journalists would heavily critique the design ideas, giving crucial feedback on which seemed like a feasible avenue to pursue. Rather, the journalism was widely uncritical of the ideas, and lacked a more piercing engagement with the designers and the ideas that they produced than had been anticipated.

This lack of critique is not only about affect and a feeling of involvement in or loyalty to the Bespoke project, but also a symptom of a wider difficulty faced by the project. Although the journalists were given training in both "hard" technical skills and wider "soft" journalistic skills like interviewing, with no previous experience of mediated analytical engagement to draw on they struggled to find ways of articulating critique. As a result, the videos often felt slightly superficial, and accepting of official discourse – both from the Bespoke project itself and from service providers in the area.

As in Turner's work with the Kayapo (1991), the reality of community video also involved consideration of social hierarchies and relationships of power within the local area. "Communities" are complex social and heterogeneous arenas of competing interests and identities, which are not necessarily reconciled by geographic proximity (Delanty 2003), and Callon and Fishwick are no exception. The community journalists inevitably encountered local politicking and even low-levels of enmity – for instance between two youth clubs competing for scarce resources – and had to negotiate between following their story and the need to keep everyone happy. The process of creating video required an attention to preserving multi-vocality, not only to make the designs reflective of the different needs within the community but also to try to avoid alienating possible partners.

From the perspective of the designers, the community journalism method was contrasted with previous experiences they'd had in conducting user-centred design. As one of the designers summarised, the process of community journalism doesn't give you the same depth or "emotional or relational aspects" that you can get from tightly focused user-centred design, but "you do get the breadth" of incorporating a multitude of different voices and characters into brief but contextually rich pieces. For this designer, the key was to differentiate between the purpose of user-centred design for an individual with a specific relational experience of the world, versus community-centred design which fundamentally orients itself towards a "range of people with information needs and routines around

Figure 4: designers watching community-produced videos

physical space." Community-centred work, in his estimation, cannot take into account the emotional needs of all residents, but can identify some informational or physical needs that can be actioned as part of the design process.

This attention to wider service and informational needs has led the Bespoke designers to developing two different design ideas that will be developed together with the on-going process of journalism. The *Viewpoint*, will be a mechanism for voting on local issues and polling opinion, which will also have a visual presence through a "meter" visual design. We are currently in talks with local stakeholders to ensure that opinions expressed by residents interacting with the design will be able to be acted on so that residents don't feel they have participated in a consultation without a clear objective. The second design to be built is the *Wayfinder*, which will be a movable signpost that will be able to be updated via text message to point directly towards local activities held by organisations.

The designs we are developing are indicative of the results of using community journalism as a method which favours developing an understanding of wider social issues rather than a more profound but singular knowledge of individual preferences. In addition to accessing wider information, the designers repeatedly commented on the degree to which community journalism created an "inspiring" methodology for design. During project sessions the designers sat together and watched and commented on the videos collaboratively, occasionally fixating on specific shots or passages because of their content or because of the choice of illustrating scenery. In this sense, the method is similar to the technique of using "cultural probes" which allows for the inclusion of the implicit, the relational, and the "non-rational"(Dunne & Gaver 2001).

Reflecting on the process of looking at the videos later, the designers felt that it had been both time- and cost-effective in comparison with lengthy ethnography, and had provided a more elusive source of inspiration for design ideas. As a new member of the project described after watching a series of journalist-produced videos, "speaking as someone who knew nothing about this place a week ago, I feel like from the showcase I got a feel for the character of the community… I feel like I can design for them." As another designer later described, "This was different [from user-centred work] because it concentrated a whole different set of voices in a moment." This "inspiration factor" cannot be definitively quantified but supports Raijmakers' work on "design documentaries" in providing anecdotal evidence that film can be uniquely "effective at offering inspiration" (Raijmakers et al. 2006: 232).

Centrally, the use of moving-image allowed not only for a multiplicity of community-level interlocutors but also for engagement with the area as part of a mediated experience of multiple sensory registers. In particular, the designers cited the often-unintended visual or audio aspects of the films as giving them inspirational fodder for creating design ideas. One of the designers commented, "The tradition in design is to design for problems of *foreground*, with opportunities like this we're getting *background* as well and I like that." By background, he went on to say, it was not simply informational background but "frivolous" details about life in the area that would not have been identified in an interview – for instance the shape of a signpost or what people wore to a meeting – but that provided key inspiration. Video, according to a designer-maker on the project, provided detail "beyond the purely information based" through incorporating sound, and images, it allowed for a heightened "sense of place" (Feld & Basso 1996) through mitigating normal sensory registers through video.

As described above, this is part of the nature of moving images, in that they inherently operate on several sensory registers simultaneously, but this was enhanced by the "non-professional" quality of the films produced by the community journalists. In viewing the films the designers were disappointed with the level of critique but cited the "rough" quality of the films – in their use of lengthy takes and unedited interviews, of wind interference with sound quality or of meandering long tracking shots of the local area – as contributing to rather than detracting from their experience as design-attuned viewers. The very "amateurish" qualities that can make community media difficult to watch if you don't know the local area (see Boyle 1997) were seen as fascinating by the designers.

Key to understanding the use of participatory video within the Bespoke project is seeing community media not only as the *product*, to be viewed by the designers, but also the performative *process* undertaken by the journalists. In creating the journalistic procedure the team had to reflect on the realities of work in the local community, and

learn about local debates and personalities. The process of creating community video was inherently reflexive for not only the journalists but for the project team, in raising challenges to understandings of what constitutes a "community."

As the project moves forward, community journalism will be extended throughout the design cycle, as a means of gathering feedback on prototypes and later on the deployed designs themselves. Our experience on the Bespoke project suggests both unique challenges and benefits to using participatory video as an ethnographic tool within design. The use of video has been inevitably imbricated within existing power relationships and hierarchies in the area, which has influenced the outcome of the project on multiple levels. In pursuing a methodology appropriate to designing for a community rather than for an individual user, we have of necessity sacrificed some depth for breath. However, the use of participatory video created myriad intended and unintended sensory registers and incorporated a multiplicity of voices that have provided not only information but also inspiration for designers to respond to. The use of community journalism has allowed for a broad generation of ethnographic understandings that, while not replacing traditional in-depth ethnography, can provide a useful tool for the creation of multi-authored, reflexive ethnographic insight throughout the design process.

NOTES

[1]For the purposes of this paper, we use the words 'film' and 'filmmaking' to denote the processes and products of constructing fiction and non-fiction stories through moving image. Whereas once film- and video-making were considered divergent technological and creative practices (Boyle 1992) the availability of affordable high-quality digital video has collapsed many of these distinctions.

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BY WAY OF THEATRE: DESIGN ANTHROPOLOGY AND THE EXPLORATION OF HUMAN POSSIBILITIES

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ABSTRACT

Such dualisms as between mind and body and between nature and culture persist in anthropology, despite recurrent attempts to dismantle them. The persistence of dualistic thinking can be attributed to a division between practice and theory that underpins the discourses of anthropology, as of every academic discipline, and that rests on the same ontological foundations. This project seeks to move beyond the practice/theory division and to develop scholarship that shifts away from retrospective description to responsiveness in the midst of engagement. I am approaching this task by studying with a particular community of knowledge-craft: research theatre makers. In their work they explore what it means to be human, taking the whole organism-person as their point of departure. For them, theatre work offers a path towards theoretical understanding that is as much practically enacted as discursively articulated. I aim to open up this approach from the relatively narrow domain of theatre research to address the broader concerns of contemporary Design Anthropology.

INTRODUCTION

At a conference called Sound and Anthropology in 2006, the anthropologist Steven Feld, who had presented his soundscapes of bells from around the world, was asked whether his recordings were intended to convey his theoretical arguments to the same extent as his writings – or were the recordings illustrations? Feld, expressed his long felt frustration that although *in theory* his point was that the recordings did indeed carry the arguments he expressed in writing, only the latter so far seemed to be able to communicate them explicitly. This anecdote flags how non-linguistic forms of expression are considered not to be explicit enough to carry academic arguments.

The association of theory with language and other modes of expression with practices other than theory are part of a wider ontology prevalent in academia. Dualisms such as mind and body and nature and culture persist in anthropology, and in contemporary society more broadly, despite recurrent attempts to dismantle them. In anthropology, the much-vaunted 'paradigm of embodiment' (Jackson 1983, Stoller 1989, Csordas 1992), for example, reproduces these dualisms (while claiming to obviate them) by excluding from its conception of the body, on the one hand, semiosis, discursive thought and self-conscious practice, and, on the other, the organism (Starrett 1995, Farnell 1999, Ingold 2000). The persistence of dualistic thinking can be attributed to a division between practice and theory that underpins the discourses of anthropology, as of every other academic discipline. Academic disciplines in fact rest precisely on the ontological separation between theory and practice. The project that I am developing, called *By way of theatre: Design Anthropology and the exploration of human possibilities,* seeks to move beyond the practice/theory division, and by the same token, to develop an anthropology that is processual in its approach to scholarship not only in its texts.

I am approaching this task by studying with a particular community of knowledge-craft: research theatre makers. I trained in research theatre groups between 2001 and 2006. I worked with Icarus performance project from 2001 – 2004 (icarusproject.info) and with CIRT between 2005 to 2007 (teacirt.it). Since then I have participated in and given various theatre anthropology workshops (workshops with Nhandan Chirco, Italy, Rachel Karafistan, London, Krystian Godlewski, London, Song of the Goat Theatre, Poland).

In order for the actors in this type of training to achieve the awake-ness and aliveness that they search for in their improvisations the whole organism-person needs to be trained. The training is specifically aimed at sharpening the actor's responsiveness: A responsiveness that does not separate physical expressiveness from memory or meaning. In their work, research theatre practitioners explore what it means to be human, taking the whole organism-person as their point of departure. For them, theatre work offers a path towards theoretical understanding that is as much practically enacted as discursively articulated. My aim is to open up this approach from the relatively narrow domain of theatre research to address the broader concerns of contemporary design anthropology.

In this paper I present in what way Design Anthropology (DA) is taking a different path to conventional research practices, and how my embryonic project, *By way of theatre*, furthers this emerging approach. I then describe the project questions and in the subsequent section I explore aspects of the theatre training that I am already practiced in, so as to give an indication of how the project questions can begin to be addressed. In my experience I have gathered the training from theatre and from anthropology separately, in this paper I am beginning to explore them as part of a joint project.

There are at least three reasons why this approach is valuable to design processes. First, retaining the focus on language and writing as the final product of academic processes affects what is paid attention to in fieldwork. Although there is increased interest in the senses, so called embodiment and experience more generally, most ethnography still relies on language, on interviews and people's words (Wikan 1993). The effect of the hegemony of language is that various forms of meaning, understandings, and values are subsumed under the semantic framework of language (Jackson 1983), thereby allowing entire swathes of people's experience and lives to go unnoticed in ethnographic research. Second, the focus on language and especially 'theoretical' knowledge that permeates archetypal notions of academia is part and parcel of a hierarchy, or regime of expertise, in which tacit or 'technical' knowledge is always of secondary importance (Strathern 2000, Latour 2003). Therefore when collaborating with persons from outside academia, for instance in collaborative design situations, where this archetype of theoretical vs practical knowledge is present apriori, this hierarchy is simply reinforced. Third, developing a design anthropology where 'response in the midst of engagement' is equal in academic value to subsequently produced documents (of varying sorts) entails being able to participate in *ongoing* exchanges, creating value as a part of the exchange 'in the field'. The tension here is between value for those involved in the immediate exchange and the wish to share insights with others not present. This tension is the focus of one of my research questions, that I shall now expound upon.

DEVELOPMENTS IN DESIGN ANTHROPOLOGY

As Miyazaki (2004) has recently pointed out, the kind of descriptive ethnography that has long been the mainstay of anthropology is inherently retrospective. Implicit in the retrospective glance of ethnography is the notion of a completed world: what for the people are moments of hope, of opening up to a future that is 'not yet', are converted in the process of ethnographic writing into moments of closure and finality, wrapping up what has already come to pass. How, Miyazaki asks, can we overcome the incongruity between the retrospective orientation of ethnographic description and analysis and the prospective orientation of hope? So long as we assume that anthropological analysis is geared to the production of written texts, this incongruity is inevitable. DA, however, offers an alternative. Not an anthropology of design but an anthropology by means of design, where design (like hope) is the way or method of research rather than its object. DA shifts the practice of scholarship away from retrospective description to responsiveness in the midst of engagement, or what Ingold (2008a) has called 'correspondence'. In this correspondence, the analysis and reflection characteristic of academic work move forward in synchrony with the flow of happenings in the surrounding world. By way of design, the theoretical or speculative work of anthropology, understood as an exploration of the potentials and possibilities of human being and knowing, can proceed in tandem with our engagements with others in what is conventionally called 'the field', rather than being postponed to the subsequent production of retrospective texts (Ingold 2008, Das nd, Marcus pers. com.). Through its synchronized correspondence with social life, Design Anthropology promises a genuinely processual paradigm.

Why have I chosen to develop Design Anthropology by carrying out research with theatre makers? The reason is that their practice is precisely one of cultivating responsiveness in the midst of engagement, in which the temporal orientations of practical action and philosophical reflection are the same rather than opposed. Both are prospective. It therefore offers an exemplary paradigm for a broader Design Anthropology. The theatre makers' work taps into extensive living traditions of holistic attention and calls for the training of the whole organism-person. This training is aimed at sharpening the actor's responsiveness in a way that does not separate physical expressiveness from memory, meaning or intention. In the terms of research theatre, an action has to have an intention to be considered alive. Intention here is often written as in-tension, in order to highlight the inseparability of will, muscles, consciousness, breathing and memory.

A fundamental notion in research theatre is that since everyone is different and since everything is constantly changing, there can be no formulaic recipes for training. Yet in apparent contradiction to this, practitioners talk extensively of 'foundations' and 'origins'. Thus their practice raises in an acute form the tension, which also lies at the heart of anthropology, between the specificities of human experience and its universality. In furthering this project I shall consider what lessons can be drawn for anthropology from the ways in which theatre makers address this tension.

STATING THE QUESTIONS

In the intellectual Cartesian tradition in which mind and body are es-

sentially disparate, certain aspects of our lives and experiences are allotted to mind and others to the body. Particular sensory organs become more associated with the mind and others with bodily sensation (Ingold 2000a). Most evident in this dichotomy is the separation of theory from practice. Theorising together with thinking, reflecting and pondering are allocated to the realm of mind, while things done with the limbs, hands, feet and other visible 'parts' are allocated to the body and practise. It is in this ontology that spoken and written language are considered to be more explicit than other forms of expression, that are allocated to the realm of affect as opposed to the realm of thought.

Counter to Cartesian dualism, neuro-science and neuro-anthropology (Lave 1988, Clark 2001, Downey nd) are making increasingly evident what philosophers of phenomenology have long argued (cf Ingold 2000a chap 9, for a review): that practices of thinking and reflection depend on the whole person acting within a particular task in particular places. In a processual ontology (Ingold 2008a, 2008b, 2000a, 2000b, 1993 and Latour 2003) the multifarious aspects of an environment (human and non-human) participate in the continuous constitution of that environment. Through this understanding of the world even to view, in reference to the etymology of the word 'theory', is *active* in the constitution of the very real world around us (Okely 2001, Ingold 2000). This also counts for thinking (Shurman and Munro 2006) and imagining (Ingold 2000a). Thinking, reflecting, remembering as well as imagining, hoping, abstracting and theorising have observable effects in the world around us.

Like speech-acts (Austin 1962), theorizing can be considered a type of what I would like to call thought-acts. Thought-acts, including theorizing, are not independent of other activities/practices a person may be engaged in (cf Lave 1988, Clark 2001, Downey nd). Therefore theorizing will be of a different character when, for instance, it is part of a theatre project, then when the theorizing is carried out sitting at a desk (Ingold 2008a). Keeping in mind this processual ontology, the question of the explicitness of language that Steven Feld pointed to in comparison to other forms of expression can be seen in a different light.

The ambiguity of non-linguistic forms of expression (music, dance, and so-called physical theatre) are often quoted as the reason why academics prefer linguistic means of communication. However, language has been shown to be equally ambiguous. I argue that the ambiguity of language is not considered as problematic as that of dance or theatre, because due to the ideological allocation of language to 'mind', generations of scholars have dedicated themselves to refining the skills for reading, interpreting, understanding, writing, argumentation and discursive articulation. Therefore, the difficulty of conveying the theorizing embedded in a form of communication such as dance or physical theatre seems to emerge from the hegemony of language rather than from any inherent limits in other forms of communication. More specifically it is the hegemonic status of academic text and speech. Poetry, creative writing, or language used in theatre, although often included in academic work, are nevertheless considered peripheral to the essence of such work.

In order for other forms of expression to reach the point at which their ambiguity is not considered a barrier, but the site of negotiation as a matter of course (as much as negotiation is part of interpreting and discussing text/language, cf Rapport 2003, Ricoeur 1991) what is needed is their legitimacy within academia. Such legitimacy will at least make space for scholarship that does not reinforce the theory/practice divide. Through my work with theatre makers, I am therefore exploring the following three questions, also with the aim of enabling others to engage in their own processes of discovery.

First, how can anthropology balance a commitment to the creation of knowledge through engagement in real-world contexts of action with its commitment to disseminating the knowledge thereby created to audiences beyond these contexts? How should normal procedures of participant observation be revised in order for both commitments to be satisfied simultaneously?

Secondly, how can research theatre training be translated into methods for anthropologists to be responsive to organism-persons in their continually changing environments? What alternative forms of notation (other than writing) could be developed to record the results of such methods?

Thirdly, does a focus on growth and maturation allow for a new understanding of humans in which both change and continuity can be accounted for? Can such an understanding allow for future-orientated behaviour that emphasizes human possibilities rather than human actualities?

These are the questions that have arisen in my work as the result of anthropological studies and fieldwork as well as the insights I gained from practicing with research theatre groups. Therefore in the next section I describe aspects of the theatre training and how I believe they can be used to draw attention to the theorizing embedded within activities as yet not associated with the products of scholarship. The key in the practice is how the training brings memory, reflexivity and thought to act in tandem with other human ways of responding. Following Lave's (1988) work I typify this enskillment as distributed cognition, with a focus however, on how one can be trained to become aware of how different practices (types of thinking, types of movement, types of attention) mutually shape each other and the way people relate to each other and their environment. This sort of research theatre can train people to pay attention to simultaneous processes going on in themselves and their environments.

EXAMPLES OF TRAINING PERCEPTION FROM RESEARCH THEATRE

During the activities of the Summer University of Performing Arts 2005 (SUPA 2005), one of the bodies of work proposed by Frank Camilleri, creative director of Icarus Performance Project (Icarus), was "work with the stick". The work consisted of various tasks that included handling, throwing and catching the stick alone, with a partner or in a group. The throwing and catching techniques are based on bandolier stick work, juggling stick work and Frank Camilleri's own defamiliarisation research. This body of

work acts to bring the actor's attention to the 'intention' that characterises an action. The stick is a tangible extension of the intention. If the intention is not precise, the stick falls.

Another body of work that, in the past, Frank Camilleri had proposed to his apprentices in Icarus, also employs objects in order to perceptibly extend intention. The body of work with objects demonstrates how this process of extension is one of the initial stages where the actor becomes aware of intention and can then proceed to revise his or her own actions and check for the precision of intention. The work with objects involved a number of tasks in consecutive stages. The first task was to identify a number of portable objects. The next task consisted in a thorough defamiliarization of the objects, paying attention to remember the actions that arose from this search. The following task was to remove the objects and explore the action and the intention of the action, returning to the object in order to check the precision of the intention (See Icarus 4 2003 for detailed description of these bodies of work). Here it is important to point out that intention does not refer to an emotional state, but to the precise person-organism state brought about by interaction with the object. An action may include an image, a memory or an emotion, but the work on intentions does not give these undue emphasis. Rather it is a process which allows these to arise. In these two bodies of work using objects, what is apparent are the processes whereby the apprentice actor becomes aware of their intentions in order to be able to revise them.

Richard Schechner (1985) talks about 'revision' as a fundamental aspect of the actor's skill. He refers to revision in terms of what happens after the performance; an actor revising a presentation that has been completed. However, writers like Renato Rosaldo (1983) and Rane Willerslev (2004) describe how in many skilled practices such as hunting, action, decision and revision are simultaneous and inextricable aspects of a single task. A description of a body of work proposed by Mario Ruggeri, artistic director of C.I.R.T., can illustrate how the actor, in very much the same way as an orchestral musician constantly revises and adjusts their actions according to the relations with the whole context of the performative event. One of the forms of training that is integral to C.I.R.T.'s work, as of many research theatre groups, is referred to as "balancing of the space". As with the bodies of work with objects, described above, this form of training also aims to raise the actor's awareness of their actions. However, the focus here is on the intentions of the person in relation to the whole performative event, including the other actors, the space, the rhythm and the texture of the unfolding happening.

The actors, usually not more than six at one time, work in a demarcated space. One of them is designated the leader. The leader begins to move in the space and the others are to move in the space according to specific tasks. Those working are to follow the exact rhythm, and the changes of rhythm, as well as the texture of the leader's movement. Mario says: 'become the same type of animal as the leader'. Attention must be paid to ensuring that the space is at all times fully occupied while they are moving in the space, there should be no crowding or gaps, this would unbalance the space. In this training the actors are called to be aware of their own rhythms, actions, paths of movement not only in relation to the leader but also in relation to the others in the space and the space itself, in order to balance the space. The relationship between the actors is diffused within the whole person. The rhythm and texture are performed with the whole body, for instance the arms are not to move with a different rhythm to the feet. Furthermore the whole body is called to relate, to acknowledge the presence of another when moving in the space. This can be seen when two actors pass one another. An observer can recognise the changes in the bodies of both actors that shape the space between them, while all the time retaining the relationship with the leader.

Mario describes that when the task succeeds the actors move as an organic whole and it is no longer clear who the leader is. Have you ever seen swallows grouping and regrouping, without hesitations, without colliding? That performance can, maybe, convey a sense of what "balancing the space" is. In this training the actor needs to be constantly aware, constantly revising their actions in order to follow the changes in rhythm and texture of the leader and in order to relate to the whole moving group. However this awareness, this revision cannot be simply reflective, since the adjustments need to be made immediately and with the whole body. For this reason the awareness and the revision must necessarily be diffused. Perception, decision and action are not interrupted, consciousness is very present but discursive reflection does not overpower the actions of the actors.

Both Icarus Performance Project and C.I.R.T. engage in different bodies of research to explore both personal intentions and relational intentions. I have chosen to relate the specific bodies of work, described above, because they, in particular, clearly illustrate research into personal reflexivity (work with objects) and relational reflexivity (balancing the space).

Generally, when anthropologists are reflexive, they focus on actions, intentions and relations with the aim of distinguishing, as far as possible, between their own cultural baggage and that of the subjects of fieldwork (Okely 1996, Bourdieu 2005, Kenna 1992, Gatt nd). The methods of research theatre provide a possible approach to fieldwork training that can prepare anthropologists to pay attention to the simultaneous processes I discussed above. During the SUPA 2005 exchanges of work, Frank Camilleri noted the ease with which the actors of C.I.R.T. picked up the tasks he assigned them, namely floor work, stick work and plastics (cf Camilleri et al. 2003). Conversely, when I worked on several occasions for short periods of time with C.I.R.T., I found that the apprenticeship under Frank Camilleri in the Icarus Performance Project, between 2001-2004, allowed me to participate in their training.

Mario has often said that the training they carry out is aimed at *learning how to learn*, or in Grotowski's words, learning how to steal from a master (Richards 1995: 3). Drawing on the theatre work such as that of Icarus Performance Project and C.I.R.T., reflexive approaches can be used to expand the researchers' attention in fieldwork, as well as sharpen their awareness of the multiple processes in which people are

immersed. A convergence of the two disciplines, anthropology and theatre, demands attention to *how* we learn. By conducting an active search into not only the lives of the people but also the way researchers learn to take part in a life-world, we may be equipped with sharper tools of discernment.

CONCLUSION

I have argued that in order to develop scholarship that can participate and contribute in synchronicity with ongoing life, and thereby enacting the prospective character of design, there needs to be a shift away from a practice/theory dichotomy. This dualism prevents scholarship from responding in the here and now because the act of theorizing is associated with retrospective practices such as the writing of texts. Other forms of communication, expression and perception, that nonetheless have embedded within themselves the speculative and analytic approach of scholarship, what is usually referred to as theory, can be usefully put to work to bring about such prospective scholarship. However, in order to develop such responsive skills I have also argued that we need to train our attention in order to be aware of how such processes already work in our daily lives in order to be able to harness them and develop scholarly skills within this processual approach. Such training and explorative projects are necessary since this far energy has largely been dedicated to honing scholars' skills in the analysis and production of academic text and language, to the detriment of other modes of expression and perception.

As is well documented in studies of power, resistance tends to replicate the hegemonic assumptions, or that such resistance falls on deaf ears if it refuses to adopt the dominant discourse. For this reason I propose that a combination of academic language *and* theatre may be the vehicle to allow other forms of expression to start being understood and developed as theorizing practices. In the US there have been longstanding engagements between anthropologists and performance professionals (Schechner 1985; Turner 1988), but the UK for instance has seen fewer collaborations of this kind. However, developments in British anthropology, at least, indicate that the time is ripe for approaches that go beyond conventional textual and imagistic media. Lucas's (2010) doctoral research employing Laban notation was a key experiment in practice-based theorizing. In 2010 a practice-based PhD programme in Anthropology and Performance was launched at the University of Manchester, and in the same year MSc courses were launched in Design Anthropology (University of Aberdeen) and Design Ethnography (University of Dundee). These developments are part of the increasing demand on academic disciplines to demonstrate their value to the wider community. Developing a contact between design anthropology and research theatre is a pro-active response to these pressures that could be equally fruitful if other communities of practice are engaged with a similar approach: that while exploring academic questions one identifies the value of anthropological work in engagements with academic and non-academic interlocutors.

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INNOVATION AND COLLABORATION THE IDA WAY

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ABSTRACT

In this paper we describe a global collaborative innovation process we have designed to create products and processes that will enable audiologists to increase their skills for communicating effectively with their patients.

The profession of audiology has for many years been extremely technology driven, and many hearing care professionals, as well as manufacturers of hearing aids, believe that the time have come for a shift to more focus on the human dynamics of hearing loss. But they do not know how to accomplish this goal - and that is the raison d'etre for the Ida Institute.

We have designed our innovation process as an answer to the questions: How do we foster a better understanding of the human dynamics associated with hearing loss? How can we change the mindset of a profession from technology-centered to people-centered? How can we facilitate interaction among the professionals in order to bring human dynamics to the agenda within the profession? How to 'tangiblize' this mindset change in the form of 'tools' that are useful for the everyday practice of audiologists on a global level?

It is our aim in this paper to share the design of a collaborative innovation process that seems to work successfully. We are in the process of developing: a terminology to describe the process; an understanding of why it is successful; and an understanding of which parameters we can measure – and (to some extent) control.

The Ida Institute has held 10 international seminars and created a number of tools that have been shown to have a positive impact on the profession on a global level. We believe that by describing the global collaborative innovation process we have employed to achieve these outcomes, we can contribute a unique and hopefully relevant approach to facilitating collaboration in innovation and reflective design processes.

INTRODUCTION

The Ida Institute is a non-profit organization working to foster a better understanding of the human dynamics associated with hearing loss. The Institute was funded by an initial grant from the Oticon Foundation in 2007 – and funded for another three year period in 2010.

The core of our innovation process is a series of "Think Tank Seminars" – where we engage participants from around the world in discovering the unmet needs of the profession of audiology, and in helping to determine what we can invent/create/design in order to meet those needs. This is accomplished through a strictly choreographed process that includes pre-work from participants, web fora, ethnographic films, research presentations, forum theater, and interactive design methods.

Although it is a strictly choreographed process, it is open-ended and we alternate between concrete and abstract levels – and moving back and forth between raising questions and exploring possible answers.

We have formulated a very ambitious vision: To affect cultural change within the field of audiology – a change from a technology focus to a focus on people. We see the think tank seminars as a forum to gather people who would like to pro-actively work towards this vision. Att the same time, our seminar participants are experts within the field and

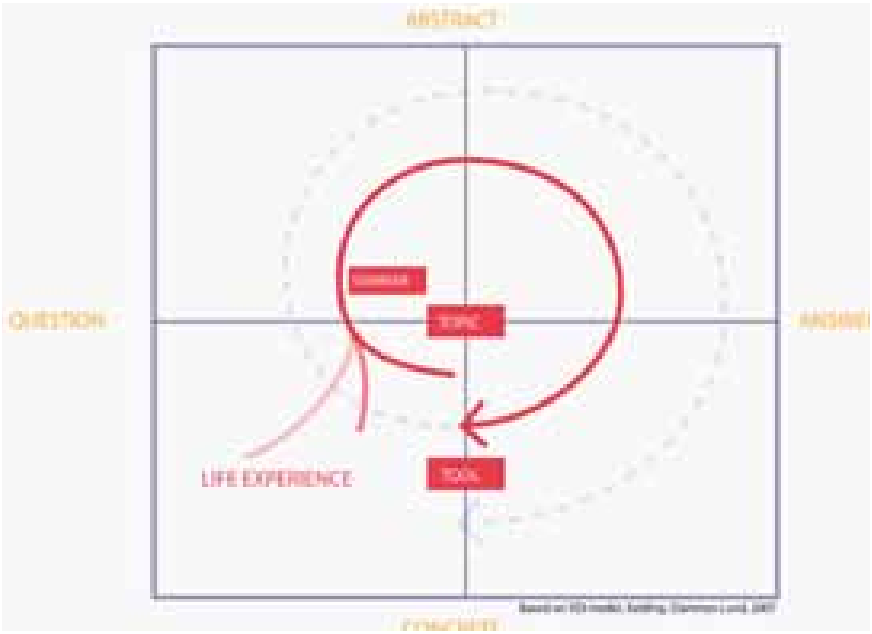


Figure 1

can help us to better understand the nature and culture of the profession, and what is needed in order to initiate a change process.

This vision is shared by many stakeholders within audiology – in academia as well as by the manufacturers – sometimes explicitly formulated, other times as an unarticulated wish or dream. The work of the Ida Institute is moving forward on this partly articulated wish from many areas of the profession. An article in the latest issue of Audiology Today describes how the Ida Institute seminars can be seen as a catalyst of a paradigm shift that is about to take place within the profession (ref. Sweetow et al 2010)

The seminar process design that is presented in this paper has taken place in the working environment of a non-profit organization and not a research institution. It is a process that has been developed through a collaboration of the Ida Institute staff that is comprised of a variety of disciplines including anthropology, audiology, and design and learning specialties.

THE SEMINAR PROCESS

An Ida Institute Seminar is a three-day seminar with 25 participants. For each topic we explore, we have three seminars – and each of these seminars consists of a new group of participants. This means that for every topic, we have a total of 75 seminar participants.

For each series of seminars, we collaborate with a "Faculty", made up of four experts, primarily from academia. The Faculty contributes to both the exploration of the topic and planning the seminars. At the seminars, they give lectures in their area of expertise and actively participate in the facilitation of the process –bringing insights from one seminar into the next.

The seminar is part of an extensive process focused on a single topic. It is a process that begins with life experience – raising questions that we want to explore and find "answers" to.

The products that result from this process – our Ida Tools - are proposed solutions to challenges articulated by the seminar participants. They can be seen as answers to questions arising from the profession.

We define a tool as:

"Anything that recurrently can address a specific need in specific situations/ dealing with specific issues. A tool can emerge as a board-game, a metaphor, a process-description, a service on the internet, a language, a model, something concrete, something abstract or something visual . . . the possibilities are limitless."

The questions that we address have grown out of life experience, but have not necessarily been articulated. This is the aim of the seminar - to delve into the (un)articulated needs of the profession and explore what we can invent or create to meet these needs.

In the following, we describe each of the elements of the seminar process and present a new model that can help us to analyze the interplay between the elements of the seminar and their importance and relation to our overall goal of engaging the participants in a collaborative innovation process.

THE SEMINAR TOPIC

Each year, we work with a new topic. The topic is chosen in collaboration with our advisory board consisting of international experts within the field of audiology. The topic is chosen to facilitate work towards futhering our mission of fostering a better understanding of the human dynamics associated with hearing loss.

This year, we have been working with the topic: "LIVING WELL WITH HEARING LOSS." Within this topic, the questions that we want to explore are:

- How can we as hearing health care professionals bring the concept "living well with hearing loss" into our clinics?
- What steps should we take to understand what our patients need to live well with hearing loss?
- How do we enable our patients to integrate their hearing loss with the lifestyle they wish to have?

THE IMPORTANCE OF THE TOPIC

"Living well" is not a concept that is readily integrated in audiology practice. However, it is a concept that has the potential to be relevant and meaningful to the practice, and may possibly result in better outcomes for patients.

It is important to point out that we do not endeavor to find the great arguments for choosing a topic in advance of the seminars, Rather, we ask seminar participants to help with the formulation of the critical questions prompted by a topic. This enables us to better formulate relevant and important questions and at the same time, gives ownership of the topic to the participants.

Our web forum is an important part of the development process. It is a closed forum housed on the Ida Institute website (idainstitute.com) where seminar participants are given assignments to fulfill, before, during and after a seminar. Through this process, a a dialogue around the topic is created and grows.

As an example, one of our participants

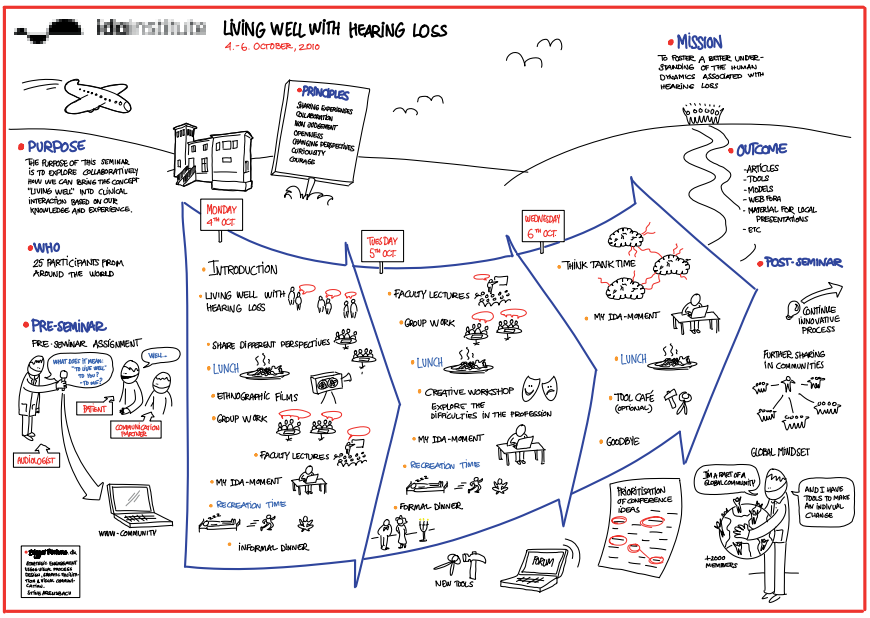


Figure 2

wrote in our web forum on the second day of the seminar: "*Research has shown that although hearing aids help, they often end up unused, in the drawer, and/or with dissatisfied clients. This suggests that something is not right with our current model of practice. We need to understand the person, not their loss, and their life. Our intervention needs to suit their life and their needs; not the other way round that they need to fit in with our practice, interventions and expectations.*

If we can help the client to live well (and for some, in the first instance it may be 'live better'), then we're more likely to have satisfied clients. We all agree that the medical model of practice doesn't work well in audiology and that 2-way interaction with the patient contributing to their management is more effective. But our contribution as audiologists would be far more effective and appropriate if we understand what really is important to the client, and what constitutes 'living well' for them. How can we improve their Quality of Life?"

Another participant wrote:

I think the main reason for bringing the concept of living well in to the clinical interaction is that it forces the audiologist to focus on the whole person rather than on the audiogram. Using the narrative and conversation to initiate a session, to building relationships, to understand the patient's perspective, and to understand how the communication partner and person with hearing loss relate to one another freed the audiologist up from reliance on the audiogram. Clearly, this forced most clinicians out of their comfort zone but led us each on the road to gathering information that could help the audiologist realize the important goal of helping the person with hearing loss and the communication partner live well and potentially be aligned regarding necessary steps.

A GLOBAL COMMUNITY – OUR PARTICIPANTS

Our participants have been selected from among those who have applied to become a participant through our website and those who have been recommended by people in our global network.

Our seminar participants come from almost every corner of the world – with language being the main barrier for further diversity. Ida Institute seminars are conducted in English and participants expected to be able to interact without undue limitations in their ability to communicate in English.

Figure 2 shows the agenda that the seminar participants receive upon arriving at the seminar:

The "the-arrow-divided-in-three" representation depicts a seminar process that moves forward in time, passing through phases that depend on each other. The illustrations outside the arrow indicate that the process is influenced by the profession and society and other related external actions that are taking place.

LIFE EXPERIENCE AS STARTING POINT

Life experience has a double meaning: The professional lives of audiologists and the lives of their patients. We have several activities designed to bring these life experiences to the agenda so that they become the points around which other activities revolve.

Having two anthropologists on the Ida Institute staff gives us the opportunity to explore the topic before each seminar series begins. We produce a series of ethnographic video documentaries, taped both inside audiology clinics where interaction between audiology and patient is central and outside the clinic where ethnographic interviewing

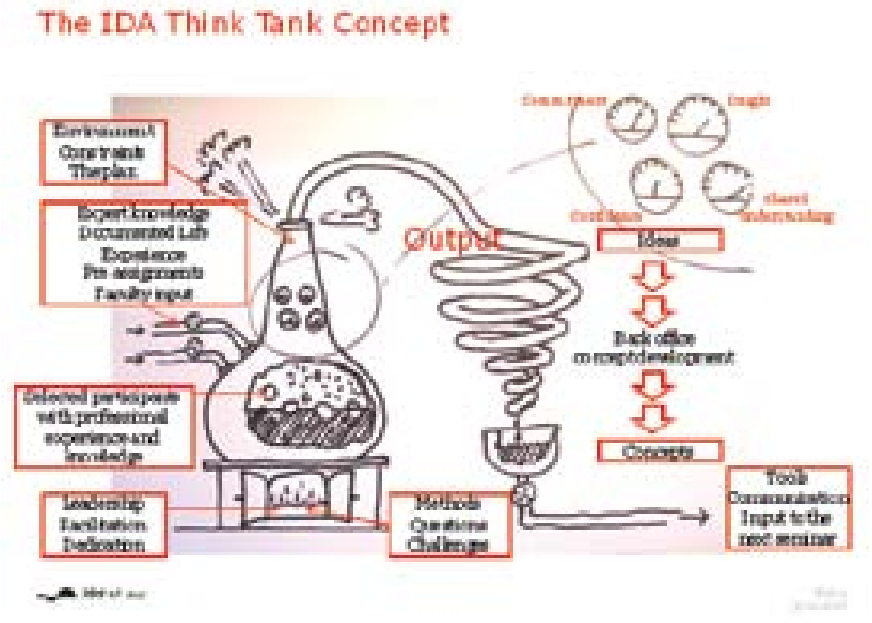


Figure 3

Figure 4: a (Visionpool®) collage

invites patients to talk about their lives and the audiologists to listen.

At the same time, we also ask seminar participants to interview patients and their communication partners outside the clinic prior to participation in the seminar. Participants are encouraged to write the content of this interview and share it on our web-forum with their co-participants before they arrive at the seminar.

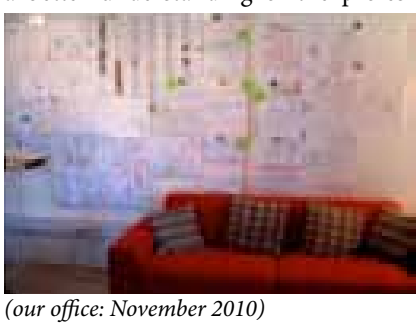
BUILDING CONFIDENCE, SHARED UNDERSTANDING, INSIGTH AND COMMITMENT

Ida Institute seminars are highly interactive – and feature a series of activities designed to facilitate interaction between the participants.

The openness and willingness of participants to interact and collaborate is a prerequisite for this creative process to take place.

We also believe that confidence, shared understanding, insight into the topic we explore and commitment to the task are essential and the first part of our seminar program is designed to build these elements.

On the first day, our participants are asked to describe audiology as it is practiced, and as they practice it in their country. They share their stories with each other in small groups and the groups change several times during the session. During this interchange, they listen to each other and speak themselves, and in a very short time reach a better understanding of the profes-



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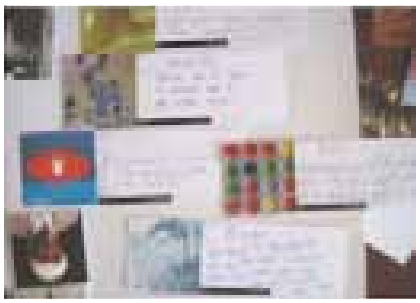

Figure 4: (Visionpool®) documentation cards

sion worldwide. What we often hear at the end of this session is surprise that "our day-to-day challenges are the same even though the political, economical and cultural structures with in which we work are very, very different!"

Then we show them our ethnographic videos – and this builds on the shared understanding. Not only do participants get to share an understanding about the five to six people they get to know through the videos, but the content of the videos often mirrors their own practices and the part of their practice where they (to some extent painfully) feel the need for an enhanced focused on the 'human dynamics' instead of technology. Through this process, we build on the shared understanding of the challenges and the participant's commitment to the Ida Institute mission.

Pre-seminar assignments are brought into discussion by the means of group work. Participants share their experiences from specific cases of their own. As they listen to each other revealing their own day-to-day experiences and the concrete details of their daily working environment, participants relate more fully to the the global community of audiology and the topic of the Ida Institute seminar.

By the end of the seminar's day 1, we have established a group of participants that share the wish to be part of a community re-acting against the technology dominance of the profession. They are ready to involve themselves in an explorative process.

ALREADY EXISTING KNOWLEDGE

The Faculty, as previously described, are four 'experts' who are highly acknowledged academics from universities around the world and whose specific research area is related to the overall topic of the seminar. They are invited to become active participants in the seminar process. .

After having established shared understanding of the relevance of the topic and commitment to act, the faculty presents established knowledge in the format of four brief lectures. This knowledge becomes inspiration for the creative work that follows.

EXPLORING DILEMMAS – WORKING WITH THEATER

Our next session explores how we might integrate the concept of living well into clinical practice. Although talking about the matter does not seem to be difficult, we create an opportunities for participants try to enact possibly approaches in different scenarios. As participants discover through these enactments, looking for new ways of interacting with patients, trying to get the conversation in the clinic focused on the concept of 'living well' quickly becomes more challenging.

These scenarios very overtly place the audiologists/participants outside their comfort-zone, a fact that often surprises them. It soon becomes obvious that they need help. As one participant expressed it in the web forum following the session:

"Having the experience of the actors as well as playing roles myself makes me consider viewpoints that I don't traditionally consider. I want to make sure that I am engaging the patient and communication partner, addressing their concerns while respecting their individual needs. I can see how audiologists can enter into areas outside of their comfort zone and… I am looking forward to brainstorming tools or life jackets that enable them to safely go into the uncomfortable waters."

By the end of the seminar's second day, we have delved well beneath the surface of the dilemmas that face audiologists in their clinical interaction. As a group the seminar participants agree that we were working on an extremely relevant challenge for the profession and they are committed to the task of engaging in a co-creative process.

TRANSFORMING DEEP UNDERSTANDING INTO VALUABLE SOLUTIONS

On day 3, we facilitate the moment of creative collaboration.

The process takes place in two main phases. In each phase we challenge the

participants to answer a specific question.

The first question:

> *"How does the landscape of 'living well' look like – from the patient's perspectives?"*

The first question takes as its point of departure what we earlier described as 'life experience.' by introducing discussion of the 'patient's perspective' – not directly, but as interpreted by the audiologists through interviews and ethnographic films. This question also indicates that we want our participants to acknowledge that the concept of the seminar, "Living Well with Hearing Loss," is as important to the patient as it is to the audiologist and is especially relevant to the interaction between the two.

On day 2, we use the Visionpool®, a visual, scenario-building dialogue tool. Visionpool has playful characteristic and looks like a game, but it's not. It is a way to organize and condense a common understanding of a subject by connecting keywords and abstract images - "visual samples". In this way, we build a two-dimensional visual pattern through a reflective but structured process that is based on individual interpretations and associations. While participants are connecting keywords and visual samples representing the subject of "Living Well.", they are also building a metaphorical representation of the subject in its most important aspects as a shared mental image.

A tangible outcome of this process is the identification of a range of significant issues in a short form -- that is, described in a headline, represented by a single visual sample and explained in a short sentence.

The second question (with the aim of scoping the final ideation process):

> *"How can you enable the patient to communicate the qualitative experience of Hearing Loss in different situations?"*

At this point, we have established confidence, provided the participants with insights, created a common understanding and a common language and built a level of engagement.

Now we use the time-constraints of the seminar to put participants under pressure to produce a solution to be presented in plenum. The intention is to increase participant engagement and commitment. We specify that the answer must be a concrete idea for a tool that would facilitate (or enable) communication of the concept of "Living Well" in the clinical setting.

We facilitate this step with a card-sorting process, prioritizing the six most important issues to translate into concrete "tool"-ideas.

To facilitate a speed-ideation process, participants are asked to work individually to develop the six issues into ideas for tools. They are working solo in time span of two minutes on each issue, then passing the issue to the participant next to him or her to take over. Finally, under continued time pressure, participants come together to qualify ideas and present them at plenum.

By the conclusion of the seminar's third day, participants have thus created a number of ideas – ranging from the abstract to the concrete.

By departure, the 25 participants typically communicate relief at finally being able to express themselves in a 'community' of like-minded audiologists. They express a strong sense of belonging to this community and a great willingness to continue being part of the development process upon returning home.

AFTER THE SEMINAR: CONDENSING THE RESULTS

Although the seminars are the core activity of the Ida Institute, they represent only one phase in the innovation process.

A crucial part of the process takes place between the seminars.

We bring a many materials back to the Institute from the seminars. Some things can be categorized as ideas; still others are more like new questions or other representations of the increasing understanding.

Ideas are also documented by the participants as process results or presentations. Some have been found in the forum discussions and others are captured from our personal diaries and notebooks.

At the moment of writing this paper, November 2010, we are between seminar 4a and 4b. We have gone through a process of identifying and sorting out ideas.

We have been able to describe 50 – 70 basic ideas, depending of the definition of "an idea".

The condensing of the ideas has led to one to two major themes and we are focusing on four to five pre concepts for "tools" that might address these themes.

A number of ideas has been captured but may not have actual relevance for the topic. They are kept to be developed in relation to other topics or Ida Institute activities.

Next step is to gain feedback from our faculty and then develop prototype tools for seminar 4b.

From a process perspective, seminar 4b will start at a higher level of acknowledgement and understanding of the topic. The prototypes developed will act as potential answers to the questions of the topic. Even though there are now tangibles tools to 'test', the process of collaborative creation will continue as we take the answers to our initial questions, "the tools", to a new level.

THE PROCESS BRIEFLY SUMMARIZED

At the Ida Seminars, we:

- Bring a selected and prepared group of people together
- Invite them into a special environment with strict constraints
- Provide participants with knowledge, inspiration and experiences
- Enable deep understanding and insight moments
- Facilitate collaborative creation
- Condense the result – and give it back to the profession – as "tools"

CONCLUSION

Collaboration and innovation go hand in hand in our seminar process. Thanks to the funding of our Institute, we have had working conditions that have given us the freedom to use all means to explore how best to optimize the process.

The seminar process as described in this paper has developed over several years. Although from the start we have viewed the seminar participants as experts who would participate creatively in the innovation process, this concept of participation has evolved as we have gained confidence in the process.

What is the balance between how much we as seminar organizers should be prepared to give to the participants, and how much can we expect to ask for their contribution?

Would individuals agree to become participants, and spend the majority

of the time 'giving' and 'contributing'? This was a question that we asked ourselves in the beginning.

And the answer is yes. Participants not only want to contribute but they highly appreciate this and ask for even more. The seminar process developed differs fundamentally from traditional seminars within their professional field. Our participants often leave us with the impression that they not only gained knowledge (for the most part acquired by interacting with each other) – but that they are inspired to do things differently when they engage in a process with their patients. As a seminar participant wrote in the web forum upon leaving the seminar:

> *I am returning home equipped with new ideas for engaging in conversations with my patients and their families that are not just about "hearing well" but in fact, living well. In some respects I have been moving in this direction for a long time, but the seminar has made it possible for me to push through the messy stuff knowing with greater confidence that the end result will be richer for my patients and their families.*
>
> *The same acceptance process we will ask of our patients has been asked of us here. We return changed and inspired by the knowledge of greater outcomes, shaped by our patients using their definitions of "living well."*
>
> *I am eager to see how our Think Tank visioning becomes a real clinical tool, and I love that the collaborative process involved was creative and intellectually stimulating in such a fun way!*

The question is if – and how - this approach to changing the mindset of a profession can inspire or apply to other everyday innovation realities outside our privileged Think Tank laboratory.

By this paper we would like to invite to that discussion.

MICROSTRUCTURES AS SPACES FOR PARTICIPATORY INNOVATION

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ABSTRACT

Microstructures are networks that aim to solve persistent social problems in rural or urban areas. These are transdisciplinary networks of inhabitants, entrepreneurs, professionals, and academics who bind their forces to realize an ambition they share in the area concerned. They require small investments in governance which we expect to result in social entrepreneurship and self organisation. We developed a six step program to develop microstructures and tested it in Feijenoord, a Rotterdam area characterized by socio-economic, cultural and linguistic diversity, but in general inhabited by people of colour and low income. This paper describes the pilot, its theoretical roots, outcome, and lessons learned.

INTRODUCTION

Inspired by the success of micro-credits, in which small financial investments – which in turn symbolize trust – facilitate entrepreneurship and result in high return on investment, we (consultancy firm Urbancore and research agency OrléoN) developed the concept of microstructures. Microstructures are transdisciplinary networks of people with a shared concern in their local area. Transdisciplinary means that people from different knowledge domains (disciplines) and types (academic, professional, experience) join forces to analyse a problem, thus generating a common sense about the origins of the problem and possible solutions. Moreover, in order to actually solve the problem they actively engage in a process that requires some executive powers, putting the microstructure in the seat of public management. In turn, this requires a careful preparation of microstructures in terms of finding the right people to participate. This preparation is a six step program we designed. In this program, narrative research and network strategies are combined.

PARTICIPATORY DESIGN OF THE SOCIAL

To cut budgets and to stimulate citizens to fully engage in society, Dutch government seeks ways to promote active citizenship. One of these ways is interactive policy making, in which citizens are invited into the policy-making process. The outcome of this experiment is rather disappointing (Enthoven 2005). Arnstein (1969) has developed a ladder of participation in which the level of participation ranges from being consulted about new policy to setting the agenda and co-decide. In the Netherlands, interactive policy making has remained largely on the lower rungs of the ladder. In some cases, citizens are involved in decision making, but in most cases, citizen participation is limited to preparation of policy. Still, Dutch government remains very interested in ways to co-produce policy with social actors and social actors are interested in co-production, with government and/or with each other as well (Enthoven 2005).

In a critical study on the discourses of active citizenship, I (Basten 2002) found that the ways in which different parties define active citizenship in the Netherlands is distributed in bipolar categories of on the one hand citizens concerned with specific societal issues and on the other hand politicians and policy makers. Within the latter group, definitions diverge largely along the lines of political affiliation. Citizens concerned with societal issues do not tend to call themselves 'active citizens', but they consider themselves for instance environmentalists, fighters for gay rights, responsible entrepreneurs, free thinkers, union leaders, or anarchists. Citizenship is not the issue as such, neither is becoming active. These people tend to identify a problem and act on it from a sense of justice. Democracy, open society, and solidarity are key values herein and citizenship is more or less a by product of activi-

ties aimed at achieving these values. In contrast, the definitions of active citizenship as used by politicians and policy makers contain much essentialist morality, pointing at both what 'citizenship' and 'active' should be. From a neo-liberal point of view, active citizens are those citizens that are financially self-sufficient and do not use up state resources. The neo-republican definition of active citizenship focuses on political involvement. It defines citizens as active when they participate in for instance councils and commissions. Finally, the communitarian definition highlights citizenship as participation in civil society, mostly in voluntary work in socio-cultural contexts. The analysis (Basten 2002) showed that none of the definitions was able to fully describe the concerned and engaged citizens we spoke with in in-depth interviews, and moreover, that most of these citizens defied these definitions all together. Where to place, for instance, anarchists who voluntarily waved high income jobs and lived on unemployment benefits in order to rethink society and experiment with new socio-economic models? Or responsible entrepreneurs, who did not so much engage politically, but sought ways to introduce youngsters into the labour market or to produce and provide environmentally and socially acceptable products? Furthermore, these definitions were gendered. They precluded for instance women from citizenship when they stayed at home to raise children; child rearing is not considered valuable for society (Lister 1997).

All definitions were treated as self evident and neutral, thus charging 'active' with implicit moral choices about what to be active with. The concerned citizens in the empirical part of the study, however, defied these descriptions and went on doing what they thought was good for society. From the point of view of politicians and policy makers these were not the activities they desired. The discrepancy between their own definitions of active citizenship and the activities of concerned citizens made them disregard these activities. They concluded that active citizenship in the Netherlands was at a lamentable low level and should be encouraged. Appeals to active citizenship fell, however, deaf to the ears of concerned citizens, who considered themselves to be already active. The analysis of the discourses of active citizenship started with a review of the literature of Dutch academics. Interestingly, the literature showed a contempt for civic involvement, using terms that referred to diseases (Hollanditis) or obstacles (hinder power). In short, in the Netherlands there seems to be a difference between civic activity, engagement, and involvement as such (citizenship as practice) and as perceived by politics and policy-making (citizenship as instruction). Traditionally, mutual trust is low. Part of the low trust in civic participation can be explained by the regent culture that has dominated political life since ages. Government tends to see itself as Father State, with a specific pedagogical task regarding its citizens (Metz in Hendriks 2008). Distrust in government is not new to the Netherlands either (Aerts 2009). Dutch citizens keep their trust in democracy and how it is institutionalised, but they question the legitimacy of modern politicians and specific government bodies. There is a crisis in legitimacy (Raad voor het Openbaar Bestuur 2010).

Against the backdrop of this mutual distrust, in which both civic and political activities are contested, the ambition of participatory design of the social is a challenging one. In a theoretical study of prerequisites for public co-production, the notion of the public was central (Basten 2010). A public, in terms of Dewey (in Basten 2010), is a group of people that arises in reaction to an event that existing political and scientific structures and institutions are unable to respond to adequately. In such a situation, a public prepares the future settlement of the affair. In the study, a public is equipped with means to handle its own research. Hence the name 'researching public'. A researching public is a temporary and heterogeneous network of people concerned with one and the same event and its outcome. There is a widespread consensus among sociologists that modern societal life is organised in networks (Cf. Castells 1996). Narrative research was also a key notion in this study. On a collective, public level, narrative truths, as opposed to historic truths, play an important role in analysing the origins of the event and in making sense of its consequences (Cf. Elliot 2005). In this study, I described public activities as citizenship in action. The study, however, was a theoretical exercise that lacked empirical evidence of practices. Putting the theoretical model to the test, in which narrative and network were key notions, we designed a method that would enable us to both shed light on sense-making (discursive or narrative) processes and tap into (networks of) civic, political, and professional energy. We (consultancy firm Urbancore and research agency OrléoN) designed a six step program in which we combined narrative analysis of meaning production by stakeholders in order to map their logic on the one hand, and strategies for network building, matching stakeholders according to their logic concerning specific societal issues on the other hand. These networks, in which meaning and logic are binders, are called microstructures. We tested this program in Feijenoord, a Rotterdam urban area. In the next paragraph, the six steps are presented.

NARRATIVE ANALYSIS AND MEANINGFUL NETWORKS

A microstructure is a small-scale, heterogeneous network of people (entrepreneurs, inhabitants, professionals, academics, civil servants, etcetera) who join their forces to solve a local problem they really care about. They can turn into single issue movements or other social networks, but we assume that they do not yet exist or operate only on a scale too small to create an impact. The process of creating microstructures is therefore an attempt to identify subliminal social needs and potential problem solving capacities, and to join the people concerned in a productive network, mini public that prepares new decision making and ways of working. To be successful, a microstructure needs both a joint problem analysis and some executive powers that take the co-production of policy beyond tokenism. This calls for a careful preparation, in which strategies for network building and narrative research go hand in hand. In our program, we distinguished between back-stage and front-stage performance while creating and facilitating

microstructures. Initially, microstructures do not exist or only on a subsurface level. For them to become (more) productive, they need to be created or made manifest. Where to find the right people to participate? This is mostly a concern for our backstage activities. Alternatively, to enable microstructures to attract participants we had not noticed or thought of ourselves, they also need a public face. This is the goal of front-stage activities. In short, back stage we select and front stage we facilitate people to self select, the latter to preclude we exclude interested parties. Table 1 summarises the six steps, which will be elaborated in more detail below.

Step	Front-stage	Back-stage
1		Orientation on key players in the area: walk around, talk to people, get them interested, sow the seeds for future networks by inviting people personally for step 2
2	Public meeting: outline of the program and invitation to participate, starting with signing up for step 3	
3		Narrative research: interviews with candidate participants and analysis of collective logics, to be presented in step 4
4	Public meeting: feedback of the collective narrative and invitation to step into microstructures, to be further developed in step 5	
5		Meetings of microstructures: deepen collective logic and problem analysis, develop program for problem solving and prepare for making it public in step 6
6	Public meeting: present the programs of the microstructures	
7	Grounding the microstructures, assuring that they continue along the lines of self organisation and social entrepreneurship.	

Table 1: front-stage and back-stage activities.

The table also shows a seventh step. Although we were not involved in this step, some ideas about grounding microstructures will be discussed.

STEP 1+2: MOBILISING AND ENTHUSING

The first step is to start mobilising possibly interested parties. In Feijenoord we invested a lot of time in face to face contacts, getting to know people and getting them involved in the program. We used the database of the civil servant responsible for the development of Feijenoord, in which he had collected his personal contacts. We enriched this database by adding new contacts and asking all contacts for further contacts. This enabled us to invite a lot of people personally for the first public meeting. Some 60 people participated in this meeting. Our goal was to enthuse participation, so we chose an appealing location (a local restaurant) instead of the usual spots for public meetings, such as community or sports centres. Our choice of location was also supposed to underscore that microstructures were not just another municipal initiative but an experiment initiated by several parties concerned, i.e. municipality, housing corporation, an external sponsor and us (we invested in this pilot as well). To further underscore this special character, we had a rich schedule of activities which both reflected the program in total (examples of narrative interviewing on stage and of dialogue techniques in groups) and appealed to a sense of community (we made a film and digital photo collage of the area which we showed during entrance and a local singer sang a song about Feijenoord). As a result, people not only were informed about the project, bur several people also signed up to be interviewed in step 3.

STEP 3A: INTERVIEWING

We enlarged the list of respondents by personally inviting others as well (both opportunistic and purposive sampling) and by asking respondents to suggest others (snowball sampling). Our selection criterion was that respondents had to be actively engaged with their neighbourhood. How they were active (for instance as inhabitant, entrepreneur, professional or civil servant) or for what were no criteria for selection. We wanted to focus on engaged and active people as the interviews were also used to select participants in the microstructures to be built. We chose narrative interviews as these are themselves potentially enthusing. In narrative interviews, people are invited to tell stories about events in their personal lives. We designed an interview guide for open questions about living, working, friendships, activities, and growing up in Feijenoord. We trained students with role playing to do the interviews and we invited people to be interviewed. Although we had invested a lot of time in establishing personal contacts, we found it difficult to find Moroccan women willing to be interviewed. In the end, 26 people were interviewed; 16 men and 10 women; 13 Dutch, 5 Moroccan, 3 Surinam, and 5 respondents of other ethnic origins (for instance Cape Verde or second generation immigrants). The interviews were recorded and transcribed extensively (including 'ehs' and slips of the tongue).

STEP 3B: ANALYSING THE NARRATIVES

The interviews were analysed three times. The first analysis was a thematic analysis as performed in grounded theory (Glaser & Strauss 1967). This resulted in an overview of themes and events that mattered to the respondents (what). We classified the themes in the five subjects from the interview-guide and connected themes that were related. For instance, growing up in Feijenoord was connected to living in Feijenoord as both took place in a built environment that was uninviting for children (lots of buildings, not much place for playing, unsafe traffic conditions, impoverishment). Furthermore,

it was connected to working, as the local labour market did not offer a lot of prospects and youngsters did not have many opportunities to show and develop their talents.

The second analysis was an analysis of perspectives (who). This analysis was based on the actant model of Greimas (in Bal 1985). In this model, that was designed for the analysis of literature, six positions can be identified in stories. There is the (anti) hero (subject) who sets out on a quest with a goal (object), there are powers that send him or her on the quest, there is a beneficiary (sometimes but not necessarily the hero) and there are helpers and adversaries. These positions are called actants, because they can be both human (actors or characters) and non human (entities). In every story there are subjects and objects, the other actants can be left out. An analysis of perspectives sheds light in how respondents position themselves in regard of the themes and events they bring up. For instance, when it came to youngsters, we found two main positions adults held. The first was youngsters as adversaries, causing problems in public space. Sometimes they (as subjects) set out to correct them (object), sometimes they expected others (municipality, police, social work) to act. Only people with personal negative experiences stereotyped all youngsters as trouble makers, attributing bad behaviour to a general sense that everything gets worse (dystopia). The second was youngsters as the beneficiaries of respondents' activities and projects, aimed at creating chances for them in the areas of sports, music, culture, and art. These people also sometimes had negative experiences with youngsters, but attributed bad behaviour to lack of present activities and lack of a future perspective. Youngsters themselves often took the role of subject with their own undertakings. The role of subject, however, was denied to them by adults, who saw them as either adversaries or beneficiaries. The latter positions made it difficult for them to understand youngsters fully.

The third analysis was an analysis of values based on rhetoric used by respondents (how). A narrative is not only a story, but also a performance, even when it is in an interview context. It is assumed that rhetoric, as a device to persuade a public (Kohler Riessman 2008), is an indicator for the value and truth the teller or narrator wants to convey. Some themes, for instance the quality of the built environment, were discussed using exaggerations, repetitions, colourful language and metaphors, whereas others, such as friendships, were discussed in more abstract, distant terms, stressing that a neighbourly feeling is more important than intense friendship relationships. Most people had some friends in Feijenoord, but more friends in other places. They did, however, all stress the fact that Feijenoord is a multicultural area and that they felt that mutual, neighbourly contacts could be improved. This, they felt, was more important for the social quality of the area then were new friendships. As a consequence, they wanted more possibilities for people to casually meet. Therefore, we changed the theme 'friendship' into 'connectedness'.

STEP 3C: CONSTRUCTING FEIJENOORD LOGIC

The triple analysis was used to construct a collective Feijenoord narrative, in which the five themes were presented as separate chapters, but with references to and fro to demonstrate the thematic interconnectedness. The analysis showed that most respondents who had lived in Feijenoord for a long time had feelings of nostalgia and to illustrate that, the chapters were organised chronologically. The chapters also showed how respondents had different ideas about the themes they discussed by organising the chapters as a dialogue with arguments for and against different positions. Below is an excerpt.

... ***Ik weet zeker dat er heel veel kwaliteiten is in Feijenoord en mensen die een bijdrage willen kunnen leveren in de buurt. Maar deze mensen moeten benaderd worden en die moeten de kans krijgen om betrokken te zijn.*** *Wij zijn een netwerkorganisatie, wij werken enorm veel samen met mensen uit de wijk. Zowel individuen als welzijnsorganisaties, jongerenwerkers, kunstenaars.* verbinding *Wij verbinden ons heel erg makkelijk aan partijen in de wijk* opgroeien *en hebben een positieve input gegeven in de afgelopen anderhalf jaar door gewoon ontzettend leuk met jongeren te werken...*

The use of colours and the labels ('verbinding' and 'opgroeien' or 'connectedness' and 'growing up') supports the referencing among themes. The larger font indicates that these lines are part of the summary of the story as it was presented in the next step, the public meeting. This is the translation of the excerpt:

... ***I'm very sure that there are a lot of qualities in Feijenoord and of people who want to contribute to the neighbourhood. But these people must be approached and get the opportunity to be involved.*** *We are a network organisation, we work enormously much with people in the neighbourhood. Both individuals and social work, youth workers, artists.* connectedness *We easily connect with parties in the neighbourhood* growing up *and have given a positive input in the past year and a half by just working very pleasantly with youngsters...*

The triple analysis gave insight into what we called the Feijenoord logic. For sake of space limitations I will not go too deeply into this logic, but I will briefly sketch some results. First and foremost, all respondents expressed a sense of pride in their Feijenoord, but they also saw room for improvement. What they said Feijenoord needed was better education, better job opportunities, better physical quality of the neighbourhood, a more open space for people to meet and get to know each other a bit better. Most respondents agreed on what Feijenoord needed, but they differed in the analysis of the situation and consequently the solutions they sought. We found two positions. The first was based on what we identified as traditional active citizenship. These respondents took part in commissions and councils (neo-republican). They defined their activities in terms of representation. They had the contacts with municipality and the housing corporation, but they felt that they were not representing the people

Figure 1: Coming about of microstructure 'Cultures living together'

of Feijenoord any more, as newcomers were often from a different ethic background. Part of their problem analysis was precisely how Feijenoord had changed into a collection of cultural, linguistic and socio-economic islands with little connections between them. They blamed these newcomers for not trying to blend in and municipality for disregarding the effort it takes for newcomers and older residents to get acquainted. They felt that no one had taken charge of the situation and felt powerless to do so themselves. The second, in contrast, was based on a new kind of active citizenship. These respondents took initiatives to solve the problems they saw. Sometimes this was a small initiative, such as buying flower bulbs to plant in her garden so that children in her apartment building could see the flowers blossom and learn to appreciate nature. Sometimes, however, this was a large scale, almost programmatic initiative that involved a lot of parties and organising, such as a sports school or an art sale where children could sell paintings for the local hospital and a Dutch well known artist performed. Typical for these respondents was that they just started and did not wait for grands or permission from municipality. Unlike the other respondents they had little or no useful contacts at the start, but sometimes developed useful contacts along the way. Another difference was that they in fact did represent a lot of people in Feijenoord. In short, one group had the contacts and knew the routes in official public administration, but were part of a small, closed network of (mostly white) people they had worked with for a long time, whilst the other group was deeply rooted in the neighbourhood and knew how to build open networks for collaboration, but sometimes lacked access to official public administration. Identifying the issues and respondents as part of one of these two types was helpful in the next step.

STEP 4: PRESENTING THE COLLECTIVE NARRATIVE

The fourth step was a public meeting in which parts of the collective Feijenoord narrative were read out loud, so that respondents and other interested local parties could hear the overall story back in their own words. As said earlier, the structure of the story reflected the themes that were considered most important, the different perspectives on the themes, and a comparison between what Feijenoord was like and has become today. The telling of the story took almost half an hour, but people listened captivated. After the story was told, the audience reflected collectively on its narrative and historic value, giving further meaning to the analysis. In the coffee break, several people stressed that they appreciated the effort that was taken to feed back the results of the analysis in the form of a story in their own wordings. This was experienced as a reward for their own efforts. People also said that the story was very authentic and that this helped to embrace the overall analysis, also the parts that were not theirs or that they previously perceived differently. They had actually learned more about their Feijenoord and its specific strengths and weaknesses. In other words, the collective narrative and its presentation had achieved that people in Feijenoord could agree on what needed to be done. After the break, the meeting continued in groups that were the preliminary microstructures. Inhabitants, entrepreneurs, professionals, and civil servants mixed and chose a theme for the story that appealed to them. They started with discussing the analysis, sharing their own insights and experiences (figure 1).

In the end, they presented their programs and an outline for future actions. These programs were 'Cultures Living Together', 'Feijenoord School' and 'Senior Citizens in the Streets'. The first program was aimed at ameliorating cultural openness in Feijenoord, so that people got to know one another and possibly get along better. The second program had as its goal to teach newcomers at Feijenoord (both youngsters and people who had moved into the area recently) about the past of this urban area (here lie the roots of the Rotterdam harbour area, one of the biggest in the world) in order to inspire them to big ambitions. The third program was to focus on senior citizens and improve their access to public space. Interestingly, all microstructures had both types of engaged citizens, so that the qualities of both types added up and erased the weaknesses of one or the other.

STEP 5: BUILDING THE MICROSTRUCTURES

The programs and goals outlined above in the fourth step were further developed in the fifth step, where the microstructures met three times. All three microstructures, varying from five to ten participants, collaboratively designed programs with which they want to establish what they think is important for Feijenoord. In the first meeting they continued the analysis and started

Figure 2: Second meeting of microstructure 'Cultures living together'

to design a program, focusing both on concrete activities and extending their network. The character of this meeting was more one of a brainstorm, in which all ideas were welcome. The second meeting was a bit more goal oriented and started with prioritising the activities, so that participants could focus on a to do list, such as for a public pick-nick in the local park (figure 2).
In the third meeting the plans were further detailed. In this meeting preparations were also made for the public presentation of the programs.

STEP 6: PRESENTING THE PROGRAMS

The sixth step was the public presentation of the programs the microstructures had developed. 'Cultures Living Together' outlined some activities for the near future, such as a pick-nick in the park and a festival in which cultures present themselves, followed by monthly exhibitions in which cultures alternatively host different activities such as cooking and dancing. Their ambition was to include multinationals as Unilever, with head quarters located in Feijenoord. 'Feijenoord School' focused on its ambition to create a curriculum in collaboration with multinational Hunter Douglas and other large organisations in the area. This curriculum was intended to help youngsters orient on working life, teach them for instance how to do a job interview, offer internships, and possibly a job. 'Senior Citizens in the Streets' presented a list of structural activities, such as activities for elderly at the community centre combined with a consultation hour about for instance Alzheimer's disease and other age-related disorders. This public meeting was the end of our involvement with the Feijenoord microstructures.

STEP 7: GROUNDING THE MICROSTRUCTURES

In this pilot our further involvement in grounding the microstructures was not foreseen. We did however include a small curriculum for the professionals who took over our facilitation. Our main reason for this was that we acknowledge that most professionals are unfamiliar with working with people who take initiatives and just act on a social problem they perceive. These are usually not the people they work with, the ones needing help. In other words, we thought it would be important to introduce them to a different kind of collaboration, in which they were not supposed to know it all, but to enter in an open and equal relationship with non-professionals. We met professionals in Feijenoord twice. In the first workshop, we explained the concept of microstructures and the six step program. We discussed with the participants how to build networks as they shared past experiences with working with clients. We stressed that citizens and entrepreneurs would not participate in microstructures as clients, but as people with specific knowledge about Feijenoord, knowledge professionals could lack as they see only one side of the picture. In the second workshop, professionals drew up a list of do's and don'ts for professionals in microstructures. They came up with the following list (table 2).
Although the workshops were successful in that they engaged professionals and in that professionals were willing to experiment, we felt unsure about the long-term impact on professional behaviour. Collaborating intensively with some of them, we were very alert to small signals indicating superficial learning. Examples hereof were professionals who stressed that the networking element of the six step program was a luxury they did not have in normal working conditions, while our thesis was that networking should be just that: part of regular activities. Another signal was the repeated referring to non-professionals as people who did not really understand what was going on, who were too shy to step forward or who analysed the situation based on deficient information. We interpreted these signals as resistance. This worried us and we tried to be very consistent and consequent in both our own actions and in responding to these signals, repeating the concept of the microstructures and its constituting parts in both the narrative meaning making and the active network strategies. At the time of the sixth step, we felt a bit more confident. However, we have lost sight of the microstructures and that feels unsatisfying. We feel we have established three microstructures with a lot of potential, but also that we may have left them too early. On the other hand, we have spoken to the person who initially gave us the assignment, and she reported that the microstructures are still in progress. So maybe, as we asked of professionals, we should learn to be not in control and to trust in the competences of others.

Do	Don't
Ask open questions	Think for inhabitants
Offer network and knowledge	Take over
Help in sequencing and prioritising activities	Underestimate the quality of input and the one giving input
Offer locations for meetings	Make everything bigger then it is
Offer facilities	Immediately pronounce objections
Take risks	Immediately offer funding as an easy answer
Keep your own promises	Safeguard your own position
Be explicit about your own expectations	

Table 2: do's and don'ts for professionals in microstructures.

FINAL REMARKS

In this pilot, we were eager to find out whether or not transdisciplinary teams were able to collaborate in social design. We combined our working experience and theoretical knowledge to design a six step program to create microstructures. Looking back, we conclude that local stakeholders are very able to come up with an analysis of the situation, the problems therein and possible solutions. We think the narrative approach, which respects all inputs and by way of a triple analysis puts them into coherent logics, is a powerful tool to create networks based

on shared meaning making. A negative point is that it is a labour intensive method, which makes it rather costly. A positive point is that people felt listened to, which was for some of the Feijenoord respondents reason alone to feel committed to their microstructure.

As for the mobilisation part, we found that the investment in time we needed to establish personal contacts had indeed resulted in a large network of potentially interested people. We invited some and others initiated participation themselves. In total, some 80 people were involved in the program and 20 of them participated actively in the microstructures. Although we were unable to interest some people we thought could attribute greatly (most of them were too busy with their own projects), we do think we have reinforced social engagement in Feijenoord. However, as we left early we are unsure about its long-term impact. In a final session with the professionals we worked with, they acknowledged that the microstructures might still be a bit fragile, but they stressed that they were committed to ensure their flourishing. As they estimated, it will take at least a year before the microstructures would operate more autonomously.

As envisaged, microstructures need some executive powers in order to actually realise their ambitions, therewith generating self organisation and social entrepreneurship, which could spill over onto other activities of the participants. We feel this latter part of the pilot was underdeveloped as we left at a critical point in the development of microstructures. Therefore, we will try to find other places to experiment, explicitly including a longer incubation time. Special attention will then be paid to tokenism, as we had the impression that professionals, despite their list of do's and dont's (see table 2), would easily slip back into their habit of taking over. It is especially important that participants in microstructures experience the power to make substantial changes, as this is considered to be an example for future civic activity. As the Dutch tradition in co-production of policy is not unproblematic, tokenism might reinforce cynicism on the sides of parties that would better co-operate in making society better.

To conclude, we recommend the following based on our lessons learned. First, start small in small steps. The scale of activities has to fit what people can handle. Therefore, large ambitions should, if necessary, be divided into smaller initiatives. This calls for patience and adequate facilitation. Small successes together also add up to large achievement. It is important to take a long-term perspective, hang in, and continue attention and care. Second, extend the networks and enrich the database with personal contacts, also of the unusual suspects. In the course of the pilot we found out that the databases of our partner organisations were not very helpful, incomplete and containing wrong and outdated information. We recommend a good network analysis which contains all sorts of contacts, for instance from clients, but also from people who have successfully initiated social projects, from companies and other parties relevant for microstructures. Third, connect microstructures to other relevant local partners. The content of the Feijenoord microstructures suggests that it is important to create a network between these initiatives and other relevant social stakeholders. One could consider other civic initiatives, partners in social work and education, large companies, associations of entrepreneurs, etcetera. Fourth, install a social area supervisor. In the Netherlands, the function of supervision is normal in physical projects concerned with building and maintenance of the area. He or she is responsible for the quality of the built environment. We suggest a similar function, responsible for the quality of the social environment and starting from microstructures. He or she is the ambassador for this kind of collaboration, opens doors, and oversees initiatives in order to interconnect them.

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CREATING ENGAGING INPUT FOR DESIGN TEAMS

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ABSTRACT

This paper focus on how to create engaging content for design teams based on user research and video.

Based on the work done by Blauhut and Buur a new camera style: the Cyclops camera is suggested. This style is placed in extension of the engaging camera style. The style allows more physical interaction, frees the observer from the hassle of operating the camera and allows for a more engaging first person view.

Some guidance on what makes content engaging is suggested relating both to the process of capturing video to the process of editing and refining the output.

Considerations on who to follow and how to maximize face time with scarce resources are given. Practical tips on where set up camp and where to linger to get insights from behind the scenes when doing field work in a medical setting.

INTRODUCTION

Today there is the notion that understanding the consumers is the key to designing desirable products.

How can this be obtained? Unlike tailor made items most products have a range of end users, often spanning age groups, income levels and geographic locations. Furthermore they are all individuals and it is not possible to know more than a fraction of the users.

In this paper I shall discuss some of the methods that the use of video recordings can facilitate, asking how to convey enough information without overwhelming the designers, revealing underlying patterns and how to make the experience rich and intense enough to make it stick?

ENGAGING WITH THE USERS

To know about users, data material must be collected. A number of different methods exist for this, each having different focus and outcomes.

In this paper I will focus on how to bring user research into the design process through the use of video.

I will try to use the level of engagement to characterize and segment the different formats in which video are used during early product development, while also explaining why I think it is important.

Figure 1 Engaging with user in rural area USA

Engaging with the users can be done at many different levels. It is hard to observe without affecting those observed. At least one should then be aware how you affect the results. The differentiating factor in my interpretation is the level of engagement.

FILMING AND GATHERING OF DATA

Video style as a way of describing the staging of the observer the camera and the observed in a context has been suggested by Blauhut and Buur.

Before proceeding to the 3 styles described by Blauhut and Buur, I would like to briefly discuss one of the methods where staying unengaged is key. This method is also widely used in product development.

USABILITY TESTING

Usability testing claims to be an objective method for evaluating user interfaces and for finding problem areas. In usability testing real users are brought into a lab setting to interact with products there is a list of tasks to perform and metrics are measured. (Nodder 2006).

When I conducted some of my first us-

Figure 2 Usability testing

Figure 3 First tries with video

ability tests, we were two moderators splitting the participants between us.
Facts were, that although I felt, I had not helped the participants, my batch out performed that of my colleague. Furthermore the preference rate for my favourite solution was up 10% in comparison with my colleagues' results. Need I say that I designed the system whereas she was only helping out testing the system.
So even though usability testing as a method is claimed to be objective, it is my experience that it is highly dependant on the moderator.
Video styles is a way of characterizing the way that the camera interacts with the user while the recording is taking place, Blauhut and Buur suggests that 3 different styles exist. (Blauhut and Buur 2009).

THE SURVEYING CAMERA

> *Like a nosy stranger, the camera scans the space and provides an overview of environment and people in it. It may follow people, but only at a respectful distance*
> *(Blauhut & Buur)*

I could recognize this video style from my first attempts with video in this course. Reluctant to engage and overly polite I hardly dare to speak to the persons I observe.

THE COMPOSING CAMERA

The camera paints considerate, well-composed pictures of how people move and act in context. It also is a talented listener, but does not mix interviews with action.
A lot of material in this style exists. It is often the preferred style of people experienced with making video recordings.

THE ENGAGING CAMERA

> *This camera takes on a role of its own. Like an eager partner it moves close to understand, to become part of the atmosphere. It likes to see other people's perspectives and join in conversations. People even address it and invite it to come closer.*

The style seems to work well in the few examples I have witnessed. Having the camera as a third participant, makes the observed more aware about showing what they do.
It seems there is a tight connection between the video style and how the observer and the camera stages themselves in relation to the observed.
Lastly I would like to present my own contribution to the styles suggested by Blauhut and Buur. The Cyclops camera:
THE CYCLOPS CAMERA

> *This camera is an extension of the interviewer. It engages with the others and challenges them. Fused together with the interviewer it is conceived as a part if him. The Cyclops camera plays a part and engages fully in the activity at hand.*

The Cyclops camera style is based on a body mounted camera, allowing the observer to move freely with both hands free. It is ideal for sports or labour where physical activity is involved. I would consider it well suited for capturing high intensity activities like rescue missions, fire fighting and extreme sports. It's should however not be limited to this only. Wearing the

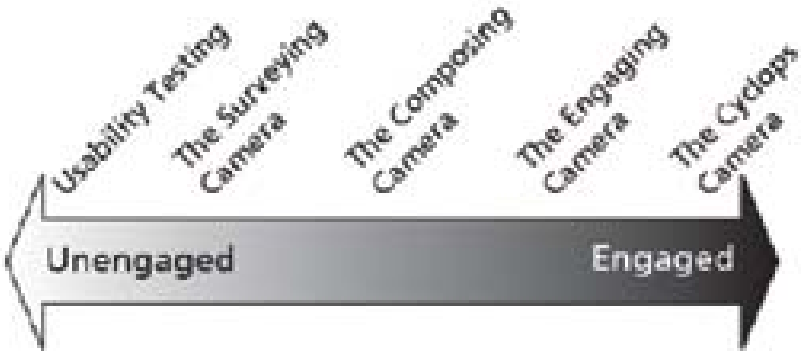

Figure 4 Video styles arranged by level of engagement

Figure 5 Helmet mounted video camera

camera gives less limitation in what kind activities the interviewer can engage in. Furthermore I found that this style allows for closer social interaction, as you are less occupied with operating the camera.

ARRANGING THE STYLES

As I have watched the different video styles, it became clear to me that they could be arranged according to level of engagement.
I have taken the liberty to add on the left hand side of the figure to add Usability testing though it is not part of the framework suggested by Blauhut and Buur.
In the centre I have ordered the three styles suggested by Blauhut and Buur. The 3 styles are arranged by increasing interaction as described in the paper, and thereby also by an increasing level of engagement I argue.
In the far right side I have added my contribution to the framework of video styles. In this style it is my argument that there is the highest level of interaction and participation in the activities being recorded. Though you could argue that The Engaging Camera shares similarities with the Cyclops Camera, There is the important distinction that the operator of the camera is not busy checking the picture or setting the zoom level during the interaction. Also it is seems that the camera is seen more as an extension of the interviewer and you therefore get in more close social contact with the ones you interview.
So from being a third party in the

Figure 6 Off the shelf HD splash proof camera

engaged camera, the camera is now linked directly to the person observing and is more an extension of the actor than a participant.

TECHNICAL SETUP OF THE CYCLOPS CAMERA

In my experiments I have used a rather crude setup mounting the camera to my regular helmet using a sponge for padding between helmet and camera and a standard cargo strap.

I have used an attached wide angle lens. Though adding substantially to weight I chose to use it as it gives steadier images.

On top I have a stereo microphone set to shotgun mode. The adding of a wind jammer proved to be a good choice sound quality wise, though it gave the whole contraption an even more curious look.

Several off-the-shelf-products that support this style are available. The cameras for this kind of use are primarily designed for and used in extreme sports.

Several mounting options are available. Helmet or head strap mount is ideal for the Cyclops camera style. A wrist mount type exists, that is suitable for the engaging or the composing camera.

IMPLEMENTING THE MATERIAL

While doing field work the team members who are actually doing the observation receive a lot of input and there exist a number of ways to convey the findings to other team members who are not directly involved. Raijmakers, Gaver and Bishay tell us how they use film to replace posters of personas.

> *"The posters did a good job in conveying information but were not effective at offering inspiration to the team – an experience they had had in previous projects".*
>
> *" The films did not give clear requirements to the team; rather they provided the team with a context of stories, objects, situations and above all people that supported them with inspiration and information during the design process."*
>
> *"Getting in touch so closely with the daily life of the people for whom they were designing was clearly appreciated by the team"*
>
> (Raijmakers, Gaver and Bishay)

User portraits are meant to inspire and to fuse the development process. But what does it really mean?

In my opinion one of the prime goals is to inspire and direct the ideation process. In short we want the audience to learn from the material.

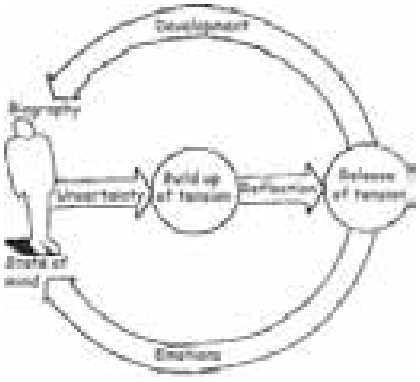

Figure 7 Model of reflective learning (McKay & Panduro)

ABOUT LEARNING

In order to survive you need to some extent to believe in the immutability of the world, at the same time adjusting your model of the world, to learn, and thereby accepting that the world is changeable. This is the paradox suggested by Jarvis.

Learning is the process, that transforms experience into knowledge, skills, attitudes and values. Learning occurs when the experience fundamentally differs from what has previously been experienced, what Jarvis calls disjuncture. The disjuncture is what starts reflection.

In conjunction with my master thesis I worked on creating an exhibition piece for a science centre. We came up with the following model for reflective learning through play. The models basis is the state of the user: His or her biography and state of mind. The user is then presented with something that challenges him or her, something that induces uncertainty. The uncertainty causes a build up of emotional tension and through reflection the uncertainty is eliminated causing release of tension. There is development in biography by learning a skill or understanding cause

Figure 8 Observing a consultation with nurse practitioner and person with type 2 diabetes.

and effect; but just as important there is joy, relief and excitement that add to the user's state of mind. If reflection is not able to remove the uncertainty the results are frustration and anger on the emotional side and that you are unapt for the task at hand on the development side.

If we apply this model to the task of inspiring the design team, we first have to establish uncertainty. Uncertainty can be derived from the context or from what people say or do. The level of uncertainty must be high enough to build up emotional tension. This is actually a measure of how captivating watching the film is. Thriller movies excel in this.

For the team members to learn anything they need to reflect and the higher the tension the more motivated they will feel to figure out what is going on. If they are able to make sense of what they see they will experience they will add this knowledge to their biography. The positive emotions derived from mastering or understanding is what motivates and helps us remember, but just as important this is why we develop empathy and relate to the people on the film.

So what it means for the material is:

- That it must induce uncertainty into its audience.
- Emotional tension must be raised to a level high enough that the audience is engaged with what is going on.
- The material must allow the audience to reflect and make sense of what is going on.
- It must be possible to get a sense of the subjects feelings to help build empathy and emotional engagement.

CASES

In the following I will discuss some of the cases I have been a part of. All are field work and user research.

BEING A PART OR OBSERVING

In September I did a field study in the

Figure 9 Shadowing nurses at a clinic. Hanging around in the back office

Figure 10 Follow up interview with person with type 2 diabetes in his trailer home.

US. The study combined sitting in on consultations in clinics, shadowing of the staff and follow up interviews with patients and staff.

Sitting in on a consultation clearly is observational focusing on what people do. It would be highly inappropriate to interfere with the consultation unless invited to.

SHADOWING

When shadowing you are still observing what people do, but you might very well do so while having a conversation with them. The combination of what they say and do allows you to pin point areas where there is a conflict in what they do and say. In order to find the unarticulated needs this is a very good place to look.

It is important to note that even though you have just arranged to sit in on consultations, you still need to hang around, so very often unique opportunities to see what happens backstage appear. So though shadowing was not agreed on or intended, intriguing information surfaces.

FOLLOW UP INTERVIEWS

When doing a follow up interview you have the opportunity to reflect on the observations together with the person you have previously observed. It shares the features of focus groups or regular interviews, but combined with previous observations it has the potential to unveil new understandings.

CHOOSING WHO TO FOLLOW AND WHERE TO SET UP BASE

When doing research in a medical clinic access to the staff is limited, so setting up camp in the lunch room or the back office is a good idea. Any place where casual conversation between staff takes place is a great place to hover as staff will hang around there if there are cancellations.

Staying in the consultation room while the health care prepares for the next patient you can often get interesting remarks widening the understanding of the consultation.

Who is hardest to get access to – most reluctant or the scarce resource? Setting up base and hanging around the right material makes a huge difference in how much data you get, but also the depth of the material is affected.

CASE VISIT IN SLUM IN INDIA

In 2008 I was doing field work in Chennai in India. We wanted to know more about the emerging market of India and we were especially interested in what has been known as the base of the pyramid (London and Hart 2004). We were visiting a community centre in the slum in the city of Chennai.

We were to meet up with a group of women, who used to assemble once a week. Next to the patio where the women assembled was a small room, where the men where lifting weights.

While waiting for the women to arrive, I entered the gym and compelled to try to lift some of the weights.

When I started lifting some of the weights they had lined up it became clear to me that not only was I studying them and trying to build rapport, but they were most certainly also studying me and building rapport. The experiment was interrupted when the women we had been waiting for finally arrived. At this point they had sent for the strongest man of the community. It became clear to me that though I was studying them they where most certainly also studying me.

The stills I took during the session were closest to the composing camera style, and as you can see from the pictures there was a feeling of "white men meeting the natives" during the talk with the women.

My meeting with the men was more engaging because I was not busy taking photographs or scribbling down notes. Using a Cyclops camera style could have captured the moment. By engaging in their activity on equal terms I was taken into their private circle. None of the other camera styles would have allowed this.

CASE: USERS IN THE FOREST, THE FOREST IN USE

This study was conducted as part of this course. The general idea was that the forest can be used as a metaphor for many types of systems. The forest has different users with varying access rights, Users have different interests and goals sometimes they are overlapping sometimes conflicting. I chose to investigate a small group of people who visits the forest on their mountain bikes.

The following is examples of what kind of analysis could be derived from a 2 hour trip using the cyclops camera style.

THE GROUP

The group is a loose network of family fathers and friends. The group assembles maximum once weekly, but often more seldom. The sessions are organised by either SMS or mails. Participants often first giving a noncommittal reply referring to the need to have the appointment endorsed at home. Sessions are often of 2 hour length.

THE RITUALS

The trips originates from Bentsens

Figure 11 Field work in Chennai

Figure 12 Interview - we are rolling

Figure 13 Bentsen

Figure 14 JC

home if he is on board. Often trips end on Fruebjerg – the highest point in Gribskov. During the trips there are high intensity sections and low intensity sections. During low intensity sections a lot of different topics come up including both family and work life. As such it is similar to many other networks. Of course there is also time to talk about equipment. In this little group all have medium priced models non of them carbon. I have noticed that as soon a bike passes the 10K price tag, it has an official price and a real price. The official price is what is told to your spouse while the real price is only revealed to people with a shared interest.

BENTSEN

Bentsen is the initiator of the group. He acts as tour guide often leading the way. His social position in the group originates from his vast knowledge of good tracks in the forest. His desire to lead the way causes exhaustion towards the end of the trips. After 1½ hour he feels cramps. He believes this to be caused by genetic misfortune rather than excessive exercise. Bentsen enjoys the tutor role, and luckily he is able to extend this to his work life as a teacher in 10th grade sports classes.

JC

JC is new in the game. He bought his bike only this winter and this is his first trip with the boys. JC is a sporty fellow who uses sport as a field of articulation. JC does not just run, he trains for the Berlin Marathon.

Keeping face and performing a "Bella figura" is key. JC performs wheelies and skidding for the camera.

RENE

René is also in for his first run with the boys. He is eager to learn, and has many questions during the ride. René has made a faux pas of cycling. He is wearing his padded shorts on the outside, revealing that he is new to the cycling sport.

ME – THE SELF PORTRAIT

It was most surprising to me that one of the best portrayed persons on the video material is actually not on any of the footage. I am the camera. When I make a move the camera is there. All my comments are captured.

Though new to cross country cycling, he has a long track record of long distance commuting on road bike and occasional races. He is highly competitive. He likes to underplay rather than to boast. Winning on inferior equipment is the best. The climbs are where he makes his moves and uses this to establish his social position in the group. He is willing to absorb a lot of pain to remain undefeated on Fruebjerg. He enjoys the psychological power play and makes casual remarks to test the others during what he sees as partly a trip partly a race.

CREATING CAPTIVATING MATERIAL

There is an ongoing discussion if such a thing as objective data in video material actually exists. In documentary film Aufderheide –gives the answer that a documentary is a movie about real life. But it is about real life and not real life in itself as it is constructed by a filmmaker to convey a certain story. (Aufderheide 2007).

EDITING A FILM OR USING SNIPPETS IN POWER POINT

In my professional work I have previously used movie clips to illustrate points and strengthen the message. We all know how captivating a slideshow is if read through after the actual presentation has taken place. In my experience the extra effort put into creating a storyboard and editing the film is often worth it as you mostly do not have the presenter available to bring the presentation back to live.

I still have not created film or documentaries based on the field work I have done. I guess that the notion of keeping the data neutral and true plays a role although no such thing may actually exist.

I have done screenplays to demonstrate use and context of projects done at Novo Nordisk. It is my experience that bringing the emotional side into play creates a more convincing presentation, but also placing the product in a convincing context works well.

When the film is edited a lot of choices have to be made. In this discussion I will focus on the choices that affect how captivating and engaging a film you create.

FOLLOWING OR TAKING PART

It is easier to demonstrate true interest in what people do if you are actually willing to participate. Also a video camera can be perceived as a symbol of power and again taking part in the activities puts you on even grounds with the ones you film.

Taking part gives the interviewer a better understanding of what goes on and enables him to ask better questions. It also gives those he follows the opportunity to reveal tips and tricks on what you are doing. In the portrait of the apprentice it is however me the interviewer that gives tips and tricks to the apprentice. Just the same it reveals rules and standards that otherwise would not be mentioned, such as that cycling shorts goes on the inside.

When we shadow staff at clinics, we are able to ask questions but often we are prohibited from taken the role as an apprentice. Even with patients we are not allowed to for instance measure our blood sugar, so in my particular field this technique has its limitations.

Figure 15 The apprentice

Figure 16 Me -ready to mount the camera

CHRONOLOGIC OR THEMATIC

I tried cutting 2 of the portraits in a chronological order to stay as true as possible to the material. The 2 others of Bentsen and the Apprentice were made with a thematic storyboard to enhance the message. Especially in the video portrait of Bentsen I have deliberately rearranged the scenes to create a better flow in the story. In this way the questions and points are kept closer together making the link clearer to the observer.

I actually also mostly use the thematic approach when creating slide shows too.

VIDEO STYLE

I have previously talked about how the video style affects what kind of material you obtain. From the limited material I have been able to create, it seems that the first person perspective has an engaging element to it as the movement of the camera reveals what kind of accelerations the rider is subject to. Likewise you can hear the breathing getting heavier uphill and the wind turbulence downhill. In this way I think that it is more like being there than if it was shot from a moving car or steady cam along the route. For the portraits of the mountain bikers I think that the use of the Cyclops camera style has provided more engaging footage than the engaging camera style would be able to. It became clear to me that when filming using the engaging camera style things are shown to the camera, whereas when using the cyclops style it is more a person to person interaction.

I would like to point out that the user portraits still contains clips that convey context like what is dominating in the composing camera style, that is necessary for the sense making.

Likewise there are clips that have the quality of the engaging camera with the important distinction, that it is me as a person and not the camera that is invited closer to for instance have a look at the gear changer.

I have actually considered bringing a smaller portable for the field study in US mentioned in this article. I refrained from doing so, as I feared that strapping gear onto nurses, doctors and patients would jeopardize the relation. It could however be interesting to do so to illustrate workflows and interaction between staff.

CONCLUSIONS

Video is a helpful tool in capturing and analysing user research, but it is much more than that. Edited video is powerful tool to convey the findings to others that has not participated in the field work.

Video styles is an interesting way to talk about how the staging of the interviewer, the camera and the observed affects the resulting footage, but also how the video style defines the roles of the implicated persons.

A new camera style the Cyclops Camera is added: From being a third party in the engaged camera, the camera is now linked directly to the person observing and is seen more an extension of the actor than a participant. It became clear to me that this also facilitates a closer social interaction as the observer is to a less degree occupied with operating the camera.

To bring the cyclops style into action in a Novo Nordisk context, it would be interesting to have staff in clinics wearing a cyclops camera for a day.

For video to guide a design team in a design process the team must learn from the material. From the model of reflective learning some guidance on how to arrange the material can be derived.

- That it must induce uncertainty into its audience.
- Emotional tension must be raised to a level high enough that the audience is engaged with what is going on.
- The material must allow the audience to reflect and make sense of what is going on.
- It must be possible to get a sense of the subjects feelings to help build empathy and emotional engagement

To create engaging material the following became clear to me that:

- Taking part in the activities studied creates more engaging situations and thus is better than just following and observing.
- Creating a thematic storyboard linking questions points closer helps reflection and is therefore better than the chronological approach.

Planning for the unexpected gives you unique insights on what goes on behind the scenes. Hang around in the back office or set up camp in the dinning area of the clinic to capture informal conversation or interesting work patterns to shadow.

And finally the content of a video recording is often surprising even to the one who shot it.

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PROJECT-IN-A-DAY: FROM CONCEPT MOCK-UPS TO BUSINESS AT PLAY

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ABSTRACT

In innovation work that spans various professional contexts, there is an overreliance upon verbal explanations and one-way presentations, as opposed to demonstrating, trying and performing. Organizing project teams across organizations and professional competencies relies upon creating active collaborative activities that allow participants to both move forward with the project, while reflecting upon how they work together. Innovation work involves not only discovering what could be possible, but also bringing novel solutions into practice, and driving the business to get them there. This contribution seeks to explore how staged role-play activities can raise practice-specific issues. The authors argue that by staging prospective project trajectories, especially at the outset of a project, the partner team members have the opportunity to orient their future actions according to potential desired and undesired futures.

INTRODUCTION

Innovation work across disciplines and across organizations requires working out both overall project directions and goals, but also what Corbin and Strauss (1993) refer to as "articulation work", working out the practical details of what will be done, when, how, and by whom. Team constellations are often in flux and understanding is partial. Non-cohesion or the dissolving of cohesion can occur for a variety of reasons. However, the chances increase when exploring undefined project spaces where the "what", of a potentially valuable outcome, the "who", as far as the competences of people involved in the outcome, the "how", of activity details, the linking of activities, and people working together and apart, and the "and then what", of who will carry the outcome further for what purposes and how, are part of the project challenge.

Aside from having robust "boundary objects" (Star & Griesemer 1989)— common objects such as a project proposal that constitute a shared understanding when together, but become highly specified in relation to each specific organization— for mediating interdisciplinary relationships across organizations, the audience(s) of a project effort can play an important role in focusing the working relationship among partners and team members throughout the span of a project. Academic researchers generally gear their efforts toward the research community they participate in, and/or the constituencies of project domain (subjects/users and stakeholders). Consultants first and foremost gear their efforts toward their paying clients. However, there are also secondary and tertiary audiences inside and outside the organizations people work for. These may involve current and future collaborators, supervisors, trainees, or policy makers.

In our case, one of us works for a design consultancy and the other a research institute. In recent years we have been partners in two innovation projects that challenge each of our organization's standard working practices. The projects have been state funded, without a direct client, yet with explicit goals for innovation and methods explorations. As innovation projects, they were expected to reach further into the business agenda than either organization generally works. Additionally, they were initiated under the ideal of three equal partners. We find two challenges that arise in innovation research projects on both the inter-organizational level and the interdisciplinary level: (a) when externally based stakeholders, such as a clients or funder, does not define the di-

rection and output of the project, these issues must be attended to through the project process; and, (b) the mismatch of expectations and understandings of the work of others, between project partners and between phases, become increasingly explicit the further a project moves from the planning and funding stage to the practicalities of organizing and conduct project work, especially as the final outcome of the project nears.

We ask the questions, how can we create an activity that provides insight into the competence of not only the various participants necessary in the project, but in the types of trajectories the project could take through various phases?

What is the value of creating a microcosm of the entire project process?

To begin addressing these issues at beginning of a project, we introduce the "project-in-a-day", a compressed version of an entire project process. We draw our example from an activity that we held at the beginning of the Språkskap project. Språkskap set out to support Swedish language learners in Sweden to turn their everyday interactions with Swedish speakers into learning encounters. This involves developing new tools for supporting learners outside the classroom setting. The project brought together three partner organizations classified by the funders as the "problem owners" (language school), the "technology developers" (design consultancy) and the "research organization" (research institute). It was funded to develop an IT demonstrator with business considerations and user-driven design methods. The project team faced not only the prospects of a multidisciplinary project team make-up, but an inter-organizational collaboration. The project was funded to tackle a complex issue, while at the same time funded to explore new user-driven innovation methods. The core team representing the three organizations was made-up of a software engineer, an interaction designer, a language pedagogue, and a design anthropologist.

Here we are interested in taking a closer look at the one-day of project activities meant to combine an effort to align the project team and organizations with productive generation of possible future directions of the project. This involved an attempt to understand different perspectives enough to act together, integrate various competences and values into project solutions, and project into the future enough to identify candidate project trajectories, their opportunities and obstacles.

We start by introducing a filter for analysing professional practice in action. After an overview of the *project-in-a-day* activities, we draw on criteria for analysing 'professional vision' to help us explain the different visions raised during the 60 minutes of sales pitch drama activity. We explore how the business actions at the end of the project created a viable business plan that re-shaped potentially key characteristics of the language support concepts. We conclude with reflections on the value of such activities and practicalities of organizing the project-in-a-day.

PROFESSIONAL VISION

Goodwin suggest that to understand a professional practice, a practice-based theory of knowledge and action looks to understand the professional vision that is created in communities of practice. This involves analysing practitioners' *coding and highlighting practices and their production and articulation of material representations* (Goodwin 1994).

(1) coding, which transforms phenomena observed in a specific setting into the objects of knowledge that animate the discourse of a profession; (2) highlighting, which makes specific phenomena in a complex perceptual field salient by marking them in some fashion; and (3) producing and articulating material representations. By applying such practices to phenomena in the domain of scrutiny, participants build and contest professional vision, which consists of socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group (Goodwin 1994: 606).

With the goal of improving our abilities to align our working understandings, we wish to raise and understand the socially organized ways of seeing and understanding by the multiple partners in a project, as well as the multiple disciplinary phases of a project, but in a way that can practically inform the working relationship. Our explorations into techniques that conflate the very issues of articulation work into each aspect of the working process, arise out of the premise that such issues as team building, alignment, and appreciation of each other's competence, should not be an isolated set of activities. Rather, these issues should be integrated into the research, design and innovation process itself.

PROJECT-IN-A-DAY

Early in the Språkskap project collaboration, the project core team of four (pedagogue, design anthropologist, software developer, interaction designer) held a compressed version of a "complete" project process. We (a design anthropologist and a designer) worked out a plan for the day that involved a set of activities that were meant to represent the types of activities that we thought would be in the project. The idea was run through a rough, rushed process that started in representations of the use context, then went through two interactions of prototyping concepts iteratively with user involvement, and concluding by pitching the concept to investors. The workshop took place at the design consultancy offices, so we were able to recruit employees to be the users and stakeholders that fit the profiles required in the project. We involved two language learners each in the begining stages of learning Swedish, two fluent Swedish speakers, and two business representatives. The schedule was timed carefully to be able to involve the users and stakeholders at the agreed upon time and to motivate quick conclusions.

This paper draws on the video documentation, pictures and our notes of the final one-hour activity. We chose to analyse the material from the business activity because of the strong contrast between the design practice we are familiar with and the unfamiliar business practice.

Overview: The day was split into six activities:

- **Mock-it-up:** Attend four stations: (a) Context; (b) Adding; (c) Content; (d) Provoking learner/coach, generate ideas to support encounter between learners and speakers.
- **Try-out 1:** Engage the other team with your ideas through having them try out use scenario.
- **Refine & mock-up:** Prepare for sec-

ond try-out.
- **Try-out 2:** Engage guest Swedish learner & guest Swedish speaker in try out scenario.
- **Document & summarize:** prepare sales pitch
- **Sales pitch drama:** Engage two guest business professionals

We organized the activities with a focus upon people "acting out" situations as if they were real and in real time, and creating activities that allow people to play themselves rather than fictitious characters.

The four team members worked in pairs throughout the six activities. Each pair started from pictures of everyday situations where learners and speakers meet, such as a parent (learner) dropping the children to kindergarten (speakers), a person (learner) waiting at the bus stop and asking a woman (speaker) for bus information, or a someone (learner) picnicking with a group friends (speakers), and sought to support interactions between learners and speakers.

For the first try user out session, the other pair played the users. For the second try out session, learners and speakers unfamiliar with the project were recruited from the company. For the sales pitch drama activity, we involved the company CEO and the director of marketing and business development. While the first activities of the day followed rather common collaborative design practices with designers and users working together (e.g., Kyng 1995), the final activity introducing the business perspective, was not.

COLLABORATIVE PROTOTYPING & PERFORMANCE

The *project-in-a-day* activities draw upon a long history of cooperative/collaborative design in Scandinavian tradition of Participatory Design (PD). Participation in PD was initially a reaction to *formal description* in systems design as a way of representing worker activities. PD focused on how specific knowledge (skill) can (or cannot) be represented and shared. PD's agenda has focused on developing technologies that support skill building rather than deskilling workers through the creation of expert systems (Bjerknes et al. 1987). Collaborative prototyping is an activity that has played a central role in supporting the mutual learning between designers and users in the design process (Greenbaum & Kyng 1991). Representations of use and of design, often in paper and cardboard, are used in collaboration between users and designers to enact future possibilities while drawing on design and technological expertise and user experience and skill. These representations are meant to allow end users to simulate their work while using a future working system (Kyng 1995).

While there is a long history of cooperative/collaborative prototyping, there is less work done to bring work concretely with a future orientation to the business aspects of design and innovation. Moving in the direction of business and planning, Mattelmäki et al. (2009) organized a partner workshop where they introduced collaborative prototyping for mocking-up the strategic relationship between two organizations in the public health research. Similar to the *project-in-a-day*, they focused on creating a series of "authentic-like" activities mimicking a project process. The workshop activities rely upon acting out rather than description, and the creation of material representations acted out for video recording. In the second day of the workshop, the participants used the material output of the workshop to concretely plan future activities.

Matthews and Clark (2005) explored how a boardroom drama activity was used to hand-over the results of a service design project from a design research team to a company client. The team facilitated a boardroom drama creating mixed teams of researchers and the client to enact an exaggerated scenario of pitching and critiquing the potential concepts. The role-play activity was used as a basis for exploring value of the concepts in relation to the company strategy and organizational particulars. The case demonstrates how in the role-play, the local business participants draw upon their knowledge of the company to merry the incoming concepts with issues the consultants were not privy to.

Through the *project-in-a-day* case, we are interested in further exploring how practice-specific knowledge, especially in relation to business issues, can be introduced in a format relevant to the inter-organizational project team. In our final activity of the day, like the boardroom drama, the team seeks to stage an activity that draws on the knowledge of the specific professionals. However, the knowledge is not drawn from a specific organization practice, but rather drawn from a competence specific practice. In the next section we will explore what happens when we invite guests with a specific professional vision to put their competence "in play" in relation to our specific project?

60 MINUTES OF INNOVATION BUSINESS

Here we wish to focus upon the shift from developing new concepts for supporting language learning in everyday encounters, to the business issues that arose in the sales pitch drama. After a fast-pace day of concept development through collaborative prototyping, the final activity was scheduled at 3:00PM, a one-hour timeslot for two of the design consultant's business experts to join. As the two teams finished their preparations for short presentations, the design consultancy's CEO and director of marketing and business development arrived to the room on schedule. The four team members and two guests spent the following 60 minutes focusing the business potentials and short-comings of the project concepts. The hour involved:
- Introduction to the project and purpose of activity.
- Concept presentations I & II
- Sales Pitch Drama preparation (A. Pitch team, and B. Venture Capitalist team).
- Sales Pitch Drama

CONCEPT PRESENTATIONS I & II

After a short introduction to the one-hour schedule, each team gave a five-minute presentation of their concepts to the two guest business representatives. They sat at a table listening, while each team stood and presented using paper and foam materials. The presentations introduced the need and the functionalities of their concepts and described use scenarios to demonstrate why they were strong, useful, and innovative concepts for supporting language learning in context.

I. *The Language Magnifier* is a device that breaks-up a single word into letters and sounds. The team used a

Diagram 1. Beacon presentation to business representatives

bulky foam prototype that displays a word and allows tangible manipulation of the letters and sounds. They presented a scenario from the earlier user test of a woman (Swedish learner) finding a note on her apartment building bulletin board and asking another woman passing by (Swedish speaker) about the contents of the note.

II. *The Beacon* is a web service combined with a hand-held device that allows users to identify and connect with Swedish conversation partners in public spaces. The team describes how it works using themselves as an example of Swedish speaker and a Swedish learner. As is common when presenting together, the presenters speak as if telling the same story:

A:	You are enrolled in the program
B:	the Språkskap site where I have a profile, which says what I want to do. What kind of commitment I am willing to do and this little thing [holding a cardboard device in his hand pointing to a color piece sticking out] means I want to talk to people that are interested in interaction design, people in my age, I want social chitchat and so on.
A:	and then I'm a learner and I have the same similar life myself and also what type of dilemmas and also issues [I am having].
B:	And when we pass each other in the train, it beeps.

Example 1. Excerpt from Beacon concept presentation.

Diagram 2. Sales Pitch Drama: Investor team on the left and pitch team on the right.

SALES PITCH DRAMA PREPARATION

Instead of engaging in a discussion about the ideas, however, we split into two groups of three. Each group had one member of each team, and one of the business guests. One group was assigned the task of preparing a "pitch" for both the concepts, and the other group was asked to be the investors who would scrutinize whether the concepts were worthy of funding. The groups were given 20 minutes to prepare before returning for the sales drama. The director of marketing and business development led the pitch team and the CEO led the investor team. When they returned from their preparations, the teams sat across from each other at the table.

THE SALES PITCH DRAMA

The design anthropologist introduces the drama activity. He then takes his seat as a member of the pitch team and the role-play begins. The director of marketing and business development sits between the two group members with a single piece of paper on the table in front of him. The pedagogue holds his group's prototype. The two investors sit with their notes in front of them on the table (the third member is behind the video camera). The design anthropologist starts the activity by holding up a piece of paper and stating:

Pitch1: We would like to give you this two-minute video. [Pause] You are now convinced that this is an amazing concept.

Invest1:	Yep, good concept!
Pitch1:	So, no, this is the actual product. Exciting isn't it?

Dialogue 2. Concept introduction.

There is group laughter as the director of marketing and business development (Pitch1) begins the presentation for the pitch team:

Pitch1: We have some information about what we thought about the business model, and distribution, how we think about customers, customer segments, the margins we have. We will tell you a little bit about the management experience in the company. And a little bit about the non-existing competition. But maybe you would like to run it according to your agenda.

Invest1:	It's very much according to our questions.
Invest2:	Yep
Invest1:	So...

Dialogue 2. Pitch introduction

At the outset of the drama here, Invest2, the co-organizer of the workshop, turns to her partner Invest1 and informs him about the structure of the activity:

Invest2:	I forgot to mention Invest1, our plan is that you're, you are like the leader from our side.
Invest1:	Am I?
Invest2:	Yeah.
Invest1:	Ok, am I? OK.
Invest2:	I'm the sidekick.
Invest1:	Ok, you are the sidekick. Ok. Um, but please continue.

Dialogue 3.

Pitch1 then introduced the business model, followed by questions and answers over the course of the next 20 minutes.

As you saw, this is a service that you run on a digital device. And it can be used in many different ways to enhance communication between people uh learning a language. We are not planning to develop our own devices because that's too costly and we think that the technology already

	exists in current mobile phones and devices that people carry. So even though we showed it on our own device, our goal is to develop a pure software application and it's gonna be a global version. We will start by rolling out Swedish, because that's what we are uh... have started actually experimenting with so far. But we have a roll-out plan with English, Spanish, Mandarin. So four languages. So, and it's gonna be a software that we are going to sell and put on all the app stores of mobile phone providers such as iTunes, Sony Ericsson store, Nokia store, and so on. And all the other [places such as] airplanes.

Dialogue 4.

Here at two minutes into the presentation, as the business representative talks, the pedagogue puts down the prototype that was not presented in any way, takes out his notebook and begins writing. The design anthropologist takes out his notebook and also starts writing. In contrast to the previous concept presentations, these first three minutes of the drama produce a strong contrast between the issues *highlighted* in the project by the core team and the business representative. Through introducing the business model, Pitch1 departs from the original concepts as they were presented earlier, by stating that it will not be a new device, nor will it be focused specifically on Swedish. Rather, as if excusing the team for having focused on Swedish, in the business criteria of market size the Swedish market is very small while the English, Spanish and Mandarin markets are very large). In relations to affordability of development, hardware is too "costly", while software is affordable. The important tangible features of the concepts are reduced to software that is only activated via an mobile application, leaving the physical nature of interaction to what can be found in existing mobile phones and computers.

The pitch drama continues in a question and answer format in 15 minutes between the "lead investor" (Invest1) and the "lead pitch man" (Pitch1), with an occasional comment from the design anthropologist and the pedagogue. The core Språkskap team of four are left as a complicit audience to the re-shaping of their research and design agenda by the business representatives. The questions and answers demonstrate how the business argumentation "should" ideally be supported in research. For instance, in the exchange below, Pitch1 fabricates his story about testing the product and conducting surveys to address an important business question:

Invest1:	How do you know that they will buy this software?
Pitch1:	We actually don't know yet. In these target groups we have tested the product and we have conducted surveys about how they feel and if they would like to use it.
Invest1:	Hmm
Pitch1:	And our numbers are based on those surveys.

Dialogue 5.

This dialogue highlights that in building a business case that solidly demonstrates people will buy a software product, more is required about interest in the product and using it than simply product tests and surveys. At the same time, Pitch1's emphasis that "our numbers are based on those surveys" can be views as an off-hand way of demonstrating a certain level of certainty, while stating that it is not certain. Pitch1 continues throughout the drama to evidence through exaggerated or fabricated accounts, the work that the group has done.

Invest1:	Who is your target group?
Pitch1:	Yeah, we have segmented our market
Invest1:	Hmm
Pitch1:	And we have casual business users, we have global companies, we have vacationers, we have immigrants to the country, and then love refugees…
Invest1:	Yeah
Pitch1:	…people coming to the country because of loved ones. And we have done some studies and we think the penetration of this service in the different segments is gonna be after three years. Three years from launch, we are going to have 5% of the casual business users that are often-and-on traveling to different regions and need to explain something in a business meeting or understand something in the document or something like that and it could be more, but we think about 5% according to our studies. Vacationers is going to be significantly lower. It's going to be about one percent because it is a bit harder for Sweden to pay for a service like this.

Dialogue 6.

In this segment, Pitch1 again fabricates a storyline about "studies done" and

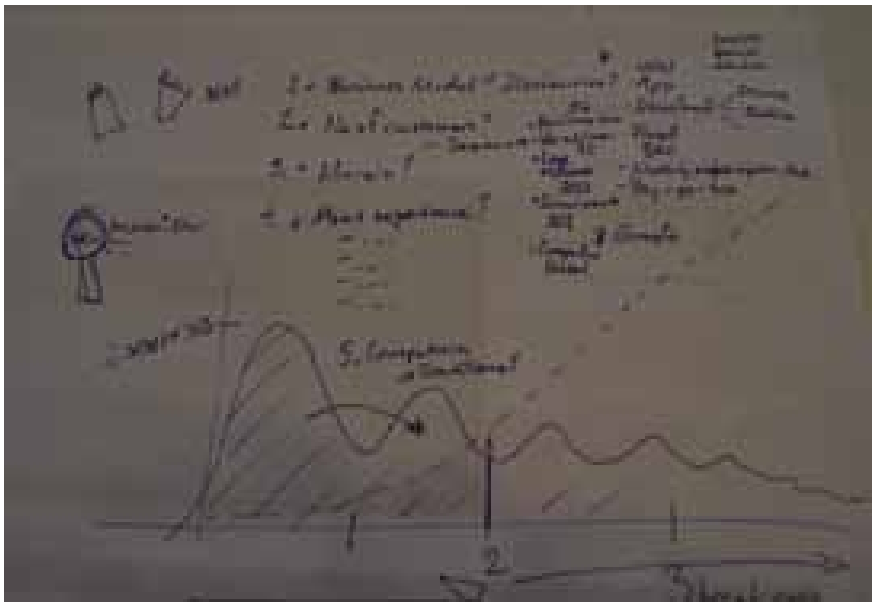

Diagram 3. Pitch1's notes and charts

percentages of markets penetrated. At the same time, he incorporates the needs and a description of use.

Pitch1 looks at his single page of notes throughout the presentation. Invest1 looks down to his notes before asking questions. Six minutes into the drama, they begin pointing to the same chart Pitch1 had written demonstrating the roll-out of various languages, the investment and return.

There is a sequence in the video when Invest1 asks the question, *Where are you in development of this product? How far away from product can be put on the market?* The cameraman makes a slight laughing sound while the pedagogue opens his hands shrugs his shoulders, as if saying "nothing". Pitch1 quickly glances at the pedagogue and back again to the paper in front of him, rotating the paper around to be readable by the investors while answering, the "development phase!". He then points to the graph and says:

Pitch1: The initial investment is done. So we have the programming for and we have all the data for the Swedish language.

Invest1:	Hmm
Pitch1:	So, I would say the main investment is done. In order to...
Invest1:	And how much is that?
Pitch1:	That's uh 25 million crowns. It's very little actually. And the next hurdle is going to be when we are going to take English.
Invest1:	Hmmm
Pitch1:	It's going to go from a single language translated to a multilingual
Invest1:	Hmmm
Pitch1:	So it is still quite big, but then we can add each other languages without so much extra.

Dialogue 7.

Invest1 interrupts while he points to a place on the graph:

Invest1:	Which language is that?
Pitch1:	This is Swedish plus the development time of the initial software.
Invest1:	Oh, O.K.

Dialogue 8.

This dialogue demonstrates a familiarity, interest and negotiation of understanding around the diagram and the discussion about investments and returns by the two business professionals. Rather than acknowledging the current status of the project and raising his hands and shrugging as the pedagogue does, the business professional turns to his prepared diagram, and provides a coherent explanation for how an investment and return process could work over multiple years while "rolling out" different languages for different markets. He adds an arrow to the diagram as he discusses. Investor1 points to the same diagram, asking for clarification. Satisfied, they move on to the next item.

In this instance, the business representatives provide a demonstration of business knowledge in action and in practice as it unfolds over the course of a business investment meeting. Here we see the Pitch1 articulates his representation in a way that allows he and Invest1 to carry on a coherent discussion that convincing reflects that of business knowledgeable investors. The credibility of their business knowledge, despite their "play-acting", the laughing and exaggeration with fictitious numbers and evidence, arises out of the naturalness of their discussion, shared vocabulary, and appreciation of, and ability to negotiate the details of similar representations. From the moment Pitch1 introduces the agenda and Invest1 responds the agenda is "very much according to our questions", we are able to recognize a shared *highlighting practice*. To reinforce this reading of the situation, we introduce a final episode from the drama.

Invest1:	You mentioned percentage. Did you mention anything about the total market potential in terms of money?
Pitch1:	No. We have not yet. The time spent doing...but that we could do.
Invest1:	Yeah, I can understand it. It is pretty hard to estimate that if that is not an existing product on the market.

Dialogue 9.

This time Invest1 provides a business explanation for why Pitch1 could not have yet addressed the value of the market. In this instance, the business representatives negotiate the limitations of market research in relation to a new market. Pitch1 did not attempt to fabricate appropriate numbers as in the other examples, but instead said that they could do it. Invest1 then highlights, as if agreeing, the lack of appropriate material to easily conduct such a market analysis.

A BUSINESS SHOWCASE

The 60-minutes with guest participation in the project team's activities provides a showcase for not only business practice, but of the contrast between design concepts embedded in use context and use scenarios, and the concepts evaluated in relation to their value-generating potential (return on investment, etc.).

In the concept presentations to the business representatives, the teams presented the functional merits and pedagogic value of the Language Magnifier and the Beacon. In the sales pitch drama, the business representatives ignore the details of these concepts, and instead discuss the their worthiness for investment. The pitchman and the investor raise a host of business concerns complete with demonstrations of possible ways of addressing those concerns. They draw on both the project material they were presented by the project team at the beginning of the hour, as well as drawing on what business vocabulary, including fictitiously filling-in unaddressed business concerns with satisfactory answers.

Most striking when putting the concept presentations and the sales pitch drama together is the great difference in terminology and use of representations. The pedagogue on the pitch team appeared ready for the prototype to be used as a prop in the presentation as in his previous presentation, only to put it down without any acknowledge of it. At the same time, when the question about what stage the project was in, the director of marketing and business development had prepared a representation that appeared robust in its ability to communicate adequately to the concerns of the CEO acting as investor.

STAGING & ROLE MAINTENANCE

We successfully staged the sales pitch drama so that the business represen-

tatives that were called in to help the team understand business concerns played the lead role on both pitching the project and scrutinizing the project as an investor. This allowed the project team to take an audience role watching a display of the practice of turning concepts into profitable business propositions. Pitch1 and Invest1 put on display the building and contesting of business innovation practice through the case of a new offer for language learning support outside the classroom setting.

The sales pitch drama did involve a certain amount of coordination. Inviting the right people at the right time to coincide with the project team's work. Tactically picking teams and a valuable sequence of activities. The role-play relied upon a playful atmosphere and the ability to develop the rules and roles along the way. For instance, at the beginning of the drama, Invest2 informed Invest2 that he was to take the lead role in the investor team. Despite such maintaining actions along throughout the activities, the main content did not seem to suffer.

DISCUSSION

The project-in-a-day, as emphasized by the final activity, successfully puts into play a wide variety of issues relevant for project partners. We were able to invite guests not as workshop participants, but as representatives of their field, to bring their knowledge to bear in an active way, on our material.

In this set-up, the four members of the project team are left watching and supporting their side of the argument. The way the sales story unfolds is, to a large degree, outside of their control, yet they are left to witness the possible dismantling or enhancement of their own ambitions for the project. In one respect, they are offered a coherent scenario of how the project could be handled from a business perspective. Here, the issues of affordable production, unrolling of the product, realistic distribution channels, and market potential dictate the development of the project. The social shaping of the project can be seen, heard, and felt by the differently positioned team members. They are left to assess whether the projected trajectories suit their organizational concerns, or whether they must take actions to address the project trajectory.

In contrast to a question and answer format where the project team would ask the business representatives about their opinion and be asked to answer certain questions about the project, the unfolding of the case allows the team (as audience) to understand how the case could develop version, especially in the case that the core team delegate the project maintenance to others. A future orientation to the business potentials: potential benefits, potential pitfalls, and the shaping that goes along with it, in this case, demonstrates an uncompromising set of criteria for a concept to attract investment.

The project-in-a-day leaves the team with material to use for articulating a wide range of project-related issues. For instance, by placing the two concepts together with the web service, they can ask, is this the type of outcome we are working toward (the what)? In reference to the try-outs, is this how we intend to engage users (the how)? Will we pass the project on to business representatives like this (then what)? Do we need anyone else in the project?

We do not claim that holding a project-in-a-day activity at the outset of a collaboration can solve issues, but rather that, it provides a showcase for how the social shaping process in a project can unfold.

Through the example, we demonstrate of the paper, that the process of creating and performing concept mock-ups in the design process can also bring great value to the business aspects of innovation. Attention to how professionals code and highlight specific issues and their production and articulation of representations can provide great insight into their professional practice. Rather than spending long periods of time working out the details of multidisciplinary interorganizational activities, we favor staging authentic-like aspects of the project in a way that favors action over description. We demonstrate that it is possible, in a rather short amount of time (an hour, for example), to bring the tensions between different practices together in playful rehearsal-like activities.

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NESTED EXPERIENCE: TEACHING OTHERS TO ENGAGE OTHERS

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ABSTRACT

There is a nested complexity to many participatory design challenges that can be overlooked in the initial stages. When we are teaching or training others to be participatory designers, we create a layered experience, which if we are not aware, can cause tensions for those people in the middle. It is the learners—who are both participants and guides for other participants— that must negotiate a dual experience. And we, as their facilitators, will be better prepared if we plan for it. This paper will describe a recent experience in which this tension became clear because we did not recognize the nested nature of the experience until we were immersed in it. I believe it is useful to imagine how to plan ahead for the nestedness of these experiences to achieve better results in the future.

In the beginning of 2009, I, along with two other design professionals, specialize in teaching design processes to clients and were tasked with "training four new hires in user-centred design methods" (the client's words) while completing an intense participatory project on a hospital floor, both learning and designing together.

INTRODUCTION

Hospitals, and other traditionally rigid industries, are beginning to explore the benefits of applying design thinking and user centered innovation to problems within their walls (Christensen, 2009, Brown, 2009). I tackled one such project while employed by a design and innovation firm for which there is a longstanding collaborative relationship with an American healthcare system. Together they have established a user-centered design and innovation group within the hospital setting, tasked with improving patient care on the hospital floor. This internal innovation group has earned several successes on their own over the past four years and so in 2008 was awarded an opportunity to expand their team to include four new people, through a large grant interested in measuring the effect of user-centered design in healthcare. As part of the grant, the healthcare group would hire four people with the potential to be user-centered designers—some with design training, others with hospital and healthcare training—to be trained alongside us as design professionals, as we completed a measured and tested design project on the hospital ward.

Figure 2: In the beginning the emphasis rested on our experience teaching skills to the new designers

In retrospect there are many topics of discussion that stem from such a project brief alone: the difficulty of learning while executing on a real project, the complexity of learning at once how to stretch creative problem-solving muscles, respect and honor participants in a participatory design process, and learn the strict and rigid behaviors of working on a hospital floor, among others topics. Because this is intended to be a short paper, I am most interested in exploring only the experience of teaching a participatory process in a participatory manner: the nested experiences. I will have to leave the critique of the project brief for another discussion.

PLANNING THE PROJECT

The health care client, and their supporting grant, specified two simultaneous goals: teach a participatory innovation process to the four new hires and deliver innovative, successful solu-

tions. The process of participatory innovation that we were instructing was a combination of user centred design (Kelly, 2005) and participatory design processes that the client's innovation team had developed while working alongside hospital staff. Participatory innovation was also the method used for delivering the design solution portion of the grant, in that as the facilitators of the project we would need to teach our processes and skills *while* engaging the new hires in identifying, designing and prototyping solutions in the hospital.

Three designers, with experience in teaching and facilitating user-centered design, came together in early Spring of 2009 to begin preparing for this design project. The healthcare client had conducted interviews and selected four new hires. Our project would begin when they finished their new hire orientation. The grant dictated that the project would last for two years from start of design training to finalizing the measurements of success. These metrics, simply put, were to be measurable improvements in patient health outcomes as a result of the designs from the project. The grant also described to us that our primary means for improving patient outcomes would be with the nursing staff: their tools, environment, processes and behaviors.

We had the benefit of the client team to guide the experience of working in the hospital settings. They would conduct training for all of us to learn protocol for patient and staff privacy, primers on how nursing staffs are structured and how shifts are run, and to serve as check ins for any specific questions about what we would observe on the hospital floor. Aside from that, once the corporate orientation was completed, our team from the design firm was in charge of the learning experience and project structure for the new designers.

We crafted a sketch of a timeline for the project that mirrors most design projects in our firm, with the addition of an extended time in the beginning for training the new designers and an extended time after prototyping to introduce concepts into practice in several hospital wards.

THE NESTED PROCESS UNFOLDING

Prioritized in our minds, and evident in this schedule, was the learning experiences for the new designers. We considered the flow of a design project and how to teach techniques ahead of time, as well as in the moment. We built presentations and workbooks to support discussions around observation skills and creative problem solving. We designed workshop experiences so that our new designers could learn in an active, hands-on manner.

Week	Objectives
1	Introduction to design thinking and user-centered design
2	Introduction to hospital UCD techniques (client-led)
3&4	First observations on the hospital floor, looking for the big opportunities, new designers rely on instructors for guidance
5&6	Synthesis
7	Stakeholder meeting: Sharing insights, making choices
8	Final opportunity areas chosen
9	Learning sessions: Observations and interviews
10-12	Observations in several hospital settings
13	Learning sessions: Synthesis
14	Synthesis of findings
15	Learning sessions: Making sense and Frameworks
16	Making sense
17	Preparing to share findings
18	Preparing for a Deep Dive workshop
19	Deep Dive to share findings and engage hospital staff
20	Making sense of what we learned from the hospitals
21	Learning sessions: Prototyping
22-25	Prototype building & sharing with nurses in context
26	Assessment of prototypes, choosing final solutions
27	Building working prototypes
28-31	Changing nurse processes to incorporate prototypes and gather feedback
32&33	Preparing training materials for nurses
34&35	Training sessions for nurses
36 & beyond	Incorporating new practices into existing workflows (client-lead)

Table 1: The project timeline followed this approximate schedule.

Figure 1: The affinities of the ten core team members involved.

This worked well for the first weeks. The energy and excitement of learning something new brought everyone together. The new designers practiced diligently, asked questions, read books and articles in their free time and maintained focus. Perhaps too much focus. While the goal of designing something to improve patient care was projected as the purpose of the project, it was fuzzy and vague for many months while we performed the groundwork of the grant. We did not know what we would build in the end, but we knew the steps to get there. So it was easier for us all to focus on the steps and trust that the solutions would come.

OVER-EMPHASIS ON REFLECTION

The learning experience was a significant portion of the project, and the reason that my design firm had been brought in to help. Therefore we all took it seriously. The client wanted to be sure that the value that our design firm brought was clear, tangible and recorded. They requested that the new designers capture their learnings in various journals and presentations, because they wanted to be able to transfer that learning to other new hires in the future. That added a sense of importance to the learning, and in turn, the learners. They asked more questions about process. They became more reflective. They captured their experiences carefully.

INTIMIDATION IN THE HOSPITAL

When we began the observations on the hospital floor it was a chance for

the new designers to try out their new skills. And it was also the beginning of building relationships with the nurses and other staff on the hospital wards we would be working with. Our client team stressed the value of building strong relationships so that we could engage the willing staff in the creative parts of the process. But hospital floors are intimidating places. It is stressful to interfere with the important work of healthcare, and to be seen as outsiders and novices. It was natural to rely on the experience and advice of the experienced client team. But it may have prevented each of us from constructing our own understanding and knowledge of how to engage our participants.

As a result, the new designers remained in the mode of "learner" while interacting with nurses, rather than "participatory facilitator." We made charts to track the people we spoke with, and the processes we observed. It allowed us to be sure that we were seeing everything we could. Yet artifacts that list and measure can build a wall between the observer and the subject.

REDIRECTING

It was then that our design firm team began to grow concerned. We sensed a tension within each new team member, a pressure to capture everything without absorbing it. We called a "Time Out" and literally moved out of the hospital for a day, leaving behind our charts and notes. We borrowed a room at the hotel and sat everyone down. We facilitated a discussion of what people were seeing in the hospital—without looking at their notes. This forced our learners to reflect, not on the skills they were learning, but on their observations of others. It was an invigorating day. They finished with a sense of confidence they had not had for weeks.

Figure 3: It was important for the new designers to focus on engaging the nurses, rather than on their experience with the facilitators

However, this reflection session was alarming to us as facilitators. We could see how the focus on process had affected the new designers' ability to facilitate participatory experiences on the floor. The goal of our observation phases was not to conduct strict ethnographic research limited to observation only. The healthcare clients had instructed us from the beginning that this experience is about learning from the nurses by building relationships and moving alongside them, and that solutions would fail if they did not come from the perspective of the nurses.

We finished our observations with some efforts toward a new attitude of engaging with and learning from the nurses. But it was when we left the hospital setting to conduct our synthesis and "making sense" sessions that we had a chance to really reset our thinking and habits with the nursing staff.

We needed to guide the new designers in the "service mentality" that comes with consulting and developing ideas alongside the nurses. There is a humbleness that one needs in order to engage participants in a dialogue about their goals and needs (Clark, 2007). It was subtle with our new designers, but the participants may sense whether you are working with them for their benefit or your own. "Learners" may err toward treating participants as subjects in an experiment, probing and prodding in order to learn. But strong participatory researchers empower participants with choices and treat them with sincere respect.

FOCUS ON THE END

A first step toward this new approach was to focus more on the end result. As I described earlier in the paper, the solution we were working toward was vague, and therefore easy to ignore. We brought that more clearly into focus by describing the steps of implementation. The client team was able to illustrate past examples of successful designs and how they had become a part of the hospital's processes. It is an extensive process of working with staff at all levels within the hospital and carefully engaging and designing alongside the end users. This served to emphasize the importance of being a responsible and respectful participatory researcher in the experience of the nurses' daily work.

PARTICIPATORY PROTOTYPING

With a renewed understanding of the attitude of engaging users in participatory processes that place users in a role of contributor and stakeholder, the designer learners began the steps of developing and testing prototypes. Focused on the truth that the nurses are participating in designing something that will soon become a process that they need to follow as a requirement of their job, our new designers saw themselves as the people identifying solutions that were dependant on, and shaped by the end users. The nurses must have a chance to influence and have their voices heard. Therefore the new designers were first facilitating experience, then designing products—experiences within a work environment that needed to engage the nursing staff in a way that enabled them to think critically about what they can change and sustain in their daily work.

A few practical habits helped us to be more "participatory" in the prototyping phase:

- Put making connections first. Before focusing on your ideas, focus on the participants. Taking time to develop relationships without working on specific ideas is worthwhile time spent. On some hospital floors we developed great relationships with influential nurses. They would act as our cheerleaders and networkers. They helped us learn more and they feel ownership over the ideas because they have been involved in them. On other floors where we did not have those relationship yet, and it showed. The nurses would look at the ideas as "yours, not mine" and could not be enthusiastic about trying them out.
- Support ideation with their stories. When building ideas with participants, it can be a lot to ask for them to invent ideas on the spot. When this happens, describe your goal, and ask for stories and examples of moments when that goal seemed possible, and times when it didn't. Look for the characteristics that are important to them, and imagine solutions.
- Always have a "cover sheet." A cover sheet would describe the goal or objective of the prototype. Start every interaction by describing the problem you are trying to solve, not the

solution being presented. Gather feedback from the staff about the problem first, to understand their perspective and to share your own. Once you have had a dialogue about the purpose you can begin to show a proposed solution and accommodate their perspective in the moment.

- Many of the tools for engaging participants are simply good researcher skills. But the context of prototyping is so different from the initial observation phase that the team can easily forget to apply what they know about asking open-ended questions and listening. A refresher was helpful to remind the new designers of interviewing and listening skills.

CONCLUSION

Partway through a two year project of helping a hospital to build it's own innovation design team, we gained a clearer perspective. A participatory design project has many experiences nested within it. Too much of our energy, and the weight of the work, was put into "transforming" the four new hire team members. This was a significant learning experience for them, and our goal was for them to feel inspired and in-control of what they were learning; constructing the experience themselves. Unfortunately, the result of that was that their experience became remarkably self-centered. While it is a helpful state of mind for people who are learning, it is in tension with the need for designers in a participatory process to put their participants first.

More crucial to the project than recording the learning that was happening was developing the skills to facilitate participatory experiences with nurses to find solutions to better care for patients. The fundamental belief of the client has always been that solutions are developed by, with, and for the end-user, in our case: the nurses. This is the very opposite of the reflective learner— one must believe that the answers lie in someone else. In retrospect, we did not move into that mode of thinking soon enough, making it difficult for the team to give up their own needs for the needs of the nurses. A few key learnings will help us design better participatory learning experiences in the future:

- Each of these nested experiences should have it's own ground-rules and structure. Identifying each of the layers in the beginning of the project, and begin with the central experience of the participant. Constructing all other experiences upon that could lead to a smoother experience for all people involved. We might have asked ourselves, "What will it take to make sure the nurses are engaged?" and then built the project timeline and the learning experiences around that.
- Make a distinct break between student-focused time and researcher-in-the-field time. After all, to the participants, we all were in the same position of outsider and disruptor. Once we enter the field, we are all facilitators of the participant's experience, and their experience takes priority.
- Be wary of habits that give too much weight to the learning experience. Instructing too often might take focus away from the end goal. In order for learners to become good facilitators they need time to find their own way toward the goal.

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EXPECTATIONS IN A PARTICIPATORY DESIGN TEAM

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ABSTRACT

A human factors specialist gathered ethnographical data for a deeper understanding of diverse team expectations, high-level team behavior and work culture throughout a participatory design process. Expectation levels were high for individual team members and the overall team itself, although expectations from the team for upper management were uncertain and were rated low to very low. Additionally, the participatory design team showed successful multicultural team factors to include honesty, competence, commitment, communication, creativity, and clear expectations.

INTRODUCTION

Participatory design does not just ask
Participatory design is often used within a mini-project to generate prototypes that feed into an overall project's design process (Fidgeon 2009).

Participatory design does not just ask users' opinions on design issues, but actively involves them in the design and decision-making processes (Schuler and Namioka 1993; Muller and Kuhn 1993).

Steen, Kuijt-Evers, and Klok (2007) state that "in participatory design end-users articulate a problem in their current situation and researchers/designers try to solve that problem together with them. In ethnographic fieldwork the researcher/designer shifts towards the end-users by interviewing and observing them in their current work situation. Both aim to get insight in a current situation of end-users or to solve a current problem for them."

Therefore, in this paper we present a journey through the participatory design process of control-room-layout design by a professionally and culturally diverse team. The researcher used in-situ ethnography and traditional case study methods to include personal interviews, a questionnaire and survey, and detailed observations and records of design meetings and outings to examine expectation levels and high-level team behavior.

Prior to the formation of this unique team, the Human Factors Engineering Group (a team of two) were to complete reviews for the control rooms in the new facility and created a guideline to provide a simplified design process for those reviews.

The design of a new facility, based on an already existing process, and layouts, including control room design, were to replicate the reference facilities located in a foreign country.

However, the preliminary layout designs and equipment lists were incomplete for all the new control rooms due to differences in standards and regulations from the reference facilities to the new facility, therefore requiring revised layout drawings and additional equipment and revisions to the reviewing guideline (Figure 1). The HFE group was tasked with the redesign of all control rooms as well as the final review. The control rooms involve the operations of the entire facilities. Therefore the inclusion of other departments and facility groups i.e., nuclear safety, chemical engineering, manufacturing and laboratory system engineers, procurement…etc. was necessary to gather needed information about equipment and other control room needs. HFE held several large meetings with many representatives from other departments to discuss the new layout designs. After a few of these large meetings, it was apparent that a smaller layout participatory design team was necessary to

Figure 1: The revised control room review guideline.

complete the control room layouts and intermittent large group informational meetings were more productive.

One of the authors, a human factors specialist, spearheaded a unique small design team to include professionals from multi-disciplines and cross-cultures, including former operators. Additional individuals from multi-disciplines and cross-cultures joined the initial small team when necessary as the layout process continued.

To work effectively in a culturally diversified team requires listening, open mindedness, to different perspectives of critical thinking and problem solving techniques and accepting that the parties at the table come with a unique frame of reference, lessons learned, and preconceived expectations (Janssens and Brett, 2006).

We discuss the way the participatory design team was staging its activities, how that worked and what the members' expectations were.

We start by explaining team expectations, the elements that form effective teamwork as identified in literature, followed by the dynamics in teamwork that we have analyzed in our study.

EXPECTATIONS: DEFINITIONS

According to the Collins English Dictionary (1991), expectation can be defined as a belief about (or mental picture of) the future, anticipating with confidence of fulfillment, the feeling something is about to happen, outlook, or the sum of values of a random variable divided by the number of values.

Osvath and Osvath (2008) conclude expectations, in humans, as "planning for future needs that relies heavily on two capacities, both of which lie at the heart of our cognition: self-control, often defined as the suppression of immediate drives in favor of delayed rewards, and mental time travel, which could be described as a detached mental experience of a past or future event. Future planning is linked to additional high complexity cognition such as metacognition and a consciousness."

EXPECTATIONS IN TEAMS

Forming multicultural teams is becoming more common as companies become more global. Janssens and Brett (2006) wrote, "Collaborations are generally organized in the integration and/or the identity model or the coalition model. Dominant coalition sets the scene, overrides differences that are not in line with its logic, revise and suppresses other perspectives. This, in turn, creates a less culturally intelligent team model because it discourages meaningful participation in information extraction and decision making."

The most common alternative approach, the integration and/or identity model, requires all team members to sublimate their cultural identities to that of the entire team by adopting "super ordinate goals" based on their common interests. The approach has the advantage of encouraging every team member to participate. However, it carries two risks. In the interest of unity, team members might submerge their cultural identities, and hence their ability to think differently. In addition, the effort to include everyone in decision-making might cause the team to function at the level of its least-creative member (Janssens and Brett 2006). The fusion concept aims to overcome that type of problem by ensuring that every member contributes his or her expertise to the team's discussions. This takes careful organization and team management. Every member contributes.

Successful teams have five things in place and a set of common characteristics (1) a clear sense of purpose, (2) well-understood norms of behavior (3) measurable success indicators, (4) clear roles and responsibilities and (5) operating rules (Douglas 2009).

Additionally, successful high-level performance teams adopt a set of positive behaviors that include dynamism, flexibility, action focus, new challenge acceptance. Their attention is directed towards capitalization based on competencies, high mutual trust, unconditioned team attachment, innovation, continuous learning and development. High performance teams have not only to respond to change, but also initiate it (Abrudan and Brancu 2009).

Horwitz and Horwitz (2007) suggest teams with denser expressive and instrumental social networks tend to (1) perform better and (2) remain more viable. These effects are especially potent when the network structures precede initial bouts of performance, but they diminish as time elapses and the familiarity of team members with one another grows.

To counter act diminished effectiveness, this case study suggested introducing new players to the team intermittently, especially when expertise is required from lead engineers or those individuals familiar with the reference plant operations and processes.

The high-level team discussed in this paper adopted the fusion concept. Additionally, the team did not have a leader hence the fusion team style ensured an equal input of expertise from all members. The human factors specialist organized and facilitated all meetings and the gatherings, but each member contributed equally.

ETHNOGRAPHY AND HUMAN FACTORS

Human factors specialists and ethnographers found in the workplace have similarities. Both use a form of observation of the work culture, the process of work, the behavior of human beings interaction with each other, the environment, time and space and are often times translators between engineers, designers and upper management. Additionally both are likely to be a part of a work team or participant of the group or team in a study (Jordan and Dalal 2006). However, traditionally the fields have very different roots.

Ethnography has a long history with its roots in anthropology, workplaces and more recently used in systems design. Ethnography understands the world from the point of view of those who inhabit it and is behavioral, i.e., interested in the detail of the behavior to a greater or lesser extent but only as part of the social system. In contrast, the human factors engineering field generally does consider the behavior itself as the appropriate level of analysis (Hughes, King, Rodden, and Andersen 1994).

According to Chapanis (1991) "human factors is a body of knowledge about human abilities, human limitations, and other human characteristics that are relevant to design. Human factors engineering is the application of human factors information to the design of tools, machines, systems, tasks, jobs, and environments for safe, comfortable, and effective human use".

The process presented here is a narrative of the journey undertaken by the team and reported by the human factor specialist who was also a team member. Our research inquiries included; what discussions occurred? What required

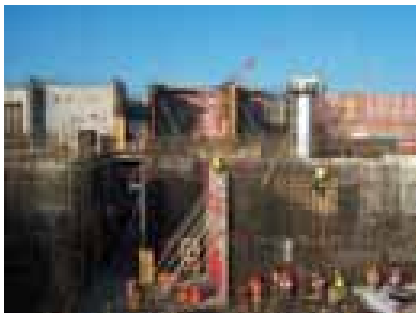

Figure 2: Huge quantities of rebar support the concrete to form massive walls for the six story complex facility.

innovation or caused frustration? How did the Team come to a consensus for decisions? What was the driving force behind any compromises made? What were the expectations from each team member and the team itself? What expectations did upper management have for Team performance? These were the questions asked to each team member during personal interviews and are represented as quotes throughout this paper.

METHODS

A human factors specialist, the first author, observed and recorded a participatory design process of a design team during layout meetings and outings with engineers, designers and users for over a year. Furthermore, because the specialist was also a team member and present during all the participatory design process, the study had an ethnographic element in it, in that it followed the process and the teamwork closely. For this study, a questionnaire and personal interviews were used to collect data and expectation levels were rated from 1-extremely dissatisfied to 5 being extremely satisfied.

THE DESIGN TEAM

A human factors specialist and applied psychologist, from the western USA, organized, facilitated and participated with the small design team.

Team members:

(1) a senior instrument and control and software engineer, many years of corporate, government, and military working experience, wise, worldly with a wicked sense of humor from Britain;

(2) a software engineer from French facilities operations, who is highly intelligent, calming, cool and collected while wearing two hats, one for operations and the other for software design, an uncanny ability to see details that others tend to miss from France;

(3) a chemical engineer from operations with years of operations experience is feisty, forceful and driven, a firecracker and dynamite in a small package, willing to put up a good fight and stand up for what is "the right thing to do for the operators", intense and dramatic from the south-eastern USA; and

(4) an electrical designer, eager, talented, excellent technical skills, common sense and smooth sense of the ironic, pays particular attention to what goes on "outside the box", also from the south-eastern USA.

The small design team met once a week. The team sent new layout information for review and comment to the larger groups via email. Meetings were held with the larger groups intermittently for final layout design.

Figure 3: A conceptual drawing of the completed facility.

THE PARTICIPATORY PROCESS

The design process for the control rooms discussed in this paper was long and similar to a journey or quest. The study was conducted for a year while the team continues to meet and will do so until all the control room layouts are complete. Team members preferred to visit the structure while under construction in addition to working on model layouts. The experience of being in an actual room helped with special determinations and the future physical control room environment.

During outings and meeting times the team often referred to the overall project as the "French Castle" or "French Fortress" due to the massive scale and extreme thickness of the double walls filled with debris surrounding the inner core structure (Figure 2).

The building will be windowless, concrete, gray, cold, and mammoth. Figure 3 is a conceptual drawing of the finished facility and outlying buildings. The missing effects: the drawbridge, a moat (filled with the local alligators) and the roofline adorned with security guard gargoyles spurting fire, hot oil or gushing water after a momentous rainstorm. Our research inquiries included; what discussions occurred? What required innovation or caused frustration? How did the Team come to a consensus for decisions? What was the driving force behind any compromises made? What were the expectations from each team member and the team itself? What expectations did upper management have for Team performance? These were the questions asked to each team member during personal interviews and are represented as quotes throughout this paper.

RESULTS

Due to the 20%, reduction in the building footprint from the original design and added extra amount of equipment and piping needed to comply with the new standards and regulations the team speculated on what type of control room operators might fit and work in the cramped, low-ceiling, labyrinth environment (Figure 4).

Finding adequate space for equipment and workstations were and continue to be the biggest challenges to this project from the standpoint of design.

The realization and response to space

Figure 4: This is a stark interior look of one of the low ceiling, windowless control rooms. 10 ft floor to ceiling height (red arrow) slated to be 8 ft. with raised floor and dropped ceiling for lighting.

Figure 5: A control room layout exercise using (to scale) colored paper for workstations.

constraints was expressed by team member (1) during a personal interview said, "Initially, there was all this moaning about how little space we had and I just felt it was overdone, however as we started shoving stuff in the first control room and the way that more and more stuff kept appearing. Then seeing the actual space that is allocated for the first control room (obviously which I had seen on drawings) but the reality of just how low the ceiling is etc. made me into a true "believer" to keep stuff out of the control rooms. So that is where I am now: revising the layouts to allow the minimum of equipment in there and (just) keep the minimum separation."

Additionally, providing adequate, comfortable workstations for a large number of operators was exasperated by space constraints.

An example was the Team did not have a designated designer assigned specifically to the control rooms and the need to work on a preliminary layout continued without a designer. Team member (1) and the human factors specialist came up with the idea to cut out colored pieces of paper for workstations. They brought the to-scale cut out pieces of papers to represent workstations to a team meeting. The team members worked together and fitted the cut outs on the preliminary drawing in the correct process order. During the creation time each member filled in the gaps, discussed workstation placement and work flow and what needed to be near each other and why. The meeting time was calm, easy, and fun. There were no arguments, just a lot of laughter. Team member (4) finally said, "This is a billion dollar project and we are using tape, colored paper, a ruler, and markers to design a control room for operators to work in for twenty years. This is not normal, is it? "The team, although proud of the new layout itself but slightly embarrassed by the elementary look of the layout, Figure 5, presented it at a meeting later on that day to the large group of department heads and met with surprising support.

During the layout process, the team realized the importance of including the 'human factor' into the layout designs.

Team member (1), "This process has really put in perspective, for me, the importance of the 'human factor' aspects."

Team member (2), "I learnt a lot about the 'human factors' issues."

Team member (3), "We were pushed for space so 'human factors' became a big player in this part of the project."

Team member (4), "How we can maximize space in the control room including incorporating 'human factors' elements into the design?"

EXPECTATIONS

The team was asked to rate the outcome of their expectation levels (a) for themselves as a team member, (b) their own expectation for the small team as a whole, and (c) the expectations the small team had for upper management. The rating scale was from 1-5, 1 being extremely dissatisfied and 5 being extremely satisfied.

During the participatory process experience, the team began to share their expectations for the assignment. Team member (2),"I tried to share my knowledge of the French control rooms processes" or team member (3), "The expectations of the TEAM are the SAME as my own" and team member (1), "team member 3 is forceful and knows (usually) what she wants but can be told differently. Myself and team member 2 both know what we're talking about and don't appear to be too stuck on any position. Team member 4 does a fantastic job interpreting what we decide. And the human factors specialist is a good organizer / coordinator that get the meetings to happen and drag us back on track etc.

The ratings for themselves as team members were all 5's, and for the small team they were 5. Despite challenges and compromises, the team rated their expectations as extremely satisfied for themselves and for the small team. Team member (4) said, "Each step was exciting - Eager, to make this design and project one to be proud of and able to use as a presentation if necessary to the client. This was a virgin control room for this project and so therefore there were no roots to follow as far as numbering, sizing, baseline furniture, steps or procedures to follow or milestones to track."

Expectation ratings for upper management were very low (1- very dissatisfied). Upper management did not appear to be interested in control room layouts and did not express satisfaction or dissatisfaction with the team. The team viewed this as disinterest and lack of communication that existed in previous lower level design efforts in this overall project.

Team member (3) said, "I don't know if upper management expectations for the team were met. I know upper management did not meet team expectations, not good communication with the Team." Team member (1) said, "I think the overall project and upper management had this expectation for some sexy, futuristic wall mounted large screen monitors that telepathically display whatever the operator desires. So if that is what they expected, I don't think their expectations were met; on the other hand, if they expected a complete design, than yes, expectations were met. Upper Management were missing in action. If they cared they would have pushed some of the other groups (cough, cough) into actually doing some work." Team member (3) said, "Upper management's main interest was to finalize the design. Some (upper management) didn't care if it was right or not, but just to finalize it. The good news is that the (small design layout) team made sure it was correct." Team member (4) responded, "Pushing out the project in unreasonable time, the time constraints were not measured in dates, but measured in the dates given with the time allowed to spend on project per day or week."

Along with the expectations of upper management additional expectations were apparent from other project groups (those involved in the larger review meeting). Issues and frustrations with other groups and expectations from the small group for the larger group and vice versa were expressed although not rated but voiced during the interviews:

Team member (1) said, "Dealing with

the 'human factor' aspects, OK a console uses up so much space and you have to decide where to put it. Explaining this to an annoying human in a large groups meeting though will just keep on wasting time blah, blah, blah. You know what I'm talking about, everybody has met these folks! Two frustrating things really: firstly getting the stuff to fit in the space allocated and secondly the human problems: getting the individual disciplines to come up with their requirements. Luckily the second one got solved by drastically cutting down the number of individuals who really worked on the layouts (and this cut out those who liked to ramble on, distract the meeting, just complained etc. etc.)."

Team member (3), "It was definitely a negotiation with other larger groups."

Team member (4), "Groups who don't know what they want or need in the control room, as if we can wait until later on when they make their minds up to get their stuff in there and we are expected to integrate changes with incomplete or inaccurate inputs (from other groups). The team made the best decisions at the time for the problems that were at hand. The team did not foresee the objections later in the project by others, and the team made all efforts and changes to abide by their new policies (for lack of a better term)."

In summary: For this study, the expectations from the team members included the explicit sharing of the quality and project completion values: goal, visions and objectives from the part of all team members. Strong focus on results, the sense of priorities, and clarity in decision were also fundamental for the team to meet high performance standards. However, expectations towards upper management and other groups in terms of communication were rated worst on the scale.

DISCUSSION

Expectations are subject to interpretation, not unlike comfort levels. The English language complicates it even more by using the word in different contexts (Collins 2010). That said the study did ask that each team member rate his or her own expectation level, the level of the team as a whole, and the expectations upper management had for the team as a whole.

In this case study, it apparent that upper management was not present in the process and was only interested in a construction schedule deadline. This was distressing to the team because they expected to produce a high quality product. The other groups tended to work in isolation from each other on this project. This was the preferred upper management style and caused communication issues for the team because the control room layout involved the "big picture" to include all the groups together in the layout designs.

The team experienced changes and communication problems from upper management and other groups within the organization. These types of problems typically stemmed from the top.

Ideally, in order to help teams deal with change, leaders present a positive attitude themselves and help teams see the opportunities. They may ensure the necessary safety for teams willing to take risk, as well as the necessary instruments to have teams innovating necessary change (Abrudan & Brancu 2009).

Janssens and Brett (2006) found that managers often set up their teams to fail because they themselves fail to help the team anticipate changes or communicate the changes in a timely fashion. Two of the basic elements of fusion are meaningful participation and coexistence.

The team was expected to provide innovative solutions to problems. Figure 6 shows an example of the original conceptual design before the team began the new layout designs. Figure 7 shows the final design after numerous design meetings, outings and discussions.

The discussions would occasionally veer off track and the team got outrageous with their imaginations. Hence, images of vampire penguins (hybrid) who were short and small, able to fit at the undersized workstations, withstand the cold, able to see in the dark, have wings, can fly, able squeeze in and out of tight spaces and walk through walls. Sleeping accommodations and ways to feed the hybrids were also discussed. Flying monkeys were also considered because they have tails and could hang off the pipes to perform maintenance duties in hard to reach spaces. Most of these "off the wall" conversations about types of operators and building additions occurred whilst the team conducted actual on-site visits to the structure itself and were not included in meetings with other groups or upper management.

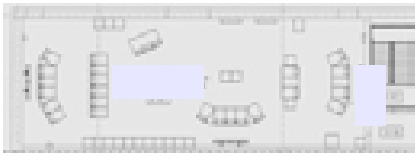

Figure 6: Control Room layout in conceptual design phase.

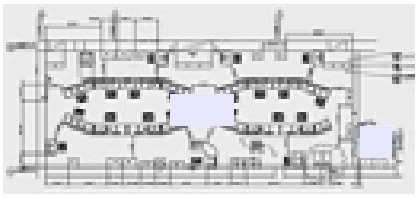

Figure 7: Control Room layout in final design phase.

In all seriousness, the team was very professional and made "perfection" in the layout designs a priority. The humor was a redeeming quality in an often times depressing and oppressive environment of conceptual design mishaps and constant design changes. Upper management was obsessed with the concrete and construction schedule and was not amenable to necessary design changes, although those changes are inevitable.

Although the team was multicultural, cultural differences did not interfere with the expectations or participatory process. Multicultural differences were not a hindrance but beneficial due to the international nature of the project design. The team appreciated the differences and thereby enhanced the process by the sharing of diverse perspectives on problems and creative solutions. The team enjoyed the humor of team member (1) and looked forward to the meetings and outings because they expected to have a good time together, albeit frustrating at times. Creative solutions to the problems often came out of a heated discussion or funny comment and the team would regroup and be ready to move forward and not bog down with drama or useless drivel.

The team exhibited the qualities of a successful team by (a) being honest with themselves and others involved in the design process, (b) providing professionalism, expertise and competence in presenting those aspects in a well-thought out design, (c) an overall commitment to the project through collaboration, innovation and creativity, (d) clear expectations from themselves,

expectations for other team members and those for upper management, and (e) communicating clearly and concisely the needs of the team and results throughout the layout design process.

One major difference between workplace ethnography and traditional ethnographic research is that workplace ethnographers routinely work as part of interdisciplinary teams. It is through those team members who are most capable to become the most effective advocates of the benefits of ethnographic approaches in the company as a whole. Managers are attuned to hear findings directly from technical experts, the systems developers, customer account managers, market analysts, and computer scientists we work with may contribute substantially to a change of attitude in the company (Jordan and Dalal (2006). This is also true with human factor specialists who are included in multicultural teams with professionals from different disciplines. Individuals can demonstrate the importance and benefits of human factors to the success of the project. Participatory design team opportunities provide for the inclusion of both human factors and ethnography in present and future design and system development work.

In reflecting upon the ethnographic methods of inquiry in this case study: Hughes et al, (1994) state that "even though design may be concerned with developing a completely new system, understanding the context, the people, the skills they possess, what kind of work redesign may be involved, and more, are all important matters for designers to reflect upon. It is also more capable than most methods of requirements elicitation, as it ought to be, in highlighting those 'human factors' which most closely pertain to system factors which are not always just about good interface design but include training, ease of use in work contexts full of contingencies which are not the remit of system design, and more. It is in respect of these considerations that ethnography is especially useful in design."

CONCLUSION

The participatory design process resulted in a successful high level, multicultural design team. Team factors included honesty, competence, commitment, communication creativity, clear expectations and moderately happy consensus with layouts considering project challenges. The team was collaborative, determined, strived for perfection and worked diligently to create control room layouts for the health and safety of future facility operators.

A number of high performance key aspects were demonstrated in the high-level team during the design process. The team exhibited a clear understanding of what each individual expects from themselves and the team as a whole and a commitment to being part of a team but still reflecting their own characteristics. It showed competence and the strength of the team as directly proportional to its members' abilities and initiative, clear and honest communication with each other, cooperation and efficiently working together, and creativity and innovative spirit and open to new ideas and initiating change. Challenges prompted responses from team members and required innovation honesty and collaboration to formulate viable solutions.

Expectation levels were high for individual team members and the overall team itself, although expectations from the team for upper management were less certain and rated low to very low. The low ratings were largely attributed to management agendas, priorities, styles and actual management personnel changes that occurred throughout this design process. Communication deficiencies with upper management and others in the larger groups were and continue to be the most challenging to the team expectation levels and the layout design process overall.

Additionally the inclusion of ethnography in the usability methods for this study proved beneficial as a complimentary evaluation technique for a deeper understanding of diverse team expectations, team behavior and work culture throughout a participatory design process.

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IMPROV DESIGN TROUPE: DESIGNING IN AND OUT OF CONTEXT

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ABSTRACT

New constellations of professionals seek to combine their expertise in the exploration of unknown solution spaces in areas craving innovation. This increasingly demands the experimentation of approaches that attempt to include the expertise of the various knowledge traditions and professional practices of not only project team members, but also the various users, stakeholders, and subject matter experts. Rather than looking separately at research (inquiring into current practices and theorizing about new forms of practice), design (creating new materials and services) and evaluation (subject matter expertise for evaluating their value in practice), this paper explores an organizing metaphor that characterizes these practices in their productive collaboration when engaging various contexts, whether use practice or production practice. The paper draws on a case of a multidisciplinary team working to support second language learning in everyday encounters to explore the "improvisational design troupe" as an organizing metaphor for multidisciplinary innovation work.

Creativity is the ability to introduce change, whether that change is collective or personal or sudden or gradual. (Richard Schechner 1985:253)

INTRODUCTION

New constellations of professionals seek to combine their expertise in the exploration of unknown solution spaces in areas craving innovation. This increasingly demands the experimentation of approaches that attempt to include the expertise of the various knowledge traditions and professional practices of not only project teams, but also the various users, stakeholders, and subject matter experts. In design and innovation, there has been increasing attention to the users and their contexts of use and techniques for bringing the use context into the design process. Conducting fieldwork to explore the context of use of products and services is commonly done on a project level to discover user needs as a basis for design (Wasson 2000), and in a broader sense to inform new ways of conceptualizing use practice and solution spaces (see discussion in Dourish 2006). On the other side of the development process, field techniques are also employed to evaluate products and services in terms of their value to their users.

The division of labour between ethnographic studies and design require some form of mediating objects and/or mediating activities to turn the output into a resource for design (Diggins & Tolmie 2003).

There are a number of techniques for such translation; some focus more heavily on the representational devices (Jones 2006) while others put the emphasis on the activity (Karasti 2001). Jones (2006) proposes *experience models* for bridging ethnographic fieldwork with design. An experience model, often accompanied by a catchy slogan, is a diagram that provides a theoretically informed accounting of user needs and experiences while pointing toward

new solution spaces for products and services. Karasti (2001) introduces *bridging workshops* as an activity between ethnomethodological studies of use practice and systems design. She uses tools such as the "video collage" to allow the designers to engage in prepared field material as a means for creating their own research experience in the workshop as a basis for design.

Others have challenged the separation of research and design by providing organizational formats for users, designers and stakeholders to work together. Drawing on the merits of mutual learning in the Scandinavian tradition of Participatory Design, designers learning from users and users learning from designers, the workshop format has allowed facilitators to stage collaborative design activities.

The *Collaboratorium* is a classic example of a broad organizational concept for large companies moving away from stationary usability labs outfitted with cameras and one-way glass for objective observation, to a practice environment where practitioners with different competences, users and stakeholders can move in and out of more freely (Bødker & Buur 2002). A Collaboratorium is "at the same time a place and a process" for a wide variety of activities that bring users and designers together (ibid: 155).

Whereas the collaboratorium begins addressing the need for flexible activity formats (place and process) for a wide variety of mutual learning activities within a company's research and development department, the explorations into project work in context at a team level, are still rather limited. Halse et al. (2010), introduce the *fieldshop* as a combination of fieldwork and workshop, an activity where a facilitator guides users through a set of activities from problem identification to prototyping future solutions in context. The *fieldshop* emphasizes the user's identification of the challenge, and the final improvised scenario demonstrating their potential new practice.

In this contribution, we seek to focus on the multidisciplinary team as a working collective moving freely between the traditional context of use and context of production to get involved with various potential users and stakeholders in innovation-related activities. We introduce the metaphor of the *improv design troupe* to account for characteristics of the team's movement from site to site, the fluidity of roles, and the form of engagement with local settings, and participants.

We draw on a case of a multidisciplinary team working to support second language learning in everyday encounters. The *Språkskap project*[1] focuses on how to support people in Sweden learning Swedish as a second language outside the classroom setting. Whereas language instruction and material support for language learning are commonly lodged in a "school-centric" approach that focuses on the individual learner acquiring knowledge through experts and expert materials, Språkskap embraces a "situated learning" approach (Lave & Wenger 1991) seeking to turn everyday encounters between Swedish learners and Swedish speakers into learning situations.

We have come to see second language acquisition as an underexplored arena for innovation. Over the last decades, a new paradigm has emerged in language acquisition, which argues that language learning is essentially formed by social practice, experience, and socialization (MacWhinney 1999, Tomasello 2003). This brings a shift from a focus on the linguistic aspects of language alone, to the social and interactional aspects. Once learning is freed from the isolation of a linguistic skill learned through the teacher-mediated classroom, there is great potential to explore new human, environmental, and material relationships to support learning outside the classroom. The project seeks to explore not only how to extend the classroom to everyday situations, but to explore how to support a learner in their everyday encounters, whether it involves forming new types of relationships with people, with digital media, or with physical materials brought to or available in different environments. This includes implicating Swedish speakers in the equation as unofficial "language coaches", and looking to public spaces and businesses as language learning arenas.

Despite having conducted a whole range of design and research experiments related to supporting learners outside of the classroom setting, it was not until we worked as a team in everyday activities with learners and the Swedish speakers they engage with that we addressed the core aspects of the project. We had engaged in a wide variety of workshop activities with language researchers, learners, Swedish teachers, coaches, and those within the team, but we had not explored new ways of supporting people in action in their everyday activities. To do this, we organized an intensive work period for a language pedagogue, an experience designer, and a design anthropologist.

Before we introduce more details about our project activities, we will review some key aspects of design and research relevant to our approach.

UNDERSTANDING THROUGH INTERVENTION

In the search for new forms of practice, design involves the process of moving back and forth between some form of design materials and the repertoire of experience of the designer (Schön 1983). Louridas (1992) draws on Levi-Strauss to explore the designer as bricoleur. Bricolage is neither a methodical practice of implementing plans, such as engineering, nor of breaking things apart and building concepts, but rather an eclectic process that brings about something new. The bricoleur is in dialogue with what is there in relation to his "inventory" in the working out of something new.

Bricolage is therefore at the mercy of contingencies, either external, in the form of influences, constraints, and adversities of the external world, or internal, in the form of the creator's idiosyncrasy (Louridas 1992:5).

There is something about bringing something new, but also about bringing into play what is available as the material to work with. We are keen on developing the tangible and intangible relationships engaging a learner as he/she moves around from place to place. We also wish to bring an ethnographic sensibility to the design inquire. To learn to support a learner requires "following the learner".

FROM ETHNOGRAPHER TO 'ETHNODRAMATURG'

Anthropological ethnography has long sought to explore not only what people can describe about their cultural practices, but also to explore what they do that they may not be able to describe verbally. Participant observation plac-

es the researcher, as a research instrument, in the position to witness and engage in the practices he or she studies. Clifford Geertz famously defined "culture as text", something that can be "read" by anthropologists through in-depth fieldwork (Geertz 1973). Victor Turner viewed "culture as drama". Turner's work (1957) initially focused on the revealing nature of the *social drama* as it unfolds, a sequence starting by some form of breach in social behaviour, that turns into a crisis, with side taking, and finally resulting in either resolve of the issue, or the dissolving of the community relationship. Later in his career, Turner became increasingly interested in performance as a form of communication. With great influence from Richard Schechner (1985), the father of performance studies, Turner was drawn to the revealing nature of performance and the transformational process he saw in rituals and social dramas.

Through the performance process itself, what is normally sealed up, inaccessible to everyday observation and reasoning, in the depth of sociocultural life, is drawn forth (Turner 1982:13).

He saw performance both as a powerful means of communicating ethnographic studies (Turner & Turner 1987), and as a form of inquiry. Moving to performance as a form of inquiry demands a shift in interest from how people are able to formulate their perspective upon certain topics, experiences and activities, to that of their behaviours in specific times and places, what they are able to do themselves and with others. This is a shift from someone's point of view by interview to asking him or her to interact in a way that is observable. It moves from a classic "self-report" inquiry, to that of demonstration. The role of the ethnographer then shifts from that of asking questions, to providing the conditions for people to perform—provoking performances.

"Performances, on the other hand, although they can be asked for, are not really responses to questions. The ethnographer's role, then, is no longer that of a questioner; he or she is but a provider of occasions, a catalyst in the weakest sense, and a producer (in the analogy of theatrical producer) in the strongest. Victor Turner, pursuing a similar line of thought, has called the ethnographer an ethnodramaturg" (Fabian 1990:7).

We would like to depart from the individualistic connotation of the designer and the researcher and begin addressing design and research as the practice the team engages in with other people in different contexts. We are interested in a set of field experiences working with multidisciplinary teams, instead of driving the process as an individual designer, ethnographer or any other person. We seek to bring forward knowledge in a way that is not dominated by any one agenda, but rather leaves room for collective *bricolage*.

FROM TEAM TO DESIGN TROUPE

The conception of *improv design troupe* is a reaction to the lack of nuance toward action and organization in the term "team". The improv design troupe is a traveling group of professionals with different competencies who explore solution spaces by providing people an occasion to perform through various props, cues, and provocations. Borrowing from theatre, troupe refers to a traveling collective of performers. Both improv and design draw on the characteristics of the *bricolage*. The "conversation" with what is present in relation to what is in your inventory. The troupe relies upon engaging the local circumstances in performance with the roles of actors, audiences, props, and cues in flux, possibly shifting from moment to moment, rather than fixed characters or items. While a design troupe may have someone who is more directive than the others, the catalyst or director traits of the *ethnodramaturg* arises and is co-produced by the troupe collective. The troupe activity instigates an audience from those present and a performance. The performances rely upon taking cues and getting reactions from those present.

THE SPRÅKSKAP CASE

We now return to the case of turning everyday encounters between Swedish learners and Swedish speakers into learning situations. The project was at a point that the team, especially the pedagogue and the anthropologist, had developed a strong theoretical understanding about learning in everyday contexts. We had explored through a variety of activities with language researchers, language users and teachers, many aspects of supporting learning outside the classroom. For instance, we organized a series of workshops for learners and coaches that focused on the practicalities of engaging everyday encounters as learning situations. We held a "Twitter Day" where we organized a full-day of learners and coaches using Twitter. At the end of the day, we gathered and the participants reflected on the process and took a survey. We were at the point at which we had developed the contours of a model for language learning, driven by interaction in everyday activity. We were confident in our ability to support learners using their everyday interactions to stimulate learning. However, we faced doubts as to whether it was possible to provide more direct support to learners in their actual interactions with Swedish speakers.

We organized an intensive work period to test our model in practice in the design of a physical scaffolding kit. The idea was not to make a general test of many people, but rather to work out in the specific instances how to support learners in action. Over the course of a seven-day period, our team of a Swedish pedagogue, a designer and an anthropologist engaged in a variety of activities to explore with Swedish learners and speakers valuable supporting relationships for Swedish learning. The activities combined both the front stage of public spaces and businesses and the backstage of our working environments. They resulted in two main action-models for Swedish learners: (a) *Sit-Talk-Sit*; and, (b) *The Encounter Dial*; and a note-book-like physical support material we call a *passport*.

Sit-Talk-Sit is a simple sequence for Swedish learners to structure their encounters with Swedish speakers during practical activities. The steps include three main actions: finding a place to sit down (*Sit*) and jot down notes about an upcoming encounter, whether preparing practical goals or preparing vocabulary and sentences for an upcoming interaction engaging in a communicative activity (*Talk*) by interacting with the Swedish speaker for the purpose of the task, whether the task is finding a safe toy to buy or ordering a pastry and finally, after the interaction, sitting down somewhere

(*Sit*), reviewing, write notes and reflecting upon the interaction.

The encounter dial addresses the actions a learner takes when he or she does not understand something in a communicative interaction. The dial has three actions: Easy Out, Step-Out/Step-In and Full Press. *Easy Out:* upon not understanding, the learner takes the "easy way out" of the encounter by ignoring misunderstandings e.g., nods, says thank you and walks away. S*tep-out & Step-In* refers to the learner stepping out of the immediate interaction and then returning to clarify misunderstandings. This can either be a very quick sequence of stepping out and stepping in, or can be thought of as over a longer period of time. *Full-press* refers to when a learner stays in the interaction and asks for further clarification until understanding.

The *passport* is a physical, note-book-like product that folds to the size of a passport. It has three main folds that open different "spaces" to be used, for instance, sitting to prepare, as reference when communicating, and when inviting others to write.

In the next section we will demonstrate through a selection of project activities how the team worked as an "improv design troupe" moving in and out of the use context.

PROCESS AND ORGANIZATION

The design troupe, with an anthropologist, a pedagogue and a designer, provides a solid basis for supporting the learner with a set of multidisciplinary expertise around the challenge of language learning in everyday activities. However, while the members shared some ideas, in many aspects of what we were doing our confidence level differed and the details that we focused on differed. Although we see the team as a collective that learns from one another through their collaborative actions, each member clearly brings a unique perspective to each issue that manifests differently throughout the process.

In our team, our roles of anthropologist, pedagogue and designer overlapped with our roles relevant to the project. In relation to Swedish language, one was a basic level learner (anthropologist), one an advanced learner (designer), and the other a native Swedish speaker (pedagogue). We therefore embraced these attributes when working as a group, and when in context engaging with others.

A performance is something that may be planned ahead of time, but at other times arises out of a situation. For our team of three (one freshly entering the project), we can draw on an early example during our second meeting as we took up the discussion of how to scaffold learning in context. The anthropologist played the role of convincing the two other team members of the value of improvisational performance in context. The designer had brought a first iteration of a paper "passport" (name given to the physical kit by the team). After discussing its value in relation to a scenario of going to the gym, the pedagogue challenged the anthropologist to act it out. The anthropologist responded by standing up as a learner and acting out physically and describing verbally an improvised sequence in which he used the new *passport* to support a task to stimulate use of his Swedish language skill. He imagined himself to be in a queue for his gym session, waiting anxiously to converse in Swedish with the gym clerk and relying upon the *passport* for cues. Using the body language, he explored the affordances of the passport (for example, whether it should have a strap). The learner (anthropologist) received other cues from the audience (the team members in this case), prompting him when he was stuck and introducing challenges. This is just as much a performance due to the designer's spontaneous video documentation of it, and now describing it as such, but also in relation to the spontaneous actions that put the learner on stage. Specifically, his blending of the past and future by use of props in the present is a way that thrived on an audience/performer distinction.

We would like, however, to emphasize the improv design troupe working in different contexts and providing occasions for the learner to turn an encounter with a Swedish speaker into a learning situation. The Sit-Talk-Sit model follows the basic performance sequence of *making, displaying* and *evaluating* (Schechner 1992). In this respect, when supporting the learner in turning an encounter into a learning situation, we are interested in providing an occasion for the learner to go through such a sequence. At the same time, as a improv design troupe, we join in the performance.

EVERYDAY PERFORMANCES

We now focus on three episodes drawn from our visits to an iconic Swedish warehouse where we sought to use the structure and rhythm of the shopping experience as a potentially valuable language learning resource. They demonstrate the combination of inquiry, design and evaluation that contributed to the models above and the *passport*. The decision to go to the warehouse arose in an early workshop activity when learners identified situations that can be used for Swedish learning. We asked for volunteers from our earlier workshop to explore learning with us, and conducted our own team rehearsal two days before.

We selected the episodes out of a succession of events for their value in demonstrating the characteristics of working as an improv design troupe. Here we use the dialogue from video transcripts in relation to highlighting aspects of the two models, not as a basis for in-depth, conversation analysis.

PERFORMANCE 1

During our first visit to the warehouse, the anthropologist as the Swedish learner attempts to use the structure and material of the passport to turn standard shopping encounters into learning encounters. The passport prototype had three main sections for writing and reading at different times, but was free of any text or visuals.

The first step is to identify a practical goal for this specific visit. In this case, the learner/anthropologist needs to buy a room divider for his living room to accommodate his mother in-law's upcoming visit or find a way to make one out of other furniture systems. It is likely that he will have to find a custom made solution – which means he has to inquire about the options from the store employees.

With the pedagogue filming and the designer watching from a distance, the learner walks toward the information desk and stops a meter away, looking down at the passport all-the-while.

The clerk behind the desk glances at him and then looks away. The learner

Clerk:	en skärmvägg?
Clerk:	*a room divider?*
Clerk:	en skärmvägg, mm?
Clerk:	*a room divider, mm?*
Learner:	ja, precis.
Learner:	*yes, exactly.*
Clerk:	då går du till gröna rummet.
Clerk:	*Then you go to the green room [points in that direction]*
Learner:	g-r-ö-na rummet?
Learner:	*g-r-een room?*
Clerk:	ja, precis. In här, sedan höger, sedan vänder du vid kassan. Det kommer finnas på lager…
Clerk:	*yes, exactly. Enter here, then right, then turn toward the counter. It will be there in stock.*
Learner:	okej, tack så mycket.
Learner:	*OK, thanks a lot.*

Example 1: Anthropologist's (Learner) initial dialogue with the clerk.

then steps forward approaching the clerk and begins asking where he can find a solution for dividing a room, or any related furniture. He jots down the information on his *passport*, thanks the clerk and walks away. The dialogue in example one shows how the learner did not at first register the word *skärmvägg* (room divider). He then painstakingly repeats *gröna* (green) upon hearing *gröna rummet* (green room).

When the learner walks away and the three of them walk in the direction of the green room, and the pedagogue asks the learner about the interaction i.e. if he was able to locate the department. It became obvious to the pedagogue that the learner did not understand much more than "green room", although he had just thanked the clerk for her help as if understanding and walked on. Through his confrontation with the learner ("you didn't understand") and the long conversation that ensued, the troupe identified how this situation typified a common pattern in language encounters: upon not understanding, the learner leaves the situation pretending to understand. In previous research activities, learners have given different grounds for their tendency to leave without understanding. For instance, their fear of bothering the speaker furthermore, feeling embarrassed, uncomfortable or feeling fatigue from always having to ask, and for the beginners, that there is so much that they do not understand, that they could never get it all.

The incident triggered a focus, during the subsequent encounters while looking for a room divider, on how to support the learner to ask for clarifications for important phrases and words he does not understand either during the interaction, or by returning to follow-up on misunderstandings. The pedagogue encouraged the learner/anthropologist to ask for clarification. This involved asking the person to write-down the word on the passport. We became aware of the need for a more nuanced set of relationships to complement the general 'sit-talk-sit' sequence.

By the next visit to the warehouse with a learner, the team had communicated their notes and reflections via email and the designer created a few versions of a possible *encounter dial* to include in the passport.

The encounter dial as a physical and visual aspect of the passport sought to play the role of a reminder for the learner that there are different ways of interacting with the speaker, and to empower the learner by creating a license for moving from a passive opting out behaviour to a persistent pressure mode.

The warehouse activity benefitted from fluid roles among the design troupe. In the first performance, the pedagogue assumed the role of the coach and the anthropologist, the learner. The designer was responsible for documenting. The roles changed as they began to discuss, analyse, and plan for improving the situation. The second performance sequence below, this time with a volunteer learner, involved identifying clearer roles at the outside. The pedagogue played a coaching role and was responsible for maintaining the wellbeing of the learner, a Swedish language student from Folkuniversitetet. The anthropologist was most active in the preparations before the arrival of the learner and in the analysis afterward, and the designer focused on the passport prototype and documentation. The preparation for the visit included a fresh iteration of the passport, a review of the task and a short introduction of the activity to the learner.

PERFORMANCE 2

The next performance arises out of a visit to the warehouse with the design troupe and Gita, a learner who volunteered to join. Gita is a Swedish

Figure 1: Gita kneeling, taking notes on the passport prototype.

Figure 2: Gita walking back to the clerk.

learner from Poland, currently attending courses at Folkuniversitetet. As it was the first activity with a learner outside of the project team, we prepared by identifying the pedagogue as responsible for maintaining the social and pedagogic contact with Gita throughout the visit. She starts the day sitting with the pedagogue writing out the goal of her visit, she wants to buy toys for her niece. The designer takes on the documentation activity while the pedagogue assists Gita's encounter with the clerk.

Gita first walks up to a clerk and asks if the toy department is suitable for her niece, age-wise. She asks how safe the toys are, and the clerk replies that everything is safe, no risk of choking or pinching children's fingers and that everything is poison-free. Gita then walks away and kneels down next to the nearest table (see Figure 1). As she flips through the passport, when appearing to be looking for the correct spot to write, the designer intervenes and suggests that Gita can write anywhere she likes on the passport. Gita then stands and asks the pedagogue to explain the meaning of a certain word. She gives an approximation of the correct word "klämskyddad" meaning pinch safe (See dialogue in Example 2).

Gita:	"klamskydda"... nej??
Gita:	*"[approximation of the word pinchsafe…no?]"*
Pedagog:	Kan du be henne skriva det?
Pedagog:	*Can you ask her to write that?*
Gita:	Ja.
Gita:	Yes.

Example 2: Gita's confusion over the word "klämskyddad"

The pedagogue responds by suggesting Gita ask the clerk–enforcing the "step out / step in" principle. Gita, without hesitation says yes, turns and walks toward the clerk in search of the word she could not fully grasp.

The clerk welcomes Gita and accepts the request to write down the word for her on the passport (see dialogue in Example three above). The clerk completes Gita's sentence with the correct work, "klämskyddad" and then places

Gita:	Kan du skriva mig [approximation of the word pinchsafe]...?
Clerk:	*Can you write for me ..?*
Clerk:	*completes the sentence*
Clerk:	…klämskyddad? Ja...
Clerk:	*...pinch-safe? Yes…*
Gita hands the pen and passport to the clerk	
Clerk:	Kan jag skriva var som helst?
Clerk:	*Can I write wherever I want?*
Gita:	Ja.
Gita:	*Yes.*

Example 3: Gita asks the clerk to write down the word for her.

the passport on her right knee for support and asks for permission to write wherever she wants on the passport. Gita affirms. Gita thanks her and walks away. Not only did the clerk write the word, she also wrote a sentence in Swedish explaining the meaning of the word.

When we look at these episodes together, there are a variety of uses of the two action models, as well as design input into the models and the *passport*. They clearly demonstrate that scaffolding is possible, both with material support (our passport, in this case) and in the form of a personal assistant (the pedagogue) or both. Gita embraced the sit-talk-sit model in her actions rather effortlessly. Additionally, the pedagogue provided support for maintaining the step-out/step-in model. Rather than affirm the meaning of the word, he diverted Gita back to the clerk for clarification. The clerk willingly both repeated the pronunciation and in writing demonstrated the spelling and explained the meaning.

ASSESSING PROCESS WORK

The assessment and validation of the relational support for turning everyday interactions between learners and speakers and the physical artefacts develops through a series of activities over time. These are not separate activities from the field experiences we have been describing. The tendency from industrial design or even more recently, user experience design, is to separate the field work process from the development, seeing the first as input—usually in the form of what the user says. The evaluation comes at the end. The voice of the user, understandably, is a celebrated voice and is taken literally to mean, what the user says about his or her experience. However, in the two performances above, we find that the anthropologist/learner

and Gita's actions when "in action" in relation to what that did directly before and afterward, provided a material basis for both evaluating and improving the tangible and intangible structures.

We drew upon the mediating object, the passport, to support the iterative process of fine-tuning an orchestrated set of actions ("sit-talk-sit" model) for language learning in the wild. We have not only created structure out of a series of events, but also attempted to prescribe an ordering of activities. The anthropologist/learner's actions when actually performing an encounter with the information clerk revealed both a bodily display, physical and audible display that, when acted upon afterward and discussed, brought about a concrete need in the project. The exploration of the solution space resulted in Gita's performance. This provided us with the type of input about the tangible and intangible relationships important for both the physical passport and the two action-models for language learning.

Her engagement with the pedagogue, the Swedish speaker and physical material made it possible. Gita's actions of kneeling down to write, quickly returning to the clerk when cued, and sitting down at the end of the activities reviewing her notes and writing without cue, and looking at all her notes and taking more demonstrated what she needed not to attempt to articulate. While we would like to highlight these performances that combine a Swedish learner, a Swedish speaker, interaction with each other and physical materials, we are not excluding other forms bringing about understanding.

At the end of a series of Gita's encounters throughout the warehouse, the pedagogue and the designer sat with her at a café and asked her to describe to the anthropologist, who was not present during the last hour of the activity, via video recording, what she had written in the passport and to reflect upon the passport's value. They asked her opinion and challenged her with new ideas and so on. The dialogue then diverged from the physical object to necessity of the communicative talk. In this case, however, witnessing the encounters overshadowed the details of Gita's descriptions.

Additionally, by timing each activity, we do see that throughout the activities, the duration of "talk" increased from interaction to interaction and the amount of time Gita sought to discuss language matters with the pedagogue increased as well. More precisely, the amount of time Gita talked with the clerk fluctuated from seven minutes the first time to up to twenty-two minutes later in the day. This trend toward longer periods of both pure talk and discussion triggered by the talk is precisely the type of change we are after in the Språkskap project in general. We do draw on the perspective and the words of the participants as well. But the material of performance provides high quality material for the explorations into what could be possible in this new arena. We did get a thrill when in the evening after her visit to the warehouse with us, Gita tweeted to the other learners what translates to *"Really great way to learn, open to others. I did not think I could overcome my boundaries. Everybody are our coaches. In all places"*.

We have found out that scaffolding language learning in the context of everyday life is possible. The learners can use cues from their surroundings as materials to build upon and create a learning experience. Improvisation allows us to experience in context and gives us the ability to design on the fly, in a very rapid, generative and evaluative way. The team creates a safety net around the challenge, and with the diverse expertise enables rehearsals, live-acts and prototyping to converge. This pushes forward what is possible and demonstrates possible support.

DISCUSSION

The design troupe metaphor is an attempt to combat the division of labour among user research, design, and subject matter expertise in innovation work, and maintains a focus upon drawing on multiple contexts and knowledge in action and interaction. Drawing on "improv theatre", where the actors use audience cues as a basis for improvisation, relying

Figure 3: The clerk writing in the passport

on their own techniques and a bag of prepared props, here we look at how three project members engaged in design activities in a variety of settings over a seven-day period. In this case, we highlight the important roles of the ethnodramaturg rather than ethnographer alone, the designer and the subject matter expert, the pedagogue, the natural setting and the interaction between learner and speaker.

But there are points where we differ from bricolage: a bricoleur reorganizes events as opposed to scientists and engineers who break down and analyse. A design troupe does more than analyse the events. Like bricolage, as accounted by Louridas, the design troupe also "creates structures in the form of artefacts, by means of contingent events" (Louridas 1992:5) and it incorporates analysis of the events afterwards as well as points during. As the nature of design implicates, we are interested in disruption and change.

With the introduction of the *improv design troupe*, we celebrate action over description when exploring an unknown innovation space to work out new possible tangible and intangible relationships. At the same time, we celebrate creating a collective that engages with people in their natural settings of "use" and of "production". But we also reserve space for the collapsing of these distinctions in practice.

The Språkskap project's agenda of exploring new tangible and intangible relationships for supporting Swedish learning in everyday situations benefits greatly from a flexible, mobile, multidisciplinary working constellation that fluctuates between and blurs inquiry and intervention. Our interest in bringing about innovations in this area has only just begun. We embrace the *improv design troupe* as a successful metaphor for demanding that people explore these spaces in multidisciplinary groups that include learners and speakers and the setting of their encounters.

Moving forward, we look to explore further the new arenas for supporting language learning in everyday activity. We are interested in continuing to work with the improv design troupe to not only *follow the learner*, but to challenge ourselves to *follow the Swedish speaker,* as well as to occupy different spaces for longer periods to explore the tangible and intangible relationships for supporting a learning environment as learners and speakers come in and out. In the formulation of the improv design troupe, we see greater potential for incorporating new actors or forming new troupes.

NOTES

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EXPLORING THE ROLE OF ROBOTS: PARTICIPATORY PEFORMANCES TO GROUND AND INSPIRE INNOVATION

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ABSTRACT

In performing collaborative scenarios of potential ideas, relationships from the future are brought into play as both objects for critique and enhancement. We see that a design anthropology that supports, facilitates, and provokes through these types of participatory activities as an essential shift from anthropology "of" towards an anthropology "with" people as part of design processes, and as part of this transition relies on setting up a space for reflection of goals and interests within the project rather than instigating critique only from the researchers. In this paper, we introduce a welfare technology project and our early attempts at performing relations in the context of robotics and automation, assumed to be an integral part of sterilization work for medical instruments. We focus on several aspects of the project: relations between work within and outside of the project, the translation of performances towards deliverables, and the role of the researcher in such activities.

INTRODUCTION

INNOVATION ISLANDS AND RETAINING GROUNDING OUTSIDE THE PROJECT

This paper takes place on an island. Yes, there are physical islands involved - Zealand, Funen, and Als, Denmark- in which events and activities have taken place. Yet, the island of interest is an innovation project in which five public hospitals, five companies and five knowledge institutions and networks are engaging in an innovation triple helix (Etzkowitz, 2008) space. The DEFU-STEPP Project, after the Danish name which translates to "The fully automatic sterile supply and packing procedure" or as we refer to it – The Sterilcentral Project - is one of eight product development projects as part of the region of Southern Denmark's push to become the world-renown center for welfare technology, a twist on healthcare and social services technology with the drive towards reducing work burdens of public employees so that "warm hands" are closer to the care of citizens resulting in a higher quality of care.

This particular innovation project is tasked with developing concepts for technologies in hospital sterile supply wards and to develop novel ways of repackaging instruments used for surgical operations (Welfare Tech Region, 2010). These hospital wards clean, sterilize and package reusable instruments needed for operations, and are increasingly tasked with other service functions within the hospital, from single-use device warehousing to instrument purchasing.

Within the project island, we can characterize the participants in several ways. Those coming from the public sector maintain a strong non-hierarchical work culture, in which responsibility is a collaborative effort as employees grow knowledge and skill throughout the sterilization ward. The industrial sector exudes an entrepreneurial spirit to match technology to an opportunity. Both type of participants have expressed the wish to see immediate and applicable results from the project. Fruitful collaboration seems to be a forgone conclusion. In proposing the project as an island, we suggest a partial isolation from daily concerns in an effort to find mutual areas of collaboration. In some ways, this accurately portrays aspects of project work. Workshops are convened in which invited participants gather to produce outcomes, not necessarily part of anyone's day-to-day job duties to bring forth a future in which all

can see, in some respect, as desirable. At least that is the goal. Yet, as part of this "island culture" there stands a possibility of becoming too insular that the deliverable misses its mark, in spite of everyone's best intentions. The tension arises in the relation of the island to external relationships – the work of sterile assistants and technology investments – and requires balancing diverging interests. We explore these external relations through a tool in which we engage sterile assistant who are not part of the project team.

RESEARCHER AS EXPERT, OBSERVER OR SHEPHERD?

How do we as researchers "embedded" into these triple helix mutations (public sector + industry + research) position ourselves? Are we the expert voice that highlights obstacles and particular values? This suggests a patriarchal role, a "we know better" attitude. But then do we take a step back and observe the innovation process, as it happens, to document the steps taken? To remain the neutral observer suggests an even larger negligence of duties. Or perhaps should we conceive of ourselves as shepherds of innovation trying to ensure emergence of novelty through inspiration? We show our attempts at both grounding the project to current practice while simultaneously framing inspiration as a way to think beyond the immediate.

Anthropology confronted its own detachment from contemporary society by experimenting with new forms and modes of ethnography (Marcus and Fischer, 1999) and in exploring approaches and practices of design anthropology, we seek to put into practice a form of anthropology *with people* rather than *of people*, as Ingold (2008) argues defines the field from other disciplines. The distinction for us between anthropology and design anthropology is that the latter is about getting at practices that have yet to exist. In design and innovation, concepts appear to address one particular aspect of a problem space, yet the interconnected nature of social life gets left behind when implemented. Design anthropology can be used to expose the seams of these future practices by studying with people. In this sense, performances are a crucial way of making explicit understandings of current relationships and how one imagines them to be in new constellations of socio-technical possibilities. In this paper, we explore ways of working with project participants through performances as a form of self-critique, or perhaps a more literal reflection-in-action (Schön, 1987), to avoid the insular effects of innovation islands.

KINDS OF PARTICIPATORY PERFORMANCES

As the project continues to weave its way over its three-year life span (2010-2012), we have worked with performances on different levels and different contexts. One is within the work sites of the sterilization assistants as a way to envision experiences of new technology. The second and third is with "official" project participants in acting out robotic solutions to perceived problems and finally by setting up tensions through storytelling. We present these three example performances to illustrate how we have timed our moves within the project as a way of generating knowledge and understanding amongst the participants.

FUTURE FIELDWORK: PRE-KICK-OFF

In planning a course for the project, we relied on the project proposal and identified five large events in which all participants would collaborate. It started with the kick-off meeting, workshops 1 through 3, and ended with the final conference. To help orientate ourselves to the context of the sterilization ward, we setup visits to two hospitals before the kick-off. In some ways, this can be thought of as the gathering of field materials in order to setup a provocation (Buur and Sitorus, 2007)

Name	Ability
Super Strength	You can lift 10x your own weight.
Super Speed	You can move really fast.
Total Recall	You can remember everything.
Duplication	You can make copies of yourself.
Shape Shift	You can change your shape.
Time Shift	You can slow down or speed up time.
Microscopic Vision	You can see micro-organisms.
Telekinesis	You can move things with your mind.

Table 1: Superpower cards and the associated ability.

with the technologists, in line with an anthropology of people. And certainly this was the case in that we collected video of sterilization work for further analysis. We also wished to stretch our understanding of who were the project participants to include those workers not invited to the meetings, an implicit invitation of the excluded. In doing so, we asked how could we help them envision robotic technology that they have yet to experience in any context? The technique is simple in that we created a set of "superpower cards" which we asked the workers to select and prioritize the top three and explain what it would mean for their work if that special ability in fact did exist. The listing of cards in Table 1 shows the possible choices. The selection of superpowers was to ensure there might be techno-

Figure 1: Experience juxtaposing as a way of comparing work practices now and in the future. Superpower cards as a tool-to-think-with in exploring robotic technology while still in the field.

Figure 2: Experience prototyping the incorporation of robotics as part of future work practices. This scenario is for a robotic vision system to search for instrument defects and protein residue as validation after the washing cycle.

logical possibility within the project (for example, "microscopic vision" reflects the interests of one of the company partners), but also to highlight were technology did not yet exist.

We have come to think of this as *experience juxtaposing*. The purpose of such a tool is to explore potential experiences while firmly present in the here and now. Imagining such a possibility is, of course, not the same as having the experience, but the power comes from the comparative aspect. We took this approach as we wanted to understand what role robot technology would have on the worker's practice. While visions of technology often turn out much more mundane than anticipated, by pushing the hospital worker into the central role with the "choice" to wield technology as a power we could get closer to what it would feel like if technological solutions were implemented. This is a solo performance, while the next example is more collaborative and in so, approaches that of drama.

REHEARSING PROJECT VALUES: THE KICK-OFF

Going into the project's kick-off meeting, we had two research interests. How could we encourage the public and private sector to collaboratively innovate without getting lost in the "this is mission-critical and not the area to experiment" mentality? As well as how can we reduce the barriers and politics of change and transformation through transparency? One way to tackle these large issues was to stage the kick-off as a dress rehearsal of the real project, but in a day as inspired by Mattelmäki et al (2009). The goals for the day were to get to know each other and our unique competencies, rehearse the project and define the outputs collaboratively. In other words, laying our cards on the table at the beginning of the project.

There were two main parts of "The Rehearsal" as we called the kick-off meeting. The first part, *experiencing the field*, was an exposure to the sterilization context (especially for the company partners who do not currently work in this space) by watching several video clips we had gathered from the field. After the short observations, each group generated areas for exploration. The four areas were: optimizing visual inspection, ensuring the quality of instrument lubrication, streamlining the cleaning process and minimizing personal movement and transport. The second part, *designing from experience*, was when the participants imagined future robotic systems in the sterilization ward. It was here where we had the four groups in the meeting perform a scenario from the future, as if our project resulted in an implementation of a robotic and automation technology. Through this performance presentation, we hoped that these scenarios of completed solutions would show conflicting visions for the project and the interactions of the workers to the new technology. As a twist to ensure robotics were incorporated, we asked that at least one person play the role of the technology (Figure 2). These embodied performances, while effective at seeing a system in use, struggled to illustrate the tensions in introducing new technology (and nearly everyone turned out to be a robot) so at the next event, we tried a new approach.

BRINGING TENSIONS TO LIFE THROUGH STORYTELLING: WORKSHOP 1

We framed the next meeting, Workshop 1, as "the Puzzle" where the participants start to piece together the core of sterilization work by looking

Figure 3: Observing the field in many ways. In this project, we have tried several ways of getting company participants to experience the field, from self-organized field visits, watching video clips from multiple wards and guided tours. The focus was not on describing the field, but structuring enough experiences to allow for the performances to be grounded at some level within the work practice.

Figure 4: Storytelling the conflict between villains and heroes within the sterilization ward as a way of making tangible unspoken assumptions for all project participants.

at the breakdowns and the well-functioning aspects. We were interested in exposing the seams of the system and the hidden or taken for granted work. As homework, we encouraged teams to visit sterilization wards before the workshop as a way to engage with the field. This was met with mixed success and so we also scheduled a tour of the sterilization ward that was our host for the workshop so that everyone had the opportunity to observe a working ward and make observations (Figure 3).

After the tour and a round of sharing stories and insights, each group chose a theme to take further in framing the tensions in the opportunity by personifying them. We asked each group to enter into a new world filled with a villain and heroes in an effort to make tangible these unspoken tensions (Figure 4). Through workbooks, each group created a villain with certain motivations and effects on people that reveal themselves at particular moments. The heroes were to be given a superpower that had a particular effect and values with one weakness. The last page of the workbook framed the "gadgets" the heroes might possess as a way to encourage converting the make-believe world of superheroes into technological concepts. One group had us entering the world of "missing process overview" where Mr. No Process was a villain because of his preventing optimization, right choices and ergonomically correct work environments. His nemesis was the hero Mr. Brain who used his super smarts to combat Mr. No Process, but sometimes using resources inappropriately in his battles. There was an interesting tension that manifested between the groups (and possibly within). One group had a villain of Big Brother who was controlling, inflexible and impersonal, while another had one called Drake, who made estimates based on personal, subjective evaluations. The dilemmas of developing new technology surfaced through the storytelling process.

DISCUSSION

Returning to our island metaphor, what consequences have our various performances had on unfolding the relations between the Sterilcentral Project and work practice? Has it been successful at weaving the conflicting perspectives of the project participants? A final answer is unknown as we are still in the midst of the project and are currently in the process of creating and selecting sub-projects. But there are hints that the performances have influenced the initial proposals. One idea frames the solution as "semi-automated" rather than "fully-automated" perhaps in response to the identified notion of role and experiences of the workers. Another proposal centers on a system for identifying protein residue, perhaps a result of the robotic performances? One of the interesting challenges for us as researchers is ensuring appropriate framing of the time-space in which we work. The tendency seems to be that these private-public collaborations focus on immediate needs rather than longer-term challenges, foregoing revolutionary ideas. We will continue to trace the results of the performances moving forward.

REFLECTION ON THESE PERFORMANCES

Through the three performances we can make some initial observations that distinguishes them. The first centers on the unit of collaboration. Using the superpower cards, the workers gave a solo performance to us researchers. This resulted in a more reflective mode that, despite the outrageous look of the cards, prompted thoughtful critique on self-practice within the sterilization ward, although limited to aspects depicted in the cards. Whereas, the mode of performance in the kick-off meeting (the robotic performances) was more embodied and because of the nature of activity found its form in the moment, often deviating from a preconceived plan, a form of improvisation. This allowed for technological assumptions to become unquestioned in an effort to deliver a cohesive piece as part of collaboration between many performers. The storytelling of heroes and villains came to life through the efforts of not only the group creation process, but the presenter's skill of enacting the conflict between the two, often with comic timing. Collaborative performances do run the danger of playing to the audience, yet by making the performance tangible and available for repeated viewing (through video) mitigates this effect in that these aspects are highlighted. The strength of working with performance tools in an innovation space is that the social web (including people and their environment) quickly gets interweaved through their telling to allow for critique, questioning and further analysis before full-scale implementation.

A ROLE FOR FACILITATORS

A design anthropology "with" places emphasis on performances as a way to expose and critique relations from the future. However, if researchers take

too strong of a position, they run the risk of being perceived as hostile to the innovation process. Yet if you embed into the process a reflective space, where the tensions are taken into account through the collaboration, it may be possible to avoid the pitfall of technology that coerces rather than supports practitioners.

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TRACK 3

ORGANISING PARTICIPATORY INNOVATION

CHAIRS

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KEYNOTE SPEAKERS

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There are strong arguments for involving users and other stakeholders in the innovation process, when developing new products and services, but there has not been much focus on the dilemmas in organising such activities. Although relevant research is conducted within different disciplines, such as management, organizational change and policy, it is not yet fully understood how the processes of interaction between the involved stakeholders are taking place in enabling or sometimes possibly obstructing innovative processes.

We want to build a deeper knowledge of the possible impacts of bringing external voices into the organisation – or even the impacts and reactions when one intends to do so. How are these voices or intents taken up by people in R&D, marketing or production in a private company or amongst the different groups of professionals in a public organisation? Or more generally, what are the organisational attributes or impediment of organising for innovation that crosses organisational boundar-

ies? In this this track on "organising participatory innovation", we want to explore these and related questions.

There are 15 papers and four narratives, and they cover a variety of themes such as methods in organising, relations between users and organizations, concepts in organising and also the difficulties in organising participatory innovation.

NARRATIVE: AN EXPERIENCE IN ORGANIZING PARTICIPATORY INNOVATION FOR A MEDICAL COMPANY

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INTRODUCTION

I am an university researcher engaged in the field of participatory design for dedicated medical workspaces such as operating theatres and intensive care units. To gain experience with different participatory design techniques and test my own ideas in practice I try to get consultative jobs at companies and hospitals and use them as case studies. In my previous project I was involved in a case of a medical company developing a new medical appliance. It was clear that the new appliance would to some extent change the daily treatment practice. However, we did not know how the new appliance should be designed, so that the new treatment practice would be optimal. Consequently, I was assigned the task to design a setup for user workshops to explore the "ideal" future use scenario for the appliance.

GOAL OF THE PARTICIPATORY DESIGN WORKSHOP

The goal of the user workshop was to develop together with the end-users (medical specialists) a detailed description of the "ideal" use scenario and get insight into the users decisions and trade-offs in the scenario. As a side-effect, we hoped that workshop participants would commit to the company. The most important questions concerning the scenario involved which manifestations of a specific disease should be treatable by the product, who would do what in the treatment procedure (role allocation), where would the treatment preferably take place (setting), how long each step should take (durations) and what kind of user interface should provide access to the product's software. In addition, we wanted to know about the motivations of the participants for the choices they made in developing the ideal scenario and about purchase requirements (e.g., maximum costs and some use requirements).

PREPARATION

The medical company had recently redesigned the looks of their products. In this process they had developed an interest for usability and recognized a demand to make their products more user-friendly. The company came into contact with our research group to accomplish this goal and gain knowledge in the field of usability. We proposed to use participatory design workshops to match new product concepts with user experience and practice. The case described here is the second time we cooperated with the company. We already had successfully organized participatory design workshops for another project of the company. The company explicitly gave us the lead in the participatory design part of the project.

When the business case for this project was approved, they decided to use the occasion of an international specialized fair in the area of medicine the appliance would be used in to execute the user workshop. For this fair, medical specialist from many different places were in one city and therefore easily accessible. The company invited ten clients to take part in what they called a "usability workshop". All of them were medical specialists with experience in the field the appliance would be used in. The workshop was planned to take about three hours, which was the maximum period of time our company contacts figured we could ask from these medical professionals.

We had to deal with an atmosphere of urgency when the project started, because the fair was only three month away. The company representatives sent us the business proposal for the future product and a preliminary list of requirements. In return, we presented them with a list of questions about the project. We hoped that the answers to these questions would reveal more detailed information about the project and what they were searching for in a user workshop. The company representatives were only available for a few

meetings due to other commitments and the large travel distance between the university and the company. Therefore most of the project coordination had to be done by phone and e-mail.
We wrote a proposal for the setup of the workshop, suggested participatory design techniques that could be used and made a preliminary project planning. In a meeting with the company representatives the project plan was refined. Meanwhile, a contract for the cooperation was formulated and new company employees joined the project. As a next step we developed a questionnaire for two hospitals that were close contacts of the company. The goal of the questionnaire was to get some basic information about if and how a hospital would like to use the proposed product. Receiving answers from the hospitals via the company took longer than expected, which led to an increase in time pressure. As soon as the answers arrived, we developed together with our company partners several use scenarios for the new appliance in text form. These scenarios should be used in the participatory design workshop. We also hired an industrial design student who sketched digital storyboards of the scenarios. In the meantime, we wrote a script for the workshop. We invited the company partners for a general repetition of the planned workshop. In a final step, we adjusted the scenarios for the last time, using the company partners' comments.

SETUP OF THE PARTICIPATORY DESIGN WORKSHOP

My task in the project was to design the setup of the workshop. The company contacts were a bit anxious to use interactive analogue (glue and scissor) techniques, such as make tools or pivot games, because they felt they had their reputation as a serious company to lose. Therefore, we prepared a digital scenario approach in which a scenario "story" would make the use situation of the future product concrete and reveal possible problems. The idea was to present a digital storyboard of an initial use scenario by a beamer presentation. The digital scenario storyboard had several sequences which consisted of a small number of frames each. The scenario was kept very basic, so that it could be completely changed and fleshed out by the participants during the workshop. To accomplish this, the storyboard was adaptable in several ways. Single steps in the procedure, represented by story board frames, could be added, deleted and reorganized. Frames could be adapted by adding illustrations of persons with specific roles or products such as appliances or accessories. The setting for the treatment step presented in a single frame could be changed by replacing the drawn background scenery.
The initial scenario was also going to be presented to the participants in text form one day before the workshop, together with a letter describing the goal of the workshop. We hoped that this would stimulate the participants to think about the product use in advance. All ten medical specialists were invited to take part in a collective workshop. The workshop was supposed to start with an introduction by a workshop moderator and afterwards the participants were supposed to engage with the scenarios. Participants were going to be asked to fill in roles first and then step by step, adapt the other aspects if needed. After completing a sequence, specifications were going to be made to that sequence, such as defining a maximum acceptable duration for the task presented in every frame. These durations would be written down on the scenario frames. After one sequence was completed, the following sequence could be opened. The workshop was going to end with a general discussion about issues that came up during the workshop.
The team from the company and university that was going to attend the workshop consisted of a moderator (a project manager from the company), an observer (a company representative) and a "media assistant" (me). I was going to handle the digital storyboards on a PC and adapt them according to the suggestions of the participants during the workshop by showing and hiding elements and persons, by changing the background scenery and by writing comments or by drawing directly on the storyboards. In addition, I was going to be responsible that all frames were completed by the participants.

DILEMMAS

Shortly before the workshop started, I was confronted with the first dilemma: in an attempt to make the workshop enjoyable for the participants, the company organized a whole meal of several courses which were served during the workshop. No need to mention that this did not help the participants to focus.
During the actual workshop several problems surfaced. Some of them were foreseeable whereas others resulted from deviations from the original workshop setup. First of all, the moderator did not stick to the original setup. He made a last-minute decision that the workshop setup was not suitable for the participants and omitted it, but did not inform the rest of the team about his choice. He thought, based on a brief conversation with the participants prior to the workshop that the level of detail in the workshop setup was too high for the participants. He decided not to go through the scenario in detail, but to present it in big blocks, per sequence instead of per frame and to introduce the sequences only in a sketchy way. As a result, the workshop became a mere discussion workshop, rather than a participatory design workshop. Hardly any changes were made to the suggested scenario. Furthermore, the discussion was led by a few extrovert participants, while the more introvert participants expressed their ideas to the moderator only after the workshop. In addition, two higher ranking company representatives joined the workshop spontaneously and acted as moderators. These company representatives were not familiar with the workshop script and used the workshop as a forum for discussing items they personally considered important. In effect, the discussion jumped between different topics and levels of detail. A main topic of the workshop became how the treatment procedure that would include the new appliance could facilitate reimbursement of the doctors by insurance companies. Finally, people had to leave before the end of the three hours and as a result, the workshop had to be sped up. Unfortunately, this time pressure was communicated to the participants by the moderator very explicitly.

RESULTS

Was the workshop a success? Yes and no. Yes, because the company representatives were generally satisfied with

the results. No, because a) we did not gain as much information about the product requirements for the company as expected and b) from a research perspective we did not gain insight into the use of adaptable storyboards in participatory design in practice.

While the scenarios were not used as planned, they offered several advantages. The participants had the "story" in front of them and could refer to it (although they hardly did). As a result, there was a lively discussion going on during the workshop, which was inspired by the scenario. Furthermore, the scenario worked as an aide memoire for the moderators to ask the participants questions. In the reflection with the company partners, which took place in passing after the workshop, they concluded that the workshop, even though not executed as planned, had helped the company to retrieve relevant information. We learned for example that the product should offer a database of different treatment protocols and that there should be a possibility to prepare treatment plans in batch. Another positive conclusion about the workshop results was that the clients would remember the workshop for being different from common meetings. This was positively mentioned by several participants after the workshop.

Unfortunately, the gained information was mostly related to reimbursements instead of actual product requirements. For example, it was agreed that the medical specialist himself should see the patient once in five treatments, as that would be financially advantageous, when dealing with the insurance company. In addition, the expensive preparation of the adaptable digital scenarios could not deliver any additional information because the functionalities were not used. My job as media assistant during the workshop was therefore pretty much obsolete. Personally I was pretty upset and disappointed directly after the workshop. In my disappointment I send an e-mail to my research supervisor one day after the workshop and wrote: "*Yesterday did not go as planned. The moderator did not explain the scenario by using the story board but just started a discussion. I told him not to do this, but he simply proceeded, and from this moment on nothing went according to the workshop script. […] The workshop generated a lot of information about reimbursement which seems to be useful but this could probably have been obtained in an easier way. […] The workshop was a disappointment for me, because on the one hand it was not really a participatory design workshop and on the other hand because all my late hours of work to make the digital scenarios functional were redundant - and because I, in my job as media assistant was redundant as well.*"

From a research perspective it was pity that the company had not allowed filming or recording of the workshop, because they feared that their clients would not like it.

FOLLOW UP

The workshop was supposed to be complemented by one or two additional similar workshops at hospitals. It was decided to use the same setup for these workshops. The hospitals were chosen for their vanguard position in the field of medicine the appliance should be used in. Therefore, the company representatives expected that the level of detail of the workshop setup would not be too high for the participants at the hospitals, in contrast to the participants at the fair.

As a next step in the project, follow-up workshops were planned that should deal with detailing the design of the appliance. We had already written a plan for the follow-up workshops. As the company had announced that they would like to engage a design agency for the product design of the final product, we were also considering how a good cooperation with such a design agency could be accomplished in the follow-up of the project. However, this plan has not been executed though the company representatives were very positive about our co-operation. The only reason for the termination of the project we were told by the company was that the company management had reservations regarding working together with university researchers.

REFLECTION

In retrospect I had to make a lot of concessions to my own participatory design principles. As the group in the workshop was quite big, the time available very sparse and the company representatives afraid to scare off clients by the use of "too childish" participatory methods, there was no room for a more interactive technique such as a pivot game to explore the scenario. I would have preferred the latter technique to a story board method because participants could not directly push buttons to alter the scenario themselves. The scenarios had probably been set up in too much detail, but explaining the scenario's in the beginning of the workshop in more detail would have created a common background and would have brought more structure to the discussion. As the moderator had no experience in guiding participatory design workshops he did not consider that option and went directly into a too general discussion. In addition, I suspect that he was a bit anxious because higher company representatives decided to join the workshop.

This experience taught me to invest even more time in introducing the partners I work with to the principles and benefits of participatory design. It is important that they understand how to work towards a common ground in a workshop, what precisely the benefits of participative interactive workshops are and what the results can be. It is also important that they understand what resources and time it takes to achieve those results. We provided large amounts of written information on these issues, such as script books and rationales to the company representatives. However, the company partners did not always read the documents we provided them with, and in the meetings there was not enough time to discuss all the relevant aspects of participatory design in detail. Next time, I would not take the risk in assigning the role of the moderator to a company representative without giving him or her proper training.

In addition, in a following project I would take care that the setting of the workshop is different. It might be better to visit only a few end users at their "home base", instead of meeting a large group in a busy fair atmosphere. Furthermore, even with a group of valued clients there need to be some rules in the workshop, such as taking turns, to make sure that not only the extrovert participants get heard during the

workshop.

Furthermore, in the workshop many of aspects of product use were already built into the initial scenario; therefore the participants were not completely free to make their own decisions in setting up the ideal scenario from scratch. However, this setup was chosen as a compromise because of the limited time the participants were available. A scenario setup from scratch would have taken significantly more time. The problem emerged, when participants only discussed the initial scenario instead of adapting it, because the workshop script was omitted.

The most meaningful positive moment in the project for me was when I realized that, though the workshop set-up was changed on the fly by the facilitator, the scenario did help the participants to envision the use of the future product. Unfortunately I did not have a chance to evaluate the session together with the participants, therefore I do not know what the workshop meant to them. However a few participant told me that the session format was new to them and they thought it was really interesting, when they left the workshop. Looking back, an important intention of the workshop was to explore product requirements to make a product ready for the market, instead of answering to a need and developing a new product according to this need. The only need of the medical specialists that was triggered during the workshop was the need to make money. As a result, reimbursement was a main topic. Meeting prospective future users for just one session to elicit information does not comply with the principles of participatory design. Participatory design aims at including stakeholders during the whole design process with the aim to empower stakeholders to give form to their own (work)situation. Our project did not meet these conditions. However, for companies it can be difficult to include users over a longer period of time in their design processes when the initiative for product development comes from the company. In that case users should be somehow rewarded for their commitment. A longer cooperation with stakeholders may be possible they they are rewarded in a different way, for instance with the opportunity to test the first prototype of the new product. It could be interesting to think about a new model for cooperation in this format. However, when a researcher wants to use genuine participatory design it is simpler and probably more rewarding for a researcher to work with projects in which the initiative comes from a hospital and the stakeholders have a clear need.

More generally, we also had to deal with typical dilemmas that surface when university researchers are working on a commission basis. When the project started there was a lot of hurry. There was a clash between producing quick practical results and a time-intensive in-depth analysis resulting in the use of well supported methods. In addition, there was a clash between getting the opportunity to analyze workshops and publish details about them and protecting the company's interests in keeping the project details classified and protecting the privacy of the clients by prohibiting video-taping. In a next project I would make clearer arrangements on these aspects.

MULTICULTURAL PARTICIPATORY DEVELOPMENT OF A CIVIC SOCIAL MEDIA SERVICE

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ABSTRACT

While social media has given rise to user communities and their active civic participation, the public sector lacks ways of involving citizens as co-innovators of public services. In this paper we describe a case study of participatory innovation of a social media service for promoting and strengthening immigrants' civic participation. In our community-driven design approach several challenges were identified related to working in a multicultural and multi-organizational context facilitated by several researchers. Shared ownership is a necessity for co-innovation of social media service, but a challenge for effective design process. Our results indicate that the project was not only important for co-innovation of the new service but also for shaping the participating organizations and individuals.

INTRODUCTION

Social media provide a means for reaching also minorities that are not active in traditional democratic processes. In a relatively new country of immigration such as Finland, enhancing political participation of immigrants is becoming of growing importance, since this group currently has disappointingly low participation figures (Wilhelmsson et. al 2010). The question of how to enable participation and involve these people in the society and its political processes is crucial when trying to achieve inclusive society and democracy. At the same time, processes initiated by researchers or government agencies may not become truly owned by the participants (Mäkinen 2009).

In this paper, we describe a case study of involving immigrants in the participatory design process of a civic social networking service called Monimos. In this process immigrants became also owners of the service that was developed. We describe how the innovation environment is different in a case with multicultural organizations and participants, and how the collaboration process related to the experience of ownership. We present findings based on the researcher reflection as well as interviews with participants. Based on the reflections and interviews, we discuss the challenges as well as the successes of the participatory innovation processes in a complex collaboration environment like this.

RELATED RESEARCH

INVOLVING USERS IN DESIGN PROCESSES

Participatory design (PD) has a long tradition in information system development especially in the workplace context. The concept of PD is strongly linked to the ideal of democracy (in work organizations) and every individual's involvement in the decisions affecting their daily (working) lives (Damoradan 1996). PD aims at creating a closer relationship between users and developers by offering a common space where the knowledge from both sides can be combined (Muller 2002). Users are involved as active design partners in the development process (Druin 2002) using methods like workshops, scenarios and mock-ups (Schuler & Namioka 1993, Ehn & Kyng 1991).

The more recent approach called meta-design is grounded in the assumption that future uses and problems cannot be completely anticipated at design time. Instead of finished systems, design should we targeted in creating open platforms that users can modify themselves during the use time based on the new problems and needs that the same service can be used for. Users are regarded as co-designers. (Fischer 2009) It becomes unclear where the design stops and the community starts (Hagen & MacFarlane 2008).

Meta-design approach stresses that participation culture is not determined only by the technology that is being developed but equally importantly by incremental shifts in human behaviour and social organizations (Fischer 2009)

USER PARTICIPATION IN SOCIAL MEDIA

Social media services differ from the traditional information systems in that sense that the content is created by users and the ways of using the service cannot be fully anticipated in beforehand. Moreover, since no separate releases are needed for new software versions, social media services are often developed continuously (beta development) and the service development cannot be separated from its use. Therefore, the traditional distinction between "users" and "developers" does not hold anymore (Fischer 2009).

The term "user" becomes questionable also, since individuals in social media services are not merely consumers, but rather people who are switching between the roles of a consumer and producer (also referred as a "prosumer"). Axel Bruns (2008) uses the term produsage to illustrate the social media based production. Content and community are equally (or even more) important design issues than the technical features.

When developing social media services, users and their needs cannot be studied only in an individual level, but moreover from the community perspective. Since social media is used with and in relation to other people, it must be designed to support collaborative actions. Instead of user-centric design methods, community-centric approach is needed (Brandtzæg et al. 2009).

Hagen and MacFarlane (2008) introduce the concept of seeding when designing social media services in which users very much define the success of the service. Designers' role becomes to facilitate and encourage the use as well as create conditions for participation: to "seed" content, community and connections that can continue . Instead of recruiting research subjects or "users", designers need to work with a potential community of contributors. (Hagen & MacFarlane 2008)

Figure 1: Ideation workshop.

MONIMOS CO-DESIGN PROCESS

Monimos is a joint case study of the research projects Somus (by three research organizations) and EPACE (Exchanging good practices for the promotion of an active citizenship in the EU, coordinated by the Ministry of Justice) that both examine the possibilities of social media in civic participation and collaboration with the public sector. The Monimos case study focuses on developing social media tools especially for immigrants and multicultural associations in the Helsinki metropolitan area.

The case study started with creating understanding of immigrants' needs and current challenges in civic participation by interviewing civil servants working with immigration issues and the founder of a multicultural network in Helsinki. The issues and possible solutions were further discussed in two workshops with a group of emigrants and other people working with immigrants (NGOs, media, civil servants) (See Figure 1 and Figure 2). Based on common interests, we started to collaborate with Moniheli, the network of multicultural associations in the Helsinki metropolitan area.

The objectives of Moniheli network are very similar to the Monimos project goals. Moniheli aims to be a multicultural forum for the immigrant organizations around Helsinki metropolitan area and thus increase and improve cooperation between various organizations dealing with similar issues and aiming for the same outcome. Moniheli has just recently become officially a registered association and is in the final year of its "ramp-up project". At the moment it has over 30 member associations. Moniheli has an active board, with 16 members, an advisory board of 6 members and 2 employees. Moniheli believes in the idea of civil society and better possibilities to influence on society as a group in which all members have the same objectives. When establishing the network, their aim is to involve all members actively and equally in planning and decision-making.

Figure 2: Original 18 ideas with votes on them.

Our case study was based on participatory design (carried out in face-to-face workshops and online environments) and iterative software development. The original goal of the research project was to develop an information and knowledge platform for immigrant groups in accessible and understandable form based on their everyday life needs and issues. Further, goals were to enable immigrants' participation in the processes of knowledge building and public discussion, and to establish open interfaces and interaction between immigrants, multicultural associations and various government agencies.

The more precise definition of the end result and partly also the participation practices were left open for negotiation with the participating user community. We first organized an open workshop for Moniheli members to evaluate initial ideas and choose the one to be developed further (See Figure 3). Based on the group discussions we decided to combine ideas of solutions arena extended with ideas of a multicultural event calendar. Since the Moniheli network did not yet have any online service, there were high expectations of creating a comprehensive solution for wide range of purposes (basic information, network administration, marketing, creating job opportunities, getting funding via websites etc.).

Figure 3: Concept definition at a Moniheli workshop.

After the first Moniheli workshop a core team was created that consisted originally of 10 immigrants and 2 employees of the Moniheli network as well as a web developer, a designer, and six researchers of different fields. One of the Moniheli project workers invited the team members so that they represented various backgrounds (nationality, gender, professions) and had interest in social media and joining the new service development. During the process, eight new immigrants joined the team or participated in some workshops, because of their role in Moniheli or other link to Monimos. The team was therefore not static, and original members also left the group during the process.

The core team held ten monthly workshops; in addition, researchers and the developer had weekly online or face to face meetings. The design workshops were the most important space for creating a vision for the social media service, making design decisions and managing practical issues, such as marketing and press release. Participants could also attend these meetings remotely, using Skype, EtherPad and Bambuser as communication tools. In the early workshops, the focus was in idea generation, use scenarios and use

Code	Gender	Role in Moniheli	Participation phase	Nationality
P1	Male	Moniheli chairman	From start to end	Asian
P2	Male	Moniheli project worker	From start to mid	Finnish
P3	Female	Moniheli advisory board member	At the end (not official team member)	African
P4	Female	None, Moniheli outsider	From start to end	Asian
P5	Male	Moniheli board member	From mid to end	African
P6	Male	Moniheli board member	From start to end	African
P7	Male	Moniheli board member	From start to end	African

Table 1: Persons interviewed.

case descriptions, whereas later workshops concentrated on evaluating the Monimos website that was iteratively developed throughout the development process based on participants' feedback.

Between the workshops, the core team worked online in Owela co-design space (See Figure 4) and via email. Participation via Owela was open also for anyone outside the core team. People were able to make suggestions regarding the service concept, features, layout and the name of the service, and discuss and vote on these (See feature voting in the Figure 5). In final stages, three chat sessions were organized for co-testing the website.

The result of the process is a social media service called Monimos.fi that was developed iteratively based on open source platforms WordPress and BuddyPress. The service was launched publicly in June 2010 as a meeting place for internationally minded people in Finland (See Figure 6). The service has been used by immigrants, Finns and multicultural associations for networking, discussion and promoting events.

DATA COLLECTION

The audio from workshops were recorded and research diary was used for making notes during the process.

In addition, seven participants were interviewed by the authors of this paper during October 2010 - about a year after the project started and about 4 months after the service was launched. Interview transcriptions were read and annotated by two researchers, using a collaborative annotation tool for qualitative data, called Saturate. The persons interviewed and their roles are defined in the Table 1.

EVALUATION OF DATA

Interviewees were chosen based on their willingness to volunteer, and therefore only participants, who were active at the end of the development process, were interviewed. It would have been valuable to gain insight also from those people who were not particularly active in the workshops or dropped out during the process. However, the reasons behind passiveness were not necessarily related to the development process, but were understandable personal issues (e.g. maternity leave or taking care of sick family members) or lack of time. Also researchers from the EPACE project could have been interviewed as well as the immigrants participating in the process merely via online tools and not being part of the core team.

Five of the interviews were held in English, and two in Finnish. Except one, all the interviewees used foreign language in the interviews. Although

Figure 4: Remote participation using Owela (Open Web Lab).

Figure 5: Online voting and deliberation on feature prioritization.

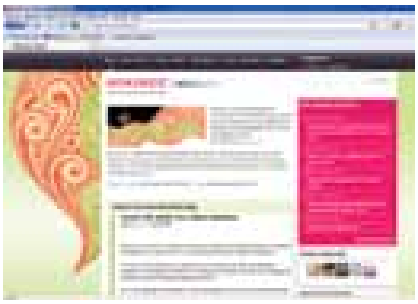

Figure 6: Monimos.fi screenshot.

their knowledge of language was good, there may be some nuances that are interpreted differently. Using foreign language may lead to simplifications and unintentional emphasises.

RESULTS

Team members' experiences of the participation process were studied in the interviews. The possibilities and challenges of the process are grouped according to the following themes: Multiculturality, Participator roles, Civic participation, Working in a forming ecosystem, and Multiorganizational collaboration.

MULTICULTURALITY

Multiculturality was a core element of the project, since the service was developed for immigrants and with immigrants. The team consisted of immigrants from Africa and Asia as well as Finnish researchers and developers. Although not all immigrant groups in Finland were represented, the distribution of members corresponded to the Moniheli member organizations, which was seen positively. Even the participants realize that bringing in people from various cultures and backgrounds will be difficult, however, that was taken as a defining parameter.

> *P4: "Well, because I know that there's like, when I entered the room and there are a lot of people from different countries, I already expected it to be chaotic. I'm sorry."*

Several of the interviewed persons noted that research on immigrants tends to be observing and even considered exploiting the "research subjects". In the beginning, participants were mistrustful of researchers and the aims of the process, since they did not want to experience yet another research project, where their opinions are asked but nothing will be done in practice or the solutions do not fit the immigrants' needs.

Despite the need to get insight from various cultures, it is not just the range of cultures but rather range of opinions that is appreciated. The participants did not regard themselves as immigrants but rather as an entrepreneur, student, researcher, citizen activist, husband or software developer. Their knowledge and know-how of different issues, like marketing or project management, were more notable than their nationality.

> *P2: "Of course the cultural backgrounds were important in this project, but also the fact that there were different people, who were able to question or ask something that the other person would probably not be able to."*

Although the researchers considered the core team to represent the real end users: immigrants and other internationally minded people, the participants themselves did not surprisingly feel the same. It was often noted that the end users should be taken into account more, and more diverse people should be present in the workshops. The team members felt being a more privileged group of immigrants and worried about other immigrants' skills and possibilities to be active in online civic participation.Some participants took unofficially a role of a representive of a certain user group, e.g. refugees or business people, and brought their point of view into the discussion.

PARTICIPATOR ROLES IN THE TEAM

The roles in the core team were not defined explicitely in any point. All participants wanted to be regarded as equal team members, which was both a strength and a challenge.

> *P2: "I didn't feel like NOT being on the same level with the developers and Ministry people and others. At least I felt myself equal with others."*

The workshops were very much based on deliberative discussion and decision-making was difficult and time consuming. Since it was unclear, who is actually the owner of the process, no one dared to make the decisions. Team members would have expected more facilitation in the workshops either from researchers' or Moniheli management's side.

> *P4: "In the way that it was facilitated, I think that's the downside of having this participatory thing, because you have to like really make sure that everyone gets a say on something. And if you do that, it just doesn't work without like... Without a person who's going to say, "Okay focus. This is what we're going to talk about." I think that's one thing we really lacked. No one's really facilitating."*

The team members could not articulate what their role in the team was. The team composition was supposed to be fixed during the whole process, but of various reasons, some people joined the team later on.

> *P2: "In a way, if a person wasn't involved from the very beginning, he didn't know the process we've been through, how we've come up with the things, so we had to go through it all again – and it didn't always get understood, what we've been through."*

After launching the Monimos service publicly, different teams were founded to be responsible of content, community, marketing and administration. According to some participants, it would have been important to divide the group already earlier into those smaller teams which should have had clear responsibilities and power. However, guidelines and facilitation of the work would have been expected instead of letting the teams work on their own.

CIVIC PARTICIPATION

As the given goal for the project was to enable civic participation of immigrants, the goals were set high by the participants - perhaps unreasonably high. Since the discussion was much about democracy, the process was expected to be very democratic, causing difficulties for the researchers.

> *P2: "Well particularly good was the fact that everyone got their voice heard. In a way, though, democratically thinking, there could've been even more immigrants…but that would've made the work process even more complicated…"*

The rather open goal setting had its problems and participants would have expected the researchers to define limits of what's reasonable to aim within the project and what is not.

> *P4: "And I remember you saying that everyone can say anything that they want, that you're interested in knowing everybody's opinions, so I kind of thought, somehow thought, that that's a dangerous place to go to. I'm serious. Because it's just impossible to collaborate all these ideas."*

The participation in the Monimos development was also considered as one kind of civic participation. The Monimos development represented a participation process, where people were heard and at the same time they were

developing a service that provides opportunities for civic participation. Being part of the team gave members new contacts and better understanding of how social media could be used in civic participation. Also the fact that the Ministry of Justice was part of the project, made the people feel empowered and they wanted to use their opportunity to influence.

WORKING IN A FORMING ECOSYSTEM

It came a little bit as a surpise to the researchers how immature phase the Moniheli network was in. Our hypothesis was that this project could strongly boost Moniheli and be an effective and modern tool to start getting people together for collective action.

On the relation to Moniheli and its formation processes, the participants had quite conflicting views. Some participants thought that the Monimos service was a good tool for the forming phase of the Moniheli and the way of working in the Monimos team influenced positively also Moniheli practices.

> *P2: "In a way this project shaped Moniheli practices, for example the meeting practices and such…and it taught how to deal with different people in this context."*

Another viewpoint was that Monimos project became too chaotic, since Moniheli did not had clear structure and decision-making procedures and was therefore not yet ready to take the ownership of the Monimos service.

The relation between Moniheli and Monimos caused a lot of debate during the process, since it was not clear to the association itself. The Monimos service was not meant to be only for Moniheli members and a few people outside the Moniheli network also participated in the team. One of the team members that was not part of the Moniheli network found her role confusing.

> *P4: "Sometimes it's like they know a lot of things about Moniheli and they just -- make the decisions and sometimes it feels like, 'I can't make any decisions here because I'm the oddball'"*

MULTIORGANIZATIONAL COLLABORATION

Different organisations participating in the process had their own visions of the end result and they could not be articulated clearly enough in the beginning of the design process. Just after seeing the first drafts of the website, people realised what we are really developing and started to argue about the goals and to create a common vision, which took a lot of time.

The design process took a lot of time also because each participating organization brought its own slowliness to the process. Some team members preferred discussion and unanimous decision-making, where as others wished to have a strong leader or facilitator in the process. Some decisions, like the name of the service, were handled too democratically according to some team members. On the other hand, design decisions made by a professional designer were not regarded democratic enough.

Although there was sometimes too much bureaucracy and discussion, it was still seen that the only possibility to create this kind of civic participation service, is to involve the immigrants themselves in the design process.

DISCUSSION

From the researchers' point of view, we experienced a paradox between conflicting expectations: on one hand there was a desire for a well-designed development process (traditional participatory design), and on the other hand, we wanted to let user participants make decisions and become the owners of the planned service (community-driven design). We tried to design a service that fulfils the needs of the Moniheli network, but at the same time we knew that social media services cannot be fully designed before their use. The owner (association) of the service cannot decide, how the members will use the service. The best way to see, how people use the service and what kind of features are needed, is to let them try it out during the development phase. We also did that in the Monimos project, but a more systematic way to make changes in the service design during and after the beta testing phase, would have been needed.

Unclear ownership and unspoken roles of the participating organizations resulted in a slow development process. On one hand it was seen extremely important that the immigrants felt empowered in the process and had their say on the service that was being developed for them. On the other hand the participants would have wished to have more facilitation and stronger leadership in the process. Since the roles and responsibilities between Moniheli and the two research projects were not clear even for the researchers, no one clearly knew, who would be allowed to take the leader role and make the final decisions regarding to the Monimos service. Based on our experiences we claim that a "service owner" is needed also when creating community-based social media services.

Democracy was one of the goals of the Monimos design project, and deliberative discussion was considered important in the workshops and emails. However, democracy does not always go hand in hand with good design solutions: sometimes a professional designer knows better, what kind of things work in reality and what not, although the team members would wish something else. Sticking with decisions that were once made would have been beneficial for the development of the web service instead of continuous negotiation about the same issues.

One of the challenges in participatory design is finding the participants that represent the potential user community and are willing to be involved in the design process. In our case, the core team members were chosen based on their own interest for social media and they were not aimed to represent all immigrants in Finland or even all Moniheli members. However, the team members themselves felt that the "real end users" were not taken into account in the development process. From the researchers' perspective the team members were "end users", but a broader group of end users should have been taken into account, when defining the use cases of the service and especially in the testing phase. Team members represent the future community and have links to other potential users. During the beta testing, they could have been invited more friends to communicate on the online forum.

Since researchers and users worked together as a team and responsibilities were shared also for the immigrants, they became equal team members and kind of researchers or designers them-

selves. The members in the core team did not consider themselves as passive objects but were willing to take an active role already during the development process and divide into teams that tried to take responsibility of certain tasks. Even more tasks could have been given for smaller teams instead of discussing all issues in the monthly workshops with around 10 people. On the other hand, participation in the whole process and in all meetings made the participants feel themselves as owners of the service.

This could be seen as an ideal for designing social media services that support produsage way of doing. There are no users anymore, but all community members feel responsibility for producing content and building the community. This could have been better supported with the seeding approach, in which researchers' role is to support the community in content production and linking people instead of making design decisions (Hagen & MacFarlane 2008).

The workshops should have concentrated even more on the topics that help the community to stay alive after the research project. How to produce content, how to make community work, how to use viral marketing on the web, etc. Software design issues should not be so central. More importantly, there should be a mechanism for quick decision-making and changes in the system design based on feedback and experiences during the use.

While the goal of the project was to empower people and be even an enabler for organizational learning, the complexity of the participant and stakeholder network presented surprising impediments. Simply the fact that the Moniheli network was just being officially formed during the project surprised participants – the project process helped uncover issues in the decision-making process of the organization. Despite a strong will and belief in the project, it was difficult for people and organization to find resources for the project. At best, on the other hand, people and organizations were able to initiate concrete actions as a result of the project. Organizations got new members, and one individual even founded a company based on public discussion on the service.

Although both researchers and other team members identified a lot of problems in the design process, the participants were still satisfied with the end result. Although the use of the Monimos service has not yet become as big as the team members initially hoped, they have had concrete benefits of using it. Also the development process has been beneficial as a learning process, networking opportunity and an act of civic participation.

Action research challenges	**Experiences from the Monimos case study**
The project influences basically only those community members who participate in the project	Participation was made possible for everyone using online tools, but more attention should have been paid in concretely involving those people via existing social networks.
Continuity is a challenge, when project funding ends.	Monimos service was planned to be an integral part of Moniheli's way of doing things and part of their official web presence. The core team was divided into substance teams that can continue working after the research project ends.
Lack of time and technical challenges in participation	Workshops were held only once a month, and online tools enabled quick contributions between the workshops. However, more face-to-face guidance for social media way of working would have been needed.
Too ambitious goals in relation to resources	The web service was developed iteratively, but it took too long time for the users to see the first version online in order to see, what we are really speaking about.
Community expects that the researchers lead the process, although they should be just facilitators that empower the community to act	Thematic teams were founded among the participants to take responsibility on different issues without researchers' influence in decision-making. More facilitation and guidance for the teams would have been needed.
Misevaluation of community's needs, resources and participation possibilities	This was challenging in our case as well, but the development process also partly formed new practices and opened new possibilities.
Co-development project may not have real influence in the society	Monimos service was linked into the normal practices of Moniheli. Monimos discussions have also a link to real live events, in which the online discussions can be taken further.

Table 2: Typical action research challenges (Mäkinen 2009) and experiences from the Monimos case.

CHALLENGES IN ACTION RESEARCH

Mäkinen (2009) has identified challenges of action research, when developing social media service for civic participation with a community-driven approach. Some of the challenges are listed in the Table 2 together in parallel with how the issues were taken into account in the Monimos case study.

CONCLUSIONS

In this paper we presented a case study of designing a multicultural social media service Monimos together with its users. There were several challenges that resulted from the democratic participation of several partner organisations as well as individuals without clear roles and addressed responsibilities. Unstated roles of participants, the complex network of the participant organisations and blurry ownership both of the innovation process as well as the final product slowed down the process and sometimes frustrated participants. However, when creating a social media service, the system cannot be fully planned before its use. A bottom-up design approach (designing and refining the service during its use) is more useful although it makes the process more chaotic.

The design team members were both users and producers in a same way than they are in the final service as well. Therefore the division to users and designers does not hold in the design process either. Instead of designers and researchers, there is need for facilitators that support the "prosumer teams" in producing content and building

up the community. The success of the process cannot be measured only with the efficiency in systems design or the number of active members in the Monimos service. Interestingly, the process resulted in some unanticipated effects. Some members of the team mentioned learning a lot of multiculturality, creating contacts with other immigrants, getting to know new tools for distance collaboration, or getting inspiration for creating an own company. In that sense, people could achieve during the design process things that were goals of the social media service.

The design process became a social media for multicultural civic participation itself.

The Monimos process helped also Moniheli make missing processes explicit and define its ways of working internally and with its stakeholders. The participatory innovation process catalyzed and facilitated the shaping of Moniheli processes and activities.

ACKNOWLEDGMENTS

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NARRATIVE: TOWARDS CUSTOMER CENTRIC SERVICES: SUSPENSION OF EXPECTATIONS AND TRUST

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INTRODUCTION: PUBLIC ORGANIZATION AND SERVICE DESIGN PILOT-PROJECTS

This narrative is written from the basis of experiences gained in working in collaboration with the City of Helsinki (later referred as the City) in a public service design project. The City has a new strategy where developing internal and external networks, user-driven innovation and business-friendly attitude are emphasized. The strategy has been implemented in three pilot-cases, titled as the Service Journey-projects, where the customer-centric and user-driven approach of service design, has been used for the first time. The aim of the pilot-cases has been in improving the public services for small and medium-sized enterprises and the actual execution of the projects has been carried out by two external service design consultants.

The development of public services requires a cross-functional process. This demands a new kind of thinking and attitude from different departments of the public body, which traditionally have been used to operating mostly within their own departments. Also, new means and methods for organizing, planning and facilitating co-operation with different groups of stakeholders are needed. This starting point offered the City a platform for a collaboration project with the Aalto University Service Factory and it was carried out through a project that included three parts conducted by students from different disciplines. This narrative is based on one of the parts, a Master of Arts thesis work, which aimed at exploring and testing how explorative and „designerly" co-design approaches such as design games (Brandt 2006) can be applied in the challenging environment of public services, which is a rather novel play ground for the application of design competence. The study was conducted in the form of three workshops where the service users, subscribers, providers and purchasers were asked to participate with other stakeholders and contributors (see fig.1-3).

This narrative reflects the experience gained by working in co-operation with the City representatives, consultants, and other stakeholders. It also discusses the experiences gained from organizing the workshops in the context of public services, where a novel approach, i.e. co-design, was introduced to the participants at the same time. Finally, some comments and experiences from the City representative's interview have been attached.

THREE WORKSHOPS

Three co-design workshops were organized to support the planning and launching faces of a new Service Journey -project for social and healthcare entrepreneurs, which was a continuation of the earlier three pilot projects.

Figure 1: Workshop setting in a context of public service development

Figure 2-3: Participants negotiating the current state of the services and visioning the dream situations in one of the workshops. Elements from design games such as game rules, turn-taking, visual cards, etc. tangible pieces were utilized to facilitate, stimulate and enhance the discussions.

Except recruiting the participants, all the arrangements for the workshops, such as planning, organizing, facilitating and transcribing the workshops were part of the Master of Arts thesis work. The work was part of a City funded research project and it was supported by Aalto University supervisors. The project group, along with the supervisors and the students from the University, consisted of a project manager and other representatives from the City and a representative from an organization that runs the interests of social and healthcare entrepreneurs. The two consultants were also actively involved in group meetings and attended the workshops.

The goal of the first two workshops was to gather information and experiences from the current situation, and map out the expectations towards the new Service Journey-project. The first workshop was aimed at entrepreneurs who were the customers and the users of the services and there were 14 social and health-care entrepreneurs attending the session. Second workshop was organized for the employees of the City and 10 officers participated the workshop. In the third workshop both parties, 14 officers and 10 entrepreneurs, were brought together to discuss and negotiate current issues raised during the previous workshops and to envision the ideal service journey, future collaboration platforms and the ways and manners through which these visions could be reached.

For most participants, including the project group itself, this was a first experience and contact to participatory design methods and user-driven empathic approaches. Therefore the objectives from the Service Journey – project's perspective were in helping to define, who should be involved in the development process, orientating the participants into the new approach, thinking and methods, and in creating a ground for the upcoming project and cross-functional collaboration. From the research perspective, the aim was to test and develop further a radically different working method that challenges the traditional practices and is suitable for the purposes of the future service development in the City.

EXPERIENCES AND CHALLENGES

INEXPERIENCED ACTORS

The project set-up was not particularly easy for a master student trained in industrial and strategic design programme to enter. The service design consultants had their own work in progress with the three pilot projects and the development work
had already been going on over a year. This meant, that the people participating the pilot project were already busy and as the project manager stated, tired with the development work and could not be bothered with yet another new project. Even though the City representatives were eager to start the university collaboration project, finding the suitable context to execute the research in reality was bit challenging and time-consuming.

COMPLICATED ORGANIZATION AND DECISION MAKING PROCESS

The service design consultants had backgrounds in economics, service marketing and advertising. Therefore they were not directly familiar with co-design and design games approaches and it was clear that these kinds of workshops could not be attached into their ongoing projects. However the City had made the decision to start a new Service Journey-project, which created a platform where the „designerly" approach could be implemented, but since the decision making in a big organization progresses very slowly, e.g. setting the dates for the workshops turned out to be challenging. Therefore all the three workshops were organized within one month, while the whole collaboration project lasted eight months. This was a bit tight schedule both practically and research wise, since the idea was to utilize the previous workshops contributions and reflect and develop the exercises and the material always to the next workshop.

FATIGUE TOWARDS THE DEVELOPMENT WORK AND QUESTION OF MOTIVATION

Another matter was that since there are constantly different projects and ventures going on inside the organization, there seem to occur some sort of fatigue towards the constant development processes among the employees. Therefore it can be challenging to try to get them excited about yet another new project, consultant or method. Especially, when they usually don't have extra resources reserved for development projects, but the work has to be made on top of their normal duties. This was shown in the requiting process. Although the call for participation was done by the City it was difficult to try to involve a sufficient number of participants to the workshops, so that the sessions would actually benefit the forth-coming Service Journey-project. Some of the biggest and at the same time most important bureaus are so massive with different departments and sections, it was not enough that only one or two persons participated the workshops. Above mentioned issues are linked to many questions from resources to individual motivation of the officers as well as acknowledging the importance of cross-functional development work.

RISK OF THE UNKNOWN AND STRANGE

Since the goal of the workshops was to support the planning and launching faces of the new project, the idea was that the consultants would continue the development of the project from there. This created a lot of pressure and stress before the first workshop. When people don't have first-hand, personal experiences of the co-design methods, it is impossible for them to fully understand what the methods are all about. When one sees pictures and presentations of workshops where „designerly" approach has been used, it can seem like a childish kindergarten play instead of „serious and productive working". Therefore even though the project group had had several meetings, where methods and plans of the workshops had been introduced, the atmosphere in the last meeting before the workshops was really tense.

TRUST

For most participants these workshops would be the first contact and orientation to service design mindset and participatory methods, and therefore the consultants were nervous about what kind of impression the workshops would leave. They wanted to highlight the point that the workshops would have to be successful in every way. Also the project manager from the City was confused about the structure and the goal of the workshops and it was clear that the attempt to introduce the method to the

Figure 4: Project group in a middle of a quick exercise and introduction to the mindset of the working method before the workshops.

Figure 5-6: Participatory project meeting. With the help of visual map project group tried to achieve consensus and negotiate about the project and research goals.

project group had not been sufficient enough and shared trust towards the student project had not been gained.

Even though the first workshop didn't succeed perfectly, material and exercise wise, it was apparently convincing enough to create trust inside the project group towards the next workshops. After the first workshop participants, including the project group had a chance to leave anonymous feedback of the session. The comments turned out to be almost all positive and enthusiastic. One could almost feel the release of pressure in the air.

REFLECTIONS

They say that there is a first time for everything and within the whole Service Journey -project settings there were plenty of those factors. As the project manager said afterwards, it felt like the whole project was about piloting after piloting for something. It was the first time the City had used service design approach in developing cross-functional public services, it was the first time the consultants had worked with the public sector and it was a first attempt to build research collaboration between the City and the Aalto University's Service Factory in this context. So there was no manual on how to operate in each of these situations. Another important issue was the fact, that the City is a relatively complicated organization with a very traditional and hierarchical decision making structure, which along the inexperienced actors influenced the stickiness of the beginning of the collaboration project.

Due to the same reasons, communication and building shared understanding among the project group were things that were problematic during the entire project. Looking backwards now, it is easy to see how there should be some kind of alternative way to introduce a novel approach to the project group and workshop participants in the future. If the project manager asks you still after four months of collaboration, right before the workshop; "what was it again that you were doing", clearly the traditional powerpoint presentations are not enough to introduce the co-design and design game methods – even though they were practiced with a small scale exercise in one of the project group meetings earlier (see fig. 4). In the same way the project manager had experienced the orientation phase extremely difficult, because it had taken a lot of effort from the City representative's part to communicate the organizational structures, functions and manners as well as their expectations for the collaboration to the students and hence, achieving a common vision and consensus had been hard to reach (despite the attempts to try to communicate the complexity of the initial project setting with a visual map, see fig. 5-6). These are important issues that should be investigated more in the future.

One reason to the communication problems was probably also the nature of the methods as well as terms and language that were used. Although it is always pointed out that a framework for innovation and creation of change requires liberating and relaxed atmosphere where there is room for failure, it is not easily implemented in real life situations. The employees of a traditional public organization were asked to throw themselves into different and unknown actions and thinking, which challenged the normal behavioral patterns, e.g. meetings or workshops they were accustomed to, which is related to previous work done in Aalto University (Mattelmäki et al. 2009). Working with tangible and visual material, such as carbon figurines, lego blogs, pictures, clue and scissors represented to the project group even different activities than the service design consultants had introduced and used before.

Therefore it is easy to understand how these matters can awake doubt, fear of unknown and there is a risk of losing credibility. It takes a lot of courage from the manager's side to trust and believe in these methods, especially when there is no guarantee on how people will react and operate and what kind of results participants will produce. Furthermore, retrospectively thinking the project manager assumed, that one of the factors that created pressure before the first workshop was the situation, where a student project in a manner of speaking stepped into the territory of the consultants. In this way the consultants couldn't start the new project with their own terms and were thus obligated to take part in the collaboration project. As the project manager sees it, the pressure of succeeding was linked to the ways the consultants work, which is purely business and maybe cannot be as experimental as research approach can be.

From a master student's point of view the situation would have been extremely challenging without the support and backup coming from the supervisors and the knowledge gained from previous work and literature review. Due to these factors there was not really a risk or a fear of failing completely, but it was a bit painful and frustrating to notice how difficult it was to try to achieve some credibility and to try to convince the project group about the benefits of the working method. Because of the tight schedule between the workshops, there was not as much time as originally planned to develop the workshop tasks

and analyze the produced material, and it feels like the workshops were organized in too much rush. Even though the research objectives were in that sense achieved, that a radically different working method was introduced, tested and developed further, it feels like the workshop structures, tasks and materials could have been designed even more comprehensive way. This is linked to the fact, that it is always better, more effective and more creative to bounce ideas with another colleague or team. Planning and organizing as well as producing and developing the workshop materials is rather a group effort than a single person's job, even though the supervisor of the thesis work contributed a lot to the process. Thinking about the future projects and the development of one's professional skills, these have been very valuable lessons to learn.

IMPACT

The project manager described afterwards that the workshops were a real eye-opening experience for her and revealed a whole new perspective on what working together with different parties could be. She was especially delighted of the concreteness and efficiency of the teamwork during the workshops, and the amount of material produced in a small period of time. The fact that results of the previous workshop was directly utilized in the next workshops, and therefore quickly open and available to everyone to use as tools for the future development, was also a positive experience as the project manager noted it. From her point of view there is now even more enthusiastic desire to continue doing collaboration projects with the Aalto University in the future.

One could say that the true impact of the collaboration therefore was in demonstrating a different method which enabled various groups of people to encounter each other, share their viewpoints and ideas together, build a shared understanding of the situations and imagine the future situations together in a stimulating workshop environment. How the consultants on the other hand had utilized the workshop results, or if they could have utilized them at all in their future work, remains unknown.

Although the instant feedback from the workshops were highly positive, the true impacts of this kind of working methods should be investigated more closely and in a longer period of time. One impact could be the change in attitudes and growing interest of implementing design practices and „designerly" methods more and more into the organizational practices. There has already been a continuation for the workshops, as an internal, cross-functional workshop for the City employees was organized in a different context and more forms of collaboration are under negotiations.

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FIVE PERSPECTIVES ON INNOVATION

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ABSTRACT

Innovation typically involves cross-divisional, -functional, and -disciplinary collaboration when performed in large organizations. This paper explores five different concepts of innovation. The aim is investigate how different people involved in innovation conceptualize innovation in an effort to reduce misunderstandings and thereby improve innovation processes. A series of interviews was conducted on how innovators understand what they do. We identified five perspectives: an organizational, a technology, a user/consumer, an idea/concept, and a participant model. These mental models then can be used to start to bridge the different academic traditions in the innovation literature. They can also to help innovation teams make sense of their struggles with the aim to improve innovation practice.

INTRODUCTION

Innovation, the introduction of new products, services, or experiences to the market, is generally recognized as a driver for growth in business. It typically involves different disciplines and functions within the company, as the complexity of products demands a broad range of knowledge. However, cross-functional collaboration presents a number of challenges (Edmondson & Nemhardt, 2009; Bechky 2003). Members of different disciplines may hold different mental models of innovation, which can lead to frictions and misunderstandings.

Mental Models are people's representations of the world based on experiences and assumptions. The concept originated from cognitive psychology (Craik 1943; Johnson-Laird 1983). It was adapted and later used heavily in the field of Human Factors Engineering as conceptions about how systems work (see Nielsen 1990, Moray 1996, and Rutherford 1989), which since the 1990s has largely been incorporated into the field of Human-Computer Interaction (HCI). It became an explanatory device for making sense of usability problems: If a system fails to match the user's mental model of it then there will be a breakdown. When a system matches the mental model of the person using it there should be fewer if any problems. Therefore it is thought that in order to build computer programs, systems, and especially interfaces system developers should aim to match the mental model of those using the system. The concept of mental models is a powerful one, bringing with it the baggage of cognitive psychology, but we do not import this wholesale, rather we invoke it as a metaphor useful in explaining how people understand their work.

The motivation for this study was to apply the metaphor of mental models to understand how those involved in innovation conceptualise what they do, and whether the concept could help to understand when and why problems arise. We argue that if those that participate in innovation had a clear and shared understanding of how their work contributed to the overall project or the role they played in a system, then the in-

novation process as a whole would produce fewer problems and delays. I.e. if people understood clearly what was to be achieved and how to achieve it, they would be able to do it more effectively and efficiently. The way that this information can be gathered is through the process of reflection-on-action (Schön 1983) in the interview process.

Initial gathering of information to ground the research design was based on internal documents available freely on the organizational intranet, as well as informal conversations and requests for documents on the subject as part of participatory ethnographic observation inside of a research & development organization in a group of researchers focusing on user experience. This initial documentation period lasted approximately 10 weeks.

During this initial period a number of concepts of innovation were mentioned that needed explanation and investigation in the literature such as open innovation (Chesborough 2003), Blue Ocean strategy (Kim and Mauborgne 2005), and the general ideas of innovation (Van de Ven 1986, Garcia 2001). The concepts of open innovation and Blue Ocean strategy, are used frequently by those inside of the organization, and going back to the original literature it became clear that the organization aspired to many of these kinds of things and that some programs had been put into place to promote it, though it was not readily clear whether those initiatives were successful. Concepts such as roadmap, adjacent, and breakaway innovation were also used frequently though their use was often not distinct and there was no clear shared understanding. From Van de Ven and Garcia it became clear that even in the literature there is a not a clear consensus in many basic definitions of innovation, bringing at least that aspect in-line with the current status inside of the target organization. Based on this a broad and open perspective and approach was taken to the study.

METHODOLOLGY

There were several important factors in this initial period that influenced experimental design. First there was an accepted model of innovation and concordant processes and methods, yet it was also clear that these processes and methods were not always followed. This phenomenon needed more than just questionnaires; it would require visits to sites as well as deeper interactions.

Twenty-two interviews were conducted in all divisions of the organization. The interviews were semi-structured and typically lasted for one hour. The questions focused on innovation and what innovators conceived of it and how it is carried out. During the interview participants were supplied with a large (A3) piece of paper on which they could sketch their innovation process at the appropriate moments. When the participant did not care to sketch the researcher often would take up the pen and collaboratively sketch what they described in order to give focus to discussions and when different things happen at different times.

INTERVIEW GUIDELINE

Typical introduction and disclosure started each interview along with the start of an audio recording. Given the approach broad and open wording was used around the following key questions:

- "What comes to mind when the word innovation is mentioned?"
- "Who do you involve in your innovation process?"
- "At what points do you involve them?"
- "In what way do you participate in innovation as part of your job?"
- "What percentage of your time do you think is focused on innovation?" "How do you feel about that?"
- "Do you follow a fixed or semi-fixed program of activities for innovation? "
- "Think of a project. What is the name of that project? Could you sketch or describe the process you followed, and relate it the program you just talked about?"
- "If you were in charge of innovation, what would you do differently, if anything?"

SAMPLE

It was decided that a general, organization-wide understanding of what innovation is and how it is practiced would be the most interesting. One of the main reasons for this focus was that the owners and promulgators of the officially recognized innovation process did not only reside inside the research and development (R&D) organization, therefore a study that reached beyond those barriers was called for. The second reason for choosing an organization-wide focus for this initial study was that there was already preliminary evidence of cross-divisional, -function, and –disciplinary issues. Cross-disciplinary issues were quite prominent and an early finding was the great disparity between how people were studied and their needs were incorporated into the process of innovation.

Recruiting was undertaken using a snowball system starting with existing contacts who were willing to refer others. A conscious effort was made to reach out to all the major business sectors of the organizations as well as the various corporate divisions involved in innovation. Generally prospective participants were invited via email with a short introduction to what the interview would be about. The researcher then travelled to their location and the interview was conducted in a meeting room or the participant's private office.

PARTICIPANTS

Business Sector	11
R&D	7
Design	4

Total # of participants: 22

The following table gives an overview of organizational position of the participants.

C-level participants: 2	Director-level participants: 6
Participants in Corporate HQ: 1	Non-permanent participants: 2
Approx average years of service: 11	

**Note that some participants fit into 2 categories, i.e. one could be a non-permanent employee in design*

The interviews lasted on average 55 minutes from start to finish, and were audio recorded. Interviews were then transcribed verbatim, except where the participant repeated herself. Transcriptions also included contextual comments such as [pointing to sketch] [repeats] [both laugh] [pause].

ANALYSIS

The target organization, especially in the research and development organization was especially interested in reflecting on their work practices and improvement, calling for a participatory approach. This along with the large amount of data gathered and the desired open approach led to an analysis that consisted of three distinct phases: 1) Participatory group

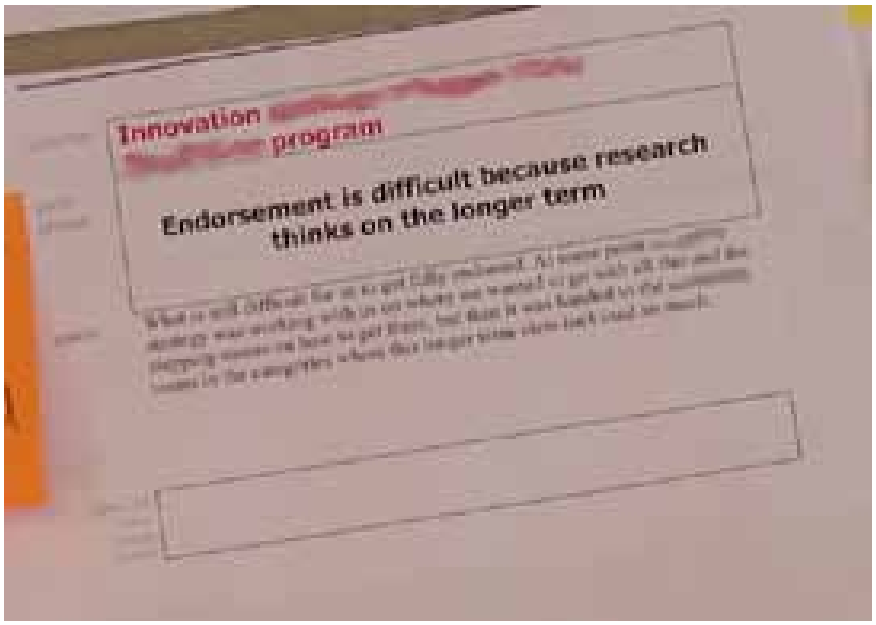

Figure 1 This is a statement card before it is filled in digitally, then printed out and brought to analysis sessions.

affinity analysis; 2) systemizing unification of group findings; and 3) Iterative analysis of affinities and axial coding (looking back into transcripts for more examples of a particular finding). The participatory group analysis is based largely on Stappers (2008) Concept and Conceptualization, which is a grounded method with participatory elements.

A group of nine researchers and interns from the target organization versed in working in user-centered research was asked to participate in the analysis, which consisted of some individual preparation and a group analysis session. As part of the individual preparation, each researcher was given 1-2 transcripts to read the transcript in order to familiarize themselves with the contents and to highlight important passages. From those highlighted passages the researchers were then asked to select between 6-10 passages to put into cards. Each card contained both the text of the original quote, the title and organizational unit of the person interviewed, as well as a paraphrase/initial interpretation of the quote. There was space on the card for comments and reactions. At the group some researchers were asked to present a few of their cards to each other then the cards were passed around so that each person could have at least a passing familiarity with each card as well as to comment on individual cards should they desire to. Affinities of cards were then developed via presentation and negotiation. Each affinity was placed on a table and rearranged to represent the kind of relationship between the affinities.

After all the cards were placed, affinities that contained many cards were unpacked and further differentiated into subcategories. Relationships between the groups were then explicitly mapped and defined. Each participant individually could then comment on any part of the results including individual cards, groups, and relations. This resulted in a diagram shown in figure 2.

Figure 2 The pink notes show affinity names, the yellow relations between affinities and blue are comments from research team members about that affinity

Each group session lasted for approximately 2 hours total and analysis participants reported spending between 1.5-2.5 hours in advance of the session in preparation. Four separate analysis groups covered all the interview transcripts.

The researchers then consolidated affinity results across all analysis sessions, further merging affinity groupings as appropriate. The comments and some of the relations were removed where there was overlap.

Next was a series of iterative (re-)evaluations of the statement card data collection where all the relations were removed and the affinities were created afresh or affinities were parsed into different subgroups and meta-groups. Diagrams and relations between the groups were undertaken at various points. It was at this point that axial coding took place, where additional data was looked for on certain topics in the existing data set as well as in ethnographic field notes and codes. Figure 3 is an example of an emerging diagram of topics.

FINDINGS

OVERVIEW

All participants were passionate about the subject of innovation. In all cases participants were able to express both positive and negative aspects of the innovation practice inside the organization, though most tended to skew more heavily in one direction or another. This

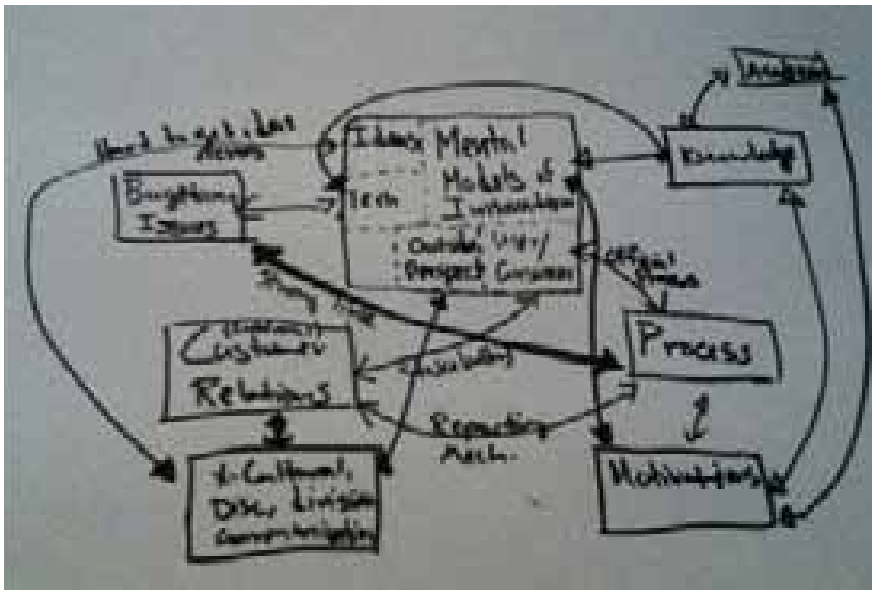

Figure 3—this is an intermediate step showing a large set of affinities grouped in the center with other around it with their relations

skewing and sometimes rather strong statement can be attributed to the participants' eagerness to excel in the area of innovation, and to see their organizations excel as well. All of them considered innovation to be the main focus of their work, no matter their job description. In about 50% of the interviews participants sketched out their process, in other cases they described it verbally.

Most interviewees struggled with what they perceived to be a less than optimal ways of working, inefficiency or sometimes frustration. When confronted with this one manager said *"This has to do with their passion for innovation."* I.e. people care so much about innovation, and see it as so much of a priority that they desire to see it be done as well as it can be. The passion for the subject is noted above as well as the fact that there was no shortage of people who were willing to give up an hour of their working week to speak on the subject.

A large number of issues were identified as strongly affecting innovation including cross-divisional work, cross-disciplinary work, inefficiency of business processes, concerns about competencies, and budgetary processes. In order to bring coherence to the findings the metaphor of mental was invoked and a natural delineation of data emerged into five difference perspectives.

A large portion of the cards generated in the analysis consisted of groupings of statements that proposed various mental models of innovation. No one perspective emerged, and there was some data that suggested that those interviewed thought there is "no one way to innovate" and that the way people innovate must be tailored to the context of the project. While this may be so, it is clear that there are some clear foci to the perspectives emerging from the data. There are no sharp lines between perspectives, but rather relations between them as they are each connected. The perspectives are: organizational, technology, user/consumer, concept/idea, and innovator.

In this way the organizational focus clearly shows the top-down, organization-as-a-whole nature, the three middle models acts as approaches for either a top-down or a bottom-up focus, and then the innovator focus as bottom-up.

Each focus will be presented first with a short summary of the findings, then a numbered list of the findings that fit into that perspective. In this section (as well as above) a statement in quotation marks in *italics* represent a direct quote from a participant and a statement in standard typeface represents a close paraphrase of several participants combined used for clarity and space limitations. A statement in a numbered list without any quotation marks is our interpretation of the data.

INNOVATOR FOCUS

The essential questions of the innovator focus were: "What must I do to innovate? How can I push my project forward? Where will I focus my innovation work?" This perspective is decision & action oriented. Innovators are hungry

Figure 4 The five perspectives of innovation

for this kind of information, and are not finding it in a general form in the workplace. One participant even expressed his doubt as to whether can be one approach, *"I don't think there can, or ought to be one approach."*

The findings were condensed into the following statements, of which 1-4 refer to those pursuing innovation inside of the R&D division.

1. For those doing innovation inside of R&D: "I am irritated… *it is hard to access information, and even once you have it we don't have the proper background to use it well."* (see 2)
2. "It's hard for me to make decisions about innovation because often it's not clear what innovation really is, inside of a project there are too many factors to consider such *as user needs, business needs, market opportunities, open innovation partners, there is no one expert on innovation."* "I'm not trained on many if not all of these things as they are outside my area of expertise."
3. Innovators liked to have some control over what they work on. When asked about what they would do differently some responses were that they would introduce "20% time [for innovative projects], a return to the good old days when they [corporate]… *would drop a bag of money on us each year."* I.e. more freedom to decide research direction and more budgetary independence from business. Another researcher proudly remarked that he has, *"been involved in strategic discussions"* about where a product category was going.
4. R&D personnel said that in order to get an innovation *"to land inside of a business"* unit it had to be within already developed business channels. "In some cases I will tend to focus my efforts in established places, and in other cases I want the business to be bold and step outside." At the same time one researcher said that "*if I'm developing something that fits into two separate places in the organization and could benefit them both I would never try to sell it to both of them, because one would say, 'let the other pay for it.'"*
5. "It's hard to work with people from other perspectives, we don't always value each other… *We talk about depending on each other… there used to be a lot of talk about acting like one organization… but we don't all feel like one unified organization."*
6. "I am managing innovation and I wish there were much more understanding of different ways of working, there's so much cultural inertia, I want to change the culture and mindset instead of just processes and procedures."
7. "*I don't think we focus enough on breakaway innovation." "People in* [a certain section of the organization] *don't seem to be concerned about long-term innovation* [while we in this part are concerned more about it]."
8. *"I'm frustrated with* [the process that I'm required to do for funding and budgetary approvals]. *It feels like a waste of time." "I once calculated how much time we spend on* [this process] *multiplying that with our annual salaries it turns out to be a lot!"*

The innovator focus revealed individual motivations for innovation that were almost always associated with a sense of adventure ("Let's try this!"), challenge ("Can this be done?"), and scientific curiosity ("what would happen if...?"). This focus also addressed people's frustrations when they could not do what they perceived as their best work. These frustrations were related to the organizational focus as well as the user/consumer focus. From the organizational focus, processes led to frustration when they were seen as an impediment rather than an enabler of work. When budget decisions or selection processes were experienced as opaque and arbitrary, this also led to frustration. Nevertheless it is clear that the innovator-focused model can be of help to both the innovators and those managing them (see statement #6 above for example). Some innovators were not totally comfortable with the idea of connecting to the user/consumer perspective. This discomfort was on the part of highly trained people who are specialized in fields not traditionally focused directly on human needs. In this case the user/consumer perspective introduced an *"unclear selection criterion"* into the innovation process as one researcher put it, which to this person made all of a range of choices equally good.

It should be noted that statement seven in this focus was quite universal. Everyone interviewed was concerned about ensuring sufficient time and resources for long-term, breakaway, or blue ocean innovation. Everyone shared this same concern irrespective of their position or division.

The innovator perspective is about what the participant can do, what are the actions they can take, what kinds of decisions they must make in their own work. This relates to what they think about innovation for their own project or ideas (this connects to ideas/concepts in general and to other people's ideas/concepts), how they fit into the organization (they're not particularly happy with constraints), what processes they must use (they think they are inefficient), how they feel about the organization (where they fit, how they relate to other parts of it).

CONCEPT/IDEA

This second type is focused on the concept/idea focus itself. The concept/idea was often conceived of as having a life of its own, with particular properties pertaining to it. In this case the property of newness was seen as primary to innovation. When talking about how ideas start and turn into innovation, the metaphors of size, speed, and luminosity were called on as properties. If an idea was described as "gaining traction," speeding up, getting bigger or brighter, it was seen as moving forward on an imagined path towards completion. This imaginary path that a concept or idea takes from a vague starting state to market launch is a very common understanding of how innovation works.

The data for this focus fall into the following affinities:

1. Some people consider originality or newness to be primary. *"The next generation of* [a product category]… *that doesn't count of innovation, I'm talking about something really new. We don't do that enough* (connecting to the innovator focus point 7)."
2. "*We are starting to understand that innovation doesn't have to come from technology." "Innovation can come from not changing the product at all but changing the way we package or sell it, like the way Dove totally changed the way they sell their product."*
3. *"I think that ideas can come from anywhere, make room for them to bubble up from anywhere."* There is a continuing rumor that a researcher first thought of the concept that led to a large well-known product category while on the toilet. People mention ideas coming from family members.
4. "I see ideas all over; the people who

have them don't know what other people are also doing with the same/similar ideas." They further lament, *"if ONLY we had a way of knowing what people are doing!"*

5. In response to how does an innovation move to market one participant tellingly said, *"Once an idea has enough people working on it or believing, it gains momentum, people start coming to the idea, then it will happen."*

During each of the sessions participants had the opportunity to sketch their process. A number of different conceptions of how their innovation process worked came forth from these drawings. These drawings were without fail idealizations of actual events or an abstraction of their process. This kind of sketch visualizes the concept moving along an imaginary line or through numbered steps. The drawings produced were in line with many diagrams of innovation or design processes both in academic literature as well as those that are used in practice (See von Hippel 1976, or Sharp et al 2007 for several examples). E.g. from the world of software development, the waterfall model would be prototypical, see figure below and http://www.jknichols.co.uk/SL2.html for numerous examples. Participants envisioned an idea or concept as progressing in a certain way or being stopped and thrown out.

The concept/idea focus also relates to the technology focus. A technology such as an algorithm, a patent, or a standard is all examples of an idea or concept. They are also seen as independent of people in some way.

The innovator focus is close to the idea/concept focus in several ways. First of all even though we often conceptualize a concept as independent of people, especially as it progresses towards market launch, although of course it is only through the efforts of participants that such things can happen. This also links to the ideas of getting the right people to work on an idea, getting champions of that idea etc (for a review of this process see Howell and Boies 2004).

Some participants found that the newly introduced social media platform was starting to fulfil this desire to some extent. Some suggested other ways of dealing with efforts by other companies such as Tata or IBM which are similar to that described by Aiken & Carlisle (1992) would further fill the desire stated. This connects again to the innovator perspective in that it relies on innovators to drive a preliminary participatory process in order to produce more solid concepts to build upon.

USER/CONSUMER

The user/consumer focus relates to more traditional notions of participatory design and innovation. The involvement of people who will ultimately use or be served by a particular innovation was the focus of this mental model of innovation. If the process was centered on users innovation was described as starting with defining and understanding a human need and then a solution would be tailored to that approach. This could be done from several disciplinary points of view, though the two most common were marketing and design. In this focus innovation was not seen as ending at launch, but rather launch was just the more widespread opportunity to gather feedback about the innovation. The feedback could be used to adjust either the innovation itself or the way it is understood/marketed or both. This model has recently been challenged by Norman's 2009 statement that technology always comes first. However, whether this is true or not is still a matter of debate (See Nussbaum 2009).

There are a number of different approaches to understanding human needs and desires and then profitably creating something that responds to that need/desire/problem. The data in this focus were summarised in the following statements:

1. "I use a user-centered design approach, using such tools as cultural probes, observation, ethnography, getting into the head of the user via similar experience."
2. *"In* [our part of the organization] *we analyze larger societal trends such as aging population or the types of things happening in emerging markets."*
3. *"What we aspire to do is anticipate needs before they arise by proposing solutions to latent needs."*
4. *We understand people in a human way and not just as units of consumption."* *"We look at life stage transitions and see if there are unmet needs in some of these places."*
5. "I see society's future as all about solution-centered design: start with an identified problem, define that problem more precisely, then empowering one person to be in charge of solving it, and then check to make sure you actually solved it."
6. *"We use so-called value propositions and/or insights in a formal way prescribed by* [one part of the organization]."

There seemed to be strong connections with the marketing research, UCD, and various kinds of analysis for understanding the human experience and needs. UCD and marketing research tended to not do particularly well with breakthrough innovation, but this was balanced by multiple approaches that spanned outside of these typical domains. This connects with the organizational perspective in terms of some approaches that were officially accepted and in some cases obligatory. The user/consumer perspective connected with the technological focus as it is seen as a kind of filtering mechanism for those ideas research and development (see #2 below).

TECHNOLOGY

The Technology focus dealt with technologies, how they were developed, protected through patents, and sometimes put into standards. Other times technology was developed as a kind of shotgun approach, taking a wide swath of technologies with the understanding that some of them would win in the marketplace. The technology focus interacts heavily with both the organizational focus and the idea/concept focus. The use of the word 'we' below refers to the participant's particular division.

1. "What we do, or what we want to at least is build up expertise in a field of technology, be a key player around that area, sometimes this is an explicit choice looking at where the market may be going sometimes, but not other times."
2. "We use a kind of shotgun approach: develop a whole lot of technology, patent and protect it and then *let the market filter it.*" "We hope, and push for the technology we develop to become part of market accepted standards"
3. *"We see technology as enabler, it is what makes other things possible, and it shouldn't change too often."*
4. *"We start with technology and when it's proven then you can start adding in the other things, gathering use requirements, and user input."*
5. One c-level executive said, *"We still*

believe that the technological possibilities can inspire innovation."

6. *"I see that teams often decide first on functions and technical specs before other considerations, even marketers and product managers do this...* as opposed to involving users/consumers, their needs and desires, into the process"

During the discussions in the analysis phase, the research team first considered lumping technology into the concept/idea focus and/or the organizational focus because it related directly into those to areas. However, it was decided that it needed to stand on its own. The technology focus is related to the organizational focus because so often the legal and intellectual property departments have a strong hold on many different processes. It is related to the concept/idea focus as the focus is on the thing itself and away from the people who create and use it. This was one area that people took so for granted that they did not talk about it extensively in interviews. During informal conversations noted in ethnographic field journals the first author noted how strongly technology influenced their work, especially how intellectual property issues played a large role in what they did.

ORGANIZATIONAL

The organizational focus of innovation is about management, business process, and organizational structure of innovation. This focus is process oriented and often presents clean graphic representations of how innovation ought to happen. Often these processes are mandated, stage-gated, and controlled. The target organization, considers that innovation is what will keep them competitive and fuel growth but surprisingly in many companies there is no one, unified way of looking at innovation from the fuzzy front end to product launch and feeding back the results of product purchase and usage back into the loop. Another surprise in this area of focus was that there was no a unified business process that similarly spanned the length of innovation.

For the organizational focus two major categories were identified: Process & Budgets. Here are the affinity statements for them:

Process

1. "[In one part of the organization] *there's no set program, but we have a series of ambitions.*"
2. A manager speaking of how many projects have used the official process says, "*Not everyone has adopted the official processes to the same level* [where it has been given]."
3. *"Project* [pre-] *selection is inefficient. It is not always clear how the decisions are made in this process.*"
4. "We use similar processes to [the function that owns the official process] but because they are not official or exactly the same types of outputs, the result is that our methods [and the results] are not accepted by others."
5. "From where I'm sitting in a director position meant to help ensure processes are being followed there is no way to tell how many projects are going at any given time, and how many products are launched in a year in my area of responsibility." I.e. there are not dedicated tools to use to track business processes across the innovation process as a whole.
6. A senior manager of the function that "owned" the official innovation process says, "The official way of doing is good in theory, but it is possible to follow it to the letter and still miss the purpose of it... We had a project last year where we really followed the spirit of the process, but not all the steps, and the results were superior [then if we had followed each step strictly]."
7. A more junior manager from the same function *"I've seen where a team followed* [the official process] *exactly got their* [outputs of the process a kind of report] *and all they did was flip it open to the last page to see if it was* [approved]." I.e. following the official process becomes a kind of box ticking.

Budget

1. *"We* [as an organization] *tend to spend the limited budget on things that have to be done anyway. The business unit believes that since they bring in the money they should control it, but often they spend their budget on short-term things, so there is an 'innovation tax' to get around this*"
2. Budgeting for innovation projects comes from various places within the organization, either from corporate (via the "innovation tax") or from the business units themselves.
3. Stage-gating of innovation budgets was used as means to control which projects move forward. This was a matter of content of the projects which was judged on a particular scale.
4. Stage-gating was used to make sure the project team followed the official process for innovation.
5. One participant poignantly wondered, *"What if we had one budget for innovation, integrating marketing, design, and R&D?"* I.e. why if innovation is cross-functional, why do we divide budgets by function?
6. "When we do work for another division we charge them. The intention of it is to bring some kind of financial transparency showing where our money is spent, and if it is well spent. I'm not sure whether we have that transparency, it's not my speciality, but everyone in my department agrees that the whole thing makes working together more difficult."
7. *"They* [other divisions of the organization] *are of such a high calibre, that having them work with us is justifiably very expensive.*" There are instances when outside contractors have been brought in to work on some projects when internal divisions could have provided the same services. When asked what the rates of the division was the reply universally, even by those whose services were being offered was "I'm not sure what it is right now" followed up with *"but I'm sure it's high."*

All of the process and most of the budgetary findings fall around an axis with control on one end and independence on the other. The idea of control in an organization via a process is a tempting one for managers, though at least one participant acknowledged he would instead like to change people's mindset. From the interviews and from the internal document search it is clear there is a propensity for creating processes and programs which are usually mandatory. Making a certain way of working required puts constraints into a creative process. Many participants clearly felt like they were being boxed into certain ways of working and they considered this detrimental to their output. The other effect that was clearly seen was that even when control measures are put into place then people will simply follow them in a way that will satisfy them.

The organizational perspective is connected to the technology focus in that

a specific direction can be specified broadly from upper levels, leaving the details of research and execution to innovators themselves. This perspective is also very strongly connected to the concept/idea focus because the processes and budgetary controls often figure into the idealized paths that are used in the concept/idea focus. As seen previously in figure 4, organizational is at the top, symbolizing how organizational aspects are decided from above.

DISCUSSION & CONCLUSION

The user/consumer perspective shows that there is some unity between the user-centered design perspective and that of the marketing and marketing research. Surely there are large differences between these communities of practice, but they are still in the service of the same goals embedded into the same perspective. This is the kind unity that helps transcend boundaries in working as well as research that we propose below.

The innovator perspective has been treated to some extent in the project management literature, but coordinating kind of understanding with the other perspectives could yield additional insight. A more individual approach to the innovator perspective has appeared many times in the business press, but it does not appear to be a well developed scientific research community.

The perspectives presented here are fragmented, and none address the totality of what innovation encompasses. If the reason for studying mental models is to understand how people understand a particular subject in order to improve that subject, then it stands to reason that having a unified perspective may be helpful, but that is beyond the scope of the present work. Some of the possible benefits to researech have already been explored and we argue that an improvement in understanding how innovation works can be used in order to better guide one's own innovation practice. In practice having further clarity on the way innovation works can help. We put forth two possible avenues where this may be of service:

1. Seeing past functional/disciplinary/divisional boundaries
2. Appropriate use of model given the situation

An open, explicit discussion of various perspectives of innovation could conceivably help people working across boundaries if there were some organizational acceptance of multiple perspectives. If an innovator has no idea what the official processes are, it may not matter how well it meets a user/consumer need. If a decision maker is clearly in an organizational perspective it won't help to talk about what the innovator herself must do at a decision point. From the organizational focus it may seem like just following the prescribed process is sufficient. In all of these cases there is a need for a shared understanding in order to collaborate in the service of innovation. In future work we plan to explore this communication further via a focus on the material artefacts that are used to communicate across boundaries.

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AESTHETIC UNDERSTANDING AS A PART OF PARTICIPATORY INNOVATION AND LEARNING

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ABSTRACT

Practice-based innovation can take place anywhere, anytime but in organisations, it needs input from several members of an organisation. Innovation refers to the employees' and the managements' renewal of their own operations i.e. development of new working methods, routines, products or services. This kind of renewal is based on learning in and through work processes within the operations concerned. (Ellström 2010, p. 28) In this paper we discuss how spaces for participatory innovation can be created in organisations. As a result we suggest research-based theatre as a dialogical method for innovation and learning. Our study shows that theatre, as an element of participatory innovation activity, offers methods for both expressing one's own and understanding others' worldviews, attitudes and behaviour.

INTRODUCTION

A key issue for participatory innovation is how to enable wide participation and catch various viewpoints and insights into co-production of innovations. The challenge is especially how to capture knowledge embedded in ongoing practices. A collaborative form of inquiry is required to provide possibilities to articulate one's own experiences and conceptions, and to expose others' views and practices. (Van de Ven & Johnson 2006) The communication between various units and professional groups in an organization as well as with their customers is the key to constructing together both new insights and richer shared multivoiced understanding.

This leads us to a research question: how can spaces for participatory innovation be created in work organizations? The potential of innovation triggered in a practical context seems to be widely understood, but methods to exploit that potential still seem to be missing to a great extent. We study aesthetic understanding (King 2008; Strati 1999) of Boalian theatre (Boal 1992, 1995, 1996) as a method to create spaces for participatory practice-based innovation (Harmaakorpi & Mutanen 2008, Harmaakorpi, V., Tura, T. & Melkas, H, Melkas & Harmaakorpi, forthcoming, Parjanen, Melkas & Uotila, forthcoming) and learning in organizations. Knowledge embedded in practice does not exist without social action. Innovations emerge through the interactions between the practices of heterogeneous groups in the social contexts in which they are located (Pässilä, Oikarinen and Vince forthcoming). In this paper we discuss a method called Research-Based Theatre (RBT).

AESTHETIC SPACE AND MULTI-VOICED UNDERSTANDING IN PRACTICE-BASED INNOVATION

Our approach rests on coproduction of innovations where the contribution of practitioners of various fields is crucial. We based our study on the idea that innovations emerge increasingly more often in practical contexts and conducted in non-linear processes utilising scientific and practical knowledge production and creation in cross-disciplinary innovation networks.

(Melkas & Harmaakorpi, forthcoming, Parjanen, Melkas & Uotila, forthcoming) From an organization's point of view, practice-based innovation refers mainly to the employees' and the managements' renewal of their own operations i.e. development of new working methods, routines, products or services. This kind of renewal is based on learning in and through work processes within the operations concerned. (Ellström 2010, p. 28) This definition focuses on workplace learning as a fundamental mechanism behind practice-based innovation processes and highlights work processes as well as wide participation in learning.

In generating possibilities for communication and shared understanding we have turned on narrative and theatrical approaches (Pässilä & Oikarinen 2010). We study aesthetic understanding (King 2008; Strati 1999) of Boalian theatre (Boal 1992, 1995, 1996) as an organizational practice that can create spaces for innovation and learning. The strand of Boalian theatre, namely Forum theatre and the European strand Rainbow of Desire have been described before our study. But in this study we suggest, based on previous studies, that the innovation potential is triggered through an interactive art-based learning process and with the help of participatory exercises (Pässilä, Oikarinen, Parjanen, & Partanen 2009). Participatory elements are essential to Boalian theatre (Meisiek 2004). The purpose of participation is to encourage and enable the employees to reflect upon and generate new ideas and share knowledge by interpreting the performances (Buur and Larsen 2010; Meisiek 2002; Darso 2004; Oddey 1994). On a general level, the learning focus is to reveal and discuss different world views and power positions (Taylor 2003) between groups of professionals and customers, to uncover problems which the customers point out, to question the employees' assumptions and attitudes and make them transparent. The participatory exercises are related to the theatrical scenes. These exercises facilitate the employees' redefinition and reconstruction of the theatrical scenes and stimulated dialogue. (Mienczakowksi et al. 1996)

Forum Theatre is interactive theatre in which the audience have the power to suggest and make changes to events onstage. Augusto Boal invented Forum Theatre in a context of social change and democracy. Forum Theatre explores emotional and political dynamics of community and in practice. The Rainbow of Desire is extended from Forum Theatre. According to Boal it is a European mode of exploring oppressive tensions and power relations. In the Forum Theatre the members of the audience are encouraged to join the action onstage, become co-constructors and co-actors, which Boal terms 'spect-actor'. Using the Greek terms 'protagonist' and 'antagonist', Forum Theatre seeks to show a person (the protagonist) who is faced with obstacles and resistance (the antagonists). In Forum Theatre, the facilitator of the action is referred to as 'the joker'. The joker takes responsibility for the logistics of the process and functions as a neutral link between the actors and the audience, encouraging them to step into the role of 'spect-actor'.(Boal 1992, 1995) We assume that in the context of participatory innovation and learning, theatre is not a method to find one single solution or truth. Instead, in theatrical interactions the participants look for many different meanings hidden somewhere in the process of finding solutions, new meanings and novel possibilities.

Boal explains theatre as an aesthetic space, and the understanding of it through the concept of metaxis. Novel seeing emerges through ongoing relations and roles in aesthetic space. The actual moment of subjective understanding is situated in between, metaxis, interpretations of imitations constructed in aesthetic space (Boal 1995, 14-20). Boal suggests that aesthetic space stimulates knowledge and discovery, as well as cognition and recognition, in a specific way, and thus it is a form of knowledge based on learning by experience, where transformational learning happens in reflections and interpretation between experiences of lived life and fictional life situations. Symbolic actions in role play scenes assist the participators in observing the existing situation ("as is") and the non-existing possibility ("as if") in order to investigate habits, beliefs, language and social relationships. The aesthetic space, formed in theatre contexts of imitation, is a specific place of representation (mimesis) in situated time and reality. Aesthetic space emerges temporarily during interactions between people when they reflect on organizational actions by acting and interpreting actions in scenes and roles. (Boal 1995, 13-20) Seeing roles and relations 'acted out' in theatre helps to reduce the unconscious acting out of emotional and political dynamics in practice. This approach helps to create a space in the mind that underpins engagement with collective spaces of learning and innovation. (Pässilä, Oikarinen and Vince, forthcoming,). We suggest that aesthetic understanding could be considered a multi-dialogue (Nissley et al. 2004, Pässilä & Oikarinen forthcoming) which invites one to observe ongoing relations and "experience the other side" (Buber & Smith 2002). So, aesthetic space is rather an imaginative and polyphonic space between people than a spatial metaphor or placement. Assuming that contextual and situated understanding is vital in a collective learning process, then making meaning in a context of theatre could be understood as a process of sense making (Pässilä & Oikarinen 2008). Therefore, awareness of how meanings are constructed appears to be a valid issue.

PARTICIPATORY ACTION RESEARCH

Our research orientation emphasizes social interaction between people, as well as changing practices. We create forums in which people are able to work as co-participants and develop practices related to their everyday working life. (Kemmis & Wilkinson 1998, p. 22) Methodologically, the study follows a specific artistic orientation of action research, namely, research-based theatre (Boal 1995; Pässilä & Oikarinen forthcoming) where theatre is applied (Mienczakowksi 1995; Mienczakowksi, Smith & Sinclair 1996, Mienczakowksi & Morgan 2001) to participatory action research and we modified it for the micro-level practice-based innovation activities of organisations.

Reseach-Based Theatre (RBT) is used as a participatory method to bridge the experiences of various professional groups and clients and it is aimed to

Cases	Case Factory	Case Care Unit	Case Public corp.
Field	Multinational forest industry	Public sector health care unit	Public health centre
Boundary object	Customer reclamations	Teenagers no-show to dental care	Emergency duty re-organization
Participating work units	Operators Operators Sales managers Sales assistants Designers	Dentists Nurses Assistants Customers	Nurses Doctors Collabo-rators
Participants	70	36	25
Sessions	Storytelling (6 sessions), Theatre session, Action planning session	Storytelling (7 sessions), Theatre session, Action planning session	Storytelling (2 sessions), Theatre session, Action planning session
Steering group	Managers	All occupations represented	Managers
Empirical data	4 hr videotape + researchers' notes	5 hr videotape + researchers' notes	3 hr videotape + researchers' notes
Time frame	2008-2010	2009-2010	2009-2010

Table 1: Case organizations.

construct user-oriented knowledge building. RBT applies narrative and dramaturgical intervention techniques within the organization. The practical actions of RBT concentrate on sharing, repeating, amplifying and interpreting everyday work processes and social practices in order to make those visible and to re-interpret and re-sequence them.

MULTIPLE-CASE STUDY

The empirical data is from action research based development projects in three different organizations (see Table 1). Common to these case organizations is the fact that they all operate in fields which have faced major structural changes during this decade. All the projects began with a development need identified in the organization. But in the course of planning together with the practitioners of the organizations and the researchers, the aim of development was widened to issues of innovation and learning. Altogether there were 21 sessions in the three organizations and over 130 participants. Researchers made notes of the sessions and some of them were videotaped (12 h).

The foci of analysis were participatory and theatre-based learning interactions. Analysing the data was a heuristic process done jointly by the researchers, the development team of case organizations and the theatre team.

AN EXAMPLE OF CASE: CARE UNIT

In this study we illustrate more detailed the development project of Public health care unit where RBT was used as a participatory method to bridge the experiences of the teenage customers and the work of the dental care staff. Thirty-six service providers (dentists, nurses, assistants) and one hundred and fifty 13-16 year old customers participated (seven storytelling sessions, Forum Theatre session for customers, Forum Theatre session for service providers, and an action planning session). All interactions were documented and videotaped. Table 2 illustrates the steps.

Through narrative and visual data (writings and drawings), the researcher, the artist and the pupils of one school class created a dramatised role-play character called Netta, a shy and quite ordinary school girl of 14. After the creation of the fictional Netta, we used her as a stimulus for storytelling in a drama-oriented workshop for the pupils of another school class. We asked them to describe Netta´s feelings, dreams and fears about the dental care process. Step by step, the researcher and the artist, with the help of the rest of the development team, sketched a picture of a teenage customer and transformed it into themes for scripting. Script writing was a way of analyzing the data, with the aim to change the results into drama.

We did not forget the employees' voice either; when collecting and devising the customers' voice and experience we simultaneously organized a storytelling session with the employees. The storytelling, Work Story, led employees to issues which should be reformed and improved. Stories were told in three stages. We used theatrical pictures to help the storytelling. Firstly, individual stories were told in

Meetings with organization members	22.9.2008 9.10. 2008 15.12.2008
Plotting realities; narrative data collection and interventions among customers and dental care staff	10.10.2008– 9.1.2009
Analysis; dramatization of narratives	1.11.2008– 13.1.2009
Theatre rehearsal process	1.11.2008– 23.1.2009
Validation of the dramatization with the customers (teenagers)	9.1.2009
Searching multi-voiced understanding; presenting narratives in organizational theatre intervention	23.1.2009
Roundup from theatre session	
Reflection meeting	24.1.– 2.3.2009
Meeting with organization members	3.3.2009
Action planning session	27.3.2009
Roundup from idea generation	28.3.–2.4.
Meeting with organization members	3.4. 2009
Action plan and action	3.4.2009– 23.11.2009
Reflection session	2.12.2009

Table 2: Phases of the case Public Sector Health Care Unit.

writing (4 pictures and one "free" story, altogether 30 minutes), secondly, a verbal story was gathered together in groups (seven theatrical pictures were to be reorganized and interpreted to describe a problematic episode which ends in a situation where the client is dissatisfied; altogether 45 minutes) and thirdly, each group presented its story to the others (45 minutes). This was followed by a discussion, facilitated by the researchers (15–30 minutes).

We were interested in dental care workers' actions towards a patient, and more precisely, how young people had experienced these encounters. The main idea was to make visible how teenagers felt about the dental professionals' actions in treatment (Figure 1). The forms of the scenes were different genres of applied theatre. For the most part, the emphasis was on Forum Theatre. The interesting question was how to transform the material into Forum Theatre. Before staging the action in front of the employees we had to confirm the validity of our Forum Theatre scene with the original informants - we had our first staging at the school where we presented the scene back to the teenagers. We asked their opinion on the scene, checking that it was their voice and that it was telling their story and their experience.

In the scene the young patient had the role of the protagonist and the dental care workers were seen as antagonists. This creates a different situation to the original concept of Forum Theatre, in which it is usually the protagonist whose story the participants are examining. We made this radical shift from the original form of Forum Theatre because it was a key issue to bring in user perspectives to the organizational settings. Power relations and distance between dental care workers and their teenage customers were so obvious that it seemed to be impossible to create a forum where dental care workers and their customers interact together. In the beginning of process the teenagers and workers world views and interest were afar from each other. "I could not be less interested"-attitude and "we just take care of teeth not the person" -attitude of workers blocked their communication.

That is why we wanted the young patient to be seen as the main character but still explore the story from the worker's viewpoint. This shift also changed our scene into the application of Forum Theatre and Rainbow of Desire. It was interesting to see how the scene worked when the role of the antagonist was replaced by the audience. The scene lasted 4 minutes and presented how Netta was invited to the operation room and how the dentist's actions were communicated to Netta. The questions we focused on during the Forum Theatre were: how events are seen from the perspective of patient, how dental professionals are acting in a specific situation performed on stage and how they could act differently.

The data showed us how communication and shared understanding was constructed in aesthetic space. In one part of Forum Theatre Henrik, the employee (as a spectactor), pointed out the moment for change. He shouts "Stop!" and suggests that the place for this moment is in the corridor. The joker points with her finger to the floor behind her and asks Henrik "You mean here in the corridor?" (The stage is an empty place; there is only one chair and three actors standing on the floor.) Henrik responds "Yeah, in the corridor." And all of us, as spectactors, imagined that events were now happening in the corridor. The corridor becomes imaginatively "real".

It seems that the "in the corridor" -phrase on stage refers to the situation in real life as well as spectactors' imagination and events on the stage. Thus we suggest that aesthetic space of the Forum Theatre is a bridge from real life actions and reflection of it. Through aesthetic space it is possible to demonstrate the present situation of reality as it is experienced and it also offers a place for simulations of various situations as if it might happen.

Figure 1: An example of Forum Theatre scene.

So, during the theatre session the care unit members of the organisation performed, examined and deconstructed a codified event which could have happened or has happened in their organisation. With the help of the joker guiding the discussion, they started to recognise and define problems behind events when they jumped on stage and took a role.

During and after the performance the spectactors posed questions to each other with the help of the codified event: What actually happen in that event? What was that story about? What other changes characters could have done? And what would they have done in a similar situation in a real life? During the reflective conversation they pointed out that it was a unique situation for Netta but routine for themselves. "Oh, I didn´t realise how such small things could affect a teenagers feelings on how an operation is going." Problems and possibilities surfaced as well as the generation of new ideas. Through the codified event they distanced themselves from an event in order to make sense of it.

DISCUSSION AND CONCLUSION

The problem this research aims to resolve is: how the teenagers' experiences can be transformed (especially through theatrical interaction) by participatory innovation and learning in health care organizations. In our case, Forum theatre was an application of the original Boalian form of it. We try to engage employees and managers in observing themselves and their actions. We explored how public service employees, using aesthetic analogy, obtained distance from their own activity, enabling them to see what could be renewed in the organization (and how). In our case, the bridge was built on aesthetic space; we found that the language of theatre – play between imitation and imagination – forms a socio-cultural bridge between professionals and young customers. Theatricality allowed professionals to imagine variations of their actions and the radical achievement was that professionals (dental care workers and managers) also reached the organizations cultural assumptions behind actions.

Aesthetic space formed in theatre context was needed to create a safe envi-

ronment. Articulation and sharing of various forms and heterogeneous knowledge of participants may be confrontational and create tensions. (Amin & Cohendet 2004) Distancing elements of aesthetic space facilitate creative and constructive coproduction of new knowledge.

Another crucial element of aesthetic space and theatrical performances is their capability to share many kinds of knowledge. Collective tacit knowledge embedded in a group's practices is typically hard to articulate and make explicit. (Brown & Duguid 1998) Theatrical performances with body language enable expressions of feelings and attitudes. By making them visible and discussable, they are made changeable too.

The goal of participatory innovation is to discover new meanings. This process of making new meanings is understood to be a multi-voiced process of sensual dialogue, which emphasizes interaction and communication. The social infrastructure of innovation process is formed incrementally through social and political change within organizational settings. Figure 2 illustrates the learning process of aesthetic understanding.

In a context of aesthetic understanding the customers' experiences and ideas are crucial triggers for organizational innovation, but in the present case there were many different barriers between the young customers and the dental care professionals. In order to enable organizational learning and innovation based on customers' experiences, these experiences were transformed into a shared format. Aesthetic understanding was a dialogical method for innovation and learning.

Our study suggests that theatre, as an element of participatory innovation activity, offers methods for both ex-

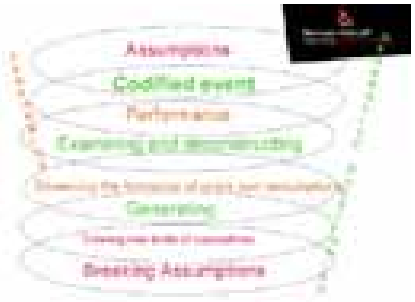

Figure 2: The framework of learning processes in aesthetic understanding.

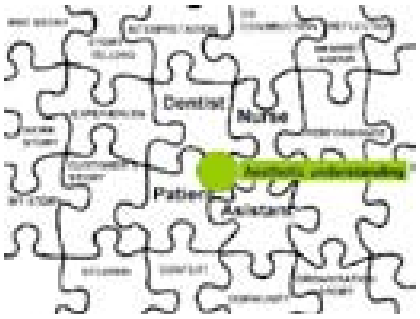

Figure 3: The creation of polyphonic interpretation in aesthetic understanding.

pressing one's own and understanding others' worldviews, attitudes and behaviour. Symbolic actions in role play scenes assist the participants to bridge (Burt 2008) the existing situation ("as is") and the non-existing possibility ("as if") in order to share experiences, generate ideas and gain knowledge together.

The aesthetic space, formed in theatre contexts of imitation, is a specific place of representation (mimesis) in situated time and reality. (Boal 1995, 13-20) We suggest that aesthetic understanding could be considered as multi-dialogue which invites one to "experience the other side" (Buber & Smith 2002). By this we mean first to gain understanding of the views and practices of customers and other professional groups and after that, professional groups construct shared meanings and practices together. This type of polyphonic interpretation is a local and personal (it takes place between participators). Power relations between participants and their customers are part of this process. Figure 3 illustrates the creation of polyphonic interpretation in aesthetic understanding. We conclude that process of participatory innovation and learning is always full of tensions related to participants various interests and power relations.

It is important to remember that what is seen on the stage and through the stage is always an interpretation that is embedded in the performance and realized through it (Clark 2008, p. 403). Theatre itself does not engender social change but it can allow members of organisations to confront hidden conflicts, behavioural patterns or critical routines (Schreyögg, quoted in Clark 2008, p. 405) in order to support attempts at change.

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NARRATIVE: HAMMASPEIKKO -TOOTH TROLL I RESEARCH VIDEO

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Our approach to innovation follows in the footsteps of interpretative dimension of innovation which questions if there is a missing dimension in innovation research - they break new ground in the field of interpretation, based on cultural and communicational studies. Innovation is often studied only as a decision-making and problem-solving process. Innovation processes must also be affected with issues that cannot be 'solved' or unified in a logical, linear and analytical fashion. The interpretative view is not widely understood in the field of innovation, although it would provide the potential for new insights. The goal of interpretative innovation is to discover new definitions. This, participatory process of sense making, is understood to be a fragmented, ongoing, open-ended (and multi-voiced) process of dialogue which emphasizes interaction and communication. We assume that one of the vital tenets of the participatory innovation process has to be toleration of incompleteness and distance, as well as to withstand multiple viewpoints and a lack of universal truths – there may be no single 'answer,' rather multiple suggestions and proposals.

BACK GROUND OF RESEARCH-BASED THEATRE

The method for analysis developed in our research is based on the idea of drama as an interrogative reading of meanings in real-life situations. In order to understand how employees in our study created an understanding out of customers' narratives we lean on participatory action research ideas about representational knowledge. As a whole, the participatory theatre based process made people participate in order to accumulate different pieces of information and structure those into a meaningful pattern that could be put to practical use. Through narratives (written, told, drawn and performed), researchers, artist, customers and members of an organization made a description of the events, actions and emotions happening in the organization, while also trying to illuminate why those things happen. The research objective of research based theatre was to capture, describe and explain the logic of representation in an organization. The narrative approach was first used as a tool for structuring the interactions, interrelationships and habits of people in the workplace and work community, and, subsequently, it was used as a research method for organizational research as well. We named our theatrical approach 'research based theatre (RBT)' (Mienczakowksi, 1995; Mienczakowksi, Smith & Sinclair, 1996, Mienczakowksi & Morgan 2001), and drama-based qualitative research actions were used to organise discourses inside the organisation and amongst customers. The steps of RBT are framed through 1) Plotting realities; narrative data collection and interventions among customers and the organisation, 2) Analysis; dramatization of narratives and 3) Searching multi-voiced understanding; presenting narratives in an organizational theatre intervention, 4) Shared idea generation for action planning. (Mienczakowski & Morgan 2001, Pässilä & Oikarinen 2009, forthcoming)

PARTICIPATORY THEATRE – THE RADICAL THEATRE OF BOAL

In participatory action research (PAR), people generate new knowing together. This type of knowing is tied to epistemology, which appreciates the value of human and emancipatory knowledge. Park (2001) broadens the horizon of epistemology to include such forms of knowledge as representational, relational and reflective as well. He claims that power and knowledge are related and that ordinary people's involvement in the research process generates knowledge for solving social problems and emancipates people to be responsible members of the community. (Park 2001, 84) Gayá Wicks and Reason (2009) point out that it is important to be aware of how access is

established, and how participants are engaged. So it is vital to understand what happens at the beginning of the action research process and pay attention on how to map out the practices of opening communicative space. (Gayá Wicks & Reason 2009)

Timothy Clark (2008, 403-404) has crystallised the use of theatre in an organisation as a resource and technology. He defines four typologies for theatre depending on its participatory and adaptive dimensions; namely, corporate theatre, radical theatre, organisational theatre and situational theatre (Clark, 2008). Each of these applications of organizational theatre puts the artist in a new professional, societal oriented role as an actor of social change (Lacy, 1995; Jacob, 1995). Each application aims at a different type of organizing participation. We are interested in discovering the possibilities of the so-called radical theatre of Augusto Boal in the use of PAR as an employee-oriented practice-based learning process within a public organization in the early stages of action research project. The radical theatre of Boal facilitates 'the process of discursive exploration, release and political action' (Clark 2008, 404).

NEW WAY OF EXPLORING "ORGANIZING PARTICIPATORY INNOVATION"

Boal´s concept is divided into 'Image Theatre', 'Forum Theatre', 'Rainbow of Desire' and 'Legislative Theatre'. Since forum theatre is an interactive theatre in which the audience has the power to suggest and make changes to events on stage, the members of the audience are encouraged to join in the action on stage, becoming co-constructors and co-actors, which Boal terms 'spect-actor'. Using the Greek terms 'protagonist' and 'antagonist', Forum Theatre seeks to show a person (the protagonist) who is faced with obstacles and resistance (the antagonists). In Forum Theatre, the facilitator of the action is referred to as the 'Joker'. The Joker takes responsibility for the logistics of the process and functions as a neutral link between the actors and the audience, encouraging them to step into the role of a 'spect-actor'. (Boal 1992, 1995) This type of theatre is associated with critical adult education and reflective learning processes (Asikainen 2003).

Forum theatre is scripted by a professional artist, and in our case, by the research actors from the organisation (employees and their customers) and researchers from the university as well. In a performance situation, the audience in a role of 'spect-actors' is given the opportunity to intervene and to become self-directed performers (Clark 2008, 404). The core idea of intervention is to create a space for democratic dialogue as well as reflective thinking (Asikainen 2003). According to Clark, quoted from his private correspondence with Iain Mangham, 'The nature of the performance emerges in consultation with audience members. Through the active participation of the audience a performance has the potential to change from the original intent. In this respect a script initially offers a set of possibilities that the audience is free to accept or reject. As the performance commences they are empowered to take on the roles of playwright and actor simultaneously and so create something that has meaning and emancipatory possibility for them' (Clark 2008, 404).

We have been inspired by organizing participatory innovation and searched for communication and shared understanding in the context of forum theatre. In Forum Theatre we were interested in the dental care professional's actions when working with a patient, and, more precisely, how the young people had experienced these encounters. It was shown from the material that there was a lack of communication between the young people and the dental care professionals. When writing a forum theatre scene, the phenomenon was taken to a somewhat exaggerated level. Therefore the question in the scene remained: What are the mistakes in interaction that can be made during an appointment?

The most interesting question was how to transform the material into forum theatre. In the scene, the young patient had the role of the protagonist and the dental care workers were seen as antagonists. This creates a different situation to the original concept of forum theatre, in which it is usually the protagonist whose story the participants are examining. We wanted the young patient to be seen as the main character but nevertheless explore the story from the workers' point of view.

CASE

The case company is a health care unit in a public organisation in Southern Finland. The age of its employees ranges from 25 to 63 years. The employees' work experience is 25 years on average. There are 36 employees who participate, of whom two are male and 34 female. The employees' levels of education range from Graduate to upper secondary school education. They usually work in pairs and/or alone.

We concentrated especially on one phase of RBT, the organizational theatre session (number 10 in Fig. 1). It lasted for four hours in total, and the forum theatre scene itself lasted for 20 minutes. Qualitative data from forum theatre was gathered via recorded videotape (4 hours) and participatory observation of five researchers.

The scene focused on how dental professionals deal with their teenage customers. The idea was to think together about what happens between dentists and their patients during the treatment process, and why. The following figure illustrates the process of action research via RBT.

The vivid element of RBT was an

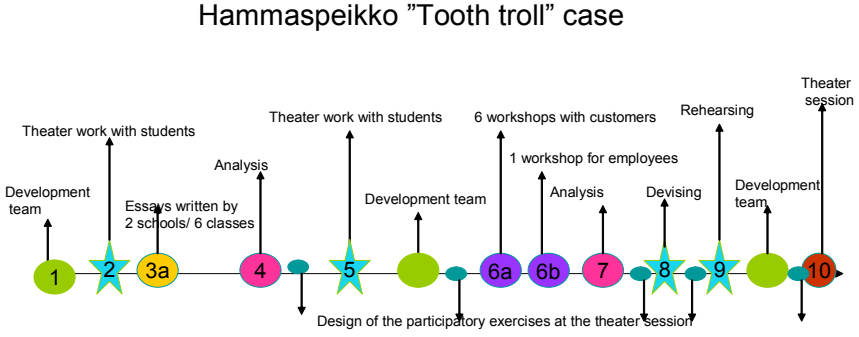

Figure 1: Process of research via research-based theatre

evocative process through storytelling and the interpretation of stories. It was felt that behind the stories, a new knowing emerged and this common knowing became a part of those who were engaged in the interpretation. We then decided to try to raise the level of relational knowledge. For example, at the start of the theatrical interactions, the employees would reminisce about their own teenage years by telling stories about their life, using their own photos that they had been asked to bring along. During this reminiscing process one could easily sense the intensity of the sharing. We thought that this connection to the employees' own teenage years was cornerstone in gaining knowledge through the customers' experiences. It opened up the employees' perspective, and at the end of the Forum Theatre phase, reflective knowledge was in the air when the employees paid attention to their attitudes and feelings about their customers like when they were reflecting upon their own youth.

Contextual and situated understanding was vital in a practice-based learning process enriched by forum theatre. Making meaning and awareness of how meanings are constructed is one key element of transformative learning. Phase on stage reflects to the situation in real life as well as participators imagination and events on the stage. Aesthetic space of the research-based theatre was a bridge from real life actions and a reflection of it. Through aesthetic space it was possible to demonstrate the present situation of reality as it was experienced and it also offered a place for simulations of various situations as if it might be happening.

WHAT CAN BE LEARNED FROM A COMBINED PERSPECTIVE?

From the perspective of organizing participatory innovation, our study has the practical objective to raise awareness among participants and we also had an idealistic goal for the people to empower themselves in a context of encounters in an aesthetic space during artistic interactions. We understand the employees' knowledge gaining during interactions as sense making and sense breaking. This sense making and breaking is a path to change actions, to find ideas as to how to renew one's own work practises and attitudes behind actions. Thus, study has a strong practise-based learning element woven into the question how to create knowing together. We thought that an artistic approach with a narrative orientation offers a framed forum for finding out how to learn from the customers' experiences and ideas.

We found that the process was as iterative and heuristic in which turns were taken between 1) sense making activities of the theatre actors, the development method designer, and the participants of the case company, 2) management targets of organizational development program, as well as 3) reflections upon research. Seen from the perspective of the systems and based on action research theory, this is a question of social structures (roles and rules) and the functioning of these structures. The level of the system operates through rational and instrumental actions and it seeks functional rationality. On the other hand, the research process stemmed from the dynamics of social order, individual and collective professional identity, which operates more or less through interpretation.

Interpretation, linked to embodied knowledge as well as given and constructed knowing, is woven into instrumental expectations during the dynamic of the research process. We found that it is crucial to be aware of one's own position and actions. From this perspective, we formed three lines of research process, based on Gummesson´s (2000) thinking as well as action research in learning and change. These three lines describe (see Figure 2) the different types of the role of the researcher as well as different research positions in a context of organizing participatory innovation: 1) a writer of scientific research, 2) an actor in the organizational development project, and 3) a constructor of a development method. These lines infect each other and produce experiential, presentational, propositional and practical knowing. In our process, we found several methods to gain knowing. In the following, we attempt to clarify the course of our process with the help of Heron and Reason's definition of cooperative inquires. According to Heron and Reason, knowing has several nature; experiential, presentational, propositional and practical knowing. In this quote, Heron and Reason controvert that:

> *"Experiential knowing* emerges through direct face-to-face encounters with a person, place or thing; it is knowing through the immediacy of perceiving through empathy and resonance. *Presentational knowing* emerges from experiential knowing, and provides the first forum of expressing meaning and significance through drawing on expressive forms of imagery through movement, dance, sound, music, drawing, painting, sculpture, poetry, story, drama, and so on. *Propositional knowing* 'About' something is knowing through ideas and theories, expressed in informative statements. *Practical knowing* is knowing 'how to' do something and is expressed in a skill, knack or competence" (Heron & Reason 2001, 149; originally in Heron, 1992, 1996a;).

Three lines of organizing participatory innovation are formed out of various questions:

1) The role of researcher includes research-related questions: Where, when and how do we collect data and analyse it? How do we get feedback from organization and how do we give feedback to them? Is feedback a monologue or a dialogue?
2) The role of facilitator consists of the questions related to the development project and the interactions in it: How do we organize storytelling? What stimulates storytelling? How do we share experiences together? How do we interpret stories?
3) The role of constructor comprises of the questions concerning learning and related practical actions: How do we use narratives? How and what do we learn from narratives? How do we script the stories? How do we dramatize scripts to performance? How do we devise stories into theatre scenes?

The following picture (Fig.2) illustrates the lines along which the researcher moves in participatory research.

During the process, the researcher engages in dialogue between theory and praxis. The cycle forms a collective learning process for the all the partici-

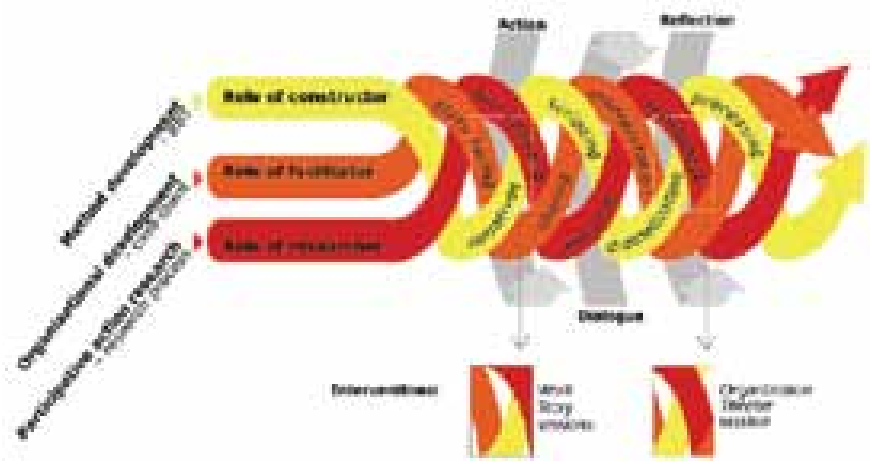

Figure 2: The lines of organizing participatory innovation

pants. Because of the sensitive nature of this type of research process, it is important to describe the richness of the process. This richness is related to how theory and practice are woven together. We are asking whether it is even possible to transform artful actions, that is to say, gestus or movement in a form of representational knowledge (Park 2001) into text. With this in mind, we have also made a research video in which we try to illustrate the interactions not only as an intellectual and rational process but affect-laden action. In the video we have dramatized events with our heads and hearts as well. As a conclusion we point out in our Tooth troll I – research video that aesthetic understanding happens besides language also through motions and emotions in acting and imagining. The aesthetic space is full of potential variations of different plots and narratives. Aesthetic understanding emerges in the encounters of different people in a shared aesthetic space, and this understanding could be seen as a polyvocal transformation in which knowing and understanding is constructed evocatively through reading the other person´s experience. In this kind of a process, learning and knowing are a constructionist action by all participators, even those who are not directly involved in the events on stage. An aesthetic learning action aims at bounding socio-cultural present and historical process of organization's everyday life to reconstruct the identity of organization.

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UNVEILING THE SHOPPING CENTER INNOVATION OBSTACLES

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ABSTRACT

The shopping center - once considered a place for effective shopping - is in the midst of changes. Shopping centers are becoming more and more places for spending leisure time and doing activities that do not always involve shopping for products, i.e., shopping centers are becoming service-oriented. Developing services in turn requires that shopping centers will need to be increasingly involved with their customers and other stakeholders, to define value creation patterns for services. Participatory innovation is a promising way of gaining insight from customers and even outsourcing some parts of the innovation process. However, compared to a single organization utilizing participatory design, the shopping center environment presents new challenges and obstacles to the innovation process. The value network within the shopping centers is rather complex. Also, the business of shopping center management has in the past been mainly concerned about efficiency and logistics, with much less concern for services or promoting the collaboration between the different stakeholders in the shopping center. There is currently exists very little research on participatory innovation and its challenges in the retail industry. This article presents a case study of participatory innovation in one Finnish shopping center. The purpose of the case study was to gain understanding of what kind of innovations shopping center visitors are after, what kind of collaboration patterns would be needed to implement these innovations and what kind of obstacles to such collaboration exist. We found that there is currently practically no support for fostering the process from ideas into potential innovations.

INTRODUCTION

In recent years, shopping centers have become a popular format of retailing and taken a strong position in Finland's retail markets. Today there is a total of 73 shopping centers in Finland with over 300 million visitors per year. The market share of shopping centers has been growing during the last years and in 2009 was approximately 14%. (Finnish Council of Shopping Centers, 2010.) The shopping center industry is, however, in the midst of radical changes, highlighted by some current megatrends, like the rise of ecological consciousness, the growth of e-commerce and services becoming more important in our society. Shopping centers are an example of a business area heading towards a direction where the value is not solely created by goods, but by services (Ostrom et al. 2010). According to Furseth et al. (2010), in the future the focus needs to be on the customer experience rather than on the products themselves. The competitive advantage could be achieved through more innovative service operations. At the same time, consumer behavior is becoming more fragmented and consumer needs less predictable (Uncles 2006). These changes challenge shopping centers to introduce more customer-centric approaches in order to understand cus-

tomers, serve them better and to produce new innovations.

In this paper, we present initial findings from the 4D-Space project, in which researchers and shopping center customers have co-innovated new services together. The purpose of the project was two-fold: on one hand we wanted to incorporate participatory innovation in a new environment, in the shopping center business in Finland and on the other hand, we wanted to find digital service innovations that could be developed and researched further. In addition to producing plenty of new ideas to be developed further, the research has highlighted organizational barriers that affect co-innovation process in the shopping center environment. The purpose of this paper is to examine what kind of barriers there are in the shopping value network and innovation processes that hinder the utilization of user-centric innovation in the case of a particular shopping center.

Results from our case study demonstrate that that the shopping center is not organized to handle the kind of innovation development the users would like to see. The organization and operations are currently not tuned for collaboration between different stakeholders and users, but rather remains very much oriented towards an efficiency-based product sales space renting business.

The paper is organized as follows: the first section explores the relevant research regarding participatory innovation, new service development and innovations in the retail industry, and. Then we continue explaining our methodology and the data gathered in the case study. In the Results section, we present findings from workshops and stakeholder interviews and describe the value network within the shopping center. Finally, in the Discussion, our methods and results are evaluated, validation considered and future work suggested.

LITERATURE AND THEORY

The phenomenon where users are taken into company's innovation processes as partners has many synonyms and the different nuances of them are not completely established even if the term "participatory design" has been already used since 1970s. Sanders & Stappers (2008) use the term co-design to "refer to the creativity of designers and people not trained in design working together in the design development process". Buur and Matthews (2008) prefer the term "participatory design" maintaining that one of its unique strengths is the ability to introduce novel user-driven practices to organisations having traditional ways of working. The implementation of participatory design brings various stakeholders together to confront each other with very different perspectives on the issues.

According to Hardagon (2003) innovation is not something that a genius person does in solitary - rather innovations can emerge when networks connect and link people, ideas and objects together. To achieve successful service innovations companies need to do things for and with the customer in new ways. The move from 'user as subject' towards a 'user as a partner' paradigm challenges the roles of designer, the researcher and the former 'user' (Sanders & Stappers, 2008). Furseth et al. (2010) define service innovation as an activity where known products, services or processes are combined or created in a new way. The innovation is to combine known solutions, or create new services, processes or business models, and either sell these on market, or employ them for internal increased value. Service innovation is a business model innovation that gives the users or customers a better experience or higher value. Furseth et al. (2010) identify three types of service innovations:

- innovation in the service aspect of products
- innovation in services already available
- the creation of new services

While there have been some recent efforts to examine service innovation generally (e.g., De Jong & Vermeulen, 2003; Furseth et al., 2010; Ostrom et al., 2010), there appears to be only little specific focus on retailing (cf. Martin 1996). In fact Hristov (2008) goes on to argue that there is barely any research on the meanings and pratices of innovation in retail sector. According to Hristov (2008) keywords "retail innovation" generated only 13 results, whereas "technological innovation" generated 13 916 results.

De Jong and Vermeulen (2003) state that retailing and other consumer-oriented services, where the innovation is dominated by suppliers, are often considered less innovative, as distinct from production-intensive services, such as banks and wholesale services, which put substantial effort into the simplification of their service offerings. One reason for relatively low scores on innovativeness in retailing, when compared to other sectors, might be due to the difficult measurement of innovativeness through traditional measures of R&D (Hristov, 2008).

Ganesan et al. (2009) point out that in most retail organizations supply chain partners earn rewards for cost savings and efficiency improvements. Thus, innovations in retail context usually involve changes in products and processes, which focus either on reducing costs or improving efficiency. According to Ganesan et al. (2009), in retail industry the shift from R&D-centric innovation programs to open innovation platforms has been rather slow. However, Martin (1996) found that direct customer participation and the usage of customer information during the service development process were some of the key factors of new successful retail services.

DATA AND METHODS

This article presents a case study (Yin, 2003) of one shopping center in Finland and comprises literature studies, interviews with shopping center management as well as participatory ideation and innovation workshops with actual and potential customers of the shopping center.

As part of the 4D-Space research project, we are carrying out a pilot project in participatory innovation together with a shopping center Iso Omena - the 5th largest shopping center in Finland, located in Espoo and owned by the retail developer Citycon. Citycon is the market leader in Finnish shopping center business and states in its vision that that it is "an active owner and long-term developer of its properties" (Citycon, 2010). Citycon also "develops its retail properties systematically and on a long-term basis, which increases their value" (Citycon, 2010). Iso Omena was considered and inter-

	Goal	Method(s) used	Results
WS1	Context study, uncovering issues that are "issues" by users	Walkshop, semi-structured group questionnaire	Audio recordings and group discussion results regarding context . Based on these, 10 themes were raised up.
WS2	Ideation	4D-Pads, group work	Identification of where the themes are or should/could be present in the environment.
WS3	Idea development through story telling	Video stories, group work	Video stories, each group presented at least two distinct topics
WS4	Concept refinement	Group work with questions	Concepts…
WS5	Prorotype evaluation	TBD	TBD

Table1: Workshops and methods.

esting platform for research not only because of its interest in participatory innovation, but also due to the fact that the shopping center is considered to be and marketed as being "like a small city". Also, the nearby area is undergoing big changes in future years in terms of construction. The western extension to the metro line in the Helsinki area will reach Iso Omena in 2014. Also, a new interface terminal for buses will also be built and connected to Iso Omena. Further, Citycon is planning to extend the shopping center by 5 000 m2 of retail space – with the considerable growth in the customer flows of the metro and bus terminals, new possibilities to increase the sales of the shopping center are created.

We have had a series of workshops, with two groups (roughly 20 people altogether) innovating new services for the shopping center. The workshop participants were recruited in two ways: firstly, by using the Iso Omena Facebook group and secondly using Qaiku social media service. The goal of using these two services was to reach various kinds of people - both committed customers of Iso Omena as well as "outsiders" who may have different kind of insight and interest in the topic. Our goal was to get a heterogenous participant group so that the type of innovations would vary and thus help expose as many issues as possible. We succeeded in the sense that participats ,aged 25-65, included people who had shopping as their hobby or retail technologies as a profession (these could be considered lead users) but also people who were living nearby and are customers of Iso Omena, but not necessarily very into shopping.

Four sessions of workshops have been implemented, with at least one more planned. The aim of the workshops has been to generate ideas for future retail services and test participatory innovation methods in the development of shopping centers. The participants have created various new kinds of ideas and concepts and also developed these concepts further - utilizing methods like walking and observing within the shopping center (walkshops, see Korn & Zander, 2010), speaking out loud, marking ideas on a printed blueprint of the shopping center and creating videos with storytelling or even short "play" that explains the ideas. In addition to workshops we have had a closed Facebook group for participants and researchers to elaborate on ideas and discussions between the workshop meetings. The workshop themes are summarized in Table 1.

Approximately 450 ideas were found from the audio transcripts from the workshops and from the Facebook conversations. The exact amount of distinct ideas is smaller because from these 450 ideas duplicates were not counted out. The 450 ideas were read aloud and organized with the affinity diagram method to groups in collaboration with five researchers. In the affinity diagram, similar issues are collected together (Beyer & Holtzblatt, 1999) - for example, using Post-It -notes that can be relocated easily. From these rather vast groups, key ideas were selected according to their popularity among the users in workshops and based on the possibility of generating digital services out of them. Eight idea combination themes were thus generated and named in an inspiring way. Users could comment the themes and vote the most interesting ones in an Internet poll. We will continue developing the most popular themes further in the upcoming workshops.

Three themes were selected for this paper for further analysis by the writers. These particular themes were selected because they are quite different from each other. The researchers estimated the amount of effort and involvement needed for implementing these. The radar plot diagrams were used to visualize the estimates.

In addition to the workshops, Iso Omena manager and marketing manager were interviewed separately, in the form of semistructured interviews. The goal of the interviews was not to walk through the innovations but rather to gain a high-level understanding of the the innovation process within Iso Omena. Based on literature, interviews and our own analysis, we have drawn out the value network of Iso Omena as well as drawn out observations about the current status of the new service development process.

Figure 1: 4D Cards, depicting themes of the 1st walkshop.

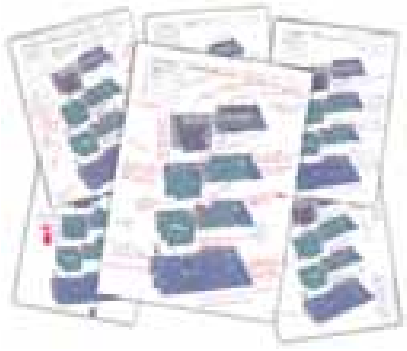

Figure 2: Workgroups have marked places for innovations into 4D-Pads.

RESULTS

INNOVATIONS OF SHOPPING CENTER USERS

The eight themes, their descriptions and example ideas within the theme are described in Table 2.

Theme	Description	Example Ideas
Sparkling car park!	Car park - the heart of Omppu? Car park can be more than just a place for cars.	Events, like Fire Brigade expo for families; DIY car shop; tire changing service
Apple drill!	How deep to drill? Short visit or a long stay? Janitor or community manager can help you to perceive the surrounding better in Omppu.	Robot hostess; chatting with the salesman in internet; speed shopping
Information worth knowing!	Who, what, where and when? Targeted product information! The needed information comes to the customer and not the other way around.	Product info: nutrients, local food, environmental effects; ad shower, hotspots for information; personalized offers to phone
Omppu's feng shui!	Visuality and the spirit of the place! The customers feel that their values are taken into account.	Addresses for the stores; renaming the places; energy displays for stores; co-operation between stores
On the stage!	Stage physically and virtually! The stage gather people together to listen each other or a local band.	Open mic, the stage is yours; organizations' presentations; collective gaming
Store3!	Breaking the barriers of stores! Shopping can be like walking through the magical forest.	Showroom exhibitions; serendipity, finding the treasure; bringing "the old" to Omppu e.g antiquarian shop
Vip-Omppu! Omppu-Club!	The next level of regular customer ship? Omppu is corner store for some customers, can these customers be taken care of in a special way?	Vip-omppu in mobile; interaction between a customer and a store; "not the card but the way of life"
Wormhole!	To be and to not be at the shopping centre! Wormhole is a place to take it easy.	Silent place; workplace; oasis for resting; day spa and luxury toilet; places in another context

Table 2: Categorization of ideas into themes.

COLLABORATION PATTERNS

In order to examine the business environment of Iso Omena more closely, we identified the value network of the shopping center, based on the interviews, shopping center literature, and our own analysis. The network, depicted in Figure 3, enabled us to mirror the users' ideas to the business environment and highlight what kind of collaboration patterns and changes they would require. According to Pepparda & Rylanberd (2006) the value network is the context in which the firm operates, assesses customer needs, responds to customer demands, gets resources and deals with competitors. In our case, we first wanted to focus on the internal business environment of the shopping center and left other stakeholders, such as competitors, outside the network.

In order to understand and estimate the amount of collaboration and stakeholders needed to produce the innovations, we further simplified the value network to six stakeholders: the customer, shopping center, grocery stores, specialized stores, public services and restaurants & leisure services. We went on to estimate the amount of effort needed by each stakeholder (type) in each of the three chosen concepts. We estimated the needed effort on a scale of 0-5, from no involvement (0), to light or optional involvement (1-2), medium involvement (3-4), up to heavy involvement (5).

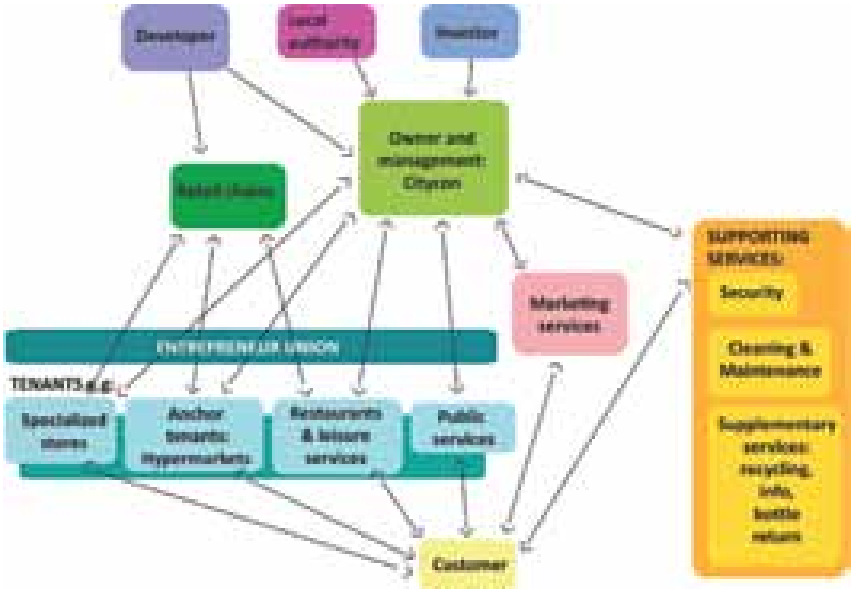

Figure 3: The value network of Iso Omena

The idea of *Wormhole* is a collection for a number of ideas that were related to the theme of spending time in the shopping center without necessarily spending money or at least not being "shopping". In other words, there needs to be space and time for relaxing and chilling out in the shopping centre. The theme consisted of separate ideas like quiet space, day spa, working spaces, meeting places, soft seating and using spaces in different contexts. The estimated collaborative effort needed to produce *Wormhole* is depicted in Figure 4.

Based on the estimates, Iso Omena has the biggest role in creating and providing the Wormhole service. Public services, restaurants and leisure services and specialized stores also have a considerable role, while hypermarkets do not. The researchers are somewhat unsure about the role of the customer in providing the service. The fact that Iso Omena is the biggest stakeholder might also imply a potential for a new player to handle the business of the new service. This was not yet consid-

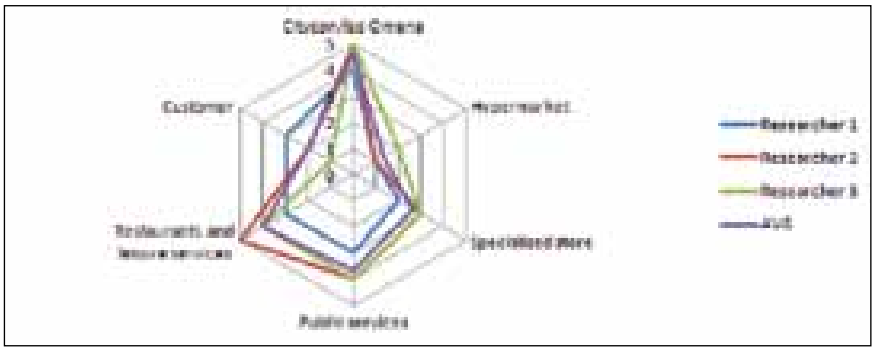

Figure 4: Mapping the collaborative effort needed by Wormhole.

ered further.

Information worth knowing is a container for concepts related to targeted information for users, typically but not necessarily referring to services available on a mobile phone. The needed information comes to the customer and not the other way around. At the best, even marketing messages seem like useful information. The concept can include, e.g., product info: nutrients, local food, environmental effects; ad shower, hotspots for information; personalized offers to phone.Estimated efforts to produce *Information worth knowing* are depicted in Fig 5.

Information worth knowing seems to engage all the stakeholders, and roughly by the same amount. Some differences are in the interpretation of effort needed - one of the evaluators has emphasized Iso Omena, hypermarkets and specialized stores more than others. The differences are likely to be related to interpretations of what this idea really contains. The role of the specialized stores is nonetheless the most significant.

The *On the stage* theme is about using the stage in the shopping center more actively and for more interesting purposes, and for showcasing non-commercial activities as well. The theme relates to the expressed needs for experiences as well as the locality of the shopping center - i.e., participants called for use cases like Hyde Park -spirited speeches, displays of local bands and artists and presentations by NGO's.

Of the three ideas under closer scrutiny, it can seen that the *On The Stage* concept requires most effort by customers themselves, not only by the stakeholders operating within Iso Omena. In addition to the customer role, the role of Iso Omena role is estimated to be moderately large. The hypermarkets are involved very little or not at all, while the role of specialized stores, public services and restaurants and leisure services may vary, depending on the implementation.

OBSTACLES OF INNOVATIONS

Based on the interviews with shopping center management, we can identify and highlight at least five larger obstacles, and several smaller ones, to implementing user innovations:

Current business environment does not appear to demand innovativeness

The interviewees stated that Finland is a rather small market area meaning that there is no need or possibility to specialize in any narrow segment. In addition, there seems to be no urgent need to develop shopping center services because the market situation was seen rather stable. However, some future challenges, like the metro line and the accompanying changes, were recognized at the same time. The attitude towards innovativeness was also uncovered when it was brought up that some improvements, such as environmental improvements, are implemented only if they are required by tenants or customers. In this sense shopping center development appears to be more reactive rather than proactive, even though Iso Omena could take a stronger role and lead the way.

Emphasis on numerical data to justify decisions

Another related obstacle is that every new innovation or improvement has to be seen economically profitable. Citycon defines itself as a property owner which aims primarily to increase the value of the property. Thus, the business aims for efficiency meaning that every innovation has to be justified economically to be implemented. This makes it difficult for users' ideas to come true because most of them were not directly related to buying and the profit may be realized only indirectly and in the long term.

The emphasis on the numerical data was also revealed when discussing the requirements of implementing users' ideas. The first step would be to carry out a market research to find out whether there is a larger demand for those innovations. Market research is, however, expensive and it slows down the implementation of innovations.

Limited resources, no organization to take ideas further

It was noted that there is no R&D group or person who is clearly named business responsible for new service development, rather everyone (in the shopping center employee team) is to contribute their ideas. This has sev-

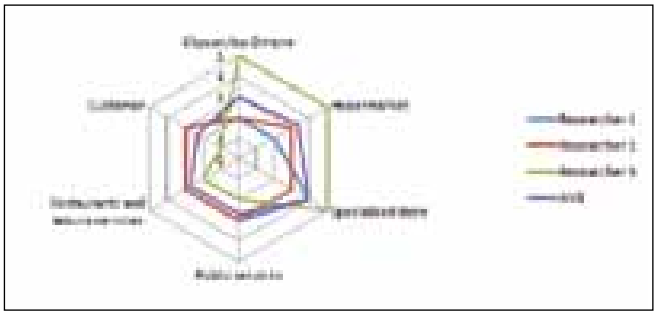

Figure 5: Mapping the collaborative effort needed by Information worth knowing.

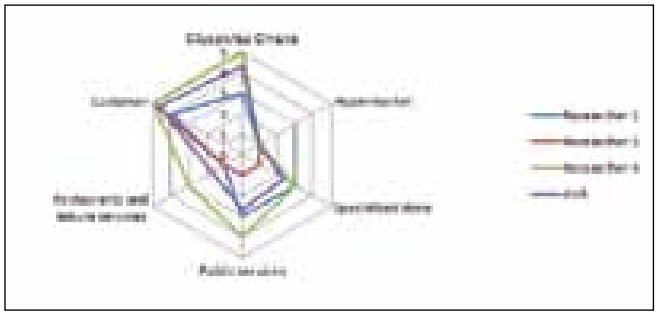

Figure 6: Mapping the collaborative effort needed by OnThe Stage.

eral implications for user innovations. There is neither actor nor service innovation and development process to take users' ideas further. There is no process for evaluating, piloting and deploying new service ideas, not in the company itself (Citycon) or with the other shops. Thus, it was noted that ideas should be fairly complete concepts when they are brought to Citycon.

In addition, the shopping center management team was found to be rather small and most supporting services, like marketing, are bought outside the firm. This results in the lack of resources for developing new innovations. If implementing user innovation would need a new actor, there is always a threshold to by a new service outside. While being eager to hear about the ideas and innovations developed during the workshops, the shopping center management has yet to take a lead on the innovation process. This can be seen in the way how taking the user innovations further was considered:

> *"if YOU [i.e, researchers] want to develop the concept, to see how far it is possible to take, then let's take it further..."*

Little dialogue with shopping center customers

The dialogue between the shopping center and its customers was found to be rather superficial. Customers can contribute to services by giving feedback in shopping center or via website or Facebook page, answering customer inquiries, or giving feedback to tenants. Also, it was noted that shopping center management follows social media and what is talked about Iso Omena. Even the interviewees noted that the threshold to give feedback may be quite high, which makes the feedback quite occasional – it is usually given when something has gone totally wrong. Iso Omena has also been planning to establish some sort of customer panel in order to get feedback and spontaneous response to current plans. This all implies that customers are still perceived as feedback givers rather than co-creators or co-innovators to the extend envisioned in research and in success stories in participatory innovation.

Little collaboration between the tenants and focus on (near-term) marketing

The tenants of the shopping center have a joint association, entrepreneur union. The main focus of this collaboration between the shopping center and the shops is marketing - for example, planning of joint campaigns and events at the shopping center. The union meets monthly, with two larger annual meetings. However, it was noted that in many shopping centers, the union has been quit because it has been difficult to find mutual understanding between tenants. It was noted that if implementing a new service would need joint effort from tenants, it may be difficult to motivate them. Thus, it seems that tenants perceive each other rather as competitors than collaborators.

Based on the interviews, the business environment of Iso Omena appears to be rather complex. It was striking that there is no process to take users' ideas further and ideas easily collide against organizational barriers.

DISCUSSION

Interestingly, a majority of the ideas and innovations developed by the users had nothing to do with the "core" buying process of products. This can be a result of the chosen workshop methods which allowed the participants to ideate and discuss quite freely and also because the workshop facilities were provided by Iso Omena and not by any store that sells goods. Also, quite a large number of ideas were not directly linked to digital services, which were the main starting point of the organizing the workshops in the beginning. This tells that it is difficult to keep the ideation space open and at the same time try to guide the innovation process towards a specific target such as digital services.

Although the project is not yet finished, we have discovered issues with regard to e.g. conflicts within stakeholder interests and with the nature of innovations or ideas developed by participants. From the Iso Omena's viewpoint, development activity is mostly seen as getting feedback from the customers and tenants. On the basis of numerical evaluation data it is easier and faster to make decisions compared to the fuzzy and raw idea data. This feature of fastness and visibility is a challenge for participatory design because it takes time and effort to interpret and demonstrate its results (c.f. Kujala, 2003). The result of participatory innovation can be a truly new kind of demand for which there are practically no tools or processes for implementing it. In addition, because nearly all the new features in the shopping center have to gain numerical data support before they can be implemented, it can effect to the amount of new features that are even considered because of executing survey costs.

The workshops and interviews have also revealed that the processes for engaging in dialogue between the shopping center and its customers are missing, both in terms of customer feedback as well as more rigorous involvement e.g. in service development. Besides traditional marketing channels, the shopping center does not have tools or forums to interact with customers to know their wishes, ideas, and aspirations. Often marketing is taking care of the customers but when it is more about customers creating new ideas, is the marketing department the right business function for take care of the innovation process? At least the marketing approach should target more towards longer term development, not only sales campaigning.

The role of researchers during this project has been to mediate between the shopping center and customers, trying to formulate new forums for collaboration. In the future workshops, our aim is to bring more players together to develop some ideas further.

The chosen methods require quite intensive amounts of work, both for workshop facilitation as well as analysis of results. The participatory innovation workshops have been found to be useful in uncovering missing forums and other obstacles to implementing innovations but there is no indication that the ideas are actually better than those conceived by industry experts.

The radar plot evaluations of the themes were done by three researchers of the 4D-Space research group. In the future, the evaluations could be done by service development experts, giving the radar plots more reliability. In that case attention should to be paid to the describing the theme and its ideas clearly. Even though the researcher had worked with the themes a lot, it was not always clear what exactly was the core idea of the theme, resulting in

variation in the radar plot figures.
It should be noted that higher level executives from Citycon, the owner of Iso Omena, were not interviewed. Also, in future work, it would be beneficial to interview the other stakeholders within Iso Omena, which would certainly highlight the tenants' points of view.
Naturally, it will be interesting to develop the concept ideas further and prototype them in a live environment - an activity that is planned for 2011. This will undoubtedly uncover new obstacles and create improved understanding of the shopping center reality. The first results from our participatory innovation workshops in Iso Omena, one of the first studies in the shopping center environment, have indicated some innovation obstacles that exist in the shopping center business. While this study does not necessarily provide data that could be generalized, it is likely that similar issues are found among other industry players. We are currently also in the process of interviewing a number industry experts and executives in the retail industry in Finland and thus also seeking for research results on innovation process obstacles on a general level and across the business.

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CO-CREATION BETWEEN ORGANISATIONS AND CONSUMERS

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ABSTRACT

Co-creation, the new term for participatory design, is an emerging trend in design research, which involves users and other stakeholders in the design development process. The key question this research addresses is, 'How can organisations co-create effectively with consumers at the idea-generation stage of the NPD process?' A strategic framework was built using insights from three case studies, semi-structured interviews with organisations in the UK, and observations from Action Research. Effective co-creation takes time and effort to plan and manage, but when practised with all the key elements in mind, as suggested in the framework, it can be of valuable benefit to organisations who wish to develop innovative products and services which better suit the needs and wants of their consumers.

INTRODUCTION

The term, 'Co-creation', has attracted much interest across various fields, particularly an emerging trend in design research. It can be defined as, "Any act of collective creativity shared by two or more people, applied across the whole span of a design process." (Sanders & Stappers 2008) Co-creation can be beneficial to organisations, because active collaboration with potential users in the new product development (NPD) process often leads to capturing consumers' latent needs and the development of innovative ideas. (Sanders & Simons 2009; Kristensson, Matthing & Johansson 2008) This may lead to identifying design innovation opportunities and the development of products, which better suit current and future markets, with the added benefits of competitive advantage. However, the practice of co-creation rests on the belief that anyone can be creative and contribute to the generation of ideas, a mindset not yet embedded in many organisations, acting as a barrier to co-creation (Sanders & Stappers 2008). Amongst other key concerns is the resistance to change, share, and take risks. Furthermore, background research has identified that research practitioners has a lack of understanding of the effective use of co-creation between organisations and consumers and a theoretical framework that can be easily followed. (Research-Live 2009; Sense Worldwide 2009)

The aim of this research is to explore these key barriers and develop a strategic framework to encourage and guide organisations to effectively co-create with consumers at the idea-generation stage of the NPD process. The strategic framework suggests one approach to co-creation: exercising idea-generation workshops involving active participants including designers, researchers, and consumers who are not trained in design.

METHODOLOGY

The methodology (see Figure 1) is a combination of qualitative primary and secondary research conducted to gain background understanding to accomplish the aim. This sequential process begins by identifying the research problem, applying appropriate research strategies and methods to collect and analyse research findings, after which insights are integrated from each research method to build the framework and provide final recommendations.

This research used literature reviews to provide a useful backdrop for the problem, which led to the need for this exploratory study and to identify existing theories of co-creation, to include its different models, approaches, methods, and key barriers. The case studies used in this research to gain insights from organisations practising co-creation with consumers examined how three Research Agencies (see Table 1) approached co-creation.

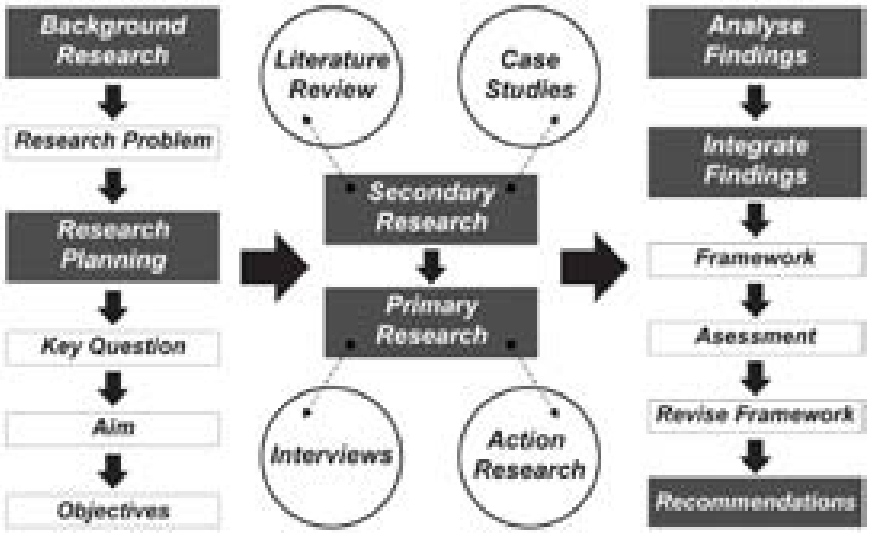

Figure 1: Research Methodology

Semi-structured interviews have two distinct purposes: firstly, to collect qualitative data from five Companies and Design Consultancies in the Industrial Design/ Brand and Product Strategy sector (see Table 1), to identify their perspectives, such as key concerns and expectations of co-creation with consumers, and the approaches they use. Secondly, they were conducted with two Research Agencies (see Table 1) to gain insights into their recommendations for successful co-creation, including various approaches and effective methods. Action Research has two distinct phases, in order to identify the main differences in participants' behaviours through observations, to identify how to successfully engage them during co-creation workshops. This approach conducted two consecutive idea-generation workshops with participants who are designers, researchers and potential consumers. The observations from the first workshop were then combined with insights from other research methods, to design a second workshop involving more engaging pre-set tasks for the same brief.

The data analysis for qualitative findings was carried out by organising the data and coding them under several categories; these will be reviewed to identify patterns and themes. (Creswell, 2003) The noting of insights from findings will be written on coloured Post-its and compiled on the wall to be mapped under different themes. The interview findings were transcribed, organised and categorised from field notes on the computer; similarly the observational findings from Action Research were captured and reviewed to identify patterns. The validity of research findings will be taken into account through triangulation of data, where insights were collected from several sources and combined during the integrate findings stage to form more confined themes, hence leading to the development of the strategic framework.

Firm	Sector	Position
Company A	Industrial Design	Strategic Design Manager
Company B	Industrial Design	Senior Design Manager
Company C	Industrial Design	Head of Industrial Design
Design Consultancy A	Branding & Product Strategy	Design Strategy and Insight Consultant
Design Consultancy B	Industrial Design	Head of User Research
Research Agency A (also used for case study)	Design Research Strategy	Founder
Research Agency B (also used for case study)	Branding & Product Strategy	Studio Director
Research Agency C (only used for case study)	Branding & Product Strategy	

Table 1: Companies, Design Consultancies and Research Agencies involved in Interviews and Case studies.

DISSCUSSION

CO-CREATION AT THE IDEA-GENERATION STAGE

Participatory design, the original term for 'co-creation', is a movement which emerged in the 1970s in Scandinavia. (Sanders & Stappers, 2008) It became more widely known when new challenges for designers emerged, as intuitive design and the passive role of the consumer no longer satisfied the changing demands of consumer needs. Hence the demand for "user participation in design" (Cross, 1971).

The new product development process (NPD) is often seen as a linear approach and a "sub-process" of innovation (Trott, 2004); The innovation process is often referred to as a funnel model in which many different ideas are gradually whittled down through different stages until eventually a small number of feasible concepts are left (see Figure 2). Co-creation activities can occur at various points during the NPD process: at the discovery stage when identifying new opportunities, throughout the design process, and in the later stages of marketing and brand development, with examples such as product customisation with NIKE ID and Dell's Ideastorm (see Figure 2). However as Sanders & Stappers suggest, the beginning of the process - also know as 'concept search', 'idea generation' or 'Fuzzy Front End' - is often ambiguous and its potential is unknown, which is when understanding the context and the users becomes important, to move forward into the design process. (Kotler 2003; Bruce & Cooper 2000; Sanders and Stappers 2008). Thus, the benefits of involving consumers as active participants at the idea generation stage in the NPD process should not be underestimated.

OVERCOMING BARRIERS TO CO-CREATION

Key findings derived from the literature and interviews revealed that co-creation is often misunderstood by many organisations, where it is regarded as an insignificant approach offering little of real value for com-

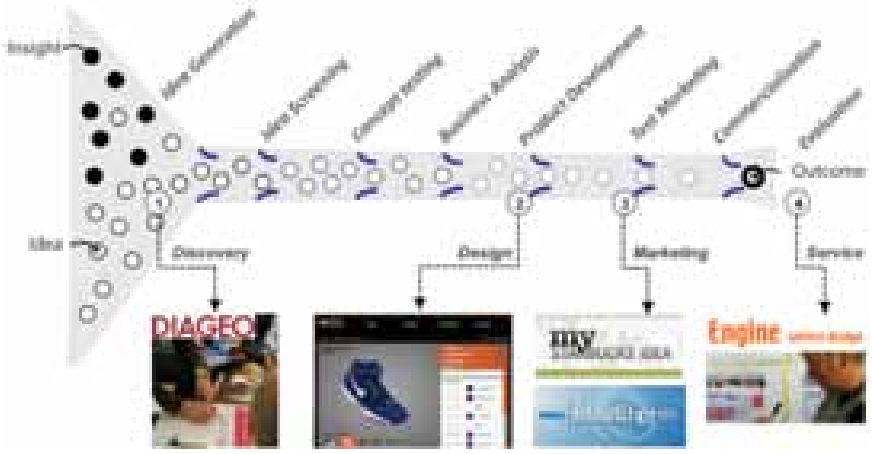

Figure 2: Co-creation activities practised across the various stages of NPD process.

petitive advantage in the market. The key barriers are a reluctance to change and share information, short-term thinking, risk-aversion, pressure from stakeholders, time and cost, consumer reliability, concerns about intellectual property and designers' egotistic concerns, and a lack of belief in "ordinary" people's ability to be creative. (Sanders & Stappers 2008; Tidd, Bessant and Pavitt 1997; Sense Worldwide 2009) Thus, for effective co-creation to take place it is necessary to challenge these organisational barriers.

The principal approach to overcoming some of the barriers is to introduce 'Openness' to the organisational mindset, to break down resistance to innovation. (Tidd, Bessant and Pavitt, 1997) The common attitudes embedded in organisations in terms of their 'short-term' thinking, resistance to change and sharing, make them less risk-averse and more open to adopting new approaches by involving consumers as active participants in the design development process. Furthermore, the mindset of certain designers is a substantial barrier to co-creation, because of their egotism and lack of belief in "ordinary" people's creativity. Data from interviews with industrial design firms indicate that designers often think research with consumers or users is not important, preferring to believe their own intuition and expertise will prompt the design and development of purposeful products for their users. This notion of openness is significant in organisational culture, with potential to alter designers' constricted mindsets.

The interview data suggested that in order to address pressures from stakeholders - about the constant demands for profits, a facts-driven decision-making process, and perceptions of co-creation being an expense which requires time and money - it is vital to convince them that co-creation with consumers can add value to the idea-generation stage, providing it follows a structured disciplined approach. Moreover, consumer reliability is another common concern for organisations, particularly when participants' background and motivations are unknown. However, this can be addressed by ensuring careful planning by selecting appropriate participant profiles, simplified workshop activities and offering guidance during the co-creation process. In similar cases, intellectual property concerns and managing organisational transparency also require initial planning, which involves setting mutual agreements with participants through legal documentation prior to involving consumers in the co-creation process. (Sense Worldwide 2009) Three fundamental aspects should be incorporated when organising co-creation workshops: Preparation, Simplicity and Discipline.

HOW TO CO-CREATE EFFECTIVELY

The key findings from three case studies reveal that co-creation is not a singular activity; it is an approach which requires preparation, careful planning, organisation and management of online and offline sessions, and subsequent analysis of all the results to develop useful insights, ideas or strategies. The various organisations developed their own co-creation frameworks, using similar approaches, emphasising the importance of selecting appropriate participants and co-creation methods, and the need to refine ideas through further developments. The interview findings also indicate that co-creation needs to be a simple structured process which requires preliminary research into mar-

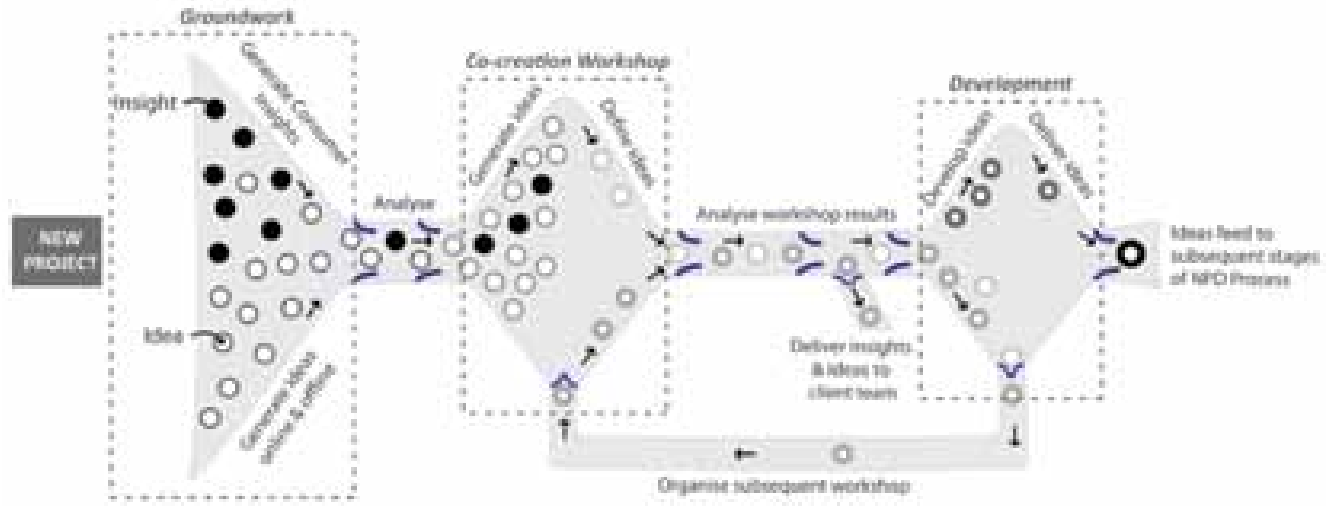

Figure 3: Processing of co-created ideas at the idea generation stage in NPD process.

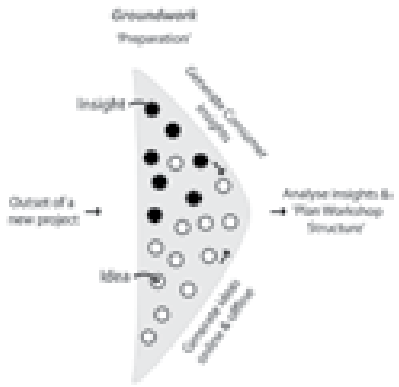

Figure 4: Idea Flow at 'Groundwork' Stage.

ket trends and competitors, and that workshop sessions require appropriate facilitation, stimulus and collection methods. Analysis and development of results can eventually inspire the design and subsequent stages of the product development process. Furthermore, the findings from the two Action Research workshops reveal that participants, especially consumers, respond to questions, images and encouraging activities which help trigger insightful thoughts and ideas. It is also important to have a facilitator to keep them focused on achieving each task, to select methods which interest and engage them in group discussions, encouraging them to share and comment on each others' ideas, thereby refining their ideas. The presence of the designer in the sessions can be beneficial in several ways, as they can visualise and conceptualise ideas generated by the group and inspire the whole session. Both workshops identified that facilitation, structured tasks and appropriate stimuli are essential in workshop sessions.

The integrated research findings indicate that co-creation at the idea-generation stage typically accompanies the outset of a new project and has three stages: *Groundwork, Co-creation Workshop and Development* (see Figure 3), similar to the 'innovation funnel' model in Figure 2 in which ideas are generated, defined and delivered along a evaluation process, until they are fed into subsequent stages of the NPD process. *Learning and refining* is also an essential step in sustaining the successful practice of co-creation with consumers; and finally it is necessary to *'Stimulate', 'Engage' and 'Inspire'* all stakeholders at the various stages of the co-creation process identified from the Action Research findings.

THE GROUNDWORK

As discussed earlier, 'preparation' is one of the fundamental aspects of effective co-creation. It is essential to set out the foundation for the subsequent stages in the co-creation approach. At this stage, (see Figure 4) numerous consumer insights and initial ideas, elicited and generated through online and offline networks, will be analysed to provide a better understanding of the context, to guide the planning stage of the co-creation workshop.

Three case studies indicate that co-creation often begins with research exploring the wider context to uncover insights; this includes understanding emerging consumer needs, identifying trends and competitors. One agency starts by first uncovering insights from observations and interviews, to prepare for setting up goals and selecting the appropriate methods to use in co-creation. Similarly another agency indicated that knowledge of the market, trends and competitors provides a focus for setting up structured disciplined workshops, thereby saving time for both researchers and participants. Action Research findings indicate that this was vital for a better understanding of the context, to guide the design of the two co-creation workshops and to provide the appropriate stimuli.

Another aspect of preparation is building a network of consumers online and/or offline, as a basis for screening for selecting consumer profiles suitable for participation and to brief them with vital knowledge about the project prior to participation. Case study insights suggested that online communities have easy access to large quantities of creative ideas through a network of people with different cultural backgrounds and expertise. The primary aim is to create a consumer forum

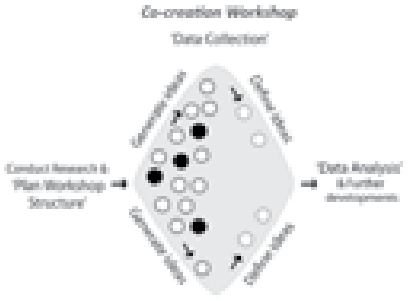

Figure 5: Idea Flow at 'Co-creation Workshop' stage.

where interesting topics are shared and discussed, to gain wider perspectives on key issues and opportunities, and as a source for spotting trends.

THE CO-CREATION WORKSHOP

A typical research process first defines a problem and its research objectives, develops a strategy, carries out data collection and analysis, and finally presents the findings. (Creswell 2003 and Kotler 2003). This approach also applies when conducting co-creation workshops, because as previously noted, co-creation should be a 'disciplined' process. Figure 5 illustrates the three key stages of the co-creation workshop: *planning workshop structure, data collection and data analysis*, with groundwork and further development taking place respectively.

Workshop planning: according to case study findings, the development of a strategy or plan for the workshop is a significant step. One research agency's approach to co-creation is a hierarchy where the methodology is a precondition to the selection of methods, tools and techniques. Moreover, prior to developing a methodology it is important to first identify the goals and objectives to help decide the subsequent stages, implying that a clear goal will guide the selection of activities during workshop sessions, e.g. if the goal is to generate ideas, 'brainstorming' and other games may be useful (see Figure 6). The purposes of any co-creation session should thus be identified at the planning stage. Action Research findings also revealed the importance of setting clear goals for workshops, leading to better time management and better quality ideas from the facilitator.

After selecting a clear goal, it is important to choose the people to participate in the workshop who may include various stakeholders in the project. Interview findings suggest that key stakeholders can include consumers, research and design team members and multi-disciplinary representatives from among the clients; its benefits can include an increased ability to capture insights which are valuable to each discipline, to get the best thinking through team analysis and prevent misunderstandings in the later stages of the NPD process. (Beyer & Holtzblatt 1998) Further case studies and interview insights suggested that co-creation can be more

Figure 6: Mapping of 'Co-creation' methods.

effective by involving small groups of people which are easier to manage and to engage with. It may also be useful to include a small number of participants in the workshop who have visualisation skills and a design background, because their 'problem-solving' and 'creative' skills' can guide the ideation process. (SenseWorldwide 2009; Stappers & Sanders 2003)

In market research participating consumers are selected based on demographic, psychographic or other considerations to achieve a range of perspectives. (Kotler 2003) Alternatively, an interviewee suggested an online or offline 'screening process' to identify individuals with relevant knowledge, attributes and enthusiasm who would engage in co-designing with other participants. This process can include setting small tasks or simple questions to people via online and offline networks. Moreover, one case study's approach uses a distinctive segmentation model to select suitable consumers as participants for each project.

After setting the goals and selecting participants for the co-creation workshop, it is necessary to select the methods to achieve these goals. The research findings identified three key categories of methods for co-creation workshops: *'brainstorming', 'games'* and *'making artefacts'*. Each category has different activities which can help elicit consumer insights and/or generate ideas (see Figure 6). One of the main purposes of co-creation methods is to help understand consumers' past, present and future experiences and emotions (Sanders 2005), to develop a source of inspiration for designers or create empathy for them. Activities such as 'cognitive mapping', 'collage-making' and 'envisioning' can be of great help in identifying latent consumer needs. Another key purpose of these tools is to elicit ideas from participants during workshop sessions; brainstorming in small groups can generate new ideas and encourage sharing and discussion of personal experiences to discover problems and new areas of opportunity, and to validate researchers' and designers' questions. 'Games' can help gain understanding of consumers' priorities, and it was suggested that "Play is a sequential decision-making exercise structured around a model in which the participants assume the role of operating the simulated situation." (Cross 1972) Moreover, games may be a way to interact with others in a more comfortable and less judgmental environment (Laurel 2003), thus acting as a useful way to engage group discussions.

Interview findings indicate that visual stimuli can elicit inner feelings and 'warm up' participants during co-creation sessions. Action Research findings revealed that moodboard was a good source of inspiration for participants. Moodboard is a presentation of images representing aspects of target users' lifestyles and environments expressed in a visual form, which can help stimulate new ideas. One interviewee emphasised the importance of capturing ideas generated during the co-creation workshop, which can be easily reviewed during the analysis process. In the second phase of Action Research findings, participants were more able to share and discuss ideas using a flipchart, which enabled them to refer to their own and each others' ideas.

Data collection: Once the workshop planning stage is completed, clear goals should be defined before selecting participants and appropriate co-creating methods. A key aspect to consider at this stage is how to manage the idea-generation session. Interview insights revealed that skilful facilitation is the key to successful co-creation with consumers; one interviewee stated that a good facilitator should be "constantly adaptable and have the ability to see, view and manipulate the process" and thus guide the participants through each workshop task. Other interview insights suggested the facilitator should not exert too much control over the participants, because it is vital to "let them be expressive of their own ideas." Participants should be encouraged to feel confident enough to engage in group discussions and sharing ideas. Another interviewee recommended that a successful co-creation workshop requires allowing participants to carry out a set of structured tasks, with the researchers there to guide them through each stage and utilise stimuli to trigger insights. This was identified as crucial from the first phase of Action Research findings, where there is a constant need to focus on the conversations between participants to align with the goal of the tasks, some of which are open-ended. On the other hand, it is vital to control the atmosphere, so participants feel comfortable to be involved, and to encourage the sharing and discussing of insights and ideas. (Berg 2006) Similarly, the findings from observational studies of two workshops suggest that making participants feel relaxed and at ease can contribute to engaging them in deep conversations. Moreover, giving them space to move around and complete tasks away from the desk can also help stimulate and motivate them, as the second phase of the Action Research indicated.

Data analysis: the initial step of analysing the results of the co-creation session is to edit the raw data captured, transcribing all the activities which occurred into written text, then organising or coding operations to uncover patterns of "human activity, action, and meaning". (Berg 2006) Evaluating results can be done using "a three-phase structure" that allows researchers to be inspired through their presence, to review the captured data and search for interesting insights and organise data to search for patterns. (Visser, Stappers, Lugt & Sanders 2005) Case study insights revealed that some organisations adopt a similar approach to analyse workshop results, because of time and budget limitations. The interview

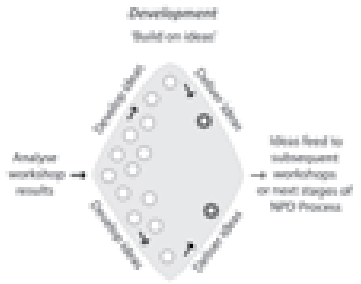

Figure 7: Idea flow at the 'Development' stage.

findings indicate that, the attendance of a multi-disciplinary team from their organisation or from the client team during the workshop session brought different perspectives to the analytical stage to inform or inspire new ideas. Designers may benefit from reviewing all the raw materials, including video or audio tapes from the session, to establish the origin of particular insights and ideas, to avoid creating something not suited to consumer needs.

DEVELOPMENT

The research findings indicate that insights and ideas generated from co-creation workshop are not necessarily the end of the process. Some of the ideas can be further developed before they are delivered to the subsequent stages in a more refined form. This part of the research may be described as a convergent and divergent process where ideas are developed and delivered (see Figure 7).

Ideas can be refined in several ways: case studies and interview insights revealed that organisations often select the best ideas generated by the workshop for their online network to seek further validation from wider perspectives. More commonly, however, organisations explore the ideas generated in the first workshop by holding another co-creation workshop with the key stakeholders. Alternatively, they can process these ideas using two different routes: either by developing a design brief for the client to feed into the subsequent stages of their NPD process, with the data including a summary of all the workshop results and a strategy for utilising these ideas to develop tangible solutions, or by passing on all the ideas to the design team, including raw data and edited materials, to inspire the designers to develop something suitable for production. In order to communicate the results of co-creation workshops to an alternative source, such as the client or the design team, the data captured from these sessions should inform and inspire their team members, with the results in an "accessible, shareable, useful and understandable" form. (Visser, Stappers, Lugt & Sanders 2005)

PARTICIPANT BEHAVIOURS

The findings from Action Research reveal that participants' behaviours differ with varying methods, when activities and collection methods were applied in the two consecutive co-creation workshops. It is useful to utilise visual stimuli such as images and diagrams to elicit insights from participants and encourage interactive activities such as game-based tasks carried out as a team, to encourage sharing and discussion of ideas, and to document ideas on a flipchart to inspire participants with their own ideas throughout the workshop session.

RECOMMENDATIONS

Figure 8 shows the results of earlier discussions of research findings and generated insights and the overall layout of the strategic framework for effective co-creation between organisations and consumers at the idea-generation stage of the NPD process. At the outset of a new project, the approach is a continuous process with six key stages: *'prepare, plan, manage, analyse, build and learn'*. Each stage can unlock certain barriers to co-creation when conducted appropriately. Several steps and guidelines must be followed in order to achieve the six stages. Furthermore, there are three key elements to consider: the need to 'stimulate, engage and inspire' all stakeholders at various stages of the co-creation process, which are better achieved through design-led activities such as use of visual materials and creative thinking.

PREPARE

At the outset of a new project, the initial stage for effective co-creation with consumers requires 'preparation', which is best achieved by conducting research and building networks of online and offline communities to provide inspiration to the subsequent stages. The purpose of conducting preliminary research is to understand the context, identify consumer needs and wants, and to sensitise participants with preparatory tasks such as workbooks or diaries. Typical research methods would include observation, interview, ethnography, contextual enquiry, probing and keeping a diary. These can be used in combination, depending on the purpose of the research. Networks can be built by organisations to explore topics through online and offline approaches, to gather wider perspectives, undertake a trend search, to engage consumers through sharing and discussion of issues and ideas, and ways of stimulating and sensitising participants.

PLANNING THE WORKSHOP

The co-creation workshop should be thoroughly planned, including setting goals, selecting appropriate participants and engaging relevant methods. Setting clear goals for the workshop will stimulate the process, while the criteria can identify problems, new opportunities and challenges, to validate early questions, elicit insights to inspire design and generate ideas for further development. The participants should include research and design team members and a multi-disciplinary project team from the client. The selection process for consumer participants can include a screener and assigned tasks or questions, and the selected profiles should be self-motivated, confident, open to challenge and creative. They may also be lead users who are able to engage in discussions.

The three key methods categories - 'brainstorming', 'games' and 'making artefacts' - are used to elicit past, present and future experiences and emotions from the participants, to trigger new ideas and share group discussions. Stimuli such as images, stories, video clips and objects can help engage participants and stimulate thoughts and ideas. It is also important to collect insights and ideas by using field notes, recordings, flipchart sheets, and through the researcher or designers' memory.

MANAGING THE WORKSHOP

The co-creation workshop is best managed with effective facilitation and a controlled atmosphere. The facilitation process should start at the planning stage by selecting the appropriate methods, stimuli and data recording methods. The research findings and discussion indicate that effective facili-

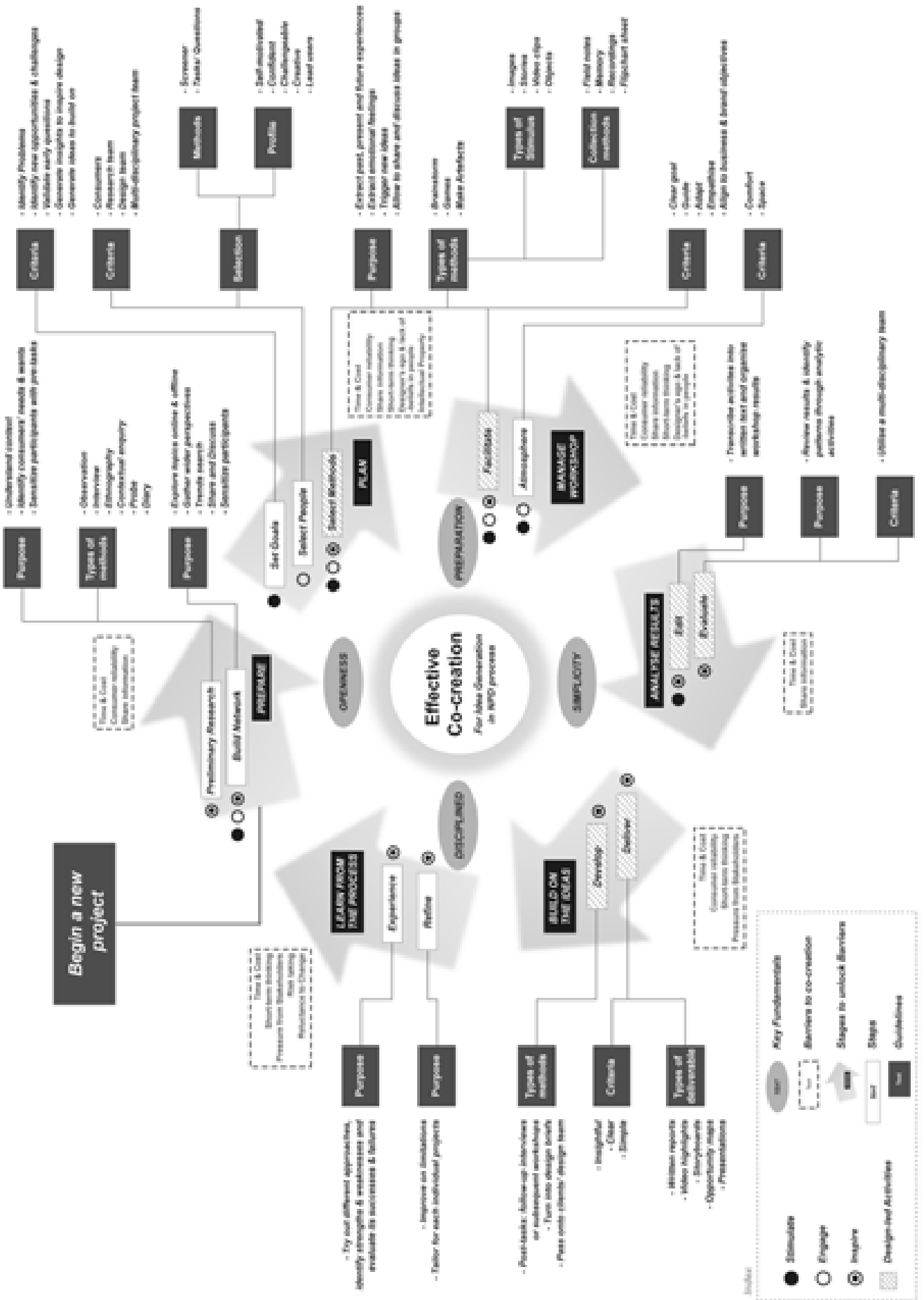

Figure 8: Strategic framework for effective co-creation at idea generation stage in NPD process.

tation at a workshop depends on having a clear goal, guiding the process, adapting to changes, empathy with inspirational ideas, and the alignment of ideas to business and brand objectives. The facilitation should stimulate and engage participants and inspire the design process, through design-led activities. Providing comfort and space encourages stimulation and engagement amongst participants.

ANALYSING WORKSHOP RESULTS

Making sense of the co-creation session follows on from effectively managing the workshop. Results can be analysed by first editing the raw data and then evaluating them. The research findings and discussions indicate that effective analysis of data is achieved by organising the workshop results by transcribing all the activities into written text. The results can then be reviewed and analysed to identify patterns. Effective evaluation can be done using a multidisciplinary team during analysis sessions. Creative thinking can also be applied to analysis of the workshop findings. The findings should thus inform and inspire the design process.

BUILDING ON THE IDEAS

Ideas from co-creation workshops can be built on through further developing them to eventually deliver results to the appropriate parties. It may be appropriate at this stage to adopt the use of visual materials and provide creative deliverables to inspire the design process. The ideas can be developed through follow-up interviews or more workshops. Alternatively the ideas can be converted into a design brief, or the results can be passed on to clients or the design team. Data insights should be delivered to clients or the design team clearly and simply, using written reports, video highlights, storyboards, opportunity maps and presentations.

LEARNING FROM THE PROCESS

Continuous learning from the workshops is essential, using personal experiences to inspire and refine the outcomes through trial and error. Try out different approaches, identify strengths and weaknesses and evaluate successes and failures, to improve on the limitations and tailor the approach for each individual project.

ASSESSMENT OF THE FRAMEWORK

Four senior members of well-known organisations were invited to assess the strategic framework and offer feedback and advice against five key questions. Their key findings were that while the framework may not give value to organisations, it offers a good general overview of co-creation for organisations less familiar with it. The framework was described as "thorough" but at the same time "confusing visually". The framework's key weakness was that co-creation was limited to conducting workshops. However, the interviewees said there are other ways to approach co-creation, and their recommendations include testing the framework through a project to prove its validity, and to further develop and define key aspects for each step of the six-stage process.

CONCLUSION

This research presents an exploratory study in effective co-creation between organisations and consumers and identifies its significance when practiced at the idea-generation stage. It has explored ways to challenge some of the key barriers to co-creation, through four fundamental principles: 'openness, preparation, simplicity and discipline'. The outcome is a strategic framework comprising six key stages, providing general recommendations for use by organisations as a starting point or a thorough guide to practicing effective co-creation. It may, however, be necessary to adjust the approach to individual needs, depending on the purpose and available time and budget for each project.

Finally, it is important to note that this framework is only one of a number of ways to explore co-creation with consumers through idea-generation workshops using active participation from consumers, multi-disciplinary team members from the organisation and professional designers and researchers. It is also vital to test the strategic framework in practice, to prove its validity and further develop and define the key aspects for each step of the six-stage process.

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RESEARCH METHODS FOR UNDERSTANDING PARTICIPATORY INNOVATION IN SME

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ABSTRACT

In this paper the implications of different research approaches and methods are illustrated by using two projects of the authors. Both projects take place in the same context: exploring participatory innovation within Small-to-Medium sized Enterprizes (SMEs). The main aspects coming forward when comparing the research characteristics of both projects are the importance of time and momentum, the structural set up of the project, people or participants and the abilities of the people involved. The research goal and the background of the researcher are main determinants for the chosen research methods. We hope with this paper to make researchers aware of the implications of the research methods and approach on the results of the project.

INTRODUCTION

In the field of Participatory Innovation, at the moment, little is known within Small-to Medium sized Enterprises (SMEs). Defining a range of companies within the typology of micro, small-and-medium and large companies probably makes good sense within policy making. And the definition stems from the European Commission [1] with the purpose of streamlining funding opportunities such as the state aids and framework programmes within the EU. But does the definition help us understand barriers and opportunities for participatory innovation just by grouping companies by headcount, turnover and balance sheet totals? Well perhaps. This paper describes research conducted in two funding-dependant university systems and primarily focuses on the research methods and approach used to generate insights on participatory innovation in SMEs. The respective research projects of both authors will be described first, and will be explained in more detail later in the paper by using two case-studies to further elaborate on the differences between the two research approaches. But just to briefly describe the shared perspective, the common focus of the research projects is on SMEs that:

- are product developers
- wish to innovate based on knowledge about users
- have in-house design or engineering competencies for conceptual design

Methodologically these two research projects are very different. What is in common is that both projects have a very practical purpose meaning that one of the main aims is that the knowledge is applicable and relevant to stakeholders outside academia. Thus practice is studied in order to answer the following questions:

- How can SMEs be involved in participatory innovation?
- Is it possible to have an impact that will add value to the company and how?

For this paper the different research perspective are explored in order to understand differences, shortcomings and advantages between the individual approaches. This paper is also considered a learning experience for both authors in order to gain inspiration and share different understandings that will provide critical reflection on the current practice and the use of methodologies. To understand more of the cases and methodologies, short background information on both research projects is provided as well as an overview of the research project of each author is presented in the next paragraph. Following these short summaries, an extended overview of the two different research methodologies will be provided using the research projects to explain the differences as well as the implications of the selected methods and approaches.

PRESSURE COOKING AND SME APTITUDE - DESCRIPTION OF OUR TWO RESEARCH PROJECTS

Both Mark and Christine focus their

research on SMEs that are product developers, wish to innovate based on knowledge about users and have in-house design or engineering competencies for conceptual design. This target group of research is still overlooked in current research. The European 'Capabilities' innovation program FP7 to stimulate research for the benefit of SMEs [2] only focuses on product and technology innovation projects. Research projects for user driven innovation are even not considered for grants within the program. Only since the global Watch Report of Wakeford (2004) participatory design for SMEs has been recognized as an important field. But still, we do not really know that much about SMEs in relation to innovation - and in particular participatory innovation, for this reason both our research projects take place.

SME APTITUDE - DESIGN ANTHROPOLOGICAL STUDIES WITH A LARGE MANUFACTURING SME

The focus of Mark's doctoral research is to understand the relations between design anthropology, user-centred design and participatory innovation. Methods include action research, ethnographic field studies, anthropological investigations and research through design approaches. The research has a dual focus on understanding the organisation and its value network while continuously and constructively attempting to challenge the status quo. Mark has worked closely with fellow researchers from disciplines such as Innovation Management, Design Research, Interaction Analysis as well as the Dacapo theatre who focus on change management through interactive theatre. Alongside he has developed new concepts with employees from different departments within the SME and held workshops and seminars with participants from across the value network. From a disciplinary perspective one may argue that design anthropologists working with fast-paced organisations may find it difficult to introduce other perceptions of time than the constant arising deadlines that rule daily business. If we assume that innovation is not just a headless search for the 'new', we may acknowledge that the organisation's history of turning fragile ideas into profitable products would be relevant to understand. By intertwining the here-and-now with the organisation's past and its' desired future, we may add some valuable insights and qualities to the innovation process. This approach calls for a tangible and compelling format for handing over the co-constructed learning and insights. In Mark's research a functional demo-model has played an important role as a device for creating a space for discussing strategies, for stimulating entrepreneurship and considerations about identity and values. The stories told around this device have often been located both in the past, the present and the future.

The main purpose of the research has been to involve end-users and other stakeholders in innovative processes with a particular focus on R&D projects that happened across the value network and:

- to create an understanding and recognition of the potential of user involvement within the value network as a starting point for the development of new products and services.
- to develop methods for studying and involving end-users specific for the particular aptitude of the SME.
- to contribute to strategic development within the company and to inspire strategic collaboration across the value network with a focus on supporting decision making.
- to improve the company's competitive advantage and ability to benefit by their specific position within the value system through the development of innovative Infotainment concepts.

MAIN FINDINGS

The particular type of user-driven innovation (UDI) that has been tested in Mark's project is called Participatory Innovation and has its origin in the SPIRE centre at the University of Southern Denmark. (Buur and Binder, 2006) Participatory Innovation is not that different from other types of UDI as it basically involves the standard procedure of user studies, ideation, concept development and business development. What may differ is highlighting not only end-users of products as participants, but also including company stakeholders as equally important for understanding what is at stake in innovative processes (Buur and Matthews 2008).

From a design anthropological perspective this is indeed interesting in relation to the specific SME as three main factors influence the company's ability to innovate - at least from Marks' perspective. First of all the company has no structured and systematized approach to new product development and innovation is mostly incremental and takes place within ongoing projects. Secondly the management group consists of a number of experienced people some of which have been a part of the company almost since it was established. Thirdly the market and business context of the company has changed drastically since it was founded, however, the product line and business model have more or less remained the same. The company is quite challenged and acts in a very competitive market. One significant finding from this project is that for innovation activities to happen and succeed, it takes full commitment from top managers. The fact that the employees holds a variety of relevant competencies for new product development such as various engineering and prototyping skills play a minor role. The loose structures of the company which on the one hand are potentially beneficial for quick decision-making and smooth communication also functions as the main hindrance for innovation as such fragile processes are relatively easy to down prioritize as the return on investment is not necessarily within sight. The combination of a management team who has experience from the early entrepreneurial days of the company and the unstructured innovation approach calls for specific competencies of the design anthropologist. He or she will have to be able to communicate and share findings through formats that are easy accessible within the respective organisation and somehow resemble earlier innovation successes. In this company very tangible prototypes were created. Demo models are more long lasting and open for discussion than thick written reports that from experience only gain little attention in a fast-paced business environment. Moreover the design anthropologist may be the main driver for creating continuity and direction in the innovation processes in situations where managers are occupied with ongoing

projects. Embeddedness of the design anthropologist therefore becomes crucial.

PRESSURE COOKING – DESIGN RESEARCH WITH 22 SMES

Christine mainly focuses on exploring the current status of participatory innovation within SMEs. She does not want to convince SMEs of the use of participatory innovation even though she feels that many companies will benefit greatly from involving their users. Christine is rather working on how SMEs can involve their end users if they interested to do so. At the moment expertise and knowledge on involving users is focused on large extensive studies. Are these methods and processes also qualified within an SME context? Do SMEs have the same goals for participatory innovation as in the current practice? These are some of the aspects Christine is looking at.

The doctoral research of Christine consists out of three phases: exploring the current status, experimenting what methods work in a SME context and validating the findings defined in the last phase. Both quantitative and qualitative research methods, though qualitative methods are the dominant methods used.

During the explorative phase, the main methods used are semi-structured interviews, brainstorms with designers of SMEs, and a quantitative questionnaire. In 2009 the experimental phase took place in which Christine was part of the organisation of a large project, which involved 22 SMEs working together in teams on 10 different cases. Each of these cases took place in a time span of 2,5 months from a formulated design brief to a concept. Because of the short time span of this project we regard this project as Pressure Cooking (designing projects under time pressure). This project was funded by the province of Utrecht of The Netherlands. Because of this, the ten SMEs with a design brief only had to contribute 250 Euro. The other cooperating SMEs on the case, for example a design agency and a user involvement expert, received a combined compensation for 4500 Euro per case. This forced all participants to minimise their current approach to one that fits an SME context. This project gave insight in how projects can take place within an SME context with time and budget constraints, what are important issues and problems during such a project and what methods and process are suitable.

During the final validation phase, three design agencies develop a toolkit to be used for participatory innovation within SMEs. All three toolkits are developed based on the insights gathered during the early phases of Christine's research. All three toolkits are used in practice and evaluated with both the design agencies and the SMEs.

The practical purpose of the research has been to involve end-users within SMEs that develop products for an end-user market:

- to explore the current practice of user involvement within SMEs.
- to map current problems, experiences and changes within SMEs.
- to develop two toolkits for studying and involving end-users specific for SMEs based on a developed framework.
- to validate and test this toolkit for SMEs.

MAIN FINDINGS

SMEs require a different approach than large international companies, it is not as much altering the existing user innovation methods in a way that they can be applied within an SME context. Rather, what many perceive as weaknesses or limitations of working within SMEs, for example time and budget pressure, should be changed into exploiting the strengths and possibilities that SMEs offer. Also, it is not as much about time and budget as many believe, more important aspects determining the success of participatory innovation within SMEs are the SMEs aptitude and the experience and knowledge of the designer working with participatory innovations. SMEs have many opportunities for participatory innovation. They have less need for formal communication due to the flat organizational structure, they are close to their market, already have some sense of who their end user is and they can operate more flexibly to the market due to their short project times. Quite often the existing contact with their users can be 'upgraded' towards involving these users in the design process. Also based on the project conducted in 2009, many SMEs are interested in integrating user involvement within their company structure. They would like to either develop the expertise to involve users in-house or completely outsource involving their users to an external agent (these agents can be either design agencies, research companies, or consultancies). This choice is often depending on the type of SME and previous experience with external agents.

DIFFERENCES AND SIMILARITIES

Both our projects are dealing with participatory innovation within an SME context. On first sight these two research projects might seem very similar. However, when looking in more detail to for example the approach or methodology, one can see that our projects do have significant differences. Table 1 gives an overview of these differences as well as the similarities in our two research projects. The intention of our paper is to reflect, inform and open discussion on our research practice within SMEs as well as on the implications of research methods and approaches on the acquired results.

RESEARCH PERSPECTIVE

Both research projects are very explorative, since participatory innovation within SMEs is a rather new domain. Due to the lack of existing knowledge on the current status, still a lot of information gathered during the research is very explorative. There is a clear distinction in project focus between Mark and Christine. Mark focuses as a design anthropologist on the organisation, the SME itself and how this organisation needs to be changed to let them involve users. Mark has to deal with convincing the SME of the use of user involvement and the advantages for the company. Unfortunately this takes a lot of time. Mark himself is the person responsible for creating the interventions within the company and observing their effects on the organisation. Christine is as a design researcher not trying to convince the SME to conduct participatory innovation, but to help those who are interested, and make them able to involve users within their design projects. Christine focuses on how SMEs can involve users, what the process looks like and which methods can be used to conduct user involvement. These different focuses cause the differences in research ap-

Design Research vs. Design Anthropology	Christine	Mark
Research Perspective	Design researcher	Design anthropologist
Methodology	Explorative, experimental, design research	Action research, Anthropology and Research through Design
Timescales	2,5 months for the experimental projects and 6 months for validation of insights in toolkits	4 years
Expected outcomes	Insight on processes and methods for participatory innovation as well as new products, new target groups for existing products, new company strategies, business development, and more knowledge on the end user.	Organisational changes, business development, prototype(s), knowledge on participatory innovation in a SME context.
Point of attention	Due to the short running time of the projects it is difficult to really observe changes in the organization and to acquire in depth information. The set up of such short projects resembles closely to the actual process within SME contexts, but the participants were forced fit together. (The researcher acted as a matchmaker between companies for this research project) This should be taken into account when looking at the results.	The support to design anthropologist and viability of the design anthropological project may only be as strong as the latest quarterly report and the interest shown from the current management team. Long-term strategic considerations may easily be down prioritized and postponed due to constantly emerging situations that need full attention from management. The ability for the design anthropologist to navigate and frame his/her findings in relevance to short term relevance for the business is necessary - yet often very difficult.

Table 1: Comparison of two research approaches.

proach and methods.

SIMILARITIES IN RESEARCH APPROACH

In analysing research, the choice has to be made to start either with theory or with a phenomenon. One can start with theory and then go about testing it by collecting data. Or one can start with a phenomenon and then try to generate a theory based on the data. In practice, this choice is less clear-cut. One can start with a theory, carry out some observations and then discuss or develop the theory. Or one can start with observation, turn to theory and then conduct more observation to evaluate or develop the theory. A researcher often has prior practical experiences or 'pre-understanding' (Gummeson 2000) or uses theories that 'direct attention', 'organize experience', 'enable useful responses' (Alvesson and Deetz 200, pp. 39-46) and guide how one looks to the world. In order to approach the paradox of theory first versus data first, we can speak of validation function or an explorative function of research. (Bourdieu, 2006) In both our cases, our research projects have an explorative nature because previous theories on participatory innovation in SMEs are non-existing.

METHODOLOGY

As mentioned in the previous paragraph, Mark works from a design anthropology perspective, where Christine works from a design research perspective (Zimmerman, 2003). Each of us takes a look at SMEs from their own background (either anthropology or design). Where Mark is actively involved and working within the context of his research, Christine is not engaged within participatory innovation projects but merely observing what is going on. Mark makes use of his knowledge of anthropology and ethnography to observe and work within his context of research. Through his conscious and predetermined interventions within the company structure and process he develops theory on user driven innovation within SMEs. Mark uses action research as a method to plan his interventions and analyse his data (Avison et al.1999 and Gilmore et al. 1986). Christine mainly uses experimental research and grounded theory to analyse her data (Glaser and Straus, 1967).

Since Mark is embedded within the organisation where his research project takes place, Mark is not only present as a researcher; he is also a user researcher and an anthropologist. These different perspectives make it difficult to clearly state the results and objectively observe what takes place within the research project. Christine has set up her research in such a way that prevents this from taking place as much as possible. She has asked other user research experts to conduct the user research within the cases. Each case was observed by a different researcher. The data generated by these researchers is collected and analysed by Christine.

Being a designer herself, Christine uses a designer-driven approach for making choices with incomplete information. Designing involved a creative and intuitive process, dealing with uncertainty instability, uniqueness and conflicting situations (Cross, 2007). Christine's approach to the research question is orientated towards solving and improving the situation; how can participatory innovation be improved in a SME context?

Christine tries to approach her research in a systematic way by building in phases, validating the previously generated results and triangulating the data. The qualitative research design of the pressure-cooking study aims to build a conceptual framework through recursive cycling across the generated qualitative data, emerging theory and extant literature. (Dul and Hak 2007; Eisenhardt and Graebner 2007; Matthyssens and Vandenbempt 2003) The first framework is developed based on the explorative phase of Christine's doctoral research and refined and ex-

tended during the Pressure Cooking study. The factors are implemented in the to be developed toolkits for the validation of the framework. All aspects present in the framework are factors that influence participatory innovation within a SME context. Existing literature on conceptual frameworks was used to aid the interpretations of the generated data for the framework (Dannels 2002).

On the other hand, Mark uses Research through Design as a method to generate information. This is a rather emerging approach where the act of designing and creating new solutions is a valuable process for generating knowledge. The considerations and reflections during the design activity contribute to the research. (Archer, 1995) The approach is based on designing structurally varied, experiential and product relevant prototypes and generating knowledge by the process of building and evaluating these prototypes. For Mark he is the person in the company being engaged in the process and he has thus the possibility to use the decision making process for the products and prototypes as input for his research. Both the building and evaluating generate knowledge.

To gather all the data from both research projects, both authors used similar methods. Both authors interviewed people involved in the research for evaluation of the projects. For example: the entrepreneur of the SME, designers and engineers, user researchers and others. Christine also let other researchers observe all separate cases and had group discussions on the results of the observations. Also, every researcher was given a notebook with assignments to streamline the observations so they could be compared. Furthermore, both authors observed the projects themselves and made field notes.

TIMESCALES

The two research projects have very different timescales. Mark deals with one company in a 4-year project. Mark has made the choice to carry out a 'single case study'. This choice can be justified the argument that it can function as a revelatory case, a study or a situation where the researcher has 'an opportunity to observe and interpret a phenomenon previously inaccessible to scientific investigation' (Yin 1994, pp 38-40). Marks study can be thought of as a revelatory case, because it rarely happens that the long-term effects of participatory innovation can be studied within a company. Also, because few extensive studies currently exist in a SME context. One example is the research of Heiskanen and Repo (2007). The company in which Marks research project takes place is a SME of the larger classification of SMEs, also owned by a large international company. Christine is dealing with 10 different cases combining 22 SMEs with employees ranging from 4 employees up to 80, in the smaller classification of SMEs. All cases take 2,5 month time to start with a predetermined design brief up to a concept based on user insights. There is a clear difference in amount of companies, time taken for the project and type of company.

EXPECTED OUTCOMES

Primarily the outcomes from Marks research will be: organisational changes, business development and prototype(s). Christine has two different kinds of outcomes: outcomes or results for the SMEs involved in Christine's research and outcomes of the research project itself for academics. The outcomes for the involved SMEs will be: new products, new target groups for existing products, new company strategies, business development and more knowledge on the end user Outcomes or results from Christine's research will be: a framework of factors that are important for user driven innovation within SMEs, explorative descriptions of current practice and ways to enable participatory innovation in SMEs using the strengths of SMEs.

POINTS OF ATTENTION

Our research projects have a very different approach and methodology but even though we both want to make the same thing possible: user driven innovation in a SME context. Christine's approach allows for fast projects with many results and a lot of different material generated in a wide variety of companies. Her approach is good for exploration. Marks approach is a long-term process, where changes in the organisation can be observed. He gets the opportunity to see whether user driven innovation 'lands' within the organisation, and is adopted by the organisation. Mark has the possibility to observe barriers to implement participatory innovation. The generated information in Marks project is in depth knowledge. Because of this, and by being embedded in the organisation, Mark can acquire a thorough understanding of his case. Unfortunately these (seemingly rather positive) characteristics of the projects also have points of attention that the researcher has to be aware of when analysing the data.

In general we should be aware that the choice of research approach determines to a large extend the kind of knowledge that is gathered. Often this is more depending on the approach than a researcher might be aware off. We have learned that it is important to be conscious about your research approach when you analyse your material. The research approach determines the type of questions which can be answered, and which cannot. How you look at your data is depending on your questions and our approach. Do not try to make claims you cannot make based on your approach.

In general, much of the differences and points of attention come down to time and momentum. We will discuss time and momentum in more detail in the conclusion.

CONCLUSION

TIME & MOMENTUM

There are a number of differences between Christine's 'pressure cooking' approach and Mark's – 'SME aptitude' approach, but the most apparent one is probably the notion of *time*. As described elsewhere the methodological differences between design research and anthropology are quite different. The position of the researcher, the number of required research projects, the roles of the involved participants and deliverables and research outcomes differ. Moreover it is relevant to consider the audience for the knowledge that we produce. As described, innovation research is typically funded by programmes that expect us to be able to show the potential. And ideally the relevance and applicability of our findings to companies rather than just fellow academics. One of Christine's aims is to develop a palette of methods for user-driven innovation that

are likely to succeed in the harsh realities of SMEs. Whereas Mark's focus more has been to develop the emerging discipline of design anthropology by letting the researcher's role unfold through the action-research type project. Though this may sound like a typical academic adventure, Mark has had to meet certain concrete expectations from the company he has been working with and thus the research has similarly to Christine's projects been dependant on the daily arising constraints and opportunities within the specific company. The point we wish to make is that the type of research we do is equally important to a business audience as to academia. This means we need to distinguish between time spent as facilitators and change agents within the projects and time spent as researchers. In order to try to answer the questions of how can SMEs be involved in user-driven innovation and whether we are able to make an impact that will add value to the company the obvious way would be to compare the impact our engagements with the companies has made, but since we are not able to do so at this time, we may want to account for what we consider key points in the projects. One concept that has come up in our conversations for this paper is the notion of *momentum*.

Our understanding of momentum in the respective projects is probably best explained through a metaphor of a heavy cannon and a light rifle. Momentum as we see it is the force that is behind a moving object. A cannon ball, a projectile or an innovation team. A heavy cannon may require a lot of people for handling and if their skills are sufficient they are able to fire a cannon ball over a long distance and make quite an impact. If their skills are insufficient they might not be able to fire the cannon or even find the target. With a rifle the distance is shorter and the force of the projectile is lesser, but with precision the shooter will make an impact. The metaphor should ideally illustrate that momentum is related to the structural setup of what gives the force, the people handling the 'device' and their ability to hit the target. If we take those concepts and apply to our projects we may highlight some important aspects.

In Christine's projects she has managed to ensure a high level of commitment from especially the company owner. All projects have had concrete design briefs and outspoken contracts to keep the focus. As mentioned the projects have happened in collaboration with a well-qualified designer. In comparison Mark's project has been very open-ended with the aim of finding new innovation opportunities for the company. His studies are partly paid by the company and the SPIRE centre. One would assume that this rather heavy expenditure would create certain expectations from the company to harvest from the research findings, which has not been the case as the company has often been too busy with daily activities to engage in shared learning activities. Mark has moreover mostly dealt with the Senior R&D manager, as the CEO has often been to busy. An important difference between Christine's and Mark's companies is that Mark's project company is owned by a large corporation meaning that the owner is not personified and have therefore not participated in person in the project setup. Whereas Christine talks about the 'entrepreneur with the spark', Mark's project has been managed by a 'financial crisis distracted CEO'. As described in the above table Christine's projects have primarily engaged end-users with the purpose of fulfilling the aims of the design brief. Secondary it has focused on involving the design people from within to co-develop ideas in close collaboration with the company owner. Mark's project has focused primarily on participation from within the organisation for a number of events such as co-design, vision seminars and reflection sessions.

Based on our experience from working with SMEs we may probably argue that a successful innovation project is very dependant on the facilitator's - whether that be a designer or a design anthropologist's ability to set the right team, to work both on a practical (hands-on design) and strategic level and be able to extract and show the respective company's weaknesses and strengths in order to gain something from the process. It may seem naive to expect such diverse competencies to be found within one professional. And in Christine's many projects this was not the case. Roles were divided and shared between a number of skilled designers who engaged in design projects that Christine had already prepared and laid out the plan for by engaging with the respective CEO, who were often the owners of the companies as well. Mark's project was a bit more blurred. Outcomes were open-ended, participants were quite well defined, but the project somehow lost its momentum in the daily realities of harsh business context. Short projects with high momentum - rather than long projects with low momentum are preferable - at least from our experience. And keeping the momentum in a long-term innovation project in an SME is still a challenge that is unresolved from Mark's research. So the question is: What can we learn from each other? Are long-term engagements with SMEs utopia? And is 2,5 months really the optimal timescale for an innovation project? The answer is probably no and no, but we may want to learn from each other's disciplines in how we set up a project and how we keep the momentum, but also how design related work should always be framed within a bigger historical and aptitudinal perspective within the company as well as the importance of seeing the innovation project from a holistic and strategic value network perspective.

IMPLICATIONS OF RESEARCH METHODS AND APPROACH

Marks' main goal for his research was to thoroughly understand how participatory innovation could take place within a SME and its effect on the organisation. To explore this using Christine's methods, the long term effect on the organisation could not be considered during such a short research projects. Christine tries to generate more general knowledge on participatory innovation within SMEs, for this reason more SMEs need to be involved to ensure a variety. With our paper we hope to illustrate the importance of selecting an appropriate research approach and method for the research questions formulated.

LEARNING EXPERIENCES

Based on the writing of this paper both authors became aware of new possibilities for their own research.

Mark, a design anthropologist recognizes how the design part and the tangible results are equally important to understand what is at stake. Moreover Christine's division of roles (not initi-

ating and making decisions in the project herself and only observing) makes good sense to Mark, but whether that is possible will probably always depend on funding opportunities and methodological considerations. In Marks project progress was depending on his eagerness and initiative. And especially taking the initiative has been lacking from the company stakeholders in the project, which is extremely problematic in a fragile innovation process.

Marks research approach has made Christine aware of the limitations of her research approach. The information she gathered from her short projects does not allow her to see whether the cases have an effect on the organisation. Christine mainly sees the results from a short project. She hopes to see more of the long term impact of the projects by returning to the companies, if the companies still work together with the partners of their case, have started a cooperation with another company of the project or have no interest in Participatory Innovation at all. Also she hopes to have more insight on the actual results of the cases.

Next to more attention to the organisational aspects of Participatory Innovation and adding a long-term vision on Christine's research, Marks background as an anthropologist has given her a new perspective on her data. Mark helped Christine to put her data in a larger context: that of society. First, she was only looking at the data of the different cases and comparing the cases. Now, she recognizes and sees that it is very interesting to try to unravel underlying drivers and putting the cases into context. This process has enriched her research project.

ABOUT THE AUTHORS

Christine De Lille, M.Sc. in Design for Interaction, and currently PhD student at Delft University of Technology and Utrecht University of Applied Sciences, has engaged 22 companies with her 'pressure cooking' approach to participatory innovation. Short-term (2,5 months), well planned and very focused design projects with a variety of SMEs. All projects have been executed in close collaboration with a number of skilled external designers.

Mark Asboe, M.Sc. in IT Product Design Denmark and with a background in anthropology and now PhD student at the SPIRE centre, University of Southern has worked closely with just one company for a four year period including one year of full-time ethnographic work within the organisation. The focus has been organisational anthropology and an action-research approach to a user-driven innovation project primarily facilitated and run by Mark.

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DIFFERENT VIEWS: INCLUDING OTHERS IN PARTICIPATORY HEALTH SERVICE INNOVATION

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ABSTRACT

We describe our experiences employing experience-based design (EBD) to improve an outpatients health service in the UK and discuss the impacts of incorporating the voices of those not directly using or working within the service. We suggest that such new perspectives, experiences and expertise may enable the development of service innovations outside patients' and staffs' conceptual space of problems/solutions, but can affect the ownership and agency within the change project. To conclude, we propose a balance between accomplishing change and creating the self-belief to achieve it.

INTRODUCTION

We are User-centred Healthcare Design (UCHD), a UK team of researchers and practitioners from design and healthcare developing a methodology for healthcare service design that aims to go beyond the improvement of existing services to the innovation of new services and tools, recognising the role of empowered individuals in the co-creation of their own care. Our first project within this larger work was to understand how patient experience and participation are already used for service design in the UK's National Health Service (NHS), which led us to the experience-based design (EBD) approach. Following an action research methodology, we have used EBD to improve the outpatients' service for older people at the Royal Hallamshire Hospital in Sheffield, UK.

We will describe our experiences in this project below and reflect on the impacts of bringing new participants into the project, with reference to three examples where we did so to improve hospital road usage, way finding materials, and staff 'customer care'.

Before presenting this case study, we will outline our position on healthcare service design, describe experience-based design, and suggest the challenge of innovation via participatory design.

USER-CENTRED HEALTHCARE DESIGN

The UK's NHS (like many public health services) is facing changed circumstances, including:

- An ageing population often suffering from multiple health problems and who obtain care from multiple sources within and outside the NHS;
- A rising incidence of long-term chronic health conditions (such as Diabetes) with people required to take more responsibility for their own care;
- Increased expectations from patients accustomed to 'customer-centred' private sector services; and
- Patients' increased desire to be informed and actively involved in decisions about their healthcare.

This situation requires a re-examination of how people manage health and challenges existing models of care.

A starting point may be to recognise health outcomes as being co-produced, with patients, clinicians & carers work

together to promote the patient's health. Building on this concept, Open Health (Design Council 2006) recognises that people are active participants in their own healthcare, drawing services and information from a variety of sources (family, government, third sector, private sector etc.), and are uniquely placed to consider how healthcare services fit into their own lives. In this model, knowledge and expertise are seen as distributed, rather than solely the preserve of the clinician.

This perspective resonates with the principles of participatory design (PD), where stakeholders are involved in the design of a system (or service) because: firstly they have a democratic right to be included; and because this results in systems and services that better fit their practices and needs (Ehn 1993).

Our research programme is based on a belief that user-centred or human-centred design (Buchanan 2001, Krippendorff (2006) can guide a rethinking of healthcare services and systems towards more human-centred models of care. Participatory methodologies then provide a means to design services that embody these new models. Understanding the design of health services in this way maps out three goals for UCHD, upon which our (action) research focuses:

1. Designing to improve existing services;
2. Designing service innovations; and,
3. Designing for strategic change.

Experience-based design is a participatory approach focussing on service improvement and as such provided the framework for our first case study.

EXPERIENCE-BASED DESIGN

Experience-based design (Bate and Robert 2007, NHS Institute for Innovation and Improvement 2010) was developed and is employed within the UK's NHS and can be regarded as the 'state of the art' for participatory service improvement within the NHS. Rather than being a single prescriptive method, EBD provides a range of techniques and tools within a four-phase structure for patients, carers and healthcare staff to work together to: *capture* and then *understand* their lived experiences of healthcare; *improve* a service based on this understanding; and *measure* the effects of change.

In the *capture* phase, EBD collects participants' stories, in their own words, using (for example) one-to-one interviews or video diaries. Patients, carers and staff then analyse the stories using 'emotional maps' to identify where improvements are required.

In groups, participants then share their stories and identify 'touchpoints' (points of interaction with the service such as a letter, a phone call, or a physical interaction with a person) and their feelings associated with them. Participants plot these touchpoints and emotions on a chart with the various stages of a patient's journey (or staff's working day) placed along the top. Positive emotions are placed nearer the top and negative emotions nearer the bottom. Clusters of negative emotions around touchpoints on the map suggest areas for improvement.

EBD suggests facilitating 'co-design' teams of patients, carers and staff to explore and implement service improvements, based on the understanding developed in earlier phases. Finally, evaluation of service improvements is shared with participants.

As the topic of this paper is the challenges of participatory innovation, we will restrict our discussion to the capture, understand and improve phases.

THE CHALLENGE OF PARTICIPATORY INNOVATION

Reviewing EBD prior to its use in our outpatients project, we felt that it would provide a powerful way of surfacing patients' and staffs' experiences, through stories, and using stories to direct the service improvement. However we had concerns about how it could translate insights from experience into innovative design proposals. The illustrative examples given tended to be where patients and staff identified simpler issues where it was possible for them to take direct action themselves. For example, re-arranging chairs in a waiting area to improve the experience of waiting and moving sets of scales to increase patient privacy when being weighed (Bate and Robert 2007). This is acceptable if the aim is service improvement via refinement of existing practices and artefacts. However, we felt that it might limit the development of innovative design solutions that challenge the existing mechanics of the service and propose radical new ones.

This typifies a challenge that goes beyond EBD to PD more generally: how to devise products, services or systems that are both novel (innovative) and relevant to their likely users' practices and needs (Mogensen 1991). In PD, stakeholders and professional designers come together to explore a space for framing problems and devising solutions from their own perspectives, experiences and expertises. It therefore may be difficult to develop solutions outside this space (Bowen 2009).

In health service design, one way of dealing with this challenge could be to bring in those with radically different perspectives to patients and staff. We could construe such participants as 'voices from outside' where 'inside' is defined by those already using or working within the service. However, outside/inside divisions might be drawn in a number of ways. For example, in our outpatients project 'inside' could be defined as those patients, staff and design researchers who worked together throughout the project. But this could suggest a coherent 'inside' group that the 'voices from outside' differ from. We prefer to consider the idea of 'new' voices being incorporated into the ongoing dialogues between participants, and affecting the change project, and participants roles within it, as a result.

As we shall discuss below, the outpatients project brought together a disparate group of individuals with a variety of perspectives, experiences and expertises. The PD exercises were then an attempt to bring these different elements together and focus them on potential improvements. EBD provided the means of doing this via story sharing and co-design but, as we discuss below, has limitations that we addressed by drawing new voices into the process. Our discussion is then how these new perspectives, experiences and expertise were incorporated, how they served to expand the design activity, and how this altered participants' roles in the change process.

CO-DESIGNING OUTPATIENT SERVICES

Sheffield Teaching Hospitals NHS Foundation Trust obtained funding for a one-year service improvement project entitled *Better Outpatients Services for Older People* (BOSOP), which also provided an opportunity for us to ex-

plore the EBD approach.

The trust includes numerous specialised outpatient departments across two large hospitals but BOSOP focussed on general medical outpatients (MOP) services at the Royal Hallamshire Hospital with the aim of sharing generalisable findings with other departments.

PARTICIPANTS

12 older patients and carers were recruited from MOP clinics and via Sheffield Churches Council for Community Care (SCCCC), a voluntary organisation who provide support such as assistance with hospital attendance and discharge. Additionally SCCCC staff participated as advocates for older people, to represent their service users and their own experiences as carers.

Nine outpatients' staff were recruited including nurses, the ward sister, a health support worker, clerical staff, an ambulance dispatcher, a doctor, and a hospital volunteers coordinator. Most were 'front-line' staff doing rather than managing the work of the department.

CAPTURING EXPERIENCES

EBD is geared towards healthcare staff rather than skilled researchers using its tools to affect change. Therefore the SCCCC participants collected patient stories following a training session on conducting informal 'story telling' interviews and on using digital audio recorders. The professional researchers collected staff stories.

UNDERSTANDING EXPERIENCES

Two half-day 'experience events' were held: one for patients and carers, and one for staff to share their stories and produce emotional maps. At a third event the groups shared their maps (and stories) with each other and used them to collectively agree which areas of the service needed improvement.

IMPROVING EXPERIENCES

Participants formed two 'co-design' teams who met regularly over two months to discuss their agreed areas and propose improvements. At the end of this period a plenary event was held to review and prioritise the proposed improvements and divide them into a series of implementation projects.

TEAM BUILDING

As noted above, the patients, carers and staff involved in BOSOP were not a constant, coherent group focussed on improving the outpatients service. Rather, individuals' understanding of the project and their role as change agents within it evolved throughout. Alliances were developed between participants, and individual's commitment to the project waxed and waned.

EBD recommends sharing emotional maps to establish a shared understanding between patients, staff and external facilitators. When patients shared their emotional map, staff's initial reactions were to defend their service. For example, an ambulance dispatcher described the complex logistics that contribute to the delays to hospital transport reported by patients. We defused this situation by restating the aim to understand how it feels to be a patient or member of staff and not to apportion blame. As participants shared stories and experiences, occasional moments of opening up helped to build trust and common ground between the patients and the staff. For example, in their separate experience event, staff had placed "the book of bullshit" as a touchpoint on their emotional map. This referred to the numerous half-truths that staff sometimes gave to patients frustrated from waiting (the idea being that patients would feel better with any explanation for a delay rather than having none at all). For the upcoming experience event to be shared with the patients, the staff had planned to present their emotional map with a less provocative Post-it note labelled "standard excuses" over the top of "the book of bullshit". However during the presentation (health support worker) Tracey revealed the original Post-it note and admitted the way staff actually thought of the situation, which prompted laughter and a release of tension in the room.

MAINTAINING ALLIANCES FOR CHANGE

Maintaining staff participation throughout the project was challenging and morale dipped during the co-design work when several staff participants became less involved. One staff member decided to step back, preferring to be consulted rather than attend further meetings. He felt his time was better spent on his clerical duties than away from them (his dedication to his work and concern about it being left undone was something he had shared at the staff experience event). Another staff member told us of an attitude developing in the department that staff were "getting time off" to attend meetings and over-burdening their colleagues by their absence (despite the project funding replacement cover). At one point the staff member received a tirade of complaints from her co-worker about the extra work arising from her attendance at a co-design session.

To prevent the build up of negative perceptions, the research team had to adapt their behaviour so that they were more visible in the MOP department, 'checking in' with staff (including those that had stepped back) to update them on progress and note concerns. We produced newsletters and ran a lunchtime 'show and tell' event in an effort to maintain support.

As the project progressed, the participating patients and staff began to see their role change from reporting problems to the external researchers (in the hope that we would do something about it) to taking ownership of issues and potential changes. For example, early in the project staff complained about frequently needing to interrupt their work to give directions to visitors for other areas of the hospital. Later, (health support worker) Tracey and (clerical worker) Nigel decided to keep tallies of such requests to build up evidence of the magnitude of the problem.

INCLUDING OTHERS

During the later stages of BOSOP, it became evident that the team of patients, staff and professional researchers did not have the necessary resources for some of the improvement work and needed external assistance. In this section, we describe three examples of such sub-projects enabled in this way.

PROPOSING A NEW INTERNAL ROAD LAYOUT

Patients and staff described the difficulties of visiting outpatients' by car. Due to parking difficulties, older patients often were dropped off while a carer went to park the car, sometimes with dangerous consequences:

> "*We were a little bit late and we couldn't find anywhere to park [..] so [my daughter] went ahead to get my appointment and I fell, right outside the Accident & Emergency place. [..] There was an ambulance driving through. [The driver] stopped and got out and a man that was walk-*

Figure 1: Main Outpatients building entrance, A Road.

ing by, they came and lifted me up. They were fantastic. It shook me up. [..] I grazed my elbow and I grazed my hip but I didn't break anything and we got in there and saw the doctor and I was okay. [..] You see I'm frightened of being late."

Ruth, Patient

These and similar stories give an impression of the emotional responses. Ruth was shaken by her fall but the situation was exacerbated by her fear of being late. Consequently, facilities for dropping off patients (and parking) were agreed as key areas for improvement.

A co-design team agreed to investigate how this situation could be improved and mainly focussed on the congested area outside the outpatient building ('A' Road - fig. 1). The team did some fact-finding (on parking policies and allowances for taxis and disabled visitors), organised a 'mystery patient' visit by two of the group (one of whom had not visited previously), and drew up some ideas for new layouts of A road.

Although the team gathered additional details about A road and the experience of using it, they felt that they needed specialist expertise to translate their ideas into practical proposals. During the early fact-finding the UCHD team met Kevin, a hospital estates manager responsible for the roadways and signage. He told us that he had commissioned a safety study from the City Council's Transport and Highways division and Richard the engineer who wrote this report, agreed to contribute his expertise to the design activity.

The previous study contained detailed recommendations to improve the safety of A Road but, although comprehensive, was written from an engineer's perspective and did not reflect the experience issues revealed by patients and staff. For example, the study noted impaired visibility for motorists at road junctions but did not recognise that the existing layout of the area made dropping off patients extremely difficult.

The implementation project then became two parallel activities. Jack (a patient) and Anne (a nurse) worked with the researchers to review the safety study and write an appendix detailing patient and staff experiences. In a separate design session with Richard they developed a new road layout proposal, using large-scale maps, paper and drawing materials (fig. 2). Richard then refined the proposal into a detailed technical drawing, which he & one of the professional researchers then presented to Kevin in the hospital's estates department.

Kevin was enthusiastic about the proposal as being "achievable", tying-in to previous proposals (by the hospital and the city council), and having the potential to improve the situation. However he was unable to progress the proposal directly and undertook to discuss it with the hospital's estates director.

Figure 2: Co-designing a new layout for A Road.

DESIGNING AND TESTING WAY FINDING MAPS

"The very fact of going to hospital for something reasonably straightforward [..] can be a worry. [..] If you have got to wait for an appointment, there is that amount of time, for you to build up an emotional concern about it. Getting there is also [a] building-up of emotional tension. And then when you get there; I've had an ECG before. Even so, you know it's uncomfortable.. It's a disturbance.. It's an emotional [..] roller coaster."

Jack, Patient

Patients reported that getting information and assistance to locate the right hospital department (and confirmation when they got there) could be difficult and contributed further to the anxieties described by Jack (above) and others. A story shared by SCCCC illustrates this:

"I met this guy who [..] was lost, he was by the Dental Hospital [..] he said 'well I've been for an appointment [..] and I couldn't find it' [..] he'd had a phone call and [..] he'd gone down on the bus and gone round to the front to A road and gone in at that entrance and he couldn't find anybody to ask how to get to dermatology so they said 'you need to go the main reception' and he'd gone over to the main reception and [..] he said 'they didn't know where dermatology was and they sent me [..] to go and talk to the porters' [..] whoever had directed him hadn't done a very good job [..] I think he'd hovered around B road and then he'd realised it was about an hour and a half since [..] he should have been at dermatology so he gave up."

Isobel, SCCCC Advocate/Carer

Like many UK hospitals, the Royal Hallamshire is a disparate collection of buildings that have grown and changed to meet the changing needs of the city's population. A typical outpatient appointment includes going to one or more other departments in the hospital (e.g. blood tests, x-ray, pharmacy), so way finding is a concern both in getting to and during an appointment. In the experience events, patients placed signage as a pervasive concern on their emotional map and discussed how this related to their anxiety associated with

the visit. Staff also described spending a lot of time giving directions to patients and visitors who were passing through their department. On their emotional map, staff placed signage and a need to 'explain the system' (of when and where to wait) as key concerns.

A large part of the discussions in the co-design team consisted of describing the issues in more detail. The 'mystery patient' visit (see above) provided additional insights. By the plenary event, the team had collected rich evidence to argue that improvements were needed, but few suggestions of concrete solutions. They felt that it was difficult for them to devise solutions because they did not have relevant expertise.

Instead the UCHD project team proposed recruiting help from two postgraduate graphic designers from Sheffield Hallam University to devise new way finding materials. In the following weeks, the designers worked with Nigel (a staff member), Ruth (patient) and Dorothy (SCCCC advocate/carer) to design and review new signage and maps. Kevin (the estates manager) was also able to provide information on NHS way finding standards and guidelines and ongoing signage projects in the hospital, which had to be considered.

One of the proposals was a map for staff to give to patients with instructions on how to get to the cardiology department for an electro-cardiogram (ECG) (fig. 3). Although Nigel, Ruth and Dorothy had their experiences and comments considered in the design, other staff were highly critical when it was presented. At the end of the project, another version of the map was produced and left with outpatients' staff to evaluate. At the end of BOSOP, outpatients' staff still resisted handing out the map, although reception staff in the inpatient hospital building were keen to adopt it to and the approach for working with their patients.

IMPROVING CUSTOMER CARE

Throughout the story sharing, the regular social interactions between patients, carers and staff were identified as a critical aspect of patients' experiences. Rather than being associated with a specific touchpoint, this was a common theme and so no co-design team was tasked with addressing it. Instead, the UCHD project team, in consultation with managers at the hospital, responded to the issue by commissioning a local theatre group (Dead Earnest) to create an interactive learning event using applied theatre.

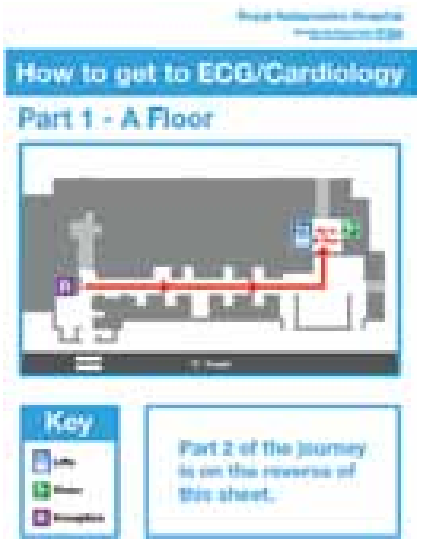

Figure 3: "How to get to ECG" map.

The hospital provides 'customer care' training via an e-learning package, but it was evident that this approach was limited in addressing the negative experiences of participants and promoting positive behaviours. Brendan (Dead Earnest's artistic director) reviewed the stories and emotional maps, spent time observing the department, and spoke to (nurse) Anne and the project team about typical working days in outpatients. In response he devised a piece of drama titled "Don't Lose Your Patients", which followed a 'day-in-the-life' of an older patient and a member of staff in outpatients. The production paid particular attention to the back stories of 'Eric' (the patient) and the nurse whom he would meet later in the day as a device to bring out the complexity buried within the familiar and everyday.

The event began with a play (scenes from outpatients) for an audience of staff and patients. Scenes were then replayed, and Brendan encouraged the audience to stop the action, challenge or comment on scenes and suggest changes in behaviour. Characters could be questioned to explore motivation and expectations, and a facilitated discussion followed each scene. Finally, the audience were asked to commit to making changes to their practice that were noted on postcards and returned to audience members as reminders. Feedback was very positive ("totally different way of training that works well", "very good entertaining and enlightening").

DISCUSSION

IDEATION IN EBD

Although EBD provided techniques that enabled participants to share perspectives and experiences and consequently identify areas for service improvement, it provided less guidance on how to design those improvements, in particular the process of 'ideation'.

In the supporting *Guide and Tools* booklet for EBD (NHS Institute for Innovation and Improvement,2010) there are 24 pages on capturing experiences, 22 pages on the understand phase, but just 12 pages on how to improve services and 8 on the measure phase. This deficit is something the developers of EBD themselves recognise (personal conversations with Helen Baxter, NHS Institute of Innovation and Improvement).

In their longer explication of EBD, Bate and Robert (2007) suggest an ideation method based on critiquing the design patterns or design rules inherent within a service. Based the ideas of Alexander (1977, 1979) and others, they conceptualise such patterns as the 'rules of thumb' or underlying principles of how a service works – the assumed 'whys' of the practices and processes within it. So:

> *"The broad task of EBD in this regard is to surface and examine the design rules in the light of the patient experience and consider which of them may need to be changed or added." (ibid. p71)*

Bate and Robert suggest that patients and staff can extract design patterns (and anti-patterns, that is misplaced or mistaken rules) from focused discussion around agreed touchpoints. To this end, EBD offers worksheets for participants to record identified design patterns and translate them into actions applying them to improve the service:

> *"If you want to achieve Y in situation S, something like X might help"*
> (Bate and Robert 2007, p152)

However, there are three limitations with using this approach.

Firstly it relies on surfacing patterns recognisable to participants from their experiences. These patterns may not

adequately account for the service issues they have identified and consequently may suggest solutions that fail to tackle more fundamental problems. I.e. problems and solutions are constrained within patients and staff's existing ways of doing things.

Secondly, the design patterns approach is usually supported by the availability of an existing 'pattern language' (Dearden &Finlay, 2006), but the EBD materials do not provide any such starting point.

Thirdly, any actions that patients and staff propose might be limited to those achievable with their expertises – i.e. things that they perceive as actionable by themselves. This limitation is apparent whether the actions derive from design patterns or another strategy.

DIFFERENT VIEWS

In some parts of our outpatients project, patients' and staffs' perspectives, experiences and expertise were sufficient to identify where and how the service could be improved (such as re-writing the standard patient appointment letters to include useful and relevant information in a clear and accessible manner). However in each of the three cases above, we perceived that the efforts to address each problem had become stalled, with discussions in co-design meetings constantly returning to unravel and re-state problems (as the participants understood them) rather than towards discovering solutions.

Our hypothetical explanation for this was that patients' and staffs' conceptualisations of problems and solutions (as a design patterns approach could produce) were restricted by their experiences and therefore were not leading them to ideas for innovation. We recognised that participants might lack the technical skills to develop certain service improvements, and therefore we chose to involve new participants to bring new perspectives and experiences.

In both the road layout and way finding examples, participants agreed that they needed additional expertise to develop solutions. We consequently engaged the traffic management engineer and the two graphic designers. In becoming participants in the outpatients project, the engineer and graphic designers also brought their own perspectives on the work, which influenced the form and content of the proposals. For example, the proposal developed for A road included the radical step of reversing the (one-way) flow of traffic. The proposals also re-presented patients' experiences in a format that was sympathetic to existing working interactions between the engineer and estates department, i.e. in the form of a traditional report and plans. The proposal also attended to the engineer's knowledge of the legal framework of safety regulations.

But these new participants did more than provide skills to create these artefacts from patients' and staffs' ideas. They could also draw on different experiences and introduced new representational artefacts to support the discussion, such as the formal technical reports, traffic flow maps, block graphics etc. The added expertise can also suggest alternative strategies for tackling the identified issues (such as using hand-out maps in addition to signage), and to raise new aspects of the problems for resolution (such as managing any impacts on traffic flow outside the hospital grounds).

As we have argued elsewhere, design can be understood as a dialogical process composed through 'material utterances' (Dearden, 2006). The utterances introduced in each case, extend the dialogical encounter of the participants, and so open up the awareness of all the dialogue participants to other possibilities for solutions.

Thus these different views provide new framings of both problems and solutions.

BROADENING THE PROBLEM/ SOLUTION SPACE

The perspectives, experiences and expertise of each participant (ourselves included) map out a dynamic space in which problems can be framed and solutions devised – what constitutes a problem, what solutions strategies can be adopted, the criteria for success, and (overarching all) the aim of the project itself. The story-sharing, emotional mapping and co-design activities in EBD are then a dialogical process where participants come to an understanding of each other's perspectives, experiences and expertises and, in doing so, map out a broader (and different) problem and solution space. As the team forms, the range of ideas that are open for consideration is extended.

However the collective perspectives, experiences and expertises of the participants implicitly bound this space. It is difficult to devise solutions (and problem framings) that are not recognisable or familiar to at least one of the participants. Moving from service improvement to service innovation often requires consideration of radical possibilities that are outside of what is initially perceived as the solution space. Bringing in participants with different perspectives, experiences and expertise, and using new representational artefacts, reframes the space of the dialogue to broaden the space under consideration.

In the customer care example, the applied theatre group Dead Earnest saw their role as to re-present patients and staff's experiences rather than put forward their own. Rather than technical skills for executing and developing participants' design proposals, the expertise they brought was concerned with how human reflective communication can prompt reflection and revision of people's behaviour. Within this, Dead Earnest used comedy and drama to provoke debate amongst the staff audience. They aimed to be faithful to the stories they heard from patients and staff whilst presenting caricatures of familiar scenarios.

Again, there is a dialogical process taking place. But in this case the dialogue was between the staff on the taken-for-granted aspects of their practices, as facilitated by the theatre performance. Dead Earnest de-familiarized these practices and made them accessible as a subject for discussion.

OWNERSHIP AND AGENCY

We brought new voices into BOSOP in order to move forward on improving the outpatients service. However, these new participants also shifted the ownership and agency of the change process.

In the way finding example, the graphic designers created the new signage and maps in consultation with the patient and staff representatives. This shifted the existing participants' involvement from co-creation towards a less 'hands-on' role – briefing the designers and feeding back on their proposed designs. On one level, this might be regarded as reducing the agency of the patients and staff because they were less directly in-

volved in the design activity. However, an alternative view is that their agency was increased by the recognition that they could work together with talented and skilled people to promote larger changes.

The proposal for a new road layout was a more collaborative effort between the patient and staff representatives, the traffic management engineer and the project team's designers. Here, existing participants remained fundamentally involved in co-creation but were able to draw on the expertise of the engineer and so extend their capabilities.

In the final case of the applied theatre work, the patients and staff had only a minor role as information providers in an initiative The applied theatre company's aim was for staff to take ownership of improving customer care by committing to change their practices. Following the event, the only formal actions were those staff recorded on postcards for their later reference.

These three examples illustrate different levels of agency in the change process. If the sole aim of our outpatients project was to improve the service (Ehn's technical feature of PD), patients and staff's sense of agency might not be as significant as ensuring the project had the relevant skills to accomplish change. However the outpatients project was also about creating a political force for change within the hospital, as exemplified by the applied theatre work. In this respect, patients' and staffs' reduced agency could undermine their self-belief in enacting change.

In participatory health service improvement projects such as ours, there could then be a tension between service innovation and building a political force for organisational and cultural change.

Including new voices in the project impacted on existing participants' agency but it did have advantages. Our interactions with (hospital estates manager) Kevin not only brought in technical expertise to the way finding and work, it also involved a key stakeholder who would be directly involved in implementing any proposed changes. This was likewise the case with (traffic management engineer) Richard. In participating, Kevin and Richard increased the likelihood of change but also became part of a political force for change within the hospital and Sheffield City Council. Their involvement also legitimised the experiences and ideas of patients and staff, whilst the reports of patient and staff experience will in future serve to legitimise arguments for future redesign of traffic flow.

Perhaps there is then a balance to be struck between the change agency of those directly impacted by a health service, and the potential to enact such change. Within this, a way of encouraging patients and staff to become a political force for change is to ensure that they retain ownership of the change process, but also to recruit a wider coalition for change. In our outpatients project, we attempted to do this via ongoing dialogue with participants in events, newsletters and other communication materials (with, as described, mixed success).

CONCLUSIONS

Returning to the goals of user-centred healthcare design outlined in our introduction, BOSOP demonstrated that experience-based design has value as an approach for designing service improvements (the first goal) but has limitations, in its current form, for service innovation.

Methodologies that use stakeholder participation, such as EBD, map out a space for framing problems and devising solutions through dialogues between participants as differently-placed experts. The collective perspectives, experiences and expertises of stakeholders bound this space and could limit the development of novel services outside of it. Those who can offer radically different perspectives (and bring new experiences and expertise) can broaden this problem/solution space and open the way to service innovation. However, as we found in our outpatients project, bringing new voices into an ongoing participatory service design project impacts existing participants' ownership of and agency within the change process, particularly if these new participants are not directly using or working within the service.

As those engaged in the participatory design of healthcare services, we need to balance the aims of our work between achieving radical change in specific services and fostering a political force within healthcare institutions with the self-belief to transform practice. It may be that only through a combination of both these technical and political features that innovative health services based on new models of care can result.

ACKNOWLEDGMENTS

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NARRATIVE: INNOVATION PROCESS IN THAI UNIVERSITY AND ANIMATION INDUSTRY LINKAGE

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ABSTRACT

Every academic year, Thai universities have been producing graduate students to industry. In the context of Animation studies, students must present their senior project to committee and obtain their approval for graduating. A number of projects were submitted and many surpass the requirements. Unfortunately, these outstanding projects are simply neglected and that therefore become a waste of valuable resources as these projects can be further developed to commercialize in the industry. However, the linkage of University with the relevant industry does not yet exist.

Qualitative approach was implemented to investigate NPD (New Product Development) process used in Universities i.e. senior projects and review literature regarding NPD process in the Animation industry to identify proper connection between both sectors in hopes to optimising existing resources and strengthening Thailand's Creative Economy.

INTRODUCTION

Having been experiencing in Visual Communication Design field, it was observed that Animation market was an emerging trend in Thailand. A study from SIPA (Software Industry Promotion Agency) reveals that in 2008 the value of Animation industry has increased by 33% from the previous year. Interestingly, more than half of the value was contributed by imported content value (rather than domestic production).

From Government perspective, the sector also shows supports to the Creative Economy evidenced by granting a budget of THB 20,000 million for Thailand's Creative Economy promotion (in April 2009). This action was a part of the Second National Economic Stimulus Scheme aiming to stimulate business and service sector within the creative industry (SIPA, 2010)

From University point of view, there is an opportunity to support and drive market growth by cooperating with the industry directly, that is, to create an innovation process (in a form of conceptual model) that draws out any potential students' senior projects and develop them to be able to commercialize later on.

This study therefore attempts to investigate the existing process of New Product Development in both parties in order to outline an appropriate linkage for future implementation.

LITERATURE AND THEORY

First of all, it is deemed crucial to study NPD process. PDMA (Product Devel-

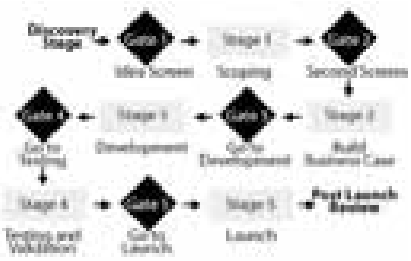

Figure 1: Stage-Gate process

opment & Management Association) defined NPD as "A disciplined and defined set of tasks and steps that describe the normal means by which a company repetitively converts embyronics ideas into salable products or services." NPD was found to be a common practice since 1960s and known to be adopted first in firm by Booz, Allen and Hamilton. There are typically six stages in the process for new product development i.e. 1) Exploration 2) Screening 3) Business analysis 4) Development 5) Testing 6) Commercialization. (Griffin, 1997)

One of the most popular models used nowadays namely 'Stage-Gate' by Cooper comprises of 5 stages and 5 gates i.e.

Additionally, a theory of University-Industry connections is also important to study. In this respect, 'Triple Helix' model suggests a new organizational mechanism that promotes innovation and new business formation in cooperation of University, Industry, and Government (Leydesdroff and Etzkowitz, 2001). For this study, only University and Industry would be the key focussed sectors as a starting point of future connection. Universities could be a decent source of innovation for Animation companies. Firms, therefore, can gain advantage to develop differentiating new product. (Schilling, 2010)

Each sector can take the role of others. For example, University could help a company form an incubator with University facilities. Whilst, Industry can take the role of University by holding a training session, or a workshop for students. Government could help provide funding or facilitate regulatory changes.

This theory was found in line with Schilling's Collaboration Strategies that grant a number of advantages i.e.

1) Enable both parties to employ strengths of each other to fasten production process than developing themselves.
2) Once capabilities and resources were shared, firm would be able to reduce asset commitment and yield more flexibility (especially high investment industry).
3) Transformation of knowledge between both parties would potentially establish new knowledge that it is hardly possible for individual party to achieve.
4) Risk and cost of project are shared.
5) Allow firms to have the same standard and cooperate in the commercialization.

Last but not least, innovation process concept was explored to answer the key research objective. Koen (2005) suggested that innovation process includes 3 parts i.e.

- Fuzzy Front End (FFE): defined as 'those activities that come before the more formal and well-structured NPD process.' They are likely to be 'chaotic, unpredictable, and unstructured'
- New Product Development (NPD) Process
- Commercialization

DATA AND METHODS

Qualitative approach i.e. in-depth interview with 5 lecturers in Animation field from 5 universities (out of 18 universities offering graduate degree in Animation) and relevant literature review were conducted.

These sample profiles should be able to provide detailed information on existing process based on their experiences. Key area of coverage includes:

- Broad information regarding Animation senior project e.g. number of students, participants, timeline, evaluation etc.
- Detailed process of senior project evaluation
- Existing cooperation of University and industry
- Existing problem/concern from both parties
- Unmet needs
- Assessment of potential linkage of University and Industry

Figure 2: Innovation Process

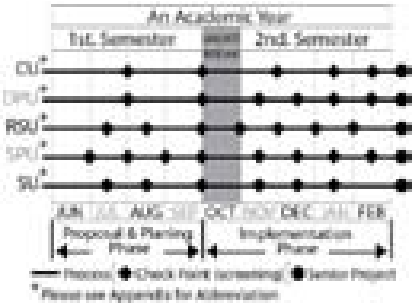

Figure 3: NPD process of senior project among the five universities.

- Area of improvement

RESULTS

All five universities offer 4 years undergraduate program. During the forth year, students have to complete a senior project in order to graduate. At the end of the year, a number of Animation project would be created in a form of computer-generated, 2D hand-drawn, or stop-motion animation.

The findings demonstrate key common ground of NPD process in University both public and private type as following

- Each university will have full-time lecturer(s) who take dual role i.e. teaching and practising in Animation industry (freelancers)
- There's a clear connection between University and Industry along the process. Practitioners from Animation company would be invited as part of committee i.e. grading, commenting, guiding, even coaching
- Timeline was found similar i.e. two semester to complete the project according to the curriculum
- All qualified project would be exhibited to the public. This is the only existing point of contact with the industry supported by University. Nevertheless, a systematic management was not established just yet.

There are also differences among public and private universities when it comes to NPD process

- Even the timeline is similar but the number of examination or screening varies across all samples i.e. from 5-8 times per academic year. The number of checkpoint (screening) would depend on number of Animation students, and the outlined curriculum.
- Level of involvement from Industry practitioners differs. Most would

participate in the final examination. Some involve from the beginning stage. Whilst, some partake in every stage throughout the process. The difference is subject to budget allocation and/or timing of both parties.

- It is also found that each university would have different focus on criteria set of evaluation (even the coverage would be more or less the same). For example, Silpakorn University tends to value art direction or aesthetic beauty of animation. Whilst, Chulalongkorn University would highlight more on the creative idea or core concept of animation. Rangsit University and Dhurakij Pundit University put a lot of consideration on market need or trend.

From the diagram, it is a linear process that works through screening phrase after phrase. In each checkpoint, details would be different among universities. But broadly in the first semester, it will have to cover proposal drafting and planning. After the first semester, students will bring their idea to life e.g. developing a character and story, designing a 3D model, or animating the character and so forth. Students would have their advisor and committee supervise until the end of second semester.

In terms of Animation industry, the NPD process refers a process of making a computer-generated (CG) animated film. It was observed that Thai animation firms show tendency to adopt the process used by a leading American animation studio, Disney.

Initially, a group of stakeholders including writers, visual artists, director, and producer would generate possible idea that they could come up with. In broad terms, idea would be rooted from 1) aged-old fairy tales 2) a book adaptation 3) completely original idea. During this beginning stage, the team would 'explore the who, what, when, where, why, and how of an idea by writing, drawing, discussing, and debating' (Hahn, 2008). The team led by the director and produce would go through gate 1 (Idea screen), stage 1 (Scoping), and gate 2 (second screen). This is considered the most crucial stage. Having a good core idea would yield a promising response from audience. Next, a proper team would be set up and assigned role in developing the animation.

A number of developing steps are concerned in order to make a computer-generated animation.

A story is to be structured (Story structure) by outlining story into three acts i.e. 1) introducing character and their world 2) developing a plot, setting up a problem that character would be involved 3) providing resolution and demonstrating how the character go through all the obstacles and defeat it (undoing of evil, triumph of the good, and the arrival 'home' to a new psychological place, Hahn 2008)

Next step is the pitch when story artist would show their drawn storyboard and tell the story in detail to the team to discuss. This will allow the story artists to take the comments and adjust the board until it is completely worked out for the director.

Editor then would play a role in assembling the story sketches into a timeline, placing a dialogue and ensuring that the continuity of story is there as it was initially envisioned on the storyboards.

In the following phase, team will be formed by different role e.g. production designer, art director, visual development artist, the costume designer, animator, and sculptors. These people will be responsible in designing details of the character in every frame.

Then, voice would play role in bringing all the character to life. Voice actor would be involved to do the job.

The crucial stage is to have Modelers to create a three-dimensional digital model of the character and the world they are in to make all the settings and props plausible.

Next step is called 'Cinematography'. Here, cinematographers would adopt tools used in cinema to compose lighting, color, movements to tell the story and work closely with director to plan exactly what audience would see.

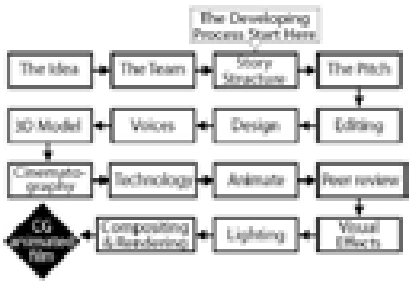

Figure 4: Developing process of animated film

Following stages would greatly rely on technology and computer software to fulfil plausibility e.g. hair, fur, plastic texture, fabric, or skin.

After all is built, animator would step in to design gestures and movement of character. The director would cast animator by their expertise.

Peer review would then take place to give critique upon individual scenes of a film to ensure that all makes sense, look for any mistake, suggest any part that can be improved before the director approves the animation to move on to the next step i.e. visual effects.

Visual Effects Animator's role is to create 'feeling of a believable, plausible environment'. They would use computer program to create both natural and unnatural phenomena e.g. explosion, or laser blast.

Up to this phrase, the animation still works under simple lights. In order to make it dimensional and plausible, lighters would work on the final lighting as 'lighting determines not only what audience sees but also what audience feels about what they are seeing.'

Finally, all the element i.e. lighting, visual, audio, effects need to be assembled using a number of computers (called 'render farm') to do the composition and rendering due to massive data generation (each second is comprised of twenty-four frame).

DISCUSSION

In summary, the findings suggested that Universities sector, Animation related program in particular, have also adopted NPD process i.e. senior project of fourth year students. These projects have been closely monitored, adjusted and improved throughout the aforementioned process. Consequently, the quality of work is there to a certain extent. There is a clear opportunity to leverage implementation of those ideas in the Animation market, that therefore, helps facilitate

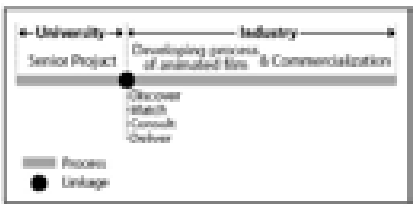

Figure 5: University and Animation Industry Linkage (UAIL) process

faster commercialization by reducing steps, time spent, and cost. While, NPD in animation takes several steps to accomplish an animated film. Fuzzy front end would be more predictable and constructed, which would significantly save time during initial phase (exploring and gather ideas).

This therefore requires intermediaries to carry out the connecting path. This team needs to have a decent knowledge and understanding of both education and Animation field. It is suggested to engage representative from both parties i.e. lecturers in Animation program (Ideally those who are also currently working in the industry) and those in Animation industry i.e. animator, producer, or director (Ideally those are also part-time lecturer in a university)

After team is all set up, process of work could be outlined as follows:

First of all, the team will gather all the idea from the key sources i.e. Animation faculty/school/program by visiting, involving in senior project as a committee or co-advisor, and eventually recruiting some potential works. This stage is called 'DISCOVER' (basically to collect potential idea as much as possible).

Next, the team will work internally with the partners (i.e. Animation companies) to identify their need. This would help a company to save time and resource in order to initiate a new project. Upon full understanding of objective and/or agenda, the team will 'MATCH' the need with relevant idea from the senior project and then propose back to the Animation companies. After the commission, the team will also act as a consultant (CONSULT) at this starting point. Team will bring together the idea inventor (i.e. students) and the animator to discuss and work on the project. The level of involvement depends on companies and university agreement.

Finally, when roles and direction have been specified upon agreement of both parties. The team will then 'DELIVER' the intended project to the industry in order to develop further in the detailed commercializing process.

The proposed conceptual model would benefit the industry undoubtedly. Once industry connected with universities, it will no longer need to struggle with typical Fuzzy Front Ends. Company will save time and cost for R&D and get to transfer knowledge with universities to gain more interesting new ideas. Universities, conversely, will not be wasting its valuable resource that has been invested on. This will potentially create another opportunity in terms of business value as well. At macro level, this linkage is in line with government's perspective to promote country's creative economy. With the successful linkage, number of imported animated films would be reduced and this would offer a good opportunity for new graduates to contribute to Thai Animation market even better.

APPENDIX

CU: Chulalongkorn University (Faculty of Fine and Applied Arts, Creative Arts)

DPU: Dhurakij Pundit University (Faculty of Fine and Applied Arts, Computer Graphic)

RSU: Rangsit University (Faculty of Digital Arts)

SPU: Sripatum University (School of Digital media)

SU: Silpakorn University (Faculty of Information Communication Technology)

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OPEN INNOVATION PROJECTS WITH UNIVERSITIES AS SEEN FROM THE COMPANIES

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ABSTRACT

Projects are in the core of a present-day university. University-company -collaboration projects are an essential way of work and a part of national innovation systems. But what companies think of the collaboration projects? Why they still participate, even in the evaluations all projects do not appear successful. The aim of the research is to construct understanding about meaning of the projects from the companies' point of view. The paper highlights the importance of social interaction and active participation from the firms' point of view. The purpose of the study is to consider especially academic design projects as a part of national innovation system and an actor of collaboration projects.

INTRODUCTION

University-company collaboration projects are a common way to organise research in the universities, especially in the area of design. At the same time, academic collaboration projects are a significant part of different national innovation systems, which aim to develop competitive advantages (Lemola 2002). The importance of the funding from outside of the universities is increasing all the time (Georghiou et al. 2002). National innovation systems emphasize cooperation between government, universities and companies (Lundvall et al. 2002). For instance in Finland popularity of the collaboration projects is based on the model of public finance (Georghiou et al. 2002, 73-90).

Financier notice itself that although university-company collaboration are part of national innovation system, their significance is still unrecognized especially outside of technology development projects (Civilization cannot be imported 2007). Regardless for the competitiveness structure of the projects should support innovation and collaboration of universities and companies.

Since from the 80' most of the literature consist of reports and *research* literature was relatively limited (Geisler & Rubenstein 1989). There is a lack of research from the point of view of collaboration firms and also in the in the context of design. Why the collaboration projects in the context of design appears ineffective? What companies think of it? Why they even bother, if the projects are as ineffective as evaluation shows?

The research considers specific university-company-collaboration projects, which are a part of Finnish national innovation system and funded by Tekes- the Finnish funding agency for technology and innovations. This paper highlights the point of view of companies' managers and foregrounds a contradiction between their conception of the fruitful collaboration project and an official structure of the innovation system. National innovation systems in different countries have similarities, and for instance transnational public programmes (Lemola 2002,1481-1483). So, even the subject of the research is strictly defined, the results of the research are exploitable widely national innovation systems in general.

The data of the study consist of interviews with the managers, who have been involved in the collaboration projects. The paper is organized as follows. First it positions the research subject conceptually within the discussions and the literature in the discourse of open innovation and research collaboration. Then the descriptions of the empirical material and analysis are given. Findings are proposed in the empirical part of the paper. In the conclusion the main findings are summed up and related to the innovation research.

LITERATURE

Cooperation between companies and

firms are led by innovation policy and national innovation systems (Lemola 2002). The third stream of the universities, societal interaction, was elevated alongside traditional streams of universities, research and education. Societal interaction is linked with innovations and national innovation systems (Lemola et al. 2008, 21-23). Finland has been at the head of the progress, by assuming the concept of national innovation system as first in Europe (Sharif 2006, 745). National innovation system has got a wide attention and currency as a part of politic decision making and academic context as well (Sharif 2006; Lundvall et al. 2002). National innovation systems are well defined from the point of view of knowledge generalization and roles of the actors (see more Gibbons et al. 1994; Etzkowitz 2003).

National innovation system is a wholeness which is composed of organizations which is engaged development and transfer of technology, products and knowledge. The prerequisite of the system is a structure created and kept up by public sector (Sharif 2006, 745). Structure of national innovation systems can vary in different countries, even countries learn each other and develop systems by imitating (Lundvall et al. 2002; Lemola 2002). The orientation of the systems is usually same, to increase national competitiveness. A purpose of the system, to create persistent innovation activity, based on the relationship of the public and private sectors (Lundvall et al. 2002, 222-227). Finnish national innovation system is consisted of producers of new knowledge (universities and research institutes) and user of knowledge (firms, government and policymakers). The ground of the systems lies in interdependency of these actors (Seppälä 2006; Lemola 2002). The central actors in the Finnish national innovation system are Academy of Finland and Tekes – the Finnish funding agency for technology and innovations (Lemola 2002, 1487; Seppälä 2006). Especially the last one is concentrated on innovations and funding also research relationships between universities and companies. In addition, European Union is also remarkable financier of the cooperation between university and firms (Löppönen et al. 2009, 15-19).

Design has an own specific role in the core of the innovation system (Löppönen et al. 2009, 141), even it is quite young discipline in Finnish universities (see more Valtonen 2007). Still design has already own and important role in the changing field of academic research, as a part of innovation system and cooperation between universities and companies (Research in art and design in Finnish universities: evaluation report 2007; Löppönen et al. 2009, 134-140).

National innovation systems and governments' actions try to support research interactions between university and industry (Caloghirou, Tsakanikas & Vonortas 2001). As it turns out, collaboration between university and firms has also many different modes. Perkmann and Walsh (2007, 262 - 264) define and present seven different modes of university-industry links. The weakest link is a use of scientific publications and networking in general level, like in the conferences. The extent of relational involvement is also quite low in the transfer of university generated intellectual property (for instance patents) to firms. Universities and companies have also links through mobility like academic entrepreneurship and transfer of human resource. The first one means commercial exploitation of technologies and inventions of academic inventors. And the second one refers for instance to graduate or post graduate training in industry.

High extent of the links and actual relationships represent contract research where the university offers research services to firms. Typical university-company relationships also include collaborative research and design (R&D) (Perkmann & Walsh 2007). This paper concerns the last one, research partnerships between university and company. In the study, research partnerships are assisted by public funds and are in their nature small-scale temporary projects in the context of national policy programmes or framework programmes in the level of European Union. Usually the projects are managed by an individual university, though consortium with several universities is possible (Perkmann & Walsh 2007, 268-270).

Geisler and Rubenstein (1989, 44-54) have reviewed of major issues in university-company relations. According to them there are six categories of arrangement. This research is concentrated for the fourth main theme, effectiveness of university-industry arrangements and mechanism for collaboration. The most descriptive subtheme for this research is cooperative research. According to Geisler and Rubenstein, cooperative research includes five modes and three of them describe well the subject of this research. First this research considers cooperative research projects with direct cooperation between university and industry. Second in this research is interested cooperative research programs, where university coordinates project and government (in my cases Tekes) is financier. Third possible mode of the collaboration project is research consortia, where university or universities and multiple companies collaborate.

The main interest of the Tekes is exact funding collaboration projects which have an open innovation nature. So, Projects were universities collaborate with firms. Collaboration projects are from firms and government viewpoint one mode of open innovation, where essential point is to generate knowledge and transfer it from universities to firms. In Finish innovation system, university-company collaboration projects have remarkable role in transferring knowledge (Torkkeli et al. 2008).

Briefly, open innovation as Chesborough (2006) defines it, means an activity where company utilizes innovation outside from the company. In contrast with the common, closed innovation model, where only internal "in house" research and design processes are employed, open innovation model utilizes external sources of knowledge and innovation.

Still, open innovation is not a strictly defined operation but rather a collection of different practices. The main idea is that the sources of innovation can vary a lot. Conventional assumption is that the firm should develop new products in house (Hippel 1988). According to open innovation paradigm, ideas can flow into the process and out into the market in many ways, for instance from outside the company (Chesborough 2006) In general open innovators utilize widely and deeply

external sources in their innovation activities. So, external knowledge plays an important role (Laursen & Salter 2006, 131-132).

National innovation system constitutes an official structure for open innovation for firms and universities. University research system is traditionally open: information, results and findings are shared in public and research is typically peer reviewed. Different sources of external knowledge have different influence subject to cultures, rules and norms of the collaborating organizations. These all contribute to the nature of the open innovation (Laursen & Salter 2006, 133).

Anyway, traditionally the relationships between a university and a company have been seen as a linear mode of technology transfer from university to companies (Bakhshi, Schneider & Walker 2008, 8). In spite of all, public scientific research offers not only a source of knowledge but also active collaboration networks. Collaborative networks are an effective way to utilize the knowledge of external scientists from universities (Fabrizio 2006).

In this research open innovation is a viewpoint of firms and a part of description of the research subject. It is defined as collaboration and knowledge sharing over organization boundaries. At the same time, participating companies are R&D oriented and the university is defined as the expert of design in the projects. Design research appears as a basis for the projects because of the role of the university and design programme in it. Still the operation and the nature of the project do not necessarily support conceptions of design research in practice.

However, effectiveness of these projects appears narrow for the financier. Evaluation has evolved to immense systems with high number of indicators and quality criteria. In general, effectiveness consist of different point of view, like research, education, societal level or organizational level, but shared basis is that effectiveness constitutes of factors in the specific criteria and framework (Parhizgari & Gilbert 2004; Lemola et al. 2008). Commonly the main point of evaluation is not only to rank the existing models but also to generate utilizable knowledge (Coryn et al. 2007). Mainstream evaluation research has mostly focused on measuring various attributes, describing the object of evaluation and finally judging the outcomes. Essential point has been the realization of goals (Guba & Lincoln 1989).

In the context of academic open innovation projects the mainstream way of evaluation is typical, but problematical. From the point of view of financial benefits the evaluation concentrates without doubt on the concrete achievements, like applications or publications. Very popular way to evaluate university-company collaborating projects is consider it through input-output model (Pekkanen, Riipinen & Leminen, 2004; Georghiou et al. 2002). For instance even Walter et al (2007) concentrates on societal effects of transdisciplinary research projects, they approach phenomenon by measuring. In the context of design, a lot of unrecognized effectiveness lies outside of the measureable indicators, because for instance input-output model do not catch that (Civilisation cannot be imported 2007) In open innovation projects research can be seen as a social intervention itself. So, concentrating on the outcomes and results in evaluation gives a one-dimensional picture of the projects.

Benefits of the research between university-company collaboration have been proven in many studies and the competitive advantages of open innovation are known commonly (Fabrizio 2006). Earlier studies highlight differences in the culture, policies and expectations between universities and firms as well as financial aspects (Geisler & Rubenstein 1989). But deeper research on the research relationships (Laursen & Salter 2006, 147; Perkmann & Walsh 2007, 272) and from the company point of view is needed. The study asks what kind of meaning university-collaboration projects in the context of design has for the firms. The research considers the subject by qualitative approach through interviews with the companies' managers and highlights the discourses which is linked with meaningful of projects.

While university-company collaboration is an interesting phenomenon, it is also a mode of project work. University-company collaboration is defined by different research interests and disciplines. Project as a work model and a way of organizing resources has also an effect to the content of the collaboration as well as to the activity. At the same time projects are a part of societal change toward temporary fabric of society (Engwall, Steinhòrsson & Söderholm 2003, 111–113). Projects are nowadays a constant and significant part of organizations. For instance Söderlund (2004, 186) describes research on projects as a key factor for understanding organizations.

Project as a work model has an effect in the collaboration and research. A classical mode of the project is strictly defined, well planned and narrowly executed (Söderlund 2004, 183-186) Instead of that, in this study the project is defined as a temporary organization. Temporary organization is an organizational way to consider projects. In the practitioner driven field of project management, temporary organizations represent a theoretical discussion without immediate interaction with practice (Engwall, Steinhòrsson & Söderholm 2003).

According to Engwall, Steinhòrsson & Söderholm (2003, 111-112, 118-128) temporary organization includes four specific qualities, which differ from mainstream discourse: 1) the social construction of project boundaries, 2) the natural uncertainty and flexibility in project missions, 3) the high degree of embeddedness and 4) the expectation and mission driven patterns.

Mainstream discourse is based on assumption that structure and mode are important in projects (Packendorff 1995, 327-328) Project is defined from the outside and established because of a specific goal. Contrary to the mainstream way of thinking, temporary organization defines the project from inside. In the temporary organization flexible goals are not a mark of a failure but a natural way to operate. In the mainstream discourse static goals and linear way to operate are a virtue. Planning and management are in essential role in the mainstream project (Engwall, Steinhòrsson & Söderholm 2003, 118-120).

In the temporary organization an important point of view is the natural and contextual uncertainty of the action. Goal's flexibility gives a freedom to produce what is needed, not only what

is planned. In other words, not the plan or the goal but the needs, lead temporary organizations (Packendorff 1995, 321; Engwall, Steinhòrsson & Söderholm 2003, 120-122) In addition, temporary organizations consider projects commensurate with the surroundings: people come from other organizations and get back to the parent companies (Lundin & Söderholm 1994, 449) So, there is an ontological divide between the mainstream and the temporary organization: the mainstream considers projects due to their content and emphasizes generic project management techniques, whereas temporary organization approaches projects as a result of their form and highlights the dynamics of the temporal form (Engwall, Steinhòrsson & Söderholm 2003, 115-118).

According to Modig (2007, 809) features of the temporary organization are seen more often in the contexts of creative projects than ordinary ones. Temporary organization highlights the meaning of the people in the project, while the mainstream discourse concentrates on planning and management instead. According to Bakhshi, Schneider and Walker (2008, 1-5), quality of the innovation system is based on the relationships between the actors, and especially on the importance of the people in the project.

Anyway, to consider projects as a temporary organization gives a possibility to dissect a project it self instead of the organization around it. From firms' perspective, the effectiveness of the university-company collaboration projects can be seen to have multiple qualities instead of evaluating it just as a way to execute and attain a goal. In this paper the subject is approached from the perspective of the companies' managers, considering what they tell about the projects. Their speech is the starting point, and discourses which arise from the data, reflected with the unrecognized effectiveness.

DATA AND METHODS

Information about the university-company collaboration projects was collected through interviews. The empirical data consists of seven semi-structured interviews with nine persons, five with individuals and two with pairs. The interviews were executed in three periods, first in December 2007, then two in October 2008 and then three in March and April 2010. The data was analyzed between the three interview rounds. So, every stage in the data collection built the interpretation and at the same time the new interviews were based on the earlier ones, as the themes for the new interviews were elicited from the analysis. The companies' managers' point of view was essential and the interviews were conducted with managers who had an extensive work experience in collaboration projects within open innovation context.

The informants are working both in midsize and large firms, which are research and development –oriented. The firms represent different lines of business, for example paper industry, printed intelligence, mobile technology and mobile services. The professional background of the informants varies; they come from different fields such as sociology, technology, design and marketing, and their tasks are mainly linked with research and development. In the interviews the informants spoke about their experience in collaboration projects in the national innovation system context. They spoke through their career experience, unattached to a specific project. The main interest in the interviews was particularly in their experiences concerning those collaboration projects, where the university had represented design expertise. University called them "design research projects", but for companies they were "experimental projects".

In the interview situation, the discussion was based on five different themes which led conversation: theme 1, describing projects; theme 2, the goals and meaning of the projects; theme 3, experiences from the projects; theme 4, after a project; and theme 5, the results and significance of the projects. In addition, the themes included questions, which helped to specify conversation when needed. Purpose of chronological structure of interview was to make sure that the interviews encompass whole process of projects when informants described their experiences. Added to this, the interviewer asked to specify some details in the description. The interview situations were informal discussions, where purpose was to get behind the formal expressions. The interviews were approximately one hour long each; in total the data includes about seven hours of talk. The interviews were recorded and then transcribed to text. The data consists of 52 pages of text.

The interviews were analyzed applying data-driven analysis using Atlas-ti data management software. Starting point of the analysis was to categorize things which were meaningful for the firms in those projects. Data was coded according to the principle of open coding in the first round. In the next steps codes formed categories and finally main categories, code families (Strauss & Corbin 1998, 101-121). The subcategories were grouped visually and constituted new categories in the network view.

Focus of the analysis was on the ways the interviewees speak about the projects and the activity in them. So, by analysis is composed of discourses around meaningful of projects. In practice analysis does not grow just from the data, but the interpretation of the researcher has its own role in the data analysis process. So even the analysis has been data-driven, the ground for the interpretation lies on the theoretical framework of temporary organization.

Knowledge of project meaningful was constructed through the alternating analysis process and interview rounds. Considering the framework of temporary organization, the analysis has emphasized three discourses. The first discourse is societal level of the projects, which refers to projects as part of the environment and deals with the projects' position and influence on their surroundings. The second discourse is the special nature of design as one of the actors in the project. This discourse refers to characteristics of design in the collaboration. Design appears very special for the other actors and entails "practical doing"–culture in the project. Finally, active participation is the third discourse, which relates to social interaction. Meaning of the collaboration is based on active participation and is linked with the constructed knowledge.

FINDINGS

According to the data, from the com-

panies' point of view, those projects appear a mode of open innovation. Open innovation describes the multidisciplinary, knowledge generation and wide context of collaboration. At the same time open innovation appears mostly as a motivator for the collaboration between university and firms. Talk about the open innovation contexts is typically at least partly official. The most interesting part of the interviews is behind the formal speech. Four discourses have grown from the interviews and the active participation concerning collaboration is one of those.

Collaboration between university and company is constructed in the interviews as an exhilarating and informal environment, which is a good setting for enabling innovation. Still the operational environment of the collaboration projects is often unusual, or difficult to conform to at least for the most participants or stakeholders in the projects. That is because a project creates an independent organization and the operations in the project organization can vary a lot compared to participating organizations around it.

The projects of research are positioned inside the third stream. Despite that actual research is carried on in the second stream. Third stream concentrates on the "commercial activities of the university" (Laursen & Salter 2004), the societal interaction. Same way the descriptions of the projects found in the third stream sound more like traditional research. Mainly informants refer in the interviews to projects, which were located inside the university. Even so, informants refer to the actors of the university naming them with the term "designer". The term "researcher" refers to the actors outside of the universities' design programme, such as researchers in other universities or a research centre. In the speech of the companies' managers, the projects collaborating with the design programme of the university, does not appear as design research, like Cross (2006) defines it. According to Cross (2006, 98-103) design research falls into three categories depending on the research subject. The goal of the design research is to create knowledge about the designerly ways of knowing, practices and processes of design and the form and configuration of design.

According to the data those projects concentrates on either technological or user-oriented perspectives. Basically projects lie in the university. Procurator from every collaborative company and financier attend in the meetings of steering group. Some times interaction between universities and companies is restricted to steering group. But companies want more interaction between partners in cooperation. One interviewee for instance describes how participation in workshops during project is important for them. Their company does not want only to receive information in steering groups but also to get empirical experiences.

The concrete outcomes are commonly seen as one of the main results of the collaboration projects. In the data university research is associated with quality among firms and thus constitutes a good ground for the innovation, even if all the concrete outcomes would not be considered significant. In one interview, informants speaks how difficult is to transfer outcomes, like knowledge from project to firm.

"Informant 1: Että se on tosi raadollista, mitä ihmiset on hirveän kiireisiä, organisaatiot on ajettu tosi uhuiksi, niin se viesti pitää aina muokata täsmämuotoon. Vaikka mä saisin hirveen hyvän PP:n, niin kuin oikein unelma PP:n, niin mä todennäköisesti joudun pistämään…*It`s really wretched, people are deathly busy, organizations has become real thin, so the message has to sweeten for niche mode. Even I`ll get very good power point presentation (from university/project), like a dream presentation, there is a strong possibility that I`ll have to still…*

Informant 2: Sitä joutuu editoimaan. *You'll have to edit it…*

Informant 1: …viiteen eri tulkintaan, että mä saan sen niille kaikille oleellisille, niin kuin tahoille syötettyä kurkusta alas. *…edit it for five different version, that I could feed information for essential people.*

Informant 2 : Se on tunkemista välillä. *It's like stuffing some times.*"

Informants think that knowledge transfer is difficult and require lot of extra job for succeed. Informants describe that the project reports are like in "wrong language" when they come from the university. Reports are difficult to utilize in the real world and they are almost value of nothing. So, contrary to the general assumptions, the companies do not consider concrete outcomes as the most in the collaboration projects.

"Mä näen hyvin suurena sen merkityksen, että ne kasvattaa mun ihmisten kompetenssia ja yleissivistystä ja tietoutta siltä alueelta. *It`s very important and meaning ful, that project should enhance competence and all-round education of my team.*

Niin se on, että tehtäis, istuttais yhdessä alas ja tehtäis jotain. Niin se, se on ainakin, mihin itse olen kyllä pyrkinyt. *So, that we would do together, would sit at the table together and do something. That used to be my aim (in the collaboration).*"

One solution for the knowledge transfer seems to be active participating. Knowledge is not just information, but also new works of action and cultures. According to the data one meaningful aspect in a project is the constructed knowledge. The aims and results of the projects seem to be too general level to produce tangible benefits for collaborating companies. Results are not utilizable straight for the firms need. So companies seek significance from the process of projects. Constructed knowledge culminates to the active and lively interaction and participation during the project.

Even if the whole point of the project is multidisciplinary collaboration between different cultures, in practice there are contradictions in attitudes. Some expressions approve the multidisciplinary character of the projects and highlight active collaboration. Regardless of that, some opinions demand ready and concrete results from the projects, and are not ready to take up active participation. And so, in the perceptions of the informants both prohibitive and supportive factors of active participation can be noted.

PROHIBITIVE FACTORS OF ACTIVE PARTICIPATION

Traditionally the utilization of the results in companies' business is the main point of the whole project. Some informants in the data underline the importance of an upswing of the revenue as the main factor of effectiveness from the concrete outcomes. Apart from that the upswing of the revenue has no

role in the effectiveness of the project. However, mostly the ability to see the effectiveness of the project beyond the measurable impacts is connected with the participants' wide experience of the projects and openness of the company. According to some managers, complete results produced by the university as well as readily applicable results, are almost the only criteria for a successful project. These kinds of expressions come from the organizations, where openness appears to be in the minority role. Those companies seem to confine the official line or method of collaboration and interaction in university-company –collaboration projects to steering group meetings. In their view, projects are described in a mainstream way, where the planning and goals have an essential role, and the concrete and ready results are important too.

Thus the mainstream way to interpret the projects becomes an essential prohibitive factor of active participation. These companies base the projects on a vision about classical project and contract research. They are waiting for results that are ready to be exploitable. According the data for instance, a manager describes that the process is unessential: firms do not want to visit to "tune in" or "watch" when researchers or designers do they job. So, if the participants' expectations are formed along the mainstream interpretation of projects, the openness is confined and the interaction across the organizational boundaries does not come true.

Furthermore, the official framework of collaboration appears in the data as a prohibitive factor. The official framework and structure of the projects leads projects and links them with a conventional way to execute project as planned. There is no room for the lively and wide openness across organizations' boundaries in that structure. In the managers' speech bureaucracy constricts collaboration by creating an artificial structure. Bureaucracy constricts collaboration through organization boundaries and prohibits free interaction in general. Factors which are identified with bureaucracy are disappointing for managers.

Dougherty (2006) affirms this by indicating that the free innovation environment and innovation-minded organization are meaningful for the results. Organizing the projects using the bureaucratic model does not enable motivation enough to get good results. The data points out this also. Still, the structure of the projects is based on the innovation system and policy. Managers' interviews point out, that the source of the project is meaningful for the organization and the mode of the project. Collaboration and interaction appears to remain narrow, when the project is led from outside the firm.

SUPPORTIVE FACTORS OF ACTIVE PARTICIPATION

Supportive factors of active participation are linked with three different discourses in the data. The first supportive discourse pertains to openness of the organizations. Firms, which are widely open and experienced in using university projects, concentrate to construct collaboration in the interactive participation. The generality of managers consider project as a mode of open innovation and the attitude is approving for the open innovation in general. The base for the open innovation appears to be lively cooperation with other participants, especially with university. Projects are then expected to be "experimental" and "wild" and directed towards the future.

The second supportive factor in the data is the flexibility of the project. Here the attitude of the managers comes closer to the discourse about temporary organization and the uncertainty of project missions is seen natural. In this perspective the project plans constitute a framework for the activity. The projects are seen mission driven, but an element of uncertainty is welcome and worthwhile.

Managers link design actors (in this study the design actors are university participants) with the uncertainty of the projects. Designers, as the managers call them, "confuse" activity in the projects. Designers have their own way of work, which appears different and unfamiliar for the managers. Not a single manager that carries this view has a design background but their speech illustrates the practical nature of design and gives a meaning for the flexibility of the project.

The flexible and innovation-minded environment described by Dougherty (2006) is a natural way to organize temporary organisations. The main point is a balance between freedom, responsibility, creative problem solving and control from the top. The open innovation project combines innovative actors and encourages participants' interaction and knowledge construction. Besides flexibility, designers seem to bring a "practical doing"–culture to the projects. So, the third supportive factor is the meaning of the process. In the data, managers emphasize the process even more than the outcomes. The generality of the managers highlights the meaning of the learning through the process. They tell, for instance, that new experiences and the influence of the multidisciplinary context give a good place for learning and refining.

The main results of the projects mentioned in the data are usually identified as knowledge, which can be applied elsewhere, sometimes also products, service concepts or other applications. Accordingly the biggest challenge in the projects is getting the knowledge from the project to the organization. As the projects are usually located outside the mother organizations, the knowledge flow is often challenging.

Cohen & Levinthal (1990) examine companies' absorptive capacity for the knowledge sharing with a cognitive approach. From their point of view the ability to exploit external knowledge, like results of the projects, is a factor of innovative capability. They suggest that the organization's absorptive capacity depends on the absorptive capacities of the individual members and grow cumulatively. In addition absorptive capacity and innovation performance depend on the history and experience of members of the organization.

In contrast to the general assumptions of knowledge as mainly individual capacity, here knowledge is seen as something that people create together (Gherardi & Nicolini 2000, 330-331). Knowledge and sharing of it, is not seen as a capacity, which is a general way to cover it. In the data knowledge sharing is essential from the point of view of project success, but without the active interaction between participants, knowledge distribution and individual learning is not enough.

In managers' interviews, the companies concentrate on the knowledge produced in the multidisciplinary projects and emphasize participation.

Active participation is a practical way to improve the utilization of the outcomes. As the temporary organizations approach assumes, knowledge is situated in the context, and in particular, it is dynamic and provisional as Gherardi & Yanow (2000) describe. Similarly to the temporary organisation, also the knowledge, which is constructed in it, has a dynamic nature. Thus the main point in the university-company collaboration projects is to recognize informal, socially constructed knowledge and find ways to share knowledge in the process from inside the project community to the mother organisations.

Wenger (2000, 237-238) describes projects a natural environment for the innovation and learning. Similarly to the open innovation, Wenger describes that knowledge sharing with the competitors is a ground for the success. Learning and knowledge are diffused from a project with the members of home community to a new project and further. The direct and active participation is the basis for social learning. By Wenger, in a community of practice, much like the projects described in this study, knowledge production, exchange and transformation are as important as the core processes of the project (Wenger 2000).

The three central factors prohibiting or supporting the participation are interpreted to be subject to the ontology and nature of the project (see Table 1). First, the level of openness interacts with active participation; thereby more open organization is more active across the organization boundaries. Second, flexible nature rather than abstinence in the official structure support active participation. Third, the importance of the concrete outcomes restrains the active participation in the process.

DISCUSSION

University-company collaboration projects culminate in the strength of the relationship (Perkmann &Walsh 2007). In spite of all, in practice there are different levels of strength in the relationships. The study shows that even learning motivates the participants more than the outcomes (Perkmann & Walsh 2007). The analysis of the data presents both prohibitive and supportive factors of collaboration.

PROHIBITIVE	SUPPORTIVE
Closed	Open
Official structure	Flexible
Results centred	Process centred
Mainstream	**Temporary organization**

Table 1: Prohibitive and supportive factors of active participation in the university-company collaboration projects.

In the research starting point of the analysis is the unrecognized effectiveness, which is approached by analysing interviews with managers of the collaborating firms. Three discourses about meaningfulness from the firms' point of view are elicited including active participation as one of those. The purpose of this paper is to propose one of the discourses, active participation and defines prohibitive and supportive factors of it.

In addition, the paper highlights the special role of the design partner in the collaboration projects in the context of open innovation. Designers appear to bring a practical doing –culture and natural uncertainty to the project. In the beginning managers are embarrassed by the way that designers work in the research relationship, but during the project managers accept the flexible mission and consider it a good way to organize collaboration.

The interview data, seven interviews and total nine informants, will be the first part of overall data. Data from two cases will be collected in the spring 2010. Case data will give a change to find deeper discourses under the main discourses and probably also new ones. Also then is a possibility for a comparative setting and increase validity of the study.

The paper pays attention to potential ways to intensify collaboration and points out the contradiction between ideal innovative environment and the official structure of the projects as well as the meaning of the process in the university-company collaboration. The study implicates that there is a need to take notice of the flexibility of the projects and the special role of the design partner or design research in the projects.

Official structure of project in the Finnish national innovation system is based on the mainstream way to understand project work nature. According to data, especially in the design expertise context, official structure support not active participating or interaction in projects. Regardless, data shows that interaction is important for companies. Together constructed knowledge is more effective from the companies viewpoint than reports or knowledge transfer. The research debates with the structure of the national innovation systems nowadays and the development of the new and more effective way to construct collaboration projects in the future.

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COMPANY-USER COLLABORATION FOR DISCONTINUOUS IDEA IMPULSES: THE COGNITIVE DISTANCE OF USERS

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ABSTRACT

In order to create and address new markets companies constantly need to tap new sources of knowledge, especially from existing and novel users. Studies have shown that idea impulses which emerge from technical less experienced users turned out to be more original. Within this paper we want to improve our understanding of distant users at the boarders of markets and non-users. We want to add a market dimension and knowledge dimension to the differentiation of users, to reach further detached market niches. Instead of solely classify individuals into a dichotomy of being a customer (bought a unit of the product or service) or a non-customer (did not buy a unit), we will apply the theory of cognitive distance on the company-user network. Derived from an interdisciplinary literature scan, we propose an operationalisation for the cognitive distance construct in user networks and draw the outline of a research proposal on the micro processes in collaboration in exploration.

INTRODUCTION

In order to create and address new markets companies constantly need to tap new sources of knowledge, especially from existing and novel users. Hence, companies are trying to engage users early in the process of product development in order to collect ideas, feedback, and other suggestions. Thereby it is crucial to understand what to expect from different types of users. While current users might give ideas that relate to the current design, novel and non-users might lead a company into new but also more uncertain territory (Chandy & Tellis 1998; Danneels 2004; Christensen 2006).

In recent years, there has been a variety of research approaches to study the integration of users who are characterised as being more or less remote to the particular market (Chandy & Tellis 1998; Govindarajan & Kopalle 2004, 2006a, 2006b; Kristensson et al. 2004; Kristensson & Magnusson 2010). However, research on the micro processes of such collaboration in the context of user collaboration is scarce, especially when it comes to a collaborative group setting. Even in creativity research collaborative groups have gained attention only recently, when it became apparent that creative activities involve increasingly social and collaborative processes (Montuori & Purser 1999; Sonnenburg 2004). To the best of our knowledge, up until now the potential and future user is a rather vague concept in the literature on innovation, so is the understanding of how a potential and future user's contributions in the idea finding phase differ from the ones of the current market. A micro process perspective will help our understanding of the processes that run down in the black box of idea generation that might be moderated by increased distance of the participating user. Company exploration is an ill-defined problem solving process and the innovation literature can learn from research approaches that rather relate to social science and cognitive psychology. Guidelines for practitioners how to adapt their tools of user collaboration might be derived from this interdisciplinary approach.

Within this paper, we will apply the notion of cognitive distance on company-user networks. We propose an operationalisation for the cognitive distance construct which in a latter study will be applied to select users for collaboration. Thereby we focus on validated constructs that influence user behaviour, such as use-experience, and might exert influences on idea generation tasks (Alba & Hutchinson 1987). Starting with a definition of the term cognitive distance, we will relate it to

user collaboration. As a next step we will compare the early idea finding process to a problem solving process (e.g. Leonard-Barton 1995). The determining components of problem solving tasks give clues regarding what might be important in an operationalisation scheme. We conclude with the outline of a research proposition. It is on an explorative study which goal it is to shed light on the contributions one might gain in collaborating with distant users. Cognitive distance thereby is the moderating variable influencing a dyadic collaborative task. Research questions include: How do the individuals adapt their strategies towards solution finding, do collaborative strategies emerge and how is the process moderated by the degree of cognitive distance? We touch three crucial concepts that we think will guide the process of our analysis: (1) the cognition of an individual, (2) the needs of an individual and (3) creativity, which to a moderate extent is seen as a basic requirement.

LITERATURE OVERVIEW

User integration in innovation activities has been a well-regarded field of study in recent years (von Hipple 1986; Foxall 1989; Kristensson et al. 2004; Lettl et al. 2006). The underlying logic is that innovations inspired by users rest upon inherent and upcoming needs and thereby have a higher success probability (von Hipple 1986). The lead user concept goes even further. Lead users are not only a source of knowledge but play a more active part in the actual conception and design of innovations (Lüthje 2004). Studies on collaboration with more remote users are scarce and have a slightly different focus (Chandy & Tellis 1998; Govindarajan & Kopalle 2004; Bonner & Walker 2004; Kristensson et al. 2004; Kristensson & Magnusson 2010). It is rather on sourcing knowledge in the form of e.g. idea stimuli than on more matured concepts towards implementation. However, the idea is the essential building block for a successful innovation (Henard & Szymanski 2001). Kristensson et al. (2004) showed that ideas generated by ordinary users scored higher on a novelty and creativity dimension than the once generated by professional developers or advanced users. They differentiated the user types by their academic education in programming skills. We classify their typology of the ordinary user as being more remote in a relative sense to the professional developers and advanced users. We compared the differentiation variable used in studies (non-conclusive) on the influence of more remote and less experienced users (see Table 1).

Chandy and Tellis (1998) state that the orientation to future markets in their case can either refer to the involvement of a different group of people than their current users, but also explore future needs of their current users. The latter three listed studies differentiate between users by technical knowledge or frequency of collaboration. The ordinary user in Kristensson's (2004) study lacks procedural knowledge how to get to a problem solution. The developers and advanced users have a clearer understanding of strategies towards solution and might rather engage in reproductive than productive thinking (Ekvall 1997). However, all users for instance are still taking part in the respective market. If you increase distance even further or on another dimension, you get to the boarders and into niches of markets or even to actual non-users of a product class. In these areas, the differentiation is not anymore to be made on the depth of procedural and technical understanding towards solution finding and products, but much more towards needs people are trying to address (Christensen 2006; Paap & Katz 2004). This paper aims at improving our understanding of these distant users. A user is considered distant when she or he has had little contact with the dominant design, values different attributes of a product or service than the mainstream market or uses it in unorthodox ways, as we will depict later. The actual non-usage might be motivated by different factors, such as lack of a need

Study	Relation	Dependent variable or construct	Differentiating factor between users	Result
Chandy and Tellis 1998	B2C	Willingness to cannibalize and radical innovation	SBU level questionnaire regarding orientation towards future users and needs	Orientation positively influences willingness to cannibalize and thereby radical innovation
Govindarajan and Kopalle 2004	B2C	Disruptive innovation	SBU level questionnaire regarding orientation towards emergent users in addition with a definition and needs	Orientation positively influences the releases of disruptive innovation
Bonner & Walker 2004	B2B	New product advantage	Relational embeddedness (frequency of collaboration) and knowledge heterogeneity	New product advantage tended to be higher in projects that involved users with heterogeneous knowledge
Kristensson et al. 2004	B2C	Originality, value and realization of an idea	Academic education towards programming skills	Higher scores on originality and value of subjects with less programming skills
Kristensson and Magnusson 2010	B2C	Radical nature of ideas	Users' awareness of technological restrictions	Users who are unaware of any technological restrictions tend to produce more radical service ideas

Table 1: Empirical orientation or collaboration studies with more remote users

or interest, lack of certain attribute characteristics or barriers that keep an individual from using a product or service. Distant users might be differentiated along these factors. We want to add a market dimension and a knowledge dimension that does not focus on technical understanding only and lead us towards boarders and niches of markets. Our approach is based on research on cognitive distance in collaboration (Nooteboom et al. 2007), since explorative activities are increasingly collaborative processes (Montuori & Purser 1999).

COGNITIVE DISTANCE

In a stream of publications about the cognitive theory of the firm, Nooteboom (1992, 1999, 2000, 2009) established the notion of cognitive distance between two co-developing companies. Cognition constitutes knowledge and perception, but also incorporates the processes that lead to knowledge and perception (Neisser 1967). The constructivist view of knowledge states, that action forms cognitive structure, while acquired cognitive structure provides basis for further action (Hendriks-Jansen 1996). As a result, people construct different representations of the world (Berger & Luckmann 1966). Cognitive distance is a term to describe and an attempt to determine the difference in cognitive structure between individuals. In interaction, difference in cognitive structure facilitates the chance to learn from the experience of the other.

Therefore, cognitive distance is imperative to learn and acquire new knowledge, though it also brings about misfits in understanding when distance increases (Nooteboom 2007). Each individual needs to understand the language and context of the other. The ability to follow the other side's reasoning is regarded as a core ability in knowledge sourcing (Tushman & Scanlan 1981). These two opposing forces lead to the assumption that up to a certain threshold, increasing cognitive distance is beneficial to the outcome of interaction, while beyond that, it becomes detrimental. It suggests that there is an optimal balance between new information and problems of understanding. Innovation impulses often emerge in the interplay between new and old needs and new and old technologies in niche markets (Paap & Katz 2004). Context shifts might originate at the more distant borders of markets.

From a company's point of view, a user is assumed at close distance (Nooteboom 2000). However, looking beyond the realm of the current customer base, there are potential users who might only have had little contact with the domain, who did not yet use the product or service or who do not use it in the designated way. These potential and rather distant users might use relevant knowledge in their specific environment in a novel fashion and might be able to relate their contextual experiences to the domain of the organization.

EXPLORATION AS A PROBLEM SOLVING PROCESS

We take a closer look at problem solving as its constitutional parts might outline the effect cognitive distance has in solution finding. Exploration in organizations incorporates company-initiated semi-structured search processes that are aiming at innovation impulses. The process can be compared to a problem solving process (Leonard-Barton 1995). Human problem solving is constituted by the objective conditions of the problem, its subjective representation by the problem solver and the process, with which these representations are manipulated (Klauer 1993). As the outcome of an explorative search is unknown, the problem state is ill-defined. Unlike with well-defined problems, the application of standardised set of procedures towards a solution (strategies) is challenging or not feasible (Davidson 1994; Sternberg 1985). However, creativity techniques in idea generation are popular tools and thereby strategies with the goal to create something new. In order to come up with solutions to ill-defined problems a redefinition of the problem is necessary (Lubart & Sternberg 1995; Csikszentmihalyi & Sawyer 1995; Mumford et al. 1997). This redefinition is rendered possible by transferring and linking knowledge components of irrelevant or distant domains (Sternberg & Lubart 1991).

The elements of the problem solving process suggest that any problem has a frame of reference. Oversimplified, the problem formulation and its objective conditions relate to a certain domain, the problem solver associates existing mental models and memory with this domain, and processes are often random sequences of search, articulation, evaluation and redefinition.When the problem state of the task is the ambition to create something new, the discovery will always relate to something old or something we know. Novelty does not emerge within a vacuum, but builds on preconditions, such as experience, knowledge, beliefs and emotions (Koestler 1966). Even if idea generation processes are led under the dogma to discard any known limitations, in practice it is hard to dust off from first associations and commonly related constructs (Leonard-Barton 1995). Increased cognitive distance in a group might bring this desired flexibility into the collaboration (Rubenson & Runco 1995). Cognitive distance between users than would serve as a moderating variable.

DIMENSIONS OF COGNITIVE DISTANCE

Before we elaborate in more detail upon the effect cognitive distance might have in company-user interaction, it is important to identify dimension to approximate cognitive distance between users and a domain. In a collaborative dyad, we have three important points of reference. Each individual constitutes one and the third one is the domain to which the explorative activity is laid out. The domain can be a product-class offered by a company or a business unit. If the distance between a user and a particular domain can be approached, we also can draw inferences on the distance between the users in relation to the domain. Cognitive structures and states of individuals are hard to map, since there is no direct measurement instrument (Klauer 1992). It seems quiet intuitive that there are many dimensions that might constitute a person's cognitive distance towards a domain. We concentrate on two dimensions; a knowledge and a market dimension. The selection is driven by the definition of cognition and our aim to look at distant markets.

Knowledge dimension. Cognition concerns that which is known by an individual (Scott et al. 1979; Neisser 1967).

In the constructivist tradition, knowledge is subjective. It constitutes ideas a person holds about the self, the world or objects (Scott et al. 1979). Validated constructs in literature that relate to knowledge of users are e.g. use-experience and user knowledge. They are certainly not independent of each other, but still relate to different expertise (Alba & Hutchinson 1987; Park et al. 1994). Use-experience constitutes knowledge through direct interaction between the user and a product and is directed to fulfil a goal. Cognitive structure originates from this interactive process. It provides the basis for further involvement with the domain, no matter whether it is in a purchase decision or in a creative process (Alba & Hutchinson 1987). In contrast, user knowledge presents the body of knowledge on a broader scope. It encompasses sources other than usage (Brucks 1985) and might be classified as being more theoretical expertise.

Market dimension. As the challenge is to look at close and distant markets, a market dimension is crucial. Market segmentations of companies mostly build on demographic variables, such as age and income. These segmentations do, however, not reflect the problems people try to solve by using a product and thereby are not very useful in attempting to uncover upcoming markets (Christensen et al. 2007). Furthermore, the ownership of an object from a product class is in our opinion insufficient to represent the affiliation to a market, partly because it is seen more related to the construct use-experience (Alba & Hutchinson 1987; Park et al. 1994). A need towards the particular domain seems more appropriate, since it allows for more fain grained distinctions. Remote but potential upcoming needs might indicate relevant market development areas. Ideas that have disruptive potential, for instance, nurture often in remote and niche market segments (Christenson 1997; Henderson 2006). Their needs are often directed towards different performance parameters of product classes than the ones the current market values (Danneels 2004). Segmentation by needs seems to be more appropriate then, since preference shifts from the current market towards the niche seem to appear in extensive market changes (Henderson 2006). Having a need is an important condition to assure involvement and certainly affects motivational factors of an individual (Amabile 1996).

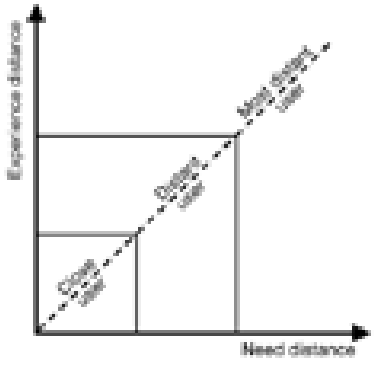

Figure 1

MAPPING THE DIMENSIONS

Neisser's (1967) definition of cognition encompasses the perception of an individual. In certain psychology scholars individual needs are seen to influence an individual's perception by affecting the availability of interpretive categories (Scott et al. 1979). We assume these two dimensions to influence each other in some way. Obviously, a strong need that might be met with a certain object might drive a person to get involved with that object, which might lead to experience. Experience with an object also might create needs or awaken latent ones.

We now map the dimensions and define both by a distance measure increasing from its point of origin and get the following segmentation (see Figure 1).

We argue that there are three rough segments that can be established along the dimensions: the close user, the distant user and the most distant user. The dashed line emblematizes a well-balanced relation between these two dimensions, which is not closer defined, since we do not know the relation between need and experience in greater depth. However, the proportion of the two distances to each other might be useful to refine each segment further. The segment of most distant users is a necessity to account for the vast part of the population that just does not want to take part in a market. Oftentimes, non-users are just that (Anthony et al. 2008). In the following we will look at the different segments in more detail.

The close user segment might entail what is often referred to as the current users (Chandy & Tellis 1998; Christensen 2006; Danneels 2004; Henderson 2006). They have a strong need that is fulfilled with the particular product class and match the need the company is trying to address. Experience is gained by constant usage and constructs domain relevant knowledge about performance attributes, (physical) components and how (physical) components and attributes affect performance attributes (Mitchell & Dacin 1996). Furthermore, close users value certain proportions between attributes of a product and can distinguish between objects by indicating whether an object has more or less of an attribute (Mitchell & Dacin 1996; Alba & Hutchinson 1987). One notion that we want to emphasize here and which relates to the reasoning above is that the focus on the most valued performance attributes of dominant designs might obstruct the perspectives for discontinuous changes (Christensen 1997). The emergence of new dimensions or the emphasis of a rather unvalued product dimension might be more important to discover new markets (Christensen 1997, 2006; Govindarajan & Kopalle 2006; Henderson 2006). That points to the importance of exploring the surrounding segment.

The users belonging to the segment labelled distant user are on one or both distance dimensions significantly further out than the segment labelled close user. Around the dashed-line you might think of individuals who are rather occasional users with rather low verve. But how can we interpret the extremes when we move either far left/up or far right/down from that line, as depicted in hatched quadrates (see Figure 2).

In the upper left quadrate the need distance is proportionally lower to the experience distance. At that point the distant user has a distinct need with regards to the product class under consideration, but is lacking pristine experience. One explanation for the imbalance between the dimensions might be a constraint the user is facing, represented by one or more usage barrier(s). Since we are seeking ways to depart from dominant designs, the barriers these users might face are not fully congruent to the once discussed in the literature dealing with the resistance to innovations (Ram & Seth 1989;

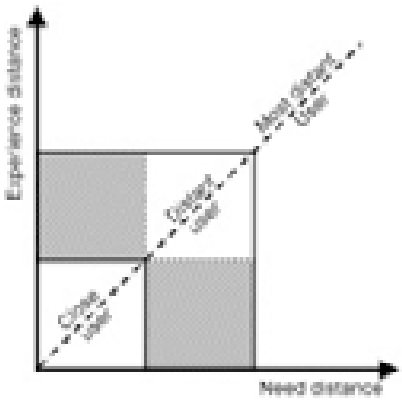

Figure 2: Two extremes in distant user segment

Garcia et al. 2007). Dominant designs might have reached the level of being a commodity altogether and might so much the more be on the verge to a discontinuous change. Potential risk or tradition barriers for instance might have been torn down a while ago. At that point, barriers that relate to the endowment of the user or the dominant characteristics of the particular product class might be more likely the cause for the lacking experience. Four often referenced once are lack of skills, lack of means (often financially), lack of time or lack of access (Govindarajan & Kopalle 2006; Christensen 2006). In particular cases, the latter is strongly related to the context of common usage. Some people might not use a certain product since it is not available in contexts where they would like to use it or would use it more often as it becomes accessible in these contexts. An example would be a strong need to pass one's time while waiting on a bus, before smart phones enabled people to pass their time on the go as they would do at home (e.g. mobile television). These barriers might be more rigid as they cannot easily be removed with marketing effort. They might demand a strong alteration of the product offering, in some cases even in the underlying business model (Christensen 2006). Collaborating with these users early on might shed light on new and unexplored usage contexts for an existing technology or different ways to approach the need, since these users might have alternative ways to meet their need in the end.

In the lower right quadrate the experience distance is proportionally lower to the need distance. At that point the distant user has pristine experience with regards to the product class under consideration, but is lacking a distinct need. One explanation for this imbalance might be unorthodox usage. It is assumed that products have one central function, but not always do users use the product for the purpose or in the way it was intended to by the company (Bercun 2007). Often product attributes and functions are used to meet a slightly different need or in extreme cases are applied in another domain. Well-known ideas emerged when product functions were applied to other domains: A vine press was used for book printing, white paint was transformed as a means of painting out typing errors when mechanically typewriting (Hentschel 2009). Unorthodox usage is triggered by the absence of an appropriate product or by inflicted barriers such as monetary endowment or restrained access. Companies have a limited view on how their products end up being used (Hentschel 2009), but changes of the product/object itself or the application context might loosen what is often referred to as functional fixedness and inflexibility (Allen & Marquis 1964). Unorthodox usage might point to development paths that deviate from the dominant product dimension and depict the importance of unvalued ones. It intensifies the dilemma between preserving the common domain and exploring new ideas that might enlarge or even change the field of activity (Kanter 2007). We define a user who is addressing a different need with a product than intended by the company as more distant.

In both quadrates you might find barriers. The ones in the upper left quadrate in tab 2 prevent people from using a company's product. The ones in the lower right quadrate exist in other domains and might force people to use a company's product in an unorthodox way.

OUTLINE OF RESEARCH PROPOSITION

We want to test the effects cognitive distance might exert in collaborative idea generation tasks within an explorative quasi-experimental design. It is not entirely explorative driven, since we already derived certain assumptions from other fields such as psychology or creativity research. These will be tested to an ill-defined problem solving task: explorative search for new market opportunities.

Subjects are recruited by a screener questionnaire which contains items that represent the prior proposed constructs use-experience, user knowledge, need and potential barriers. These constructs are domain-dependent. Domain-independent constructs such as empathy and innovativeness will be applied for two reasons. They serve as control variables and should be present to a modest degree to assure activity in the tasks. Social influencing factors of groups are minimized by a dyadic group setting (Rubenson & Runco 1995).

A subject can either be classified cognitive close or distant to the particular domain. This leaves us with three possible constellations: (1) both subjects are cognitive close, (2) both subjects are cognitive distant and (3) one is cognitive close, the other distant. Prior to the idea generation tasks, each subject is asked to state her/his first association to the domain. The overlap of dominant associations between subjects serves to confirm or disconfirm the presents of cognitive distance (Stroebe and Diehl 1994). Apart from the rules that are known from brainstorming tasks, the idea generation tasks are unstructured. At the end of the task each subject is asked to quickly draw their favourite idea impulse. A quick drawing of an idea - though highly subjective - might transport much more information than a subject might be able to express. Afterwards, each subject goes to a short questionnaire, asking how she/he came to grips with her/his ideas in the session, how satisfied he/she is with the outcome and how she/he was feeling influenced by the other person and in what way. The idea generation tasks are recorded, transcribed and analyzed. The method used to analyze the transcribtions is the verbal analysis (Chi 1997). The coding scheme is derived from research outlined above and literature on collaborative processes. Codes will relate to processes, knowledge, outcome and social factors. The outcome of the generation tasks will be evaluated by an expert panel with regards

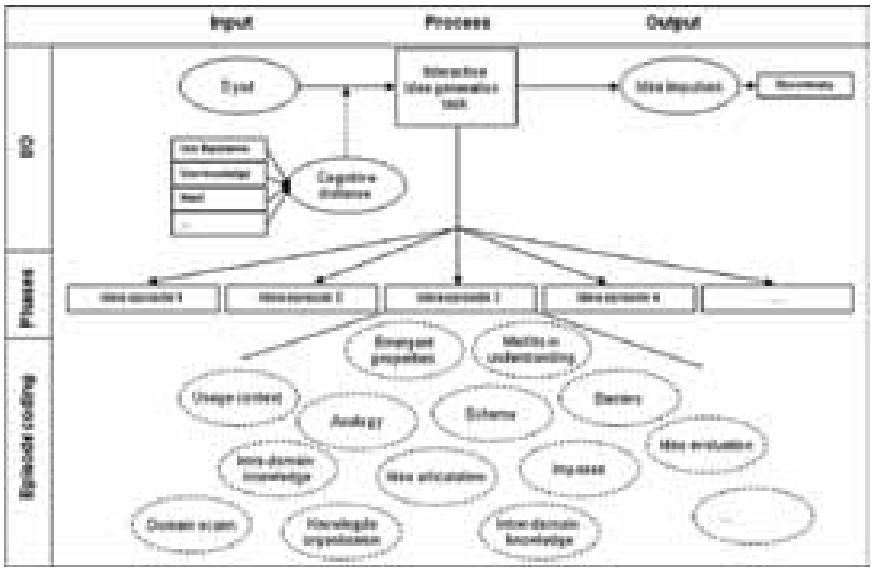

Figure 3: Input-Process-Output Model

to novelty, discontinuity and creative realism. We will analyze whether ideas are rather synthesized through an act of individual imagination or through cross-fertilisation and what precedes the articulation of those ideas. We look at how the subjects adapt their individual strategies towards solution finding, which we believe to be moderated by their degree of cognitive distance. We will provide first inferences towards the question if an optimal cognitive distance exists in collaboration with users.

There are multiple ways that coded data can be depicted, depending on the formalism chosen. As in our choice of taxonomy of codes, a simple table presenting the means for each code might be adequate. It lists how often each code is used by a user, split up to the distance classification. The differences between these classifications need validation on the domain- dependent constructs. For the strategy usage, a transition table is valuable, that shows in how many cases a certain process component was followed or preceded by the others. Once the coded data are depicted, then one can begin to seek patterns in the results. Is there a correlation between the distance and e.g. a frequent use of intra-domain knowledge, what kind of code preceded actually the articulation of an idea etc., is it rather done individually or by interactive synthesising, do experienced users more often identify a "good" idea due to their prior knowledge etc.. We will analyze whether a group of subjects (e.g. the "close-distant"-group) generated proportionately more discontinuous ideas than another group of subjects (e.g. close-close-group) or if in general misfits in understanding occurs more often in the close-distant group and if that leads to creative tension or blocking of the process.

The design is depicted in an input-process-output model following West (2003) (see Figure 3).

DISCUSSION AND CONCLUSION

New usage context and upcoming needs might upset the existing order of established practice. To hit upon these impulses, it might be fruitful for a company to explore the boarders of markets and actual non-users (Chandy & Tellis 1998; Danneels 2003; Christensen 1997). There has been research on the orientation of business units towards remote markets. A few impressive qualitative studies have explored the value of integrating relatively inexperienced users. We add a market and knowledge dimension that is directed towards users who are even less attached to a market, users who do not belong to the market or find themselves in unaddressed niches. Preference shifts towards niche market needs are in some cases causes for disruptive change (Henderson 2006). Our contribution is derived from a literature scan in various research areas and needs testing. We proposed an input-process-output model for idea generation tasks, which we will apply to pursue the question how contributions of users differ as cognitive distance increases. Though it is designed as an explorative search, we also anticipate to get a clearer picture of patterns that emerge in interactive ideation tasks led by assumptions. However, it is not before the empirical testing, that we can depict managerial implications, but we are confident to give recommendations on how to structure explorative search processes when discontinuity is the desired outcome in the near future.

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MOBILIZING LOCAL AND REGIONAL KNOWLEDGE FOR INNOVATION

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ABSTRACT

The aim of this theoretical paper is to contribute to an understanding of collaborative innovation in a knowledge based economy. The main theme in collaborative innovation we take to be mobilizing local and regional knowledge supported through research and education. The aim is supporting local and regional economic growth, co-operative advantage, social cohesion and sustainable development.

Drawing on Systems Design Philosophy we apply a systemic approach to design, innovation and entrepreneurship in complex adaptive systems. We search for a theoretical framework for participatory innovation, with local and regional community building and have identified eight systemic methodologies which may be interrelated: (1) The PentaHelix Model; (2) Knowledge Based Communities of Practice; (3) Value Network Analysis for Innovation Potentials; (4) Generative Themes in Transformative Learning, (5) Social Learning and Narratives as Knowledge Enabling; (6) Knowledge and Fitness Landscapes; (7) ICT for Design, Innovation and Entrepreneurship; (8) Strategy as Guiding Principles for Action. We explicate our way of thinking through illustrations and descriptions, but recognize that we do not fully succeed with a theoretical integration. Our next step is practice – applying the methodologies in collaborative project which may allow us to unfold a coherent theoretical frame for our work.

INTRODUCTION

The transition from the industrial to the knowledge society has produced new concepts and phenomena addressing globalization and the new economy. There are several designations for the outcome of the transformation: *information society, knowledge society* and *network society*. The term Information society came into use in the 1950s and relates to early digitalization and data management (Masuda 1980). The knowledge society (Stehr 1994) refers to a society where knowledge has become a commodity and the dominant value and component of human activity. Networked society (Castells 2000) is a broad sociological term that refers to the principal organizational forms: ad hoc networks in a global economy that are made possible by the worldwide e-permeation.

Castells (2000) points to central characteristics that have already emerged from the transition from industrial to networked society and describes the new societal structure in three dimensions. 1) *Informational*: The capacity to generate knowledge and process information determines productivity and competitiveness. 2) *Global*: Development of a worldwide IT infrastructure provides strategic activities with the capacity to work as a unit on a planetary scale. 3) *Networked*: The connectivity of the global economy generates a new form of organization, the *network enterprise,* comprising either firms or segments of firms. The unit of production is no longer the firm but the business project.

With the Lisbon strategy for the European Research EU addresses the

knowledge economy and provides two themes for collaborative efforts in creating the most competitive knowledge economy in the world:

1. A welfare equation, where economic growth plus competitive/cooperative advantage equals social cohesion plus sustainable development. In actual practices in local and regional settings this is often transformed into goals like a percentage in economic growth, amount of new jobs and/or new companies created.
2. A knowledge triangle, where Research, Innovation and Education join forces. In actual practice this is often taken to be transfer and diffusion of knowledge from universities to companies enabled by public authorities.

But how do we move from strategy to practice? Which methodologies may frame this process? In our understanding the main driving forces in the collaborative efforts are knowledge based design, innovation and entrepreneurship. However efforts must take place in a context of participation of all interest groups in and across local and regional spaces.

Hence participatory innovation is an essential aspect. But the Lisbon strategy also calls for developing theories and practices – hence methodology and methodologies - that are embedded in a context of the informational society, where the business unit of the future is the network.

The aim of this paper is to draft a theoretical frame which may help us understand collaborative innovation in a knowledge based economy. The paper is our first attempt to develop a theoretical frame. Our approach involves theories and also practices of eight systemic methodologies for participatory innovation. In order to support our argument we will take these methodologies back to their origin in philosophy and systems thinking.

We start the paper by introducing our approach to innovation. On this basis we move into the eight systemic methodologies which together form a system of interconnections. The sequence in which they are introduced is the one we prefer in our but other sequences are possible. We explain each methodology and how it contributes to collaborative – or participatory innovation in the knowledge economy. In a final paragraph we reflect on the integration of the methodologies into a coherent frame.

SYSTEMS DESIGN FOR PARTICIPATORY INNOVATION

Tuomi (2002) argues that there are two approaches to innovation: (1) linear models and (2) iterative/interactive models, and he is not alone in this understanding (Bilgram et.al. 2008), (Borgers et.al. 2010), (Chesbrough 2003), (Christensen et. al. 2008), (DECA 2010), (FORA 2005), (FORA et. al. 2009), (von Hippel 1986, 2005). The first approach is based in 'heroic innovators and entrepreneurs' that singlehanded and in a stepwise process develop products, processes, services – even organizations. This is still the main stream understanding of innovation. The other approach understands innovation to grow out of the interaction and dialogue among participants engaged in meaningful activities based in existing social and cultural practices. Thus the creative initiative of participants and communities becomes the essence in the development of innovations.

In this paper we will follow the second approach to innovation in which a pre-requisite is cross-disciplinary, even trans-disciplinary methodologies. We also build on the understanding that the current state of systems thinking (Ackoff et.al. 2010; Churchman,1971, 1974, 1979; Jantsch, 1975, 1980; Juarrero, 2002), network theory (Castells (1995-98); Benkler, 2002, 2006; Benkler & Nissenbaum, 2006), complex adaptive systems (Stacey, 1992, 2001; Stark, 2008) and knowledge management (Boisot, 1995, 1998; Boisot et.al., 2007; Snowden, 2002; Kurz & Snowden, 2003) calls for radically new innovative methodologies, which may contradict many well-established paradigms of design, innovation and entrepreneurship.

Ayas (1997) suggests that innovation may be understood to occur in four qualitatively different ways.

1. Based on existing knowledge: We innovate based on 'what we know we know'
2. Based on recombination of existing knowledge: We innovate based on 'what we don't know we know'
3. Based on white spaces of knowledge: We aim at innovation based on 'what we know we don't know'
4. Based on totally new knowledge: We search for innovation based on 'we don't know what we don't know

Our focus is ways of innovation in local and regional spaces, where the challenges are diverse, uncertain, contradictory and complex. Our first step is to turn to philosophy to help our inquiry for methodologies, when there are no stated purposes or means. System thinking seems to offer an approach, especially Churchman´s understanding of system design where he argues that it is " .. implementing improvement in social systems by means of the best available method of inquiry". (Churchman, 1974, p. 452).

Philosophically Churchman argues that implementing is based on pragmatics, improvement is based on ethics, social reality is based in ontology and best available method of inquiry is based on epistemology. We have turned this philosophy of systems design into our credo for community driven innovation: "Co-creating value with inquiring systems through partnering". In praxis this requires methodologies and in the following we suggest a number of methodologies to enhance the co-creation.

ON PRAGMATICS AND IMPLEMENTATION AS CO-CREATING

Just like innovations are developed in social and cultural practices they are also adopted when people integrate them in meaningful ways into existing social and cultural practices. We suggest two methodologies: ICT for design, innovation and entrepreneurship in order to balance informational and social connectivities in innovation (Spivack ongoing; Davis Mills, 2008) and Strategy as Guiding Principles for Action (Oliver & Roos, 2005). They are at the heart of mobilizing local and regional knowledge for innovation because they allow us to integrate practices and data in endless variety.

ON ETHICS AND IMPROVEMENT AS VALUE CREATION

However, integrating theories, practices and data from a multitude of participants creates a huge amount of data, e.g. of the roles played, of interactions, the dialogues, the material produced, the deliverables exchanged and the potential value created. This complex-

Philosophy	Systems Thinking	Our Credo	Methodology
Pragmatics	Implementing	Co-Creating	• ICT for Design, Innovation and Entrepreneurship • Strategy as Guiding Principles for Action
Ethics (Progress)	Improvement	Value	• Value Network Analysis • Knowledge-/Fitness Landscapes
Ontology	Social Reality	Partnering	• PentaHelix Model • Knowledge Based Communities of Practice
Epistemology	Best available method of inquiry	Inquiring Systems	• Generative Themes in Transformative Learning • Social Learning Cycles and Narratives as Knowledge Enabling

Table 1: Philosophy, systems thinking and methodologies for participatory innovation in local and regional spaces.

ity can only be handled by ICT – and we suggest using social network analysis, semantic analysis techniques and visualizing techniques. Two methodologies seem relevant: Value Network Analysis (Lee, 2008; Skåne Region, 2009) and Knowledge-/Fitness Landscapes (Kaufmann, 1985; ongoing) in visualizing innovation potentials.

ON ONTOLOGY AND SOCIAL REALITY AS PARTNERING

We argue that innovation is inherently social, i.e. grounded in existing social and cultural practices. These practices involve all people. That is why we focus on partnering and on the following two methodologies: PentaHelix Model (Lindmark et.al. 2009, Samsø Erhvervsråd, 2009) and Knowledge Based Communities of Praxis (Beer, 1994; Prahalad & Krishnan, 2009; Wenger 2004; Wenger et.al., 2010). Participants are not only dialogue partners for the company; they are also engaged in dialogue on challenges among themselves. In the words of Prahalad & Krishnan (2009, p. 6) we build a 'new house of innovation' by focusing on 'flexible and resilient business processes and focused analytics' based on 'personalized co-created experience' and 'global access to resources and talent'.

A recent Danish/Finish approach can be found in "The new wave of innovation" (FORA et.al, 2009).

ON EPISTEMOLOGY AND BEST AVAILABLE METHOD OF INQUIRY AS INQUIRING SYSTEMS

Inquiring Systems use a combination of personal and organizational inquiring styles (Kienholz, 1998; Courtney et.al, 2001, 2005; Malhotra, 1997) and build on the idea of the learning organization (Argyris & Schön, 1996; Senge, 1995). The methodologies that we use are generative themes in transformative learning (Freire 1970, 1985; McLaren & Leonard, 1993; Méija, 20045; Singh, 2004) and systematic and narrative knowledge enabling (Boisot, 1995, 1998; Boisot et.al, 2007; Boje, 2000; Kurz & Snowden, 2003; Snowden, 2002).

In Table 1 we summarize our frame for participatory design in local and regional spaces.

With the methodologies we also try to handle the self reflecting paradox:

> *"One underlying problem is that of the "self reflecting paradox"; e.g. the content and validity of the scientific method [best available method of inquiry, authors' remark] can only be discovered by the application of the scientific method. Similarly, Systems Design has its own "social reality" through which it perceives that of its client. "Improvement" is bound up with ethics but ethics does not admit the limitation of obligation to one sub-system, therefore improvement requires the recognition of sub-system linkages. Paradoxically, again, the "improver" is himself part of the total system and bears its impress. Implementation (of improvement) meets the paradox that Systems Design on Systems Design is needed to judge the worth of the Systems Design proposal." (Churchman, 1974, p. 451).*

To address this paradox we suggest that the eight methodologies can be used in a non-linear, yet stepwise way. The important message is that all methodologies should be part of participatory innovation, and actual practices should be able to secure and be informed by their philosophical and systemic foundation. In fact only practice - according to pragmatics - can show whether the approach suggested will create worth to society.

EIGHT SYSTEMIC METHODOLOGIES IN PARTICIPATORY INNOVATION

By systemic methodologies we mean that they all taken together form a system of interconnections. One can start the design, innovation and entrepreneurship process using either one methodology knowing very well that the other methodologies must be applied sooner or later. The sequence chosen here is the one we prefer in our work[1], but other sequences are possible.

THE PENTAHELIX MODEL

The model builds on the TrippleHelix Model but is expanded with citizens and NGO's. This can be illustrated as in fig. 1. It is especially useful in processes for design, innovation and entrepreneurship in local and regional development. Thereby the focus also is on cross-disciplinarily and border-crossing processes.

In the model the partners will bring different types of 'capital' into play, as shown in fig. 2.

Thereby we take the user in 'user driven innovation' not just to be representing the market, but as being a collection of co-operative and co-creating partners that together form a knowledge based community of practice.

Fig. 1: PentaHelix Model of co-operation and co-creation. The central position of (city) government is not to be taken as mandatory, rather it is an illustration of the fact that someone among the interest groups must take the initiative. (Adapted from Lindmark et.al. 2009)

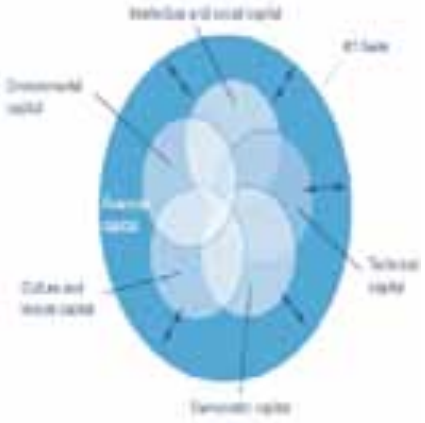

Fig 2: Diversity of capital in the PentaHelix Mod (adapted from Lindmark et.al, 2009)

KNOWLEDGE BASED COMMUNITIES OF PRACTICE (KBCOP)

Knowledge Based Communities of practice (KBCoP) has been approached by economists, technologists and innovation theorists and practitioners, hence from many different perspectives. The concepts and percepts of inquiry and knowledge management indicate that new processes and practices must be based on heterogeneous social networks. Trust building and knowledge sharing between innovation actors are essential. With the parallel processes of globalization and localization, the local and regional availability of inquiring capabilities, knowledge sharing and skills is becoming increasingly important.

The notions of the co-operative innovation networks, co-operative learning networks, co-operative networks of interest and communities of practice in innovation emphasize the interactions and trust relationships between innovation actors to create a learning environment that underpins innovative communities (Gloor, 2009). In addition to the creation of a favorable external innovation environment, the organizational network and innovation capability is also critical for developing innovative networks.

Given the complexity of the diversity of National Innovation System (NIS) and the variety of different local and regional contexts it is hard and unwarranted to describe the development of KBCoP in a single model. This leads to the requirement for academic researchers and innovation theorists to investigate different sources that contribute to innovation in different economic sectors.

It is in this context, that we suggest research AND practice on Knowledge Based Communities of Practice with a strong focus on ICT supported inquiry and knowledge sharing. Thus it is our hypothesis along with Manuel Castells, that the business unit of the future will be the Network. As stated in Manuel Castells (1995-98, Vol. I, p. 198-9): "For the first time in history, the basic unit of economic organization is not a subject, be it individual (such as the entrepreneur or the entrepreneurial family) or collective (such as the capitalist class, the corporation, the state). As I have tried to show, the unit is the network, made up of a variety of subjects and organizations, relentlessly modified as networks adapt to supportive environments and market structures. What glues together these networks? Are there purely instrumental, accidental alliances? It may be so for particular networks, but the networking form of organization must have a cultural dimension of its own. Otherwise, economic activity would be performed in a social, cultural vacuum, a statement that can be sustained by some ultra rationalist economists, but that is fully belied by the historical record. [It] is…[the] 'ethical foundation of the network enterprise' this 'spirit of informationalism.'"

This spirit of informationalism we take to be best expressed by Wenger et.al. in their "Digital Habitats stewarding technology for communities". It can be illustrated as in fig. 3 (Wenger et.al, 2010, p. 162).

The main idea in this kind of KBCoP is to combine a diversity of synchronous ICTs with a diversity of individual and collective participation and reification. So each KBCoP in the network can choose their own mix in such a way that it is possible to extract and analyze knowledge across the KBCoPs.

GENERATIVE THEMES IN TRANSFORMATIVE LEARNING

When we take the EU welfare equation as a starting point it seems that most efforts in user driven innovation has been put on the left side of the equation. But the four themes have to be balanced. It is in this process that the idea of generative themes of Paulo Freire is very helpful. By taking each of these themes to be generative it is possible to balance the equation – and even expand it according to local and regional challenges and needs.

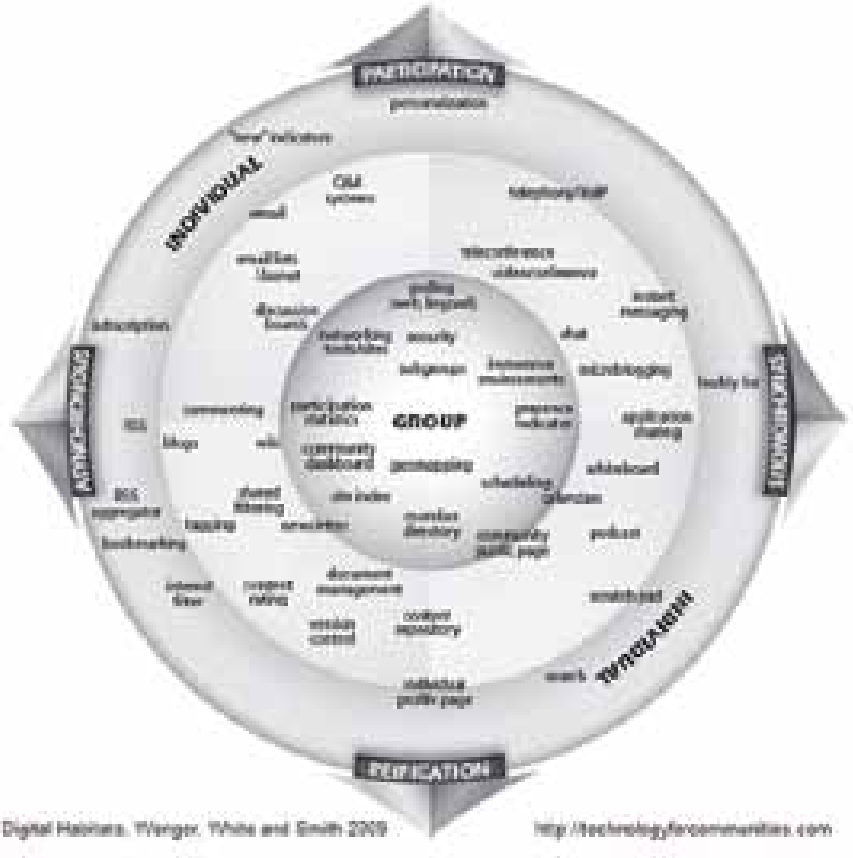

Fig. 3: Potentials in Knowledge Based Communities of Practice (adopted from Wenger et.al, 2010)

However it requires the prevention of knowledge imposition. Paulo Freire uses two different attacks on the problem of imposition of knowledge in his radical educational proposals:

1. an examination of formal aspects of the interactions in which knowledge is produced and/or reproduced - the problem of interactions – here he asks for dialogue.
2. the provision of critical methodologies with which the validity of any proposed knowledge can be questioned - the problem of validity. Here he asks for critical consciousness.

In a similar way, systems thinking aims at preventing knowledge imposition by the use of boundary critique and critical pluralism.

We take these strategies into our methodology by using the principles of transformative learning in the design, innovation and entrepreneurship processes. This implies becoming critically aware of one's own - and others - mental models, belief systems and lifestyles. It also implies that it is not possible to be a user in user driven innovation without engaging oneself – and others - in social and cultural action for innovation.

SOCIAL LEARNING AND NARRATIVES AS KNOWLEDGE ENABLING

Social Learning

According to Max Boisot (1995, 1998) we have to supplement capital and labour with data as essential in the production function. Thereby we have to develop and understand models for economizing on data in the same way as traditional economic theory has economized on capital and labour. Boisot has developed one suggestion for that in what he calls an Information Space. The Information Space consists of three dimensions: coding, abstraction and diffusion (see fig. 4). The value in economizing on data is created in this space through a movement called the Social Learning Cycle. This movement consists of six phases, where new knowledge and thereby new innovation potentials are activated in all three dimensions. It focuses in bring tacit knowing into explicit knowing. The six phases are:

Scanning: identifies threats and opportunities along with patterns herein. It gives insights and potential visions on products, processes, services, markets, cultures etc. It consists of both coded/uncoded and concrete/abstract data.

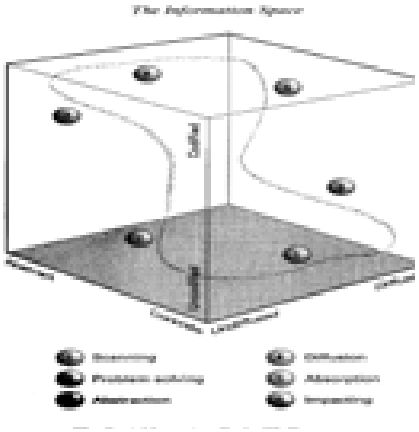

Fig. 4: Information Space and Social Learning Cycle (adapted from Boisot, 1999)

Problem-solving: gives structure and logical connectivity to insights and potential visions. It reduces the uncertainty, but is a risky and conflict laden process, because it often runs counter to well-established beliefs and convictions.

Abstraction: is generalizing on the insights obtained, which involves a reduction to the most essential content of the data. It might end in a suggestion for a new product, process, service, organization, learning process etc.

Diffusion: aims at sharing and/or selling the new insight to a target group (ex. customer, user). This also involves feedback mechanisms from the market.

Absorption: learning of the new insights through practical use, learning-by-doing.

Impacting: embedding in actual behaviour, techniques, organizations, cultures etc.

Fig. 4 shows the ideal Social Learning Cycle according to Boisot (1995, 1998). It also illustrates the cycle as a way of enhancing user driven innovation as it is a Schumpeterian creative destruction process, where user are integrated through the diffusion dimension.

Narratives

Narratives mean stories and storytelling is a fundamental human activity. It is a way of thinking, understanding, being a human. We constantly tell, transform and interpret narratives. They function as a way of organizing our perceptions, experiences, thought and feelings. Stories, myths, excuses, reasons for our actions or non-actions are all part of narratives that may support us in creating visions, insights, overview, meaning and belonging. Both for ourselves and in a wider context.

When we want to create and share knowledge narratives is a possibility and a potential for exchange of huge amounts of data. They are able to handle the exchange of tacit knowing without reducing it to explicit knowing like in the Social Learning Cycle. Therefore the two approaches supplement and complement each other.

When narratives are exchanges among people they both narrate on specific experiences and the context. But the narratives are transformed and interpreted in the communication process, Thereby a sort of co-creation of knowing is established; an ecology of knowledge sharing can be developed.

In organizations that are engaged in networks or base their organizing on informal networks narrative mechanisms will be in focus. These mechanisms cannot be mapped, planned or controlled but have to find their own way of functioning in the design, innovation and entrepreneurship processes. They have to be created and supported based on trust.

Trust functions as the clue that holds the network together. The better they function, the better knowledge sharing may work. This calls for new approaches in collecting and visualizing narratives. Knowledge and Fitness Landscapes are a potential solution.

Value Network Analysis for Regional **Innovation Potentials**

Nova Spivack (ongoing) as well as Davis Mills (2008) have been working with the development of WEB 2.0 and WEB 3.0 philosophies (see below). These approaches create new forms of visualization and interpretations of data and communication in networks.

Fig. 5: Comparison Chart of Business Process, Social Network Analysis, and Value Network Analysis (adapted from http://valuenetworks.com/public/blog/207582).

We use these approaches in the form of Value Network Analysis based on www.valuenetworks.com and Knowledge and Fitness Landscapes based on Oliver & Roos (1999).

In www.valuenetworks.com blog from April 13. 2010 a comparison of business processes, social network analysis and value network analysis is made, see fig. 5.

Business process modelling is well known. More recently social network analysis has been used as a methodology for relating business processes with people involved in order to visualize and analyse patterns in the integration of processes and humans. Value Network Analysis is a solution to that need as it combines the two and at the same time show the value produced in the network of humans and processes.

A recent example of Value Network Analysis can be seen at Value Network Analysis of the Skåne Region's Innovation System, (RIS), Dec. 2009. This shows the connections and communications among the 48 central players in the Regional Innovation System. In this particular case the landscape shows that most of the value creation is on knowledge creation (around 67 %) and the creation of infra-structure (around 26 %). While the communication of validation of the knowledge for the market is 7 % and implementing of innovation into the market is almost 0%. Like in the Skåne Region case we use Value Network Analysis to reveal and support good network patterns of value creation and explicate and support diversity, uncertainties, contradictions and complexities.

Knowledge and Fitness Landscapes

Oliver & Roos (1999) uses complexity theory to unfold their concepts of Knowledge and Fitness landscapes. They develop and discuss these concepts using the metaphor of landscape as an ever-changing picture and understanding of knowledge of individuals and organizations. They write:

> *"From the rolling contours of a species' fitness landscape, using the notion of knowledge potential we can develop an analogy of an individual, community, or organization (actor) in its own "knowledge landscape". In its struggle for survival, an actor will attempt to move to higher and higher points on a knowledge landscape. Like the fitness landscape, the knowledge landscape contains peaks and valleys of varying heights, which will be of differing interest for an actor to climb. However, instead of "fitness", the peaks on an actor's landscape represent knowledge, or given our epistemological stance, potential knowledge. Examples of potential knowledge "peaks" could include signals from competitors, suppliers, customers, consultants, experts, academic institutions, research centres, government agencies, employees and journals. "Valleys" could include sources of obsolete data, such as knowledge of "telex" technology for telecommunications manufacturers. Thus, by definition, knowledge landscapes are unique and private to each actor." (1999, p. 284)*

An illustration of this approach can be seen in fig. 6 based on a beta version of Tianamo (www.tianamo.org). It shows the major themes related to the town of Sønderborg based on a web-crawl on Google. The interesting thing here is, that in the fitness landscape the innovation potential in knowledge where 'we don't know what we don't know' can be found in the valleys, while innovation potential in knowledge where we 'know what we know' can be found in the peaks.

Thus we take the Knowledge and Fitness Landscapes to be able to visualize and guide us in finding innovation potentials in a complex knowledge economy. Thereby we have a possibility to handle the insight put forward by Charles Sanders Peirce in 1902: "a percept cannot be represented in words, and consequently, the first part of thinking cannot be represented by any logical form of argument".

ICT for design, innovation and entrepreneurship

Pyka & Scharnhorst defines innovation in this way (2009, p. 10):

> *"In a more abstract systems theoretical approach, innovation can be understood as a critical event which destabilizes the current state of the system, and opens a new process of self-organization leading to a new stable state."*

Thus innovation can be understood as a critical event diffusion processes that follows models of self-organized criticality which trigger single and overlap-

Fig. 6: Fitness Landscape on Sønderborg, based on www.tianamo.org.

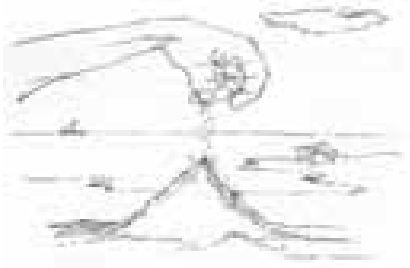

Fig. 7: Innovations as avalanches of data (adapted from Bak, 1995)

ping avalanches. It can be illustrated as avalanches in a sand pile, where the corns of sand are data. Per Bak (1997) has made fig. 7 to illustrate the process. Using this line of thought, design, innovation and entrepreneurship can be taken to be the ability to create the heroic mood in the entrepreneur in such a way that he/she may handle the essential problem in entrepreneurship: having more ambitions than resources available. A help in this process can be to be part of creating, collecting and diffusing knowledge in cross- and trans-disciplinary networks. In a complex global knowledge economy this cannot be done without an enabling ICT. This enabling can take the form of two processes:

- Identification of design-, innovation- and entrepreneurship processes[2]
- Monitorering of design-, innovation- og entrepreneuship processes[3]

Through these two processes a comprehensive theoretical framework can be created for the ICT support of design, innovation and entrepreneurship. This is done by aiming at connecting verbalizing and visualizing of perceptions.

We are used to verbalize data, information and knowledge, but the amount of data that have to be verbalized surmounts our capacities. We need a supplement of 'perceptual zing' and 'visualizing' in order to support informational connectivity and social connectivity.

Novo Spivack (ongoing) and Davis Mills (2008)[4] have used the combination of network thinking and ICT to document tendencies and potentials for a knowledge based economy, where informational and social connectivity (cohesion) walk hand in hand. This can be shown as in fig. 8.

The WEB 2.0-teknologies have created the social interaction possibilities. The movement from WEB 2.0 to WEB 3.0 calls for a semantic web, which is in its infancy. But as the figure shows the movement is happening while we write and speak. We 'just' need to create experiments that may support a joint effort between theory and practice.

Strategy as Guiding Principles for Action

So, action is essential, as experience presupposes experiment as Cowan (1959) states. Such experiments turn us back to the PentaHelix Model in order to create local and regional knowledge based communities of practice that can transform university knowledge into concrete practices in design, innovation and entrepreneurship. Efforts in Denmark like knowledge pilots, innovation agents, innovation consortia, innovation clusters etc. all points in that direction as well as user driven innovation, democratizing innovation, open innovation, employee driven innovation etc.

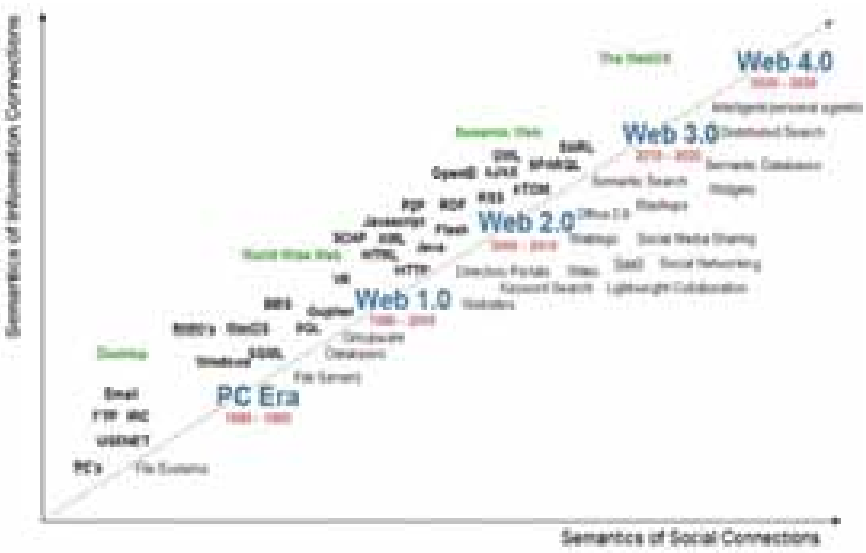

Fig. 8: Developments in WEB technologies

Design-, innovation- and entrepreneurship processes can support local, regional, national and international priorities for growth and co-operative advantages. However, in order to bring our methodologies together in practice we need strategy as guiding principles for action. Such guiding principles can be developed from narratives, emotional content and heuristic reasoning as suggested by Oliver & Roos, 2005).

As we take this to be evident from our own practice we suggest the following eight guiding principles based on Stacey (1992) and Aasen (2009):

- Developing a new understanding of control and management
- Designing appropriate uses of power
- Establishing self-organizing learning teams
- Developing multiple cultures
- Taking risks
- Improving group learning skills
- Creating resource slack
- Create permanent dialogue on private and public identity formation, meaning of life and work, power relations in cooperation and good leadership.

REFLECTION

First of all: Imagine. Imagine that the words of Kant on enlightenment in 1784 may come true: Sapere Aude! "Dare to be wise" or " Have courage to use your own reason." The vision that it is possible to combine economic growth, cooperative advantage, social cohesion and sustainable development can come true. It is our contention that this can best be achieved through the self-organized mobilization of local and regional knowledge in close connection with research and education at all levels. For that we need philosophy, systems thinking, and methodologies for participatory innovation in complex adaptive systems. It is possible to use diversity, uncertainty, contradictions and complexities for design, innovation and entrepreneurship.

We have suggested eight methodologies for that vision in order to do just that: handle innovation in spaces where we don't know what we don't know. The

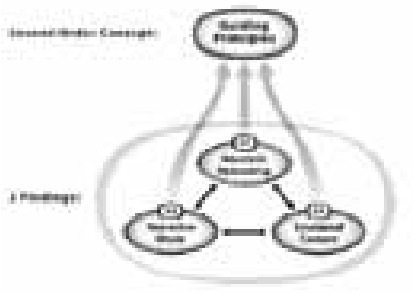

Fig. 9: Theoretical Underpinnings of Guiding Principles (adapted from Oliver & Roos, 2009)

process starts by the initiative of dedicated citizens, who engage companies, public institutions, universities, NGO's, citizens in the local or regional area according to the PentaHelix model. Together they form communities of practice in order to create knowledge for innovation on themes of their choice. Then they create knowledge as a combination of their own practical knowledge and universal knowledge from universities. The knowledge created is both on social networks and the subject matter according to themes chosen. Both types of knowledge are visualized in order to handle the complexity involved and in order to support the creation of innovation potentials. In order to support the over all process and the implementation ICT is used throughout as a way of balancing resources put into handling information and handling social connections. Finally the innovation potentials are put into practice – or stopped – depending upon to the local and regional strategies for development. These strategies are expressed in guiding principles, which – coming back to the PentaHelix model – are developed by the local and regional interests.

We have presented the theories we propose for participatory design, innovation and entrepreneurship. However, we recognize that we do not succeed fully with a theoretical integration. Our next step is practice – applying the methodologies in collaborative projects. This will allow us to unfold the next steps in a coherent theoretical frame.

NOTES

[1] We use this approach in our education in Design, Innovation and Entrepreneurship at Copenhagen Business School (around 200 students attending each year at the B.Sc. level); in MARV – Mobilizing Regional Knowing, supported by the four local counties in Sønderjylland, Denmark: Aabenraa, Haderslev, Sønderborg and Tønder.; in an Öresund project on 'Local Growth – Global Connection' in Landskrona, Sweden supported by Tillväxtverket and Landskrona County; in EULASUR - Understanding Innovation in Nano-technologies, supported by EU 7.th. Framework Programme Project between Europe and Latin America, involving universities, public authorities and companies in Southern Europe and Latin-America).

[2] See experiences of 15 years of experiments in the KUBUS innovation and entrepreneurship education at Copenhagen Business School (CIE, 2009).

[3] See the methodologies developed at Magdeburg Universitet by Kühnle & Wagenhaus (2008).

[4] Based on Nova Spivack: www.radarnetworks.com and Davis Mills: WEB 3.0 Technologies and Markets, 2008

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A CONCEPTUAL APPROACH TO FACILITATE JOINT CREATION INTERACTIONS OF PRODUCT DESIGN PROCESSES

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ABSTRACT

Collective knowledge structures for co-creation can be achieved by a process of collaborative argumentation, organized in knowledge structures, and represented by knowledge models. In previous empirical tests carried out to collect and select innovative ideas from users and employees, an aggregation of ideas of individual contributions, but not a true collaborative creation based on those ideas, was observed. In our approach we propose a process for the collaborative construction of arguments, and a knowledge structure based on the integration of arguments in Knowledge Component Models and Knowledge Metamodels. Finally, we conclude that the work carried out to understand the interactions that take place in the social construction of knowledge structures helps us to comprehend co-creation and goes further than the simple collection of ideas, contributing to a quantity reduction of unconnected information, to the improvement of the quality of proposals, and to understand, not only *what* is proposed by users, but also *why* those proposals are important to them.

INTRODUCTION

Co-creation has been defined as a social process of collaboration between producers and users, in order to generate value for users (Humphreys et al. 2009). As a social process, co-creation constructs knowledge through social interaction. Social Constructionism (Berger & Luckmann 1966) proposes that humans interacting together create mental representations that become their knowledge of reality. Co-creation as a collaborative process between producers and users generates a special opportunity to construct knowledge structures, such as arguments, by means of Collaborative Argumentation (Andriessen 2006). Finally, co-creation that generates value for users requires understanding the components of user value in order to improve the value proposition offered by producers.

Based on a traditional definition of knowledge (Davenport & Prusak 2000) and developments in social knowledge creation (Berger & Luckmann 1966), in the context of this article, knowledge is defined as a combination of framed experience, socially constructed reality, values, contextual information, and expert insight that is applied in the mind of the person that possesses the knowledge. This knowledge can be jointly created between producers and users.

Our research problem is to understand the interactions that take place in the social construction of knowledge structures between producers and users. In our approach we propose a process for the collaborative construction of arguments. In this process, a group of human agents work together, using Toulmin's Argument Model (Toulmin 1958), to represent their knowledge about a specific subject. Additionally, using Henderson and Clark's model (Henderson & Clark 1990) we propose another two types of knowledge models to be constructed by the group of human agents. The first one is the Knowledge Component Model, defined as the knowledge structure of the core arguments, and the way in which they are implemented in a particular component. The second one is the Knowledge Metamodel, defined as the knowledge structure of the ways in which the Knowledge Component Models "Are integrated and linked together into a coherent whole" (Henderson and Clark 1990).

The conceptual approach presented in this paper contributes mainly to: (1) A reduction in the quantity of un-

connected information and to the improvement of the quality of proposals obtained from joint creation activities; this is achieved by incorporating the concepts of knowledge structures and knowledge integration; (2) Understanding not only what is proposed by a user, but also why that proposal is important to users; this is achieved by the incorporation of the argument as a basic unit of the knowledge structures. Previous literature has not examined these elements regarding co-creation processes.

Our research methodology begins with the results of real experience, presented in the context section. We begin with a concise review of the existing co-creation literature, which provides insight into three methods in which users participate in product development. The objective research is then based on the findings on the literature review. Finally, a conceptual model is proposed and conceptually validated. We include directions for further work, particularly the validation and implementation of the model, based on empirical tests.

CONTEXT

Before to propose the conceptual model developed in this study, we examine the real applicability of the practice of producer-user relationship through information collected by a trial project of a telecommunication company intended to foster innovative ideas from costumers.

The data collection process used in the company's trial project comprised the following phases: (1) Focus selection, (2) Invitation to participate, (3) Submission of ideas related to the focus of the trials, (4) Commenting on submitted ideas in order to generate interactions that contribute to improving submissions, (5) Improvement of ideas to take account of comments made by other participants, and (6) Vote for favorite ideas. An adapted Internet Toolkit (Piller & Walcher 2006) was used to support the process. Two trials were active for one month, the selection of winning ideas was performed by a committee in the first test, and by participants voting in the second test.

The following conclusions emerged from the trial project: (1) In a month, the number of ideas exceeded by 300% the results of a year using the company's traditional method, which allows the submission of ideas on diverse topics, followed by annual selection by a special committee. This improvement is associated with the focus on specific topics instead of the diverse topics of the traditional method, and to the short lapse of time, which incentivizes user inputs. (2) The principal motivation of participants is winning the contest. They prefer to contribute new ideas instead of working with ideas already submitted. As a consequence, joint work between participants was scarce, and contributions from other people in the form of comments were not used to improve proposals. (3) Selection of winning ideas through mechanisms such as selection committee and direct voting by participants raised doubts about the quality of the selection procedure. Piller and Walcher (2006) identified that users tend to make a selection based on their needs, while experts make a selection with more technical emphasis. Also, the quantity of ideas makes it difficult to review them all before voting or selecting. (4) The information contained in the non-winning ideas is lost, the large quantity of ideas makes it difficult to consider them all, as a lot of company resources would be required to do so.

From a producer perspective, a better option is an approach that produces more complete and elaborated concepts, integrating different proposals, instead of a large number of disperse and unconnected ideas. It is expected that collaborative work will achieve better results than aggregation of individual work. Information about user value is expected to be collected from the concepts proposed and from interactions between participants. Another aim is the identification of user expectations that can be addressed by the producer.

Our research methodology begins with the analysis of the results of the real experience described in the previous paragraphs. A literature review was carried out on co-creation approaches and concepts, and three methods in which users participate in product development. Then the research problem was formulated, based on the findings of the literature review. Next, the conceptual model described in this paper was proposed. Further work to be conducted includes the continued development and testing of the model, and the execution of empirical tests.

LITERATURE REVIEW

CO-CREATION APROACHES

In the book *The Third Wave* Alvin Toffler (1980) introduces the concept of "Prosumer". The Prosumer is a user that is willing to produce for his own consumption when available products do not address his needs and requirements. The co-creation concept integrates the work of the Prosumer in

Approach	Source	User involvement
Mass Customization	(Davis 1987)	User participation in personalization of products, taking advantage of mass production technology
Value Co-production	(Ramírez 1999)	User participation in producer's value chain, performing activities previously reserved for the producer
Marketing Co-creation	(Sheth et al. 2000)	User participation in the definition of marketing mix fields
Knowledge Co-creation	(Sawhney & Prandelli 2000)	User-producer interactions as a source of knowledge generation
Value (Experience) Co-creation	(Prahalad & Ramaswamy 2000)	Users and producer creation of valuable and personalized experience
Co-design	(Sanders & Stappers 2008)	User participation in design activities.
Crowdsourcing	(Howe 2006)	User communities perform duties previously restricted to the producer
Co-innovation	(Mannervik & Ramírez 2007)	User participation in innovation cycle activities.

Table 1: Co-creation approaches.

product development activities. For example, Erik Von Hippel (1986) characterizes a type of Prosumer called lead user, and proposes ToolKits (von Hippel 2001) as the tools to work with lead users in activities intended to identify future needs of normal users.

Other co-creation approaches presented in Table 1 illustrate different conceptualizations of user involvement in joint creation activities, from idea generation in co-innovation (Mannervik & Ramírez 2007), to experiences with products or services in experience co-creation (Prahalad & Ramaswamy 2000). This shows the need for further work to clarify the meaning of the co-creation concept and the focus of these user-producer interactions. Nevertheless, we can associate co-creation approaches to specific stages of the innovation chain. We also identify the need to work with knowledge in all of these stages.

METHODS IN WHICH USERS PARTICIPATE IN PRODUCT DEVELOPMENT

Three methods described in the scientific literature were studied to identify user participation. One of the methods studied is open source projects. Feller and Fitzgerald (2000) describe this projects method as a massive and parallel code development and debugging that involves decentralized, cooperative and free contributions from individual developers.

Name	Open Source (S. Sharma et al. 2002)
Description	Open source software development process
Participants	Developers and users
Steps	(1) Problem discovery
	(2) Finding volunteers for tasks
	(3) Solution Identification
	(4). Code development and testing
	(5) Code change review
	(6) Code commit and documentation
	(7) Release management
Tools	E-mail, Newsgroups, CVS
User participation	Users can participate in each step, according to their capacities and reputation. When different options are available, a central group makes a selection.

Table 2: Open Source Method.

Open source projects begin with a personal idea or need, "A personal itch" (Raymond 1999). Work is not assigned, but is taken and implemented by volunteers, and there is no project plan, schedule or list of deliverables (Mockus et al. 2000). There is no explicit design at the system level, nor a detailed design; code developing is what encourages participants' collaboration (Vixie 1999).

Piller and Walcher (2006) propose a method and a web-based toolkit for collecting ideas from users for product development. These authors identify several elements that require further attention by administrators and researchers, including: Tool usability, interaction methods, idea pre-screening methods, user involvement in evaluation of ideas, procedures for idea formulation, and tools for collaborative creation of ideas.

Another method has been developed by The Virtual Innovation in Construction project, Its goal is to create an information and communications technologies "ICT supported methodology VICMET to involve building end user in a creative innovation process together with building designers, to capture and formulate end-user needs and requirements on buildings and their functionality" (Christiansson et al. 2008). A conclusion of this work establishes that "There is a need to further develop ontologies, functional building descriptions, and sequential methodologies to support a creative design in an open innovation environment" (Christiansson et al. 2008).

It is noted that in each of the methods described in Tables 2, 3 and 4, where there are different options, a designated group takes a decision or makes a final selection. There is a lack of processes that allows u sers to work on: (1) Integration of different contributions, (2) creation of new and better options when different perspectives between the user and producer are present, (3) idea formulation, and (4) user participation in evaluation of ideas. These important processes in joint creation ac-

Name	Idea Collection (Piller & Walcher 2006)
Description	Method to collect product development ideas from users
Participants	Users and company experts
Steps	(1) Interviews with managers and experts
	(2) Prototype
	(3) Tests
	(4) Selection of participants
	(5) Contribution of ideas
	(6) Evaluation of ideas by a group of company experts
	(7) Awards.
Tools	Toolkit
User participation	User takes part in submission of ideas. Idea selection is made by a group of company experts.

Table 3: Idea Collection Method.

Name	Vicmet (Christiansson et al. 2008)
Description	Virtual innovation in construction with user participation
Participants	Designers and users
Steps	(1) Anthropology and applied ethnography
	(2) Context selection
	(3) Functional building systems design
	(4) Functional building subsystems consolidation
	(5) Component building systems solutions
	(6) Component building systems requirements
	(7) Building component systems design solution
	(8) Construction
	(9) Requirements fulfillment evaluation
Tools	VIC SPACE Platform
User participation	Users don't participate in functional building subsystems consolidation.

Table 4: Vicmet Method.

tivities need further development, and the work on collective construction of knowledge structures represents an advance in that direction.

USER VALUE

Co-creation "is initiated by the firm to generate value for customers" (Humphreys et al. 2009). Therefore, a knowledge structure describing user value is the first objective of the application of our approach. The components of user value are described in the following paragraphs.

One of the main figures of scholasticism, Pierre Olivi (1248-98), proposes three fundamental sources of value "Scarcity (a relative quantity), utility (an objective want- satisfying power), and desirability (a subjective desire to gratify satisfactions)" (cited in Letiche 1969). Adam Smith (1776) describes two different meanings of the concept of value. In his theory of value, Value in Use was referred to as "the utility of some particular object", and Value in Exchange was defined as "the power of purchasing other goods which the possession of that object conveys". Throughout the industrial revolution, economic and marketing practices followed the concept of value in exchange, leading to the prevalence of Product Centered Paradigm (Vargo & Lusch 2004). The advent of a services economy encountered difficulties with Product Centered Paradigm, so Services Centered Paradigm based on Value in Use emerged; in the new paradigm "Goods are best viewed as distribution mechanisms for services, or the provision of satisfaction for higher-order needs" (Vargo & Lusch 2004).

Addis and Holbrook (2001) analyze two types of features of a product; utilitarian features provide Value in Use or Utilitarian Value, and hedonic features provide Experience or Hedonic Value. These types of value remind us of the sources of value proposed by Pierre Olivi; utility and desirability.

CONSTRUCTION AND INTEGRATION OF KNOWLEDGE STRUCTURES

There are three major schools of thought about knowledge creation. From the point of view of rationalism, knowledge is discovered by reasoning. On the other hand, empiricism emphasizes that knowledge comes from experience. And there are combinations of rationalism and empiricism, such as logical positivism that recognizes formal knowledge and empirical knowledge (Hjørland 2005).

Other perspectives challenge traditional thinking about knowledge creation. From a social perspective, knowledge is constructed through social interaction, Symbolic Interactionism (Mead 1934) places a special emphasis on communicative interactions, *meaning* is created "with the adjustment to one another of the acts of different human individuals within the human social process" (Mead 1934). Social Constructionism (Berger & Luckmann 1966) proposes that humans interacting together create mental representations that become their knowledge of reality; the process is described as three moments: (1) Externalization: The rapid outflow of human physical and mental activity into the world; (2) Objectivation: The experience of the world, the reality, created by externalization, and (3) Internalization: In the course of socialization, the world as it is experienced is internalized and interpreted (Berger & Luckmann 1966). From the perspective of psychology, social interactions allow the acquisition of knowledge by the individual (Vygotsky 1934).

Once created, knowledge is organized in knowledge structures or schemes, like scripts, goals and plans (Adelson & Black 1986). These knowledge structures can be represented using knowledge models, and can be used to work on, and share knowledge with other humans during social interactions, following the moments of externalization, objectivation, and internalization. This collective construction of knowledge is achieved by a process of collaborative argumentation (Andriessen 2006) intended to improve the arguments of others.

In our approach, the first knowledge representation to be constructed is an argument. Arguments have been widely used for knowledge representation (Bentahar et al. 2010), knowledge representation for problem solving (Clark 1990), and knowledge representation for agreement seeking (Morge & Routier 2007). Using Toulmin's Argument Model (Toulmin 1958), different participants collaborate to construct arguments using their knowledge

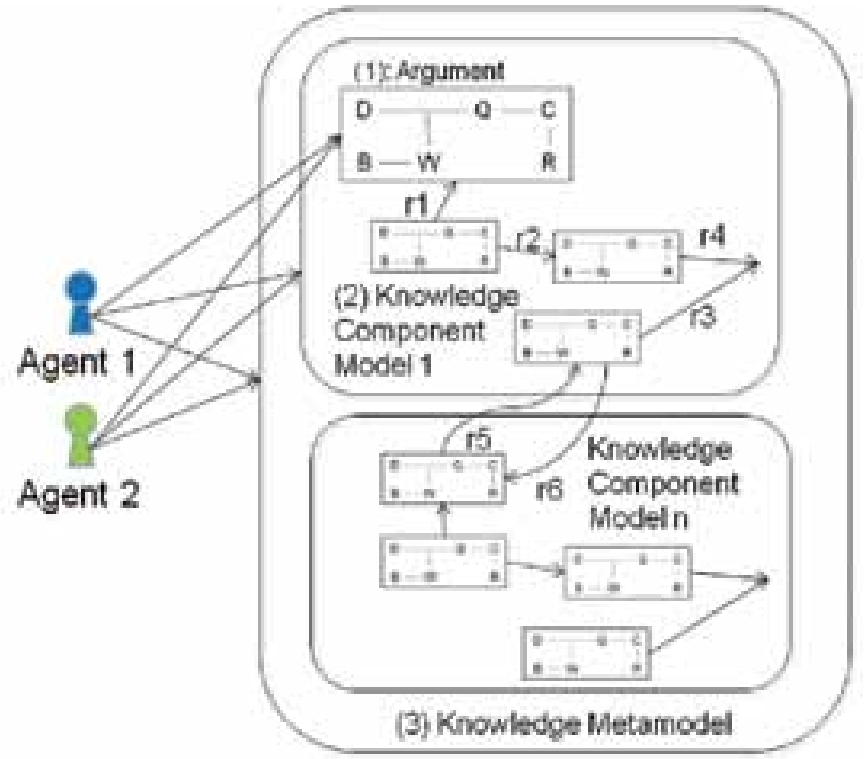

Figure 1: Knowledge Structure Construction Process: (1) Argument Construction; (2) Using a set of arguments a Knowledge Component Model is Constructed; (3) Using a set of Knowledge Component Models, a Knowledge Metamodel is constructed.

Figure 2: Components of the Social construction of Knowledge Structures.

about a specific subject.

A basic argument model contains three components. (1) Claim: A statement or proposition about the subject under construction. This is the equivalent of an idea in a traditional idea contest, but here it also represents other elements of a knowledge structure, such as, a relationship between two statements or propositions (r1 ... r6 in Figure 1). (2) Data: Evidence and facts that support the claim; and (3) Warrant: The link between the data and the claim, stating how the claim has been derived from the data. A complete argument model includes three more components: (4) Backing: Statistics, experiences, research that support or confirms the warrant; (5) Rebuttal: Conditions or situations where the statement is not appropriate, pertinent or important; (6) Qualifier: An indication of the force or confidence of the claim. Components 2 to 6 include information about user context, preferences, experiences, and user value expectations provided by users. And information about producer resources, capacities, value offers, and assumptions about user preferences provided by producer employees. An interaction protocol (Morge 2005) guides participants through the process of argument construction, facilitating the process and motivating interactions.

Using Henderson and Clark's model (Henderson and Clark 1990) we propose another two types of knowledge models to be constructed by the group of human agents; see Figure 2. The first one is the Knowledge Component Model, defined as the knowledge structure of the core arguments and the way in which they are implemented in a particular component. Using a set of arguments, a Knowledge Component Model is constructed, identifying relations between arguments. An interaction protocol guides participants through the process of Knowledge Component Model construction. The second knowledge model to be constructed is the Knowledge Metamodel, defined as the knowledge structure of the ways in which the Knowledge Component Models are integrated and linked together into a coherent whole (Henderson and Clark 1990). The Knowledge Metamodel is constructed by the identification of the relations between Knowledge Component Models and arguments. Again, an interaction protocol guides the users through the process of Knowledge Metamodel Construction, also known as the Knowledge Integration Process. Based on Linn (2000) definition, the knowledge integration process is described as the process of linking, connecting, distinguishing, organizing, and structuring Knowledge Component Models in a Knowledge Metamodel.

Important knowledge creation opportunities take place when different perspectives come into view in argument construction activities or in knowledge integration activities. These opportunities require the formulation of a new argument that represents a better perspective for both the users and the producer.

CONCLUSIONS

The conceptualization and practice of co-creation has been advancing due to the work of various authors and companies. Different options for co-creative work between users and producers are still under development, with a variety of enabling aspects requiring special attention. The literature review revealed the need to develop interaction methods, procedures for idea formulation, and procedures for user involvement in idea prescreening and evaluation. It is noted that in each of the methods described, where there are different options, a designated group takes a decision or makes a final selection. There is a lack of processes that allow users to work on the integration of different contributions and the creation of new and better options when there are different perspectives between users and producers.

A co-creation definition involves the concepts of social interaction, and collaboration. Social interaction is an important source of knowledge for the individual and society and contributes to creation of reality. Collaboration, and specifically collaborative argumentation, facilitates the construction of knowledge structures. Based on these concepts, social construction using collaborative argumentation, interaction protocols and knowledge integration processes can contribute to co-creation processes by facilitating the interactions of participants in the construction of knowledge structures. The knowledge structures composed of arguments, Knowledge Component Models, and a Knowledge Metamodel can be used to describe a co-created object or concept required in product design processes; for example, knowledge structures of user value.

This paper contributes to the concept and practice of co-creation with a conceptual approach that facilitates: (1) A quantity reduction of unconnected information and the improvement of the quality of proposals obtained from joint creation activities; this is achieved by incorporating the concepts of knowledge structures and knowledge integration, (2) Understanding, not only *what* is proposed by a user, but also *why* that proposal is important to users; this is achieved by the incorporation of the argument as a basic unit of the knowledge structures. (3) Facilitating interactions between participants by proposing the incorporation of interaction protocols. These elements were absent from the literature we reviewed about co-creation.

Further work includes the detailed specification of the model to be tested and the execution of empirical tests of the proposed approach using human agents, in order to identify the impact of this approach compared to current practice. This approach also needs to be applied to the different stages of the innovation chain that require knowledge from users.

Co-creation with large groups in a virtual environment would require other elements, including norms, conventions, and motivation. Further exploration of mechanisms that address these issues, such as the reputation system proposed by Muller (2006), is also required.

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THREE MODELS FOR TRANSFORMING KNOWLEDGE CONTROL/SHARING FOR CO-INNOVATION

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ABSTRACT

Despite considerable exuberance about the value-creation potential of co-innovation, some findings expose a problematic 'darker side.' Without a transformation of the knowledge control/sharing approach characteristic of closed innovation some analysts suggest that co-innovation in unlikely to be successful. Our exploratory study was designed to draw on intangibles management perspectives in efforts to answer the research question: *Why are some firms able to implement effective intangibles-based approaches for transforming knowledge control/sharing for innovation with external stakeholders while others are not?* This work contributes to the design research field through providing a more detailed and nuanced view of the knowledge control/sharing transformation process with its 'models of organizing for participatory innovation' centered on human capital, structural capital and relational capital.

INTRODUCTION

With high-profile multinationals such as P&G and IBM eulogizing about their innovation successes based on open collaboration (e.g., Gabor, 2009; Sakkab and Huston, 2007; Huston and Sakkab, 2006), many firms are rushing to embrace this approach. Yet open innovation has proven to be little more than a "seductive mirage" leading to disappointment and frustration in many cases (Hagel and Brown, 2008: 39).

Analyses suggest that persistence of traditional approaches to knowledge control and sharing is a major barrier to the introduction of open collaboration; some studies have concluded that organizations will not be successful in transforming the innovation process from one that is closed and within-company to one that is open and includes external stakeholders without "deep changes in the way that knowledge is controlled and shared" (Gabor, 2009: 7). Because success stories rarely include detailed insights on the trajectory from initial idea inception to final market entry, we have limited understanding of strategies that firms may adopt to help bring about this fundamental transformation process.

We approach the task of organizing for participatory innovation from the viewpoint of strategies to mobilize intangible resources. The research question that has shaped our study is as follows: *Why are some firms able to implement effective intangibles-based approaches to transform knowledge control/sharing for innovation with external stakeholders while others are not?* The goal of this research is to undertake a small-scale exploratory assessment of the 'front end' of co-innovation with external stakeholders based on three large companies operating in highly distinctive manufacturing sectors with dramatically different operating conditions to capture a 'model' of what they had done. In our view, the models uncovered could provide an appropriate starting point for much

larger scale studies that would offer constructive insights on both successful and unsuccessful applications of these models and also identify other alternative models.

Our analysis drew on the literature on intangibles management in addition to open innovation and stakeholder engagement sources for one specific reason: we contend that this literature provides valuable insights on the drivers and barriers related to value-creation that would include fundamental changes to knowledge control and sharing. Intangibles have been defined in a variety of ways, but they are generally regarded as sources of value often not represented in any way on corporate balance sheets (e.g., DTI, 2001). In the past, organizations have not typically developed intangible assets in a deliberate and systematic way. Today organizational managers are becoming ever more aware that these assets, given appropriate levels of investment and maintenance, may help to unlock sources of competitive advantage at present and in the future. What is the explanation for this superior competitive advantage? One explanation is that these resources can offer significantly enhanced capacity to collaborate. Collaboration can spur the creativity that is a vital driver of sustainable business performance (Nidumolu et al., 2009).

We conclude that our work is an essential first step in the design and implementation of a meaningful research agenda on effectively introducing a participatory co-innovation process. In all three cases studied we found that the company approached the matter of organizing for open innovation in a unique manner, a finding that led us to conclude that there were at least three potentially effective models for co-innovation with external stakeholders.

This paper is organized in six sections. The next section provides a synthesis of the key aspects of three bodies of literature relevant for enhanced understanding of the co-innovation process and the subsequent section presents the data and methods used in the study. A section that summarizes the most relevant features of the three companies studied follows. The final sections of the paper provide discussion on the findings and concluding comments.

LITERATURE AND THEORY

Three streams of literature are brought together to provide insights on co-innovation process of participatory innovation – literature on open innovation, literature on stakeholder engagement and literature on intangibles management. Key findings from each body of literature are summarized below.

OPEN INNOVATION

The literature on open innovation highlights the barriers and drivers to introducing 'outsiders' from beyond the firm's boundaries to the innovation process. In his book *Open innovation* Henry Chesbrough (2003) has observed that "open innovation" approaches have made the entire technology/marketing pipeline open to the inflow and outflow of ideas, a dramatic change from the closed pipeline approaches in which R&D was conducted entirely within a company. As Mark Myers, the former Senior Vice-President, Research & Technology, at Xerox Corporation, and today a Senior Fellow at the Wharton School's Emerging Technologies Management Research Program has remarked: "Great research labs do not operate on the basis of secrecy. Great research labs operate on the basis of openness that enables the exchange of ideas" (Myers, 2001: 5). C.K. Prahalad argued that the real impediment to co-creating unique value with customers was the traditional firm-centric system of value creation and the old established ways of thinking among the management community. To him the real challenge appeared to be in the 'forgetting' curve – not in the learning curve. In his view consumers are ready for this change, but companies are not (Prahalad and Ramaswamy, 2004). In a report by The Economist Intelligence Unit on R&D in a global growth economy, customer collaboration was regarded as highly significant in gaining initial customer buy-in, often a crucial factor in validating technology early in the innovation process (The Economist Intelligence Unit, 2004: 10).

STAKEHOLDER ENGAGEMENT

From the literature on stakeholder engagement we make several observations that have implications for our study of co-innovation. Very often it appears that stakeholder engagement, defined as "the process of seeking stakeholder views on their relationship with an organisation in a way that may realistically be expected to elicit them" (ISEA, 1999: 91), is addressed from a highly theoretical perspective, despite considerable attention from academics and practitioners in recent years (Owen et al., 2001). Grayson and Hodges speak about the "considerable gap" between corporate rhetoric about CSR and actual practices that continue to exist because of difficulties in making practices fully operational" (Grayson and Hodges, 2004). Therefore, companies are left with little guidance when they try to translate the abstract concept of stakeholder engagement into practice. There has been a call for research that provides an analysis of how companies can actually introduce stakeholder engagement into practice (Baldvinsdottir et al., 2010).

INTANGIBLES MANAGEMENT

The literature that focuses on the management of intangible resources often is associated with the subject of value creation – companies realizing their full potential (DTI, 2001). Traditional financial statements provide an historical accounting of an organization's tangible assets – its cash, land, buildings, equipment and other balance-sheet items. Because intangible assets are much less frequently featured in financial reports they are often said to represent the 'hidden' values of organizations. Intangibles are typically not given systematic attention in management and corporate planning. As a result, these assets may be under-utilized or totally ignored. Without a clear understanding of how a company's intangible assets operate as value-drivers, under pressure from an increasingly globalized economy, managers may not effectively capture the value that these resources can offer.

Intellectual capital has been described as "a resource and a capability for action based in knowledge and knowing" (Nahapiet and Ghoshal, 1998: 245) that is created through two specific processes – combination and exchange. The process of combination involves bringing together previously unconnected elements or by combining previously connected elements in a novel way and the process of exchange occurs through social interaction and joint activity (ibid, 1998: 248).

Intangible resources are classified variously, but essentially the classifications recognize that these resources can be treated as forms of capital. One common classification of intellectual capital involves division into three types: human capital, structural capital, and relational capital (Bontis, 1999; Johnson, 1999). *Human capital* has been defined as the summation of knowledge, skills, innovation, and capabilities of employees to reach goals (Sackman et al., 1989; Schultz, 1961) and, as such, can be regarded as the source of revolution and innovation for organizations, including employee innovativeness, attitude, wisdom, experience and capabilities (Grantham and Nichols, 1997). Human capital is embedded in employees and not in their organizations and, as a consequence, can be expropriated by employees leaving the company (Miller and Wurzburg, 1995). Unlike human capital, *structural capital* is embedded in organizations and cannot be taken away by employees. It has been defined as the stocks of patents, trademarks, hardware, software, databases, organizational culture, and organizational capabilities within an organization (Edvinsson and Malone, 1997; Roos and Roos, 1997). Embedded in organizations, structural capital provides the supportive infrastructure of human capital (Bontis, 1999). The third category is *relational capital*, which has been defined as the summation of relationships including customer loyalty, goodwill, trust, etc., with company suppliers, channels, customers, and partners (Bontis, 1999; Johnson, 1999).

The generally recognized function of capital is produce wealth traditionally based on cash and other tangible physical assets such as land, buildings and equipment, but more recently includes intangible assets such as relationships and knowledge, especially in knowledge-intensive firms that are increasing in number around the globe at present. Company managers can make choices about the investments that they make in intangible capital – in human capital, in structural capital and in relational capital, each of which has unique benefits. To many practitioners and researchers intangibles have fundamentally changed the way in which organizations are managed for one main reason – they can facilitate greater effectiveness in creativity and innovation, knowledge leveraging and enhanced learning as well as heightened commitment and involvement and greater flexibility and adaptability among personnel. In other words, intangibles are at the heart of competitive advantage.

DATA AND METHODS

This exploratory research study follows a qualitative approach based on the use of multiple case comparison methodology. The main feature of this approach is its investigation of phenomena in their natural settings according to Miles and Huberman (1994: 10) who have advocated the use of qualitative data as "the best strategy for discovery, exploring a new area, developing hypotheses." O'Connor (1998) and others (e.g., Lynn et al., 1996; Veryzer, 1998; McDermott and Handfield, 2000) have used qualitative data analysis in multiple case comparisons for their research on breakthrough innovation because of their strong interest in addressing questions about how and why a particular phenomenon in a contemporary set of events behaves in certain ways.

To provide us with an empirical foundation for this research we selected three Italian success stories in diverse areas of manufacturing, each of which had documented experience of moving to a more open approach to innovation. The first organization selected for analysis was Dompè, a company that has long focused its innovation efforts on developing innovative drugs for treating diseases without any cure and that plays a leading role in Italy in terms of biotechnological drugs on the market and number of patients treated. The second organization selected for analysis was Finmeccanica SpA, an Italian conglomerate comprised of 25 companies that is the largest high-tech industrial group in Italy. The company has offices in over 100 countries and is partially owned by the Italian government, which holds about 30% of Finmeccanica's shares. It is one of the world's leading groups in the fields of helicopters and defence electronics and is the European leader for satellite and space services as well as having considerable know-how and production capacity in the energy and transport fields. The third organization selected for analysis was Ferrari, the iconic Italian motoring brand that has stood for excellence in technology and design for over 55 years. It attaches the excitement of Formula One technology and lifestyle to exclusive sports cars that deliver both technologically advanced automotive solutions and highly sophisticated image-building.

A further attraction to the use of multiple cases is the additional robustness in the research design that comes from the examination of the phenomenon in more than one setting (O'Conner, 1998). Case study research, by comparison with surveys or secondary sources, has some distinct advantages, in large part as a consequence of the direct contact with founders, managers and others actively involved in the activity under study. Interviews can allow the opportunity to continue questioning on issues of interest and on matters of clarification; in addition, they can provide greater insight on how and why particular steps were taken (Veryzer, 1998).

The number of companies was limited to three to allow for comparability of findings without creating an unmanageable volume of data. Given that this is exploratory research it seemed appropriate to use a small sample size and to subject this small sample to in-depth questioning on a relatively narrow facet of the innovation process. The logic of selecting three unrelated manufacturing sector companies is that maximizing the differences among cases makes it possible to control for idiosyncratic influences in each case and, as a consequence, it is argued that diversity establishes a basis for generalizations from a small sample (Lynn et al., 1996: 12). Each of the three examples had an interesting angle relative to open innovation – Dompè represents the pharmaceutical industry that is notoriously IP-conscious, Finmeccanica represents a very large conglomerate with unrelated operations that make intensive knowledge-sharing difficult and Ferrari represents one of the world's very high-profile brands with long-standing and highly effective customer relationships that may not appear to want or, in fact, need more attention to open innovation and the insights of custom-

ers. We adopted approaches common to qualitative research studies (Lee, 1998; Miles and Huberman, 1984; Yin, 1989, 2003). Data collection involved two sources: semi-structured interviews and archival documents. Semi-structured interviews were held with Eugenio Aringhieri, CEO of Dompè, Atillio Di Giovanni, Chief of Technology Development at Finmeccanica, and Antonio Ghini, Communication and Brand Management Director at Ferrari. Documented sources were used to supplement and substantiate information collected through interviews. We prepared a detailed comparison of the findings from the three companies as a foundation for developing insights on how firms actually go about transforming from more closed to more open approaches to innovation processes using an intangibles management perspective focused on forms of intellectual capital (e.g., Bontis, 1999; Grantham and Nichols, 1997; Johnson, 1999; Roos and Roos, 1997).

EMPIRICAL CASES

A short profile of each of the companies focusing on approaches to initiating major initiatives relevant to the subject of participatory innovation is presented below. This study responds to the call for contributions that analyze how companies actually translate stakeholder engagement into practice in order to identify some of the factors that affect the initiation of open innovation processes. The company analyses are based on an interpretation of interviews made at the three companies triangulated with various secondary information sources.

CASE 1 – DOMPÈ

Dompè Farmaceutici SpA was founded in 1940 by Franco Dompè, a pharmacist in Milan who established a chain of chemist shops throughout England, Switzerland and Italy named Farmacie Italo-Inglesi Dompè. In order to further its strategy of investing in the innovation of new drugs Franco Dompè founded a manufacturing company in Milan. In the 1950s this company built a competitive advantage in three therapeutic areas. At this time the company invested heavily in communication aimed at boosting contact with medical practitioners and patients. In 1976 Sergio Dompè, Franco's son, began to work for the family company. He clearly understood the considerable potential of biotechnology for pharmaceutical production and in 1988 founded Dompè Biotec with the aim of commercializing drugs developed in the United States. That experience gave him the opportunity to develop solid partnerships with some of the most important bio-pharmaceutical companies in the USA, including two major players – Genentech and Amgen. Today the company has grown significantly and is structured into seven companies governed by Dompè Farmaceutici with a global workforce of 800 employees and a turnover of 490 million euros in 2009.

In terms of co-innovation Dompè has long recognized the need to enhance its capacity to innovate new drugs through bringing in talent from outside the organization to overcome its weaknesses in skills and competences for research on new biotechnological drugs and their commercialization. In order to improve scientific collaboration with international companies, Dompè International SA was founded in Monaco in 1997. To allow Dompè International to quickly acquire new technical skills in priority business areas as well as new markets using its highly capable and qualified personnel, the company's structure was designed to be highly flexible. As a consequence, partnerships have been set up with companies in more than 50 countries, two of which appear to be particularly significant – the partnership with Biogen, world leader in recombinant DNA drugs with branches in over 70 countries, and the partnership with Amgen, a Dompe partner for 16 years. Research collaboration relationships were established in chemical fields with several university centers, San Raffaele, Xamen and Tor Vergata. The Dompè Group has introduced a quality policy – ISO 9001: 2000 – that is part of all research, development, production and marketing activities as well as the management of staff, their training and the external environment.

CASE 2 – FINMECCANICA

The Società Finanziaria Meccanica Finmeccanica was set up in 1948 by the Istituto per la Ricostruzione Industriale (IRI) to manage the Italian government's participation in the mechanical and ship-building industries. Finmeccanica was given a clearly defined task and substantial resources to restructure important companies that would become the core of the mechanical industry for the next fifty years – Ansaldo, Alfa Romeo, San Giorgio, Sant'Eustachio, Navalmeccanica and Cantieri Navali dell'Adriatico. Attention was focused on key sectors such as automobiles, ship building, railways and industrial machinery, with an eye on the emerging electronics sector. Headquartered in Italy with a vast industrial base in the UK as well as important production facilities in the rest of Europe and in the USA, Finmeccanica has a workforce of more than 58,000 people and revenues of 18,176 million euros in 2009.

In terms of co-innovation, Finmecannica initiated back in 2003 an Open Innovation Project aimed at valuing the shared technological assets of the conglomerate's companies. The MindSh@re Project was designed with the intention of linking people in a network that could serve to multiply the creation of new ideas, products and skill sets within the Finmeccanica group and other businesses, competitors, partners, technologies and products, universities, communities and research centers. MindSh@re includes a system to measure and report on intangibles that can aid managers to formulate strategy, to assess strategy execution and to communicate performance measures to external stakeholders. Finmeccannica has made a substantial investment in internal relationships, creating a common "language" among its 25 companies with its Mindsh@re software system that has been increasingly extended to stakeholder groups outside the organization. The process underlying the Mindsh@re concept has four steps: (1) The Engage step aimed at entering an existing Mindsh@re community; (2) The Align step aimed at starting operations in the community or aligning with another community; (3) The Innovation step aimed at beginning the innovation process once knowledge awareness is sufficient; (4) The Ambassador step aimed at spreading the Mindsh@re model externally to incorporate others. Technology and innovation are acknowledged to be the keystones of Finmeccanica's success

and its competitive edge.
Mindsh@re was intended to achieve six specific objectives: to support business development, to increase efficient and effective resource use across the Group's companies, to identify synergies based on dissemination of a Group-wide vision, to create individual linkages that could increase the likelihood of new ideas/products/talents, to create a competitive advantage for the Group based on the diversity and wealth of technological competencies and to share, grow and valorize the Group's talent. To facilitate the work of the Group's companies, Mindsh@re has seven technological communities covering the main Group areas of competence – radar, advanced materials and enabling technologies, integrated environment for engineering capabilities, logistics and services, simulation for training, software and intellectual property. This network includes more than 600 Group employees, 35 universities and 28 civilian and military organizations. To "share minds across businesses" requires that about 3000 experts are made known to each other so that they can share their ideas. The Mindsh@re networking event held in Rome on 5-6 February 2008 extended the technological communities beyond the organization's boundaries to include representatives from industry, universities and other institutions to further enhance efforts to convene groups of diverse skills and capabilities that, though discussion, might identify path-breaking ways of combining their disparate areas of knowledge. It could be suggested that the award of Best Innovator 2006 for Finmeccanica is a testimonial to the efficacy of this process.

CASE 3 – FERRARI

In 1929 Enzo Ferrari founded the Scuderia Ferrari in Modena. At that time, he did not want to produce road cars, but rather to support amateur racing driver and started sponsoring drivers and manufacturing race cars. Ferrari prepared and successfully raced various drivers in Alfa Romeo cars until 1938, when he was officially hired by Alfa to head its racing department. During WW II Enzo Ferrari built the Tipo 815, the first Ferrari racing car, and in 1947 Ferrari SpA was founded and it started producing street vehicles. These vehicles rapidly gained a reputation for excellence and were popular with wealthy drivers who appreciated the distinctive style of Ferrari's cars. After Enzo Ferrari's death in 1988 the business model was radically changed with huge investments made in research, innovation, organizational changes, education, and cooperation with public institutes. Demand grew after 2000 leading to an increase of 4.8% in customer deliveries in 2006 for a total of 5650 car sales and 188 specialty cars and racing models.
In terms of co-innovation Ferrari developed The Owners' Club and the Ferrari Challenges, two initiatives that reinforce the legendary image of the car. The Owners' Club offers membership to all who own, or have owned, a Ferrari car. This club organizes events, many of which focus on the performance of the car and racing competitions, as well as a web site and magazines. Customers are invited to be club members rather than car buyers. These events also have a social dimension including 'track days' that allow members to drive on famous race courses and to attend special gala dinners. The Owners' Club develops a network of activities that create identity around the Ferrari brand and strengthen it. The Ferrari Challenges are a set of championship races for Ferrari cars also reinforce the Ferrari brand. Dating back to 1993 races have been organized around the world in various Ferrari models. In addition to the racing part of the Ferrari Challenge, there are also competitions involving the personalization of the car exteriors and interiors. More recently, Ferrari's One-to-One Personalization Program allows its customers to fully personalize the 612 Scaglietti model based on existing options and new additions in a dedicated atelier area of the factory where customers make choices in consultation with Ferrari experts.
As the history of the quality movement has documented and early experiences with open collaboration have suggested, there are major inherent barriers to these transformational processes that can only be overcome through major changes in the knowledge control/sharing approach (Gabor, 2009: 7). Tables 1 and 2 summarize the main empirical data used in the argumentation.

DISCUSSION

Increasingly, researchers and practitioners are becoming aware of the fundamental changes that mobilizing intangibles offer for one main reason – they can facilitate greater effectiveness in creativity and innovation, knowledge leveraging and enhanced learning as well as heightened commitment and involvement and greater flexibility and adaptability among personnel. In other words, intangibles are at the heart of competitive advantage (DTI, 2001).
In each of the three empirical cases one of the three forms of intellectual capital appears to have been dominant in the initiation of a participatory innovation process. In the case of Dompè, human capital appears to be most crucial with the creation of Dompè International SA specifically set up to attract the talent to complement skill sets already present in the company to expediting drug development and market entry processes. The Finmeccanica example appears to provide a good illustration of structural capital based on its Mindsh@re software system, whereas Ferrari's approach to participatory innovation can be viewed as a good example of the mobilization of relational capital in the interests of long-term customer loyalty through relationship-intensifying initiatives. In all three cases it is possible to see how the focus

Company	Innovation challenge	Innovation strategy
Dompè	To develop and market new drugs efficiently and effectively.	To build many research partnerships that bring together complementary technical expertise.
Finmeccanica	To turn the conglomerate into a learning organization in which co-innovation flourishes.	To implement a software-based knowledge-sharing and technology transfer system.
Ferrari	To continuously build sustained costumer loyalty for the long term.	To systematically develop exclusive costumer relationships.

Table 1: The role of innovation strategy for participatory innovation models in initiating major changes in knowledge control/sharing

on a specific form of intellectual capital has helped to structure the design of participatory innovation process, although other forms of intellectual capital can often be complimentary to the process. Although some observations on the functioning of the various forms of intellectual capital are provided with the comments on co-innovation below, this subject is largely beyond the scope of this study.

HUMAN CAPITAL AT DOMPÉ

Sergio Dompè is the current president of Farmindustria, the Italian Association of Pharmaceutical Industries. In his speech on the occasion of his honorary university degree from the University of Urbino he spoke about innovation in the pharmaceutical industry, pointing out the relevance of investment in R&D and in skilled and competent human resources for the development of the Italian pharmaceutical industry (Dompè, 2010).

On the same occasion Sergio Dompè also pointed out that the new paradigm for success in the pharmaceutical industry is to create networks in order to share and create knowledge in an 'open source' perspective. Indications are that open and participatory innovation are central to the future viability of the pharmaceutical industry with new open-source protection systems being adopted instead of the traditional and costly IPR. According to a survey conducted by the international Journal 'Scrip World Pharmaceutical News', quoted by Dompè, over 80% of the most effective innovation at present is created outside company laboratories, often by small biotechnology companies or by collaborations with excellent research centers and other 'best-practice' firms in the same sector. Globalization and its impact on greater global completion among companies has led to a more concerted focus on risk and, in this regard, interest has escalated rather rapidly in quality-based strategies (Pekovic and Galia, 2009). Quality-based strategies have led companies to the realization of higher levels of profitability, productivity and competitiveness (Deming, 1986). At the same time, there is strong pressure on companies to become more innovative. A recent research study investigating the relationship between quality practices and innovation performance confirmed the role that quality dimensions, e.g., customer focus, employee training and teamwork, can have on enhancement of the innovation process and lead to the conclusion that "the objectives of innovation should conform to the objectives of quality" (Pekovic and Galia, 2009: 829). The evidence presented suggests that quality practices pertaining to both researchers and their work can lead to the creation of both an environment and culture that supports innovation. In fact, quality systems enhance workplace behaviour in a host of ways – better customer orientation, employee engagement, more effective leadership, improved access to tools as well as more regular team meetings and better team spirit (Pekovic and Galia, 2009: 838).

Management system standards, such as ISO 9001, can provide a solid foundation on which to build an organization and may constructively help to involve and unite employees in working toward a shared goal and may be a source of employee pride that provides a competitive edge. It can also be argued that, for a low price, the ISO 9001 standards give organizations proven ideas, techniques, and principles that many could not afford to research on their own and for which the immediate and long-term benefits may far outweigh the costs. In addition to increasing customer confidence in an organization, an accredited certification can help the organization to operate more efficiently and effectively. In addition, Dompè International's light and flexible organizational structure allows its highly qualified personnel to rapidly acquire new technical skills in accordance with quality considerations. The company advertizes that its success in innovating new drugs is "guaranteed" by the partnerships that it has with global biopharmaceutical companies.

STRUCTURAL CAPITAL AT FINMECCANICA

To innovate and reinvent the sources of value creation, companies – especially very large conglomerates like Finmeccanica – recognize that they must become learning organizations, acquiring the skills to learn from others and from past experience at individual, team, organizational and inter-organizational levels. Mindsh@re, Finmeccanica's cooperative and interconnected network animator involving the group companies, its markets, clients, complementary suppliers and research centres, includes a system to measure and report on intangibles that can aid managers to formulate their strategies, to assess strategy execution and to communicate measures to external stakeholders (i.e., assess the financial impact of MindSh@re against the activity carried out by each community). Mindsh@re promotes the emergence and flow of information and knowledge through people and communities recognized as active co-innovators, generating value for the Finmeccanica Group. It is based on a process

Company	Innovation strategy implementation	Models of organizing for co-innovation
Dompè	Dompè International SA aimed at 'right' partnership-building and ISO 9001:2000. Certification aimed to continuous corporate improvement.	Participatory Innovation Model based on human capital (skill and competence).
Finmeccanica	Mindsh@re system aimed at sustaining the emergence and flow of information and knowledge through people and communities and specific events aimed at extending relationships.	Participatory Innovation Model based on structural capital (processes and systems).
Ferrari	The Owner's Club, The Ferrari Challenges and the Ferrari One-to-One Personalization Programme and an implementation strategy aimed at global outreach to costumers.	Participatory Innovation Model based on relational capital (relationships).

Table 2: The role of 'models of organizing for co-innovation' for major changes in knowledge control/sharing

of knowledge sharing and technology transfer involving all the operating companies as well as different stakeholders recognized as active co-innovators rather than passive recipients. It facilitates the amalgamation of disparate knowledge pools to produce novel combination in seven areas of activity of high industry priority and in so doing creates a stronger culture of innovation for the conglomerate as indicated by awards, e.g., Best Innovator Award 2006.

Included in the seven "technological communities" were personnel from R&D together with marketing and strategy personnel. Because of the centralized nature of the conglomerate's R&D function it could be argued that one key advantage of the Mindsh@re technological communities was to allow for cross-cutting of the traditional boundaries of this organization's knowledge, thereby making it feasible to identify novel combinations of seemingly unrelated technologies within the rather broad range covered by Finmeccanica's 25 constituent companies to create a stronger culture of innovation.

The effectiveness of the Mindsh@re system is enhanced very significantly through a systematic schedule of in-house activities and an increasing number of external activities on the communities such as the 2008 workshops intended to extend the knowledge-sharing activities that it facilitates outside the conglomerate.

RELATIONAL CAPITAL AT FERRARI

Ferrari shuns the advertising campaigns typically used by other car manufacturers and instead focuses on distinctive approaches to customers. The value of The Owners' Club and the Ferrari Challenges is that they provide a high sense of community, in this case, a highly exclusive community. Customers are not only customers – they are members of the Ferrari community. As such they illustrate self-sustaining exclusive customer relationships for which there are strongly anchored incentives for maintenance and growth in terms of a set of exclusive benefits to which others desire access. The high entry barriers created by the very high cost of owning a Ferrari, the prerequisite for membership, ensures that the exclusivity of these benefits is carefully preserved. It could be said that both The Owner's Club and the Ferrari Challenges serve to make visible the intangible features of the Ferrari brand's exclusivity. Ferrari merchandizing provides non-owners with the opportunity to share in this exclusivity in a small, but highly visible, way.

Based on the concept of "customer intimacy" developed by Treacy and Wiserma (1995), the "customer complete solution" offers an insight into the value proposition of companies that consider building long-lasting relationships with their customers as a critical success factor. With this value proposition, customers feel that the company understands its business and personal issues and they trust the company to develop customized solutions tailored to their wishes. Companies offering such a "customer solution" value proposition stress objectives relating to the completeness of the solution (selling multiple, bundled products and services), exceptional service (both before and after the sale), and the quality of the relationship. Often acquiring new customers is expensive and accomplished through a single, entry-level product. After the expensive acquisition of a new customer, companies must retain the customer (annual retention costs are typically far lower than the cost of acquiring entirely new customers), deepen the relationship with the customer, and broaden the relationship to encompass the sale of multiple, related products and services. The profits from customers in their year of acquisition could be negative, because of high acquisition costs. However, the objective is to capture and retain customers to produce high lifetime profitability.

Companies can develop deep understanding about what their customers value, build strong, trusted relationships with their customers, bundle existing products and solutions to individually customized solutions, and help their customers achieve success. The company's innovation processes focus on finding new ways to create value for customers. Research is directed more at understanding customers' future needs and preferences than at fundamental product innovation. The research may also be directed at finding new ways for customers to access and use the company's products and services, as has been the case with Ferrari's interaction with Ferrari owners.

Ferrari's mission has remained the same over the years: to build unique sports cars destined to represent the excellence of Italian cars, whether on the road or on racing circuits. Because of its activity in racing, Ferrari has a very strong knowledge creation and innovation track record. The production of each new model is always based on the extraordinary engineering that embodies performance and technical originality. Ferrari has continuously remained committed to advanced research, introducing at least one technical innovation per year since its founding. Innovation has been one of Ferrari's key assets – not only does Ferrari realize innovations frequently, but it also brings these innovations quickly to the market. Given the exclusivity of its cars, Ferrari considers the company's integrity, reputation and trust to be the elements that distinguish it. Every Ferrari must be perfect. Ferrari's business model is now largely defined by the exclusive relationships it establishes and supports with its clients. Its strategy to sustain, and build on, its current success is founded on its quest to enhance its innovative process.

The effectiveness of Ferarri's three major relational management initiatives has been enhanced significantly with increasing numbers of events and greater promotion of the One-to-One car customization initiatives that originally started within the Ferrari Car Challenges. A similar initiative was undertaken by Ferrari current owner – Fiat – with its foray into customer co-creation with its Fiat Mio, a car that is built with inputs from participants working in conjunction with Fiat professionals to produce a new concept car.

CONCLUDING COMMENTS

We suggest that our work, despite its exploratory nature, establishes a foundation for a significant research agenda on the 'front end' of participatory co-innovation processes. The study aimed to provide fresh insights on the question of why some firms and not others are able to successfully transform their approaches to the control and sharing of knowledge, a question that would

be answered much more fully through future empirical studies. The current study contributes to downstream research in several respects.

First, our findings identify three 'models of organizing for participative innovation' – one focusing on mobilizing human capital, one focusing on mobilizing structural capital and one focusing on mobilizing relational capital. In each case, one form of intellectual capital dominates, with one or more other intellectual capital forms playing a supporting role.

Second, we introduce intangibles management thinking to the literatures on open innovation and external stakeholder engagement to produce what we believe is a more nuanced and detailed view of the underlying dynamics. We contend that these three forms of non-financial capital largely function like financial capital in that each provides the ability to help in producing other goods, in this case the value creation that is central to sustainable competitive advantage.

The three models can be subjected to rigorous empirical testing through larger scale studies that include a wide range of manufacturing companies. It would also be possible to design a study that included, for example, small- and medium-sized enterprises and even start-up firms to uncover patterns of similarity and difference with the three large Italian national-success-story manufacturing organizations studied. In addition, cross-cultural studies of manufacturing companies could be undertaken to identify similarities and differences on a transnational basis.

A closed, firm-centric system of value creation has been the major stumbling block for firms wishing to co-innovate with external stakeholders (Prahalad and Ramaswamy, 2004). However, the three case studies included illustrate transformed approaches to knowledge control and sharing. These cases make clear the power of bringing together previously unconnected resources – the process of combination – and the power of social interactions and joint actions – the process of exchange, in line with Nahapiet and Ghoshal's (1998) research. In fact, our models show how firms can actually organize themselves for co-innovation, helping at the same time to transform the image of co-innovation from 'seductive mirage' to concrete reality.

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ORGANIZING FOR PARTICIPATORY INNOVATION ACROSS COMPOSITE BOUNDARIES & COLLABORATIONS

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ABSTRACT

Leadership and organizing increasingly require focus on innovation processes. The recently published report by OECD (2010: p. 10) clearly highlights that the financial crisis has only increased the need for innovation. The result is an intensified need for new organising across boundaries and collaborations aiming for higher returns on limited resources. The agenda is set to find out how organizing composite boundaries and collaborations can enable participatory innovation.

A process approach relying on action research is employed in eight companies connected to an innovative course, which aims for innovation 'turned on its head'. The main findings reveal an important contribution from designing flexible processes, which support participants to be aware of composite underlying assumptions and utilize collaboration with other students from companies with very different backgrounds. It reveals an insight on flexible participatory designs. A theoretical contribution is provided on the impact on variety and a practical contribution is made on how flexible designs can be organized for participatory innovation in companies.

INTRODUCTION

The research is conducted in an innovative course, called Food Architect®, which aims to turn innovation on its head – 180 degrees. It means to start the innovative idea generation within an everyday customer situation. Through the course a platform is provided for employees from food producing companies to work together and train on innovation within the food sector. The employees are called students in the following. The companies have different sizes and come from very different areas, e.g. convenience food, gourmet food, ingredients and ecological diary. They have very different production, service and sales knowledge as reference for their participation on the course. It means very different business perception and ideas of what e.g. the customer wants and how business has to be done. In this context research on the research question on how organizing composite boundaries and collaborations can enable innovation is of special interest.

The students are participating in five educational modules during about six months. The duration of each module is typically a two-day-seminar, however, the second module is done in Istanbul in order to 'get out of comfort zone'. Here the duration is four days. The students aim to develop an innovative concept in groups and further to develop a company project on innovation and implement it afterwards. They are examined both in the group concept and in the project in own company at the end of the course. However, the examination is mostly emphasized on the group project within the course. An anthropological approach is used in the course to reveal the customers' situation and needs. Customers are hereby present through the 'personas' developed by the students in relation to their idea generation in the course. The participatory innovation is formed through the collaboration of students – and not by integrating customers as such – as prevailing theory recommends (Buhr and Matthews 2008).

This platform for research provides an opportunity for a deeper exploration of the research question on how composite boundaries and collaborations can enable participatory innovation and what implication this will have on design for participatory innovation.

Hernes (2004) noted that boundaries are composite, i.e. organizations operate within multiple sets of co-existing boundaries. The notion is that these sets of composite boundaries vary from organization to organization, in strength as well as in substance. In the design for innovation normally some kind of rationality for integrating the customer in the innovation is present. In this paper the participatory innovation is formed by the aim of the students to learn to be innovative. The platform for this research therefore provides a seldom variation on different people, different knowledge, different practical training, different business models and different technical platforms. What the students have in common is their aim to learn how to innovate and use this knowledge in their own company afterwards to enable innovation. Furthermore the innovative course concept forms a common reference for the students.

The outline of the paper is to go through theory, explain the method, reveal data and evaluation of data, explore results and conclude on the findings.

LITERATURE AND THEORY

Innovation is defined by Amabile et al. (1996) as ' … a successful implementation of creative ideas within an organization. In this view creativity by individuals and teams is a starting point for innovation; the first is necessary but not sufficient condition for the second' (Amabile et al., 1996:1154-1155). In the organizational context Amabile et al's definition highlights the transformation of the creative idea formed by individuals/teams into learning in a multidisciplinary and cross-organizational approach and in the end employs a successful implementation with return on investment. The definition thus calls for participative innovation across the organization and across the whole value chain.

Organizing is defined by Weick (1995) as spanning from concrete individual actions on the new ideas to actions on collective learning and to actions on control of performance on organizational level. This wide span calls for supportive learning frameworks across levels. It means that agency theory as represented by Weick (1995) and his notion on organizing actions across levels call for participatory designs – 'bringing diverse stakeholders together who confront each other with very different perspectives on the issues' (Buur & Mathews, 2008:259). As Buur and Mathews also note 'there is still some way to go to move participatory design to participatory innovation. That is, the able development of new products, even in cooperation with users, is not always sufficient to guarantee the (commercial) success of these products'. This paper will make a contribution to this 'still some way to go' by research of implications from very flexible design where the only common thing is an industry; here the food sector and the common aim for innovation in own company by participating in an innovative course. It calls for theory application from other fields. Here especially the organizational field can provide understanding about organizing collective learning and control of performance. Tidd (2001) underpinned this by his understanding of innovation management in context of environment, organisation and performance.

Within participatory innovation in the agricultural sector Veldhuizem, Water-Bayer and Zeeuw (1997) noted that various organizations will have different but closely interaction roles to play. It sets the scene for wide participation of people, organizations and perspectives in the wider food sector.

Further through the need of very different stakeholders and different perspectives on the issues a useful theoretical implication is to employ Ashby's (1962) system approach on the 'Law of requisite variety', which says that 'the variety, which can be adopted in the organization is dependent on the variety in the external world'. Together with Hernes's (2004) thinking on the importance of composite boundaries for innovation and organizational development, a theoretical enhancement can be made on how the composite boundaries and collaborations enable innovation. What is the content of boundaries, which the participants think is important and how they perceive the impact of flow of variety on participatory innovation.

A theoretical contribution is given to how composite boundaries and variety of collaborators can enable innovation. This is useful for organising a flexible design for participatory innovation. The hypothesis in the research in this paper is that a high degree of variety from students will be beneficial for innovation perceived and obtained by the participants. Furthermore that a process approach confronting the participants with high awareness of composite boundaries for the free flow of requisite variety will be beneficial for innovation perceived and obtained by the participants. An underlying assumption here is that perception of beneficial innovation activities will result in innovation and value creation in the end.

DATA AND METHODS

The research employs 'mixed methods' of qualitative and quantitative research with a process approach of an 'inverted classical Lewin' in the action research part. Action research means not only to observe people and actions, but also for the researcher to suggest actions, which the participants can adopt and do themselves or they can drop the suggestion. Action research is closely connected to action learning and was originally noted by Lewin. The reversed Lewin means meetings with a 'freeze' of their behavior patterns. The 'freeze' provides a platform to discuss their future challenges and needed actions for innovation and change. A short note is made of challenges and actions to support the 'rebalance'. Finally the 'unfreeze' is occurring when the student and mentor go back to their daily work and continue the process.

This approach is inspired by Weick and Quinn (1999) and Argyris (1990), pointing out that: 'to freeze continuous change is two make a sequence visible and to show patterns in what is happening'. It involves a process approach, where organizational patterns and boundaries are identified and facilitated by learning in action context. For the sake of an open dialogue the first action research meetings were not recorded. The last meeting is digital recorded. The research material consists of notes from meetings, the short slides and recordings.

The material is qualitatively analyzed in the Nvivo program for identification of similarities and patterns in the data on variety and composite boundaries. (Yin, 2009; Charmaz, 2006). All

the action research participants have prior to the action research process answered an online questionnaire about their economy, growth, preferences, relationships, learning, culture and innovation activities. These answers were used as kick off for the action research process. In the 'freeze' the participants are confronted with their answers in relation to what they see as challenges for their business. The questionnaire functions as an integrated process tool to reveal important facts about their business. The participants can hereby easily relate to the importance and contribute with further important facts as they see it themselves. Three meetings of a duration of about three hours for each company were executed. In the meetings the students participate together with a mentor from own company.

EVALUATION OF DATA

The eight case companies in the research have themselves been willing to participate in the action research running parallel to the course. It could mean that the data have an optimistic bias. However, the decision on their participation was done before the course started and they in the end also got very different results of innovation in own company revealed in the research. Some companies in one end had an extremely good impact on innovation; in the other end one company got an employee qualified for innovation, however, none direct product and/or process innovation impact in own company.

All in all the majority of companies have got a very good impact on their own company as they perceive it themselves. During the action research the researcher could look deeper into what actions actually were taken and here a lot of specific activities were revealed, which had impact on top-line and/or bottom- line in the company. The impact cannot be quantified because the impact cannot be isolated from other impacts on top- and bottom- line. But it could be revealed by discussion with the participating students and mentors that these actions would not have taken place without participating in the course or the activities would have been less qualified to enable innovation.

Furthermore the participants in between were critical in relation to elements of the course. This shows that the participants were aware of getting 'value for money' through the course. The last meeting were carried through about two to three months after the course was finalized. The aim was here to get comments from the participants when they were 'back in normal business again' to avoid positive bias from the course as much as possible. Here the impact they had perceived of the benefits from the course during the 6 months could be evaluated more neutral.

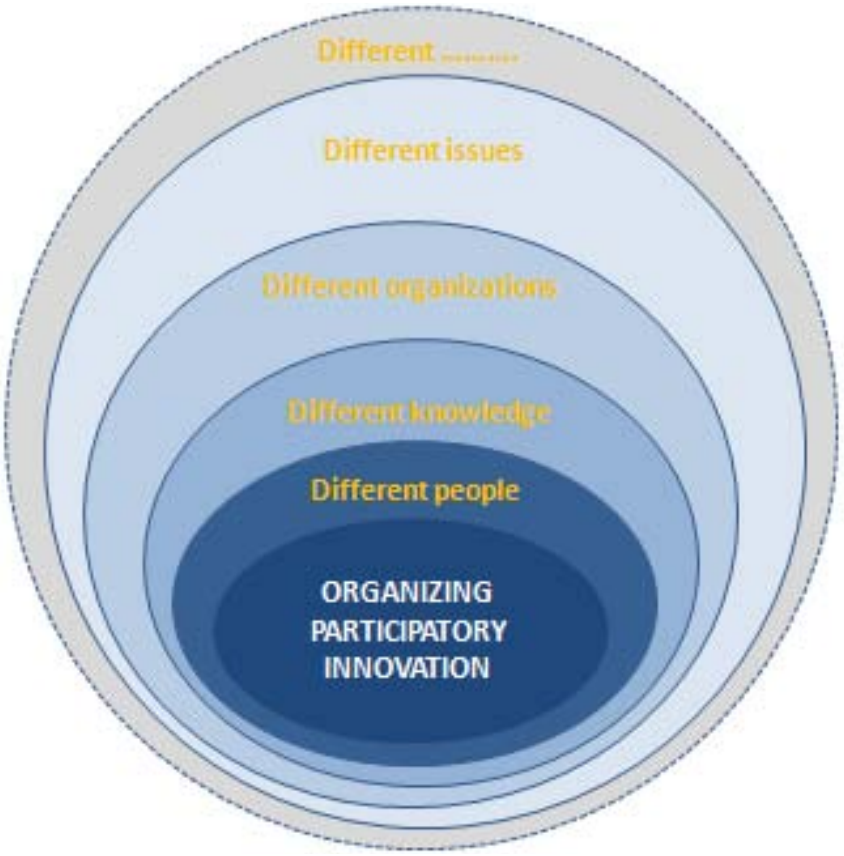

Figure 1 Participatory innovation – variety of issues

RESULTS

The collaboration with random and unknown people on a dizzy task within innovation gave fuel to innovation through new perceptions formed by variety, as one of the students from the case companies say: 'Thursday afternoon at 15.00 it began to make sense to us. It's fun to pull something out of a hat' - it is the sport of it that animates me and the group to continue. The more impossible tasks, the more fun it is to see if it can be done'.

Cultural	Management	Vocational	Strategic	Organizational
'Normally we do not do that kind of things in our organization' or 'The others would not like that'	'This is forbidden according to order or procedures from management' or 'We have not planned that now'	'We have not learned it this way' or 'It is not allowed according to vocational standards'	'This is not high priority' or 'We have no time for it'	'We are not allowed to interfere with the work of the others' or 'The others could steal our good ideas and praxis'

Table 1 Composite boundaries and typical phrases

Cultural	Manage-ment	Vocational	Strategic	Organi-zational
■		■		■
			■	
■	■	■	■	■
■		■		■
		■		■
		■		
■	■			
■	■			

Table 2 Crisscrossing of composite boundaries

Here an example of the full implication of requisite variety is employed and transformed to absorb whatever comes in through different stakeholders and different perspectives on issues. Suddenly all the differences begin to make sense in new forms and create excitement and a deep encouragement by the ability to innovate – described as 'solving the puzzle' and as a sports event of the group beating the impossible. A lot of energy is created here – very fruitful for enabling innovation. The hypothesis about high degree of variety from students will be beneficial for innovation perceived and obtained by the participants is here revealed as an important element within the field of participatory innovation. The variety on a lot of dimensions makes students in a collective process better able to absorb and transform the challenges into innovation.

This is theoretically illustrated in Figure 1, which highlights a composed organizing process with enhanced layers of variety to enable innovation.

Figure 1 shows the variety revealed

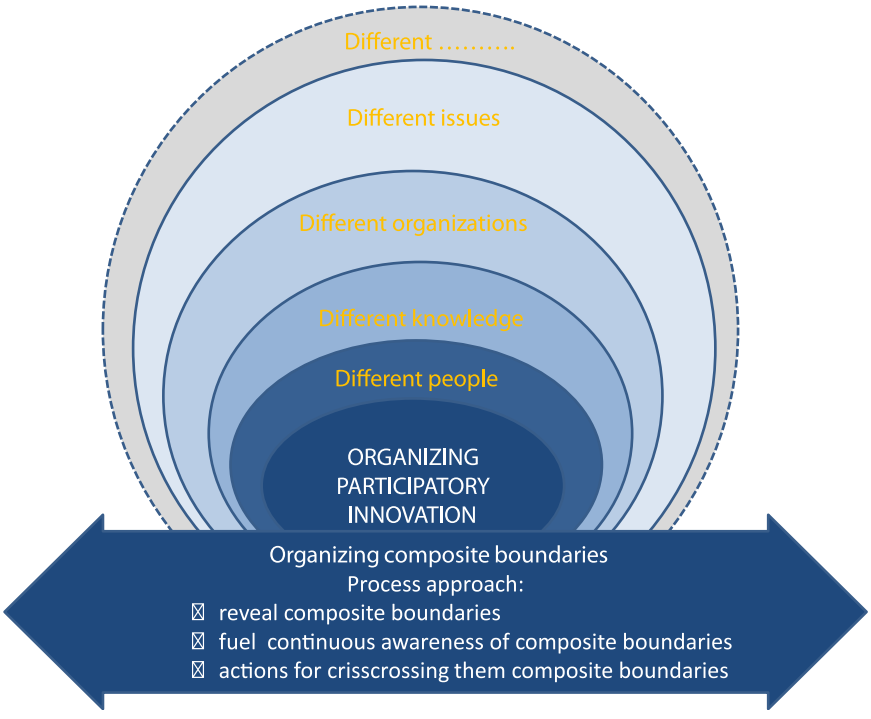

Figure 2 Organizing for participatory innovation – designing variety of issues

as positive to enable innovation. The more variety the more challenging and the more the 'sport implication' is fueled.

The practical contribution here is to highlight the need for extremely flexible design, which without purposeful rational goals for the innovation – other than the dizzy outcome of innovation itself – can enable considerable innovation on individual and on organizational level.

The findings in the research show patterns of composite boundaries which can be described in different categories. An overview of the categories revealed is provided in Table 1.

Table 1 shows typical phrases perceived as boundaries for innovation by the participants in the meetings. They can be grouped into five boundaries. The boundaries mentioned and perceived by the participants are embedded in cultural, management, vocational, strategic and organizational issues.

Having revealed the perceived boundaries it will also be interesting to reveal what boundaries the participants have crisscrossed to enable innovation. This can be seen in Table 2.

Table 2 shows the case companies anonymously listed in the rows. It can be seen that they all have met at least one boundary and that many of them have met several boundaries during the course, which underpins the compositeness of boundaries within innovation. They have all crisscrossed the boundaries they talk about. The positive impact on innovation from crisscrossing boundaries is underpinned by all participants. A typical quotation here highlights the perception of this in the case companies: 'It's crazy when you write down how much we really have reached. The training in the course has been able to communicate the innovative vision of our company into specific action on innovation - it has not been possible to do this before. It has been done now. It is thought-provoking, but it is true.'

It means that value creation from the boundary crisscrossing activities is perceived very positively supporting both strategic innovation and the specific necessary new actions within innovation in the daily work in the company. The hypothesis of an impact from a process approach confronting

the participants with high awareness of composite boundaries for the free flow of requisite variety is revealed as important and positive. It is perceived as a benefit to reflect on innovation and to look deeper into actually action on crisscrossing the boundaries.

Theory development can hereby be enhanced to integrate the organizing approach of all the different issues to be acknowledged in the participatory innovation process; furthermore also to add new issues with different approaches into the process whenever it is possible. This is illustrated in Figure 2.

Figure 2 shows that openness and not strict definitions on boundaries is of importance. The research question on how organizing composite boundaries and collaborations can enable participatory innovation can then be answered. Participatory innovation is enabled in this research by revealing the boundaries on different levels continuously in the process. Furthermore the openness to new boundaries perceived as barriers are important to be aware of and to challenge through crisscrossing actions.

DISCUSSION

The findings in this paper are gathered in an educational arena, which can make them a bit artificial. However, the action research was done on the spot in own company. The training in the course provides a playground for innovation which is interesting in a participatory innovation approach, because the prevailing emphasis on purposeful customer need is reduced to personas and partly replaced by a very open approach for participation. It means a participatory design characterized by embracing as many differences as possible and support of crisscrossing boundaries and own definitions as much as possible.

This is both interesting in relation to theory and in relation to the practical organizing of design to enable innovation of commercial value. It is not as such the customer participation, which alone fuels innovation. It is the insight of people, who are provoked by variety and their own crisscrossing of perceived boundaries, which can enable considerable innovation. Hereby a new angle is set both theoretically and in practical life on participatory innovation in companies. The research question aims to fill some of the gap between participatory design and participatory innovation for a better commercial value creation. Further research will be needed for a deepening of the understanding of organizing composite boundaries.

The theoretical contribution of this paper is thus provided by a model to reveal the composite boundaries, highlight the awareness of them and act on crisscrossing the boundaries.

The practical contribution is made on how flexible designs can be launched using a training context to enable people to have a playground with different perspectives and different boundaries for crisscrossing. Here the participant can discover their own dedication to the 'sports spirit' within participatory innovation.

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PARTICIPATORY SERVICE INNOVATION IN HEALTHCARE: THE CASE OF VIDEO CONSULTATION FOR PARAPLEGICS

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ABSTRACT

Participatory Design (PD) provides a variety of tools and techniques for involving users in innovation processes. However, user involvement in PD is often limited to singular, face-to-face events supporting short-term rather than continuous collaborative relationships between users and system developers. Such a traditional PD approach is limited within a complex multi-actor context like the field of healthcare services. Based on an action research approach we developed a participation process, which builds upon open innovation approaches. It includes methods for *Distributed* PD (DPD) that use *social media* to enrich traditional PD methods, thus enabling users to participate in a distributed (i.e. virtual) way. We applied this methodological approach in a case study revolving around the delivery of video consultation services for paraplegics. The process and outcomes of participation were analysed through formative evaluation based on work psychological models. Our results regarding the combination of distributed, participatory idea generation with face-to-face scenario co-creation on basis of user-generated content show great potential for supporting continuous collaboration in service innovation.

INTRODUCTION

Involving customers or end users in innovation processes has attracted widespread interest in recent years. Various approaches and research fields have emerged dealing with how to manage and organize customer-driven innovation processes, be it from a business, design research, system engineering or social sciences perspective. Although these approaches may have the same goal of involving various stakeholders in innovation or development processes, they differ in what is developed and the methods and techniques used. Two approaches are central to the research reported here: Participatory Design and Open Innovation.

Participatory Design (PD) emerged in the 70ies and 80ies in Scandinavia as a work-oriented system development approach (Bodker, 1996). It states as a core principle that those who will be affected by a new system should be involved in the process of design, resulting in positive effects on the users' motivation and the quality of the products developed (Ehn, 1993). PD represents a mindset and ideology – which is that of democratization and empowerment - and puts emphasis on the relationship between users and developers (Muller et al., 1993). Although PD comprises a wide range of tools and techniques (see e.g. Greenbaum and Kyng, 1991; Muller et al., 1997), this relationship is mostly fostered by face-to-face interventions, such as future or co-creation workshops (see e.g. Sanders and Stappers, 2008). Even though such face-to-face methods significantly support both collaboration between users and developers and work-oriented system development, they are often singular events leading to short-term rather than continuous, long-term collaborative relationships between users and developers (Carroll, 2005). However, people within a service system (whether as colleagues or within business-to-customer relations)

are often *distributed* regarding time, location, resources, knowledge or organisation. This was especially true for the clinic in our design case. The question that arose was how to manage participatory innovation despite this distribution. Only recently Distributed Participatory Design (DPD) approaches have started to emerge (e.g. Obendorf, Janneck and Finck, 2009, Loebecke & Powell, 2009; Naghsh et al., 2006; Gumm, 2006), that deal with the question how to enable *distributed* participation across different contexts from a system engineering perspective. This approach has been driven by the fact that an increasing number of projects apply PD in physical or organisational distributed settings (Naghsh, 2006). Even though these projects mostly concern the development of software systems like virtual networks, they provide basic assumptions and approaches transferable to the development of new services. Their rationale is seen in the fact that PD-approaches show a limitation as they often concern the development of a „single, contiguous, customized software systems representing and supporting typical workflows within one organisation" (Obendorf et al. 2009).

Open innovation approaches take advantage of distributed knowledge resources by strategically integrating organisation-external knowledge or know-how of partners, providers or customers into organisational innovation processes (Chesbrough, 2003). Other terms used for customer integration approaches are e.g. customer- or user-driven innovation, co-innovation, customer co-creation, value co-creation, or crowdsourcing. Some successful examples of customers acting as co-designers can be found in the realm of product development, resulting in new business models, especially in the apparel industry (e.g. Threadless or Spreadshirt; in Piller, 2008). Also, open innovation platforms have been created to connect solution-seeking companies with solution-providing open communities (e.g. Innocentive; in Piller, 2008). However, in most of the open innovation approaches, the participant´s, end-user´s or customer´s part is limited to idea generation and product testing and often does not involve real collaboration between end-users and developers throughout the process of analysis, design and implementation.

We are therefore interested in combining PD-methods that support collaboration between users and designers/developers with the kind of distributed, more continuous forms of user/customer input, characteristic of many open innovation approaches. Our aim is to establish a participation process throughout the whole process from analysis, through ideation and conceptual design to implementation. Additional challenges arise for participatory innovation as our design case concerns the development and implementation of new healthcare services, being far more complex than e.g. the design of products such as T-shirts and sneakers. Thus, innovation can take part in various areas of a service, for example as a new service *concept* (Edvardsson, 1996), an adapted or new client *interface*, improved processes within the service *delivery system* or t*echnological options* like new devices for communication services. Furthermore, there often is a great variety of stakeholders and roles in service systems: In our case various healthcare professionals - nurses and physicians with different specializations - *execute* a service *provided* by a clinic or institution to patients (customers), including other stakeholders such as insurances or suppliers. Consequently, successful service *innovation* relies to a bigger extent on multi-actor involvement and collaboration in the process of idea generation, conceptualization and implementation. Therefore, it is worthwhile to combine established open innovation, user-driven innovation or crowdsourcing practices with the PD toolbox for user-designer collaboration when dealing with service innovation in organisations, especially in the early stages.

THE CASE OF VIDEO CONSULTATION FOR PARAPLEGICS

In this contribution we report on a case study in the field of telemedicine revolving around the implementation of video consultation services for paraplegics. We have been working with a rehabilitation clinic for paraplegics that comprises a wide variety of physicians, nurses and therapists, as well as paraplegics from all over the country representing the potential users of video consultation services. Paraplegic treatment and care of paraplegics is comprehensive and involves many different disciplines and patients that vary widely in their degree of paralysis and related health problems. The first idea for video consultation came from two departments of the clinic, the one mainly supporting paraplegics with artificial respiration, the other one providing additional care with home visits, which are time consuming and involve significant costs. In these fields of care, video consultation could be used, for example, for early diagnosis and follow-up care of decubitus ulcers, for advice and instructions regarding assistive technology or as remote support for handling technical failures with artificial respiration equipment, thus contributing to both the quality and efficiency of care and partly also relieving paraplegics from the strain of complicated transportation. Other typical rehabilitation activities include preparing paraplegics for and supporting them in activities of daily living (ADL), physio- and occupational therapy, regular medical examinations and treatment of complications.

METHODOLOGICAL FRAMEWORK AND RESEARCH OBJECTIVES

SUPPORTING DISTRIBUTED PARTICIPATORY INNOVATION WITH SOCIAL MEDIA

Involving users additionally to face-to-face methods in a distributed, technology-mediated way, as in many open innovation approaches, seems to be more suitable for fostering continuous collaborative relationships. However, open innovation is often limited to using web 2.0 tools for including users and customers in the idea generation phase (Lindegaard, 2010), not involving them continuously in the next stages of design, development and implementation. We see a need to bridge PD and open innovation here, since the continuous integration of external and internal ideas throughout the product or system life cycle could be supported well with PD-techniques. This was one reason why we developed a method for distributed participation including a variety of users from the very beginning – the stage of analysis

and idea generation. The other reason was that we faced the major challenge of physical and organisational distribution within the care and treatment of paraplegics, thus representing general difficulties when planning and initialising innovation in the early stages.
For that purpose we developed a method aiming to combine the potentials of open innovation, PD and DPD. A broad literature research on how to involve users in PD by using new media or social media gave a good base for how to develop a method that could expand the traditional PD-methods by distributed and virtual participation. Landry (2008), Hagen, Robertson and Gravina (2007), Go (2007), Katzeff and Ware (2006), Carter and Mankoff (2005) or Isomursum and Kuutti (2004) used self-reporting techniques in form of online/digital diaries, where users documented certain situations of their daily life with photos, videos and short texts. Other studies show how collaboration between users and researchers can be managed in the early stages when beingw distributed. For example, Lin and Okamoto (2009), Irestig and Timpka (2002) or Vaughan, Rittenbruch, Viller, Yuille, and MacColl (2008) report on methods regarding dynamic and iterative processes for collaborative, distributed scenario-generation for envisioning the future. We decided to use a self-reporting method in form of online diaries, similar to Carter and Mankoff (2005) or Hagen et al. (2007) combined with an approach to enable distributed, collaborative scenario-generation (as Lin and Okamoto, 2009). As we did not only want to let users collect material and send it by e-mail or post it on a blog, but also wanted to enable collaboration among participants and researchers, we set up a social network as platform for the documentation.
Our research question was whether and how social media tools combined with face-to-face methods could support both distributed user participation and active, continuous collaboration in analysis, design and innovation. In this contribution, we focus on the stages of idea generation and collaborative generation of future scenarios.

A SCENARIO-BASED APPROACH TO INNOVATION

In our concrete case of video consultation services for paraplegics we worked with scenarios according to a Scenario-Based Design approach (Rosson and Carroll, 2008; Van den Anker, 2003, 2006). Scenarios are concrete representations of a current or, mostly, future situation. We agree with Mietinen and Hasu (2002), who state that user needs and requirements should be analysed „on the level of the development of user activities and on the level of the situated use of the artefact." Scenarios support this analysis as they go beyond mere design ideas or ideas of system features in that they project a picture of how human activity and the context of use may look like in the future when the system is in place. So in a way they cover both the idea generation and implementation elements of innovation. Scenarios open up the design space in the way that they allow us to ask such basic questions as for whom (which users?), what for (which tasks or services?) and where (which settings?) the technology will be useful, thus driving innovation in the early stages.
Our so derived approach included the following stages (see also Figure 1):
Idea generation ("analyse and identify"): Distributed participatory generation of ideas and visions of potentially useful applications of video consultation based on concrete user stories from the participants' daily work or life, using social media.
Conceptualisation ("envision"): Co-Creating future scenarios of system use and the context of use as a basis for identifying opportunities, limitations and requirements through participatory evaluation of the future processes represented in the scenarios.
Enacting the future visions: Testing the future scenarios in simulations of future work and collaboration and carrying out pilot studies in the field to derive socio-technical system requirements.

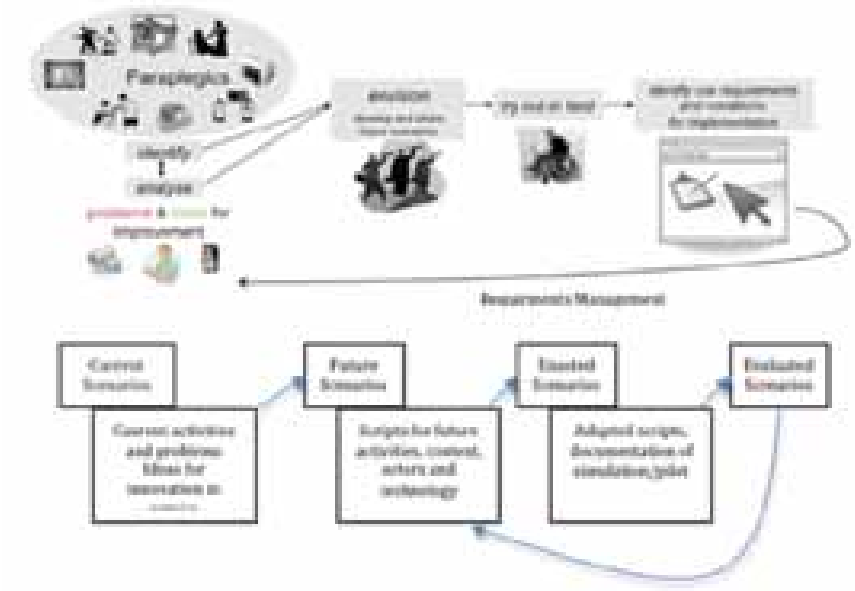

Figure 1: Participatory Service Innovation as a Process of Early Scenario-Based Design (adapted from van den Anker, 2003, 2006)

DESIGNING AND EVALUATING PARTICIPATION FOR INNOVATION – A WORK PSYCHOLOGICAL VIEW

Our research question is related to motivational aspects, skills and resources that influence why and how users participate in the innovation and design activities within our scenario-based approach. Buur (2008) speaks of skilled innovation, meaning knowledge and skills that users can apply when participating in innovation. We wanted to have a closer look on the aspects that influence participation by analysing 1) which tasks within the innovation process could be fulfilled by users with the methods and techniques provided by us (face-to-face and virtual) and 2) how these tasks could or should be redesigned in order that users would participate to a greater extent or "better". Therefore, we analysed and evaluated the users´ participation and performance throughout the process (see also section Evaluation Methods) in the framework of a formative evaluation. The results were supposed to give insights on how to support us-

ers considering their skills, capabilities and motivation so that they would participate in an active and continuous way. This evaluation should help identify implications for the designers'/researchers' activities concerning the moderation and integration of user participation within the process.

For the formative evaluation of user participation and performance, we applied the Participatory Action Research approach (PAR, cf. Pilemalm and Timpka, 2008), where a design team of researchers and users collects, analyses and reports data, jointly implements changes with practitioners, and evaluates those changes in an iterative way. We attempted to involve users not only in the various activities within the innovation process of a new technology based service but also in the design of these activities. As we wanted to find out why users participate and how participation could be supported as a task on top of the normal daily work of users - whether by tools (media, technology) or instructions - getting back to basic job design criteria seemed to provide a mindset for analysing and designing participation. The concept of the "task" (for representing the various innovation and design activities) turned out to be a useful entity for our evaluation and is a core aspect of work psychology. For example, the Job Characteristics Model (Hackman and Oldham, 1980) as well as research on Task/Work Design (cf., for example, Ulich, 2007) investigate and describe aspects of the (work) task that influences (work) motivation, such as task significance/meaningfulness, task identity, skill variety, autonomy and feedback. We took these aspects as the basis for our evaluation, together with models concerning behaviour or engagement that is not part of formal job requirements, such as the concepts of extra-role behaviour (Organ, 1988) or perceived job breadth (Morrison, 1994). In addition, the theory of „Goal Setting and Task Motivation" (Latham & Locke, 2002) was integrated. It focuses also on factors that influence performance (Goal Commitment, Feedback and Task Complexity). The criteria of all these work psychological models were analysed regarding their transferability to participation (instead of work/job in general) and integrated together with more technical dimensions concerning the social media usage to an evaluation guideline called „Sum it up" (Table 1), which is explained in the following.

S	ignificance/Meaningfulness/Importance
U	se of media and participation tools/Task difficulty
M	otivation/Joy of participating
I	ntegration of participation into daily life
T	ask design/Identification with task/ goal commitment
U P	ser erformance

Table 1: Criteria for evaluating participation

Significance/Meaningfulness/Importance: As motivation for work depends on these criteria, we wanted to find out whether these factors show similar relations to participation as a task on top of the normal daily work of users.

Use of media and participation tools/ Task difficulty: As we applied different tools and techniques, of which the online platform for self-reporting is only one, we planned to analyse the usage and effect of these tools: How are tools and media used on the online platform and for what purpose in particular? What do users report about the difficulty of using the tools and fulfilling the various tasks? How do users react on tools used in face-to-face interventions?

Motivation - Joy of participating: This dimension focuses on the question concerning the impact the participation itself has: whether people have fun participating. Furthermore, we wanted to investigate the specific nature of those tasks that users prefer in sense of joy, including questions about users' experiences with former projects or tasks of their daily work and questions on the collaboration with others throughout the process.

Integration of participation into daily life: As most of the users in our case participated on top of their daily work, we wanted to find out more about the realisation of active participation in daily practice.

Task design/Identification with the task/ Goal commitment: This dimension reflects first of all work psychological aspects of participation. It is crucial for a person's work motivation to be able to identify with the task and have a certain degree of freedom concerning the task design or fulfilment. Furthermore, performing on a task depends on the extent to which a person is committed to the goal of the task, including that he or she defines the task as being useful for achieving progress. This is why we formatively evaluated in which way the task design influenced the participation of the users and which suggestions they made for adapting the tasks. One example of a parameter in task design that can be adjusted is the instruction given to the users.

User Performance: As user performance we defined the actual fulfilment of the various design tasks, meaning user contributions and outputs which can be used for the innovation process. This might be what users document on the platform, what they say in workshops or how they act in simulations.

METHODS

PROCEDURE: IMPLEMENTATION OF DISTRIBUTED PARTICIPATION

We started with an extensive contextual inquiry (Holtzblatt and Jones, 1993) consisting of workplace and home visits, shadowing, contextual interviews and spontaneous brainstorming sessions with healthcare professionals and patients. Its aim was not only to get to know the filed but also to identify potentially useful application domains for video consultation and, consequently, the potential users to be further involved in the process of participatory innovation.

As shortly described, we developed a self-reporting method for enabling distributed participation within the first stage of the innovation process, namely idea generation. For that purpose we set up a private social network and handed out mini-camcorders to the (potential) users, who were part of the identified application domains. They were asked to report on situations from their daily work (healthcare professionals) or life (patients) with photos, short videos or text entries, whenever they observed a situation of which they thought video consultation would be useful and then to upload their documentation to the platform. We conducted instruction interviews with each participant, where we explained the technique and its purpose

and instructed the participants how they should or could go about. We also explained that the aim was to collaborate on the platform for generating future scenarios together.

As we followed an action research approach and the following stage of conceptualization strongly depended on the outcome of the idea generation stage, this procedure is described in the results section.

EVALUATION METHODS

In this section we describe how we evaluated the process and outcomes of participation. We analysed participation through: 1) analysis of the activities and contents on the platform 2) evaluation interviews and discussion groups with those who participated on the online-platform 3) audio/video documentation and analysis of face-to-face co-design activities and 4) Analysis of moderation activities by the researchers. We applied a combined inductive-deductive approach in content analysis (Mayring, 2004) in the way that we used the pre-defined categories of participation (see previous section) and extended these with other categories in the process of data analysis.

Ad 1) The analysis of the user activities on the platform focused on the so-called user performance, i.e. the usefulness of the users' contributions for design. The entities we analysed represented different dimensions that showed the *extent* to which users participated on the platform, i.e. *temporal aspects* (frequency of entries, time of entry, latencies between entries), as well as the nature of their entries, such as *medium* and *features* used for each entry and *detailedness/content* of entries. We also looked at the kind of *scenario information* the entries provided, e.g. rationale for application/innovation, actors, physical environment, equipment or technology used, time and location, activities, needs or requirements.

Ad 2) We created an evaluation guideline that contained the dimensions outlined in the previous section. Interviews were conducted several times throughout the whole project with certain users of the online platform.

Ad 3 and 4) We documented all activities initiated by researchers that were of influence on the nature or extent of participation, whether in virtual or face-to-face collaboration with users. Whenever we adapted the method so that it changed user participation in some way, the activities and the effect they had were documented.

APPLYING SCENARIO-BASED, PARTICIPATORY SERVICE INNOVATION – FIRST RESULTS AND IMPLICATIONS

ORGANISING DISTRIBUTED PARTICIPATION FOR IDEA AND SCENARIO GENERATION

The contextual analysis offered a first opportunity to introduce the users to the idea of video consultation. As we got to know the users better through face-to-face interaction in the contextual analysis, we introduced them to the online platform. This analysis – as a first contact with potential users/participants - was crucial for building relationships for further collaboration.

User performance on platform: As we applied a scenario-based design process, we wanted to gain concrete situation descriptions or stories from the users, in order to require ideas and requirements for the usage of video consultation. It turned out that one of the key aspects for performing this participation task was the instruction we gave. We adapted the instruction several times throughout the process. At first, we had a very open version, asking users only to report whenever they experienced a situation where video consultation could be useful. The first entries after this instruction were mostly entries on a specific problem that healthcare professionals had experienced with patients. The entries were not very detailed. They only contained a short description of why patients contacted them (e.g. "a technical defect with artificial respiration equipment") or very abstract description of ideas (e.g. "support paraplegics when they travel"). In general, those entries did not include information about the people involved in the situation, activities or other information concerning the context. Therefore, based on our evaluation of the user-generated contents on the platform, we adapted the instructions.

Supporting participation by task design and revealing task difficulties: One adaptation was that we added key questions to the written and verbal instructions, so that the participants would understand what information a scenario description could contain (Who was part of the situation? Where have you been, where were the other persons? What exactly happened? What did you do? Why would video consultation be useful in this situation? What was the problem you had to deal with? When did it happen?). Still, the entries did not really get more detailed. A group discussion, in which the evaluation guideline was used, revealed some of the problems users had with the method. They reported that they felt the pressure to generate innovative ideas for video consultation, which was very difficult for them, as they could not really imagine how such a system could be used. In addition, they said that they just did not know what to show on the video or picture. This was also revealed in other evaluation interviews: the issue mentioned most often was the users uncertainty of what exactly they should show on pictures or videos. These findings suggest that the problem was not only related to the difficulty of providing detailed scenario information but rather to the difficulty of the design task. A suggestion made by the users was that the researchers should provide input so that they could think of potential applications more easily, like examples from other clinics already using remote consultation systems or creating a clearer focus for what to document. Therefore, we expanded the instruction sessions with a short contextual interview about the participant's work context and activities, to build a common ground for defining the focus of what to document together. We did this by asking them specific questions, also directly on the platform, which should provide a focus for documentation, for example "Think of all the patients you saw today or that week, what where their problems? Did you observe problems for which patients would not have had to come to the clinic but show it on video instead?" After those adaptations the entries on the platform became more precise, also including information about the patient, the context and the concrete activities carried out. Additionally, the type of content shifted: the entries were not only more detailed but also mostly concerned one concrete patient expe-

rience. Before, the entries concerned rather general ideas for video consultation. It shows the importance of both specific task instructions concerning what to document as well as a collaborative definition of the task, especially in the early stages of innovation.

Even if we could only gather about 40 entries and additional comments on those entries (with 13 healthcare professionals so far; see for some examples figure 2), they finally provided a good overview of the potential application areas and for some of the ideas also first inputs ("scenario pieces") for creating scenarios and deriving requirements. A ranking based on the amount of time an application domain or application (e.g. remote assistance and instruction regarding assistive technology) was mentioned was included in the steering group's decision which of the ideas we should pursue.

Use of media and participation tools: The participants used the media in different ways. Video therefore seems to be a flexible medium for self-documentation, since the participants used various possibilities of what to show on video, like the physical environment of a situation (e.g. filming a patient in his bed surrounded by various medical devices and equipment). Quite surprisingly, participants mostly used it as a reporting tool by filming themselves telling their patient stories. As it turned out in interviews, participants found it difficult to make videos in situations where they had patients, due to a lack of time and fears of intruding privacy and intimacy. As a result, it was not possible to show real-time activities of current workflows that could profit from video consultation. Even if all users reported that they considered video as a nice, easy and quick way to document, they were more active and precise writing blogs, partly also because we commented contributions, asking for more details.

Figure 2: User Generated Content for Service Innovation

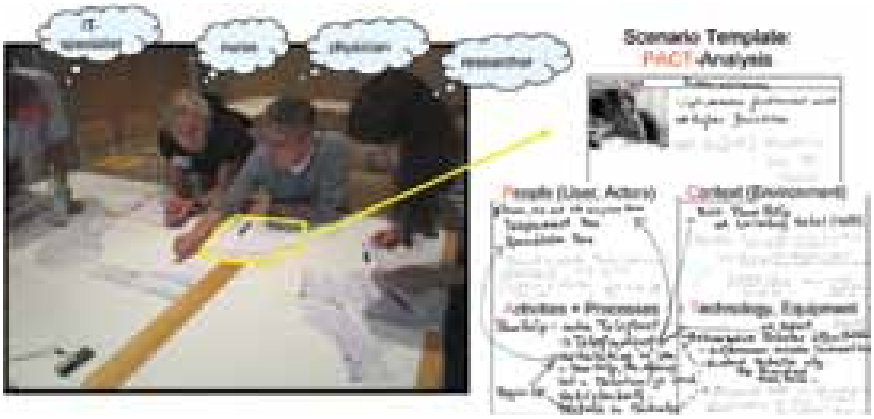

Figure 3: Co-Creating future scenarios with PACT-Analysis

Although we as researchers commented on contributions and communicated online with participants who participated on the platform, such exchange hardly took place between participants. This finding and the fact that participants had still difficulties in reporting rich scenario information themselves prevented scenarios from developing in a distributed, collaborative way. That is why we used the online user generated contents for developing scenarios with central stakeholders in a face-to-face situation, thus creating a "blended design" situation, as described in the following section.

USER-GENERATED CONTENT FOR SCENARIO CO-CREATION

The second phase included face-to-face methods such as workshops using the contents generated on the online platform in the first phase. The aim was to construct future scenarios as stories of future work and collaboration within health services for paraplegics. (In a next phase these textual scenarios would then be enacted within simulations to complement user needs and use requirements specification.) Therefore, we conducted several small future workshops (with each 3-4 participants of a certain application domain), in which we co-created future scenarios with health professionals by directly using the scenario pieces generated on the platform (see Figure 3 to 4). The structure of these workshops was such that we first created in dialogue with the workshop-participants a scenario of the current situation ("current scenario") in form of a rough flow or activity sequence model. We then asked specific questions concerning the effect video consultation would have on activities or other elements of the flow model. Then we co-constructed the future flow model by asking questions concerning the future context of use (see section "A Scenario-based approach to innovation").

Motivation and user performance in face to face methods: Two main insights can be derived from these sessions: Firstly, users participated and collaborated very intensely, even if the task of scenario-generation first seemed unclear to them. For example, we used a scenario-template for a so-called PACT-analysis (see Benyon, 2010 and Figure 3), which turned out to be too difficult to start with for creating scenarios, as the participants could not differentiate between the current and the prospected situation at first. Moreover, it was much more difficult for them to think about and name "people" involved in a scenario themselves then answering our concrete questions, such as "With which persons did you communicate during the situation?". Secondly, we found that the use of a rough flow model provided good support as we went through the different steps of a specific consultation situation together. The mentioned templates were helpful when already having created these rough flow model. Moreover, with the further workshops and as some users participated several times, participants became even more familiar with the technique, resulting in faster and more effective scenario-creations. Also, they more and more called out new ideas for how to transfer

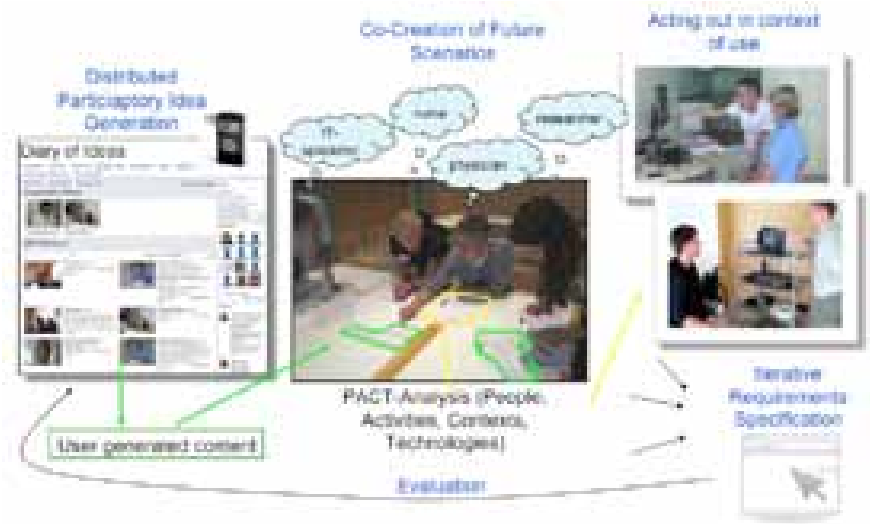

Figure 4: Blended Co-Design: Combined virtual and face-to-face tools for participatory innovation

the particular scenario to another field of care. In this way the scenarios provided a source for innovation.

To sum up, co-constructing the rough flow model and the future flow model by synchronous dialogues between researchers and users as well as using visual representations were two things that did not happen on the online platform but supported participation well.

We recently started to use the scenarios we co-created as contextual introductions to the participatory simulations with health care professionals and patients in which the problem cases from the scenarios were enacted with lo-fi technology as prototypes (see also Figure 4). For some of the users, these simulations resulted in the strongest motivation to participate so far: here they had the chance to try things out and play with the anticipated future, in a "secure" environment. This pleads for carrying out such simulations as early as possible, to raise motivation to participate also in a distributed way.

DISCUSSION

Throughout the first stages of participatory innovation we identified several issues for how (or how not) to involve users in innovation processes. First, users had difficulties anticipating an unknown future. We overstrained users with the task of documenting ideas for video consultation in a scenario format, trying to elicit rich scenario information. As the workshops later on revealed, scenarios were co-created because of a fast moving dialog: it was a highly interactive process i.e. walk-through in which the researchers frequently posed questions that the users answered, to elicit another question by the researcher. Such a synchronous interaction was not possible on our online platform, and the asynchronous comments we made could not have the same effect as there were latencies between asking and answering. Maybe, embedded chats, allowing for synchronous communications, as well as visual representation of work flows, could support online scenario-generation and encourage people in participating.

The task we assigned to users was to make the idea of video consultation tangible by identifying concrete situations for potential applications of video consultation, which turned out to be a difficult task. As the users who participated on the platform did not document out of problems or urgent issues, they needed time and support for reflecting on their daily work in order to identify potential future applications. Piller (2008) points to this issue by separating *problem broadcasting* from *solution seeking*, promoting the former when conducting local search. We experienced this difference when we adapted the instructions by asking which patient-related problems users had experienced that could profit from video consultation. This task was easier to understand and fulfil than only trying to find potential applications. Later on, throughout the scenario generation phase, the participants could imagine more easily where the system could be applied as they had received a clearer idea of what it might look like through the generated scenarios.

We therefore see three implications: Firstly, co-creating scenarios needs a preceding phase where people can reflect on their typical activities. Therefore, participants should be included more intensely in the analysis phase so that their first task is not to generate ideas but only to document on specific situations. Thus, they can use their self-documentation as a source for innovation, as we did when using the user-generated content in the workshops. Secondly, if possible, the analysis in the beginning should focus to a bigger extent on problems or aspects that could be improved within the service system. Literature on service design (e.g. Mager and Gais, 2009) might provide suggestions, e.g. by focusing on crucial touchpoints within a service system and letting users document them. Thirdly, another option can be derived from our experience in the future workshops where users came up with ideas of how the generated scenario for one application domain could be transferred to another. Therefore, a possibility would be to let those users, who already have had ideas, generate scenarios with designers/design researchers and then pass them on (virtually or in workshops), so that other participants could use them as input and think of further ideas for applications. We just started to prepare the scenarios generated together in the future workshops in a (visual) way so that they would be understood easily by others. Those could be used for further scenario workshops, for virtual collaboration on the scenarios, for evaluation and for simulations as well. To sum up, the first scenarios could represent a source for innovation. Moreover, also the simulations as being hands-on experiences can be used for stimulating idea generation much more earlier in the innovation process, especially as they turned out to have strong motivational effects on the participants.

All in all, task difficulty and task identity seemed to have strong influence on the users' motivation; the former revealed during the idea generation task being too difficult as it concerned rather solution seeking than problem broadcasting, the latter regarding the strong motivational impact the hands-on experiences had, as participants enacted situations where they could

show and use their expertise, being more secure in what to do. Moreover, involving users in the task design and adapting the tasks according to these collaborations turned out to have moderating character, especially as far as instructions for user participation were concerned, being a kind of interface between researchers and users.

OUTLOOK

In the framework of a "blended co-design" (combining virtual and face-to-face methods, see Figure 4), our further work will concern the integration of the (video recordings of the) simulations on the platform, enabling a participatory evaluation also for those who have not directly participated so far. Future work will also address the aspect of interaction between the participants on the platform, which were rare in our case study, to stimulate the collaborative development of design solutions and implementation concepts through scenarios.

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"START WITH A SMALL BALL OF SNOW" – MEANINGS AS TOOLS FOR PARTICIPATIVE INNOVATION

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ABSTRACT

This paper presents results from an action research study into a strategic change process in an organization, which aims to establish new innovation practices through introduction of a new digital idea processing system. For the research we have interviewed employees in order to gather different meanings that have emerged once the new system has come in touch with actual work practices. The results are related theoretically to science and technology studies. Based on the results we propose a participative co-design method for providing a platform for the negotiation of these meanings.

INTRODUCTION

In this paper we explore initial outcomes of an ongoing research project to an organizational initiative in a large global heavy machinery and service company aimed at widening their scope of innovation through the introduction of a digital idea collection and screening system and associated processes. Based on interviews with the staff, we have collected different meanings that emerge from the introduction of the system. Here we present our analysis of these meanings and how they can be utilized in a participatory organizational development process for bringing forth new practices. In reporting, we do not specifically focus on describing issues related to innovation management. Instead, we aim to illuminate aspects of organizational change and technology adoption that take place with the introduction of new tools that disrupt established ways of work.

The idea that a company's innovation activities need to extend to include employees not directly involved in R&D activities has been around for a long time. Recently, many companies have taken into use digital networked systems for gathering and processing ideas originating from various parts of the organization. Often these initiatives are inspired by research into open innovation (Chesborough 2003) or innovation method toolkits approach (e.g. Piller & Walcher 2006). When introducing new systems and processes that require new skills and attitudes to users, multiple interpretations of the meaning of this system will emerge, which in turn may lead towards contrasting uses of the system and disturbances in work practices. Forcing an interpretation on the users through organizational control mechanisms might lead to a failure, especially with a system which relies on collaboration and communication.

Building on the reification/participation duality introduced by Wenger (1998) and technology-as-practice orientation from Orlikowski (2000) we refer to the different meanings as means for negotiating the use of tech-

nology and organizational change. In order for any new system to be taken into active use, the contrasting meanings between management and users have to be negotiated before a shared understanding of the new practice can emerge. Furthermore, we describe as future directions a series of workshops in which this negotiation can take place through the means of a co-design process.

THEORETICAL BACKGROUND

Theoretically, this study is situated within the frames of science and technology studies, organizational studies and design research. For readers it is important to note that even though the activities in the organization under study are guided by recent developments in management theory and this paper mentions some of the approaches that have come out of these studies (such as open innovation), this paper does not situate itself within this theoretical frame nor do we as researchers utilize these methodologies when conducting innovation process facilitation. Instead, this study positions itself in the action research paradigm in which we as researchers conduct interventions into the organization work. The interventions focus on introducing conceptual tools for understanding the organizational shifts and assist in making the effects of these shifts in the organization visible and graspable.. Thus, we do not take a stance in the successes or failures of the organization in terms of renewing their innovation processes, but rather reflect on the effects of the introduction of new tools in terms of emerging meanings and practices. In this chapter we will outline earlier research affecting our study and define the key concepts used in this paper.

TECHNOLOGY AND MEANING-MAKING

Meaning making is a human means of making sense of life and its happenings. Meaning refers to an experience that enables the grasping of personal, social and material reality. According to Wenger (1998) meaning is negotiated in organizations through a dual process of reification and participation. In this model, reification refers to an act of giving form, concretization, objectification and creating "thingness". The process of reification gives rise to artifacts such as forms, records, news, receipts, art works, guidelines, stories, systems and tools to give a few examples. Reifications need not be concrete or material but they can also be conceptual such as words, formulas, signals, gestures etc. Thus, reification does not merely produce objects but also immaterial assemblies of meanings that can be seen as reflections of practices, ways of doing things. The process of participation is by its very nature social, involving active connecting, making, discussing, sharing, thinking, feeling and belonging. As Wenger (1998) suggests, this is a process of duality rather than dichotomy of the constituent parts: reification and participation cannot be separated or even be perceived existing alone. Meaning is produced negotiatively by participants interacting with each other, surrounding objects and the environment These participants, and the meanings they produce and reify, together constitute a community of practice.

Using a community (of practice) as the unit of analysis for studying organizations has been not only justified but also criticized. Instead of focusing on the community, more attention should be paid on studying the practices (Orlikowski 2002) that are argued to "create epistemic differences among the communities within a firm" (Brown & Duguid 2001). Furthermore, Orlikowski (2000) introduces "a practice lens" for studying the role of technology in organizations, according to which the research should focus more on the ways people interact with technology in their daily work practices. Thus, the center of attention in this research is not so much the groups or communities but rather the ways people use tools and understand the technologies, find purpose or make meaning for their tools and how they put the meanings into practice in the everyday use of technologies.

Orlikowski (1992) emphasizes the dialectical nature of interaction between technology and organizations. Building on Gidden's classical theory of structuration, she proposes a structurational model of technology in organizations: there is a reciprocal interaction between the human actors, or users and the technology used in the organization. Drawing on the socio-constructivist studies on interpretation and meaning-making on technology, Orlikowski proposes that technology development is a social and political process that produces structures (i.e. rules and resources, enacted in daily practices) that can be seen either embedded in technology, or emerge through the interaction with technology. Thus, the users can be seen either to appropriate the embodied structures or to enact the emergent structures through recurrent use of technology (Orlikowski 1992, 2000).

In the organizational context, technology is constructed continuously through a dual process. Technology is physically constructed by actors working in a given organization, and at the same time, technology is socially constructed through meaning formation and the use of technology. In addition, technology is interpretitively flexible, which means that different people assign different meanings to it. Furthermore, people can and do choose to use technology in different ways independent of how the technology was intended to be used by its designers. With time and through recurrent use, technology has a tendency to become reified and institutionalized. In this way technology loses its connections to the particular human actors that constructed it either physically or socially, and it starts to resemble an objective and structural part of the organization's everyday operation (Orlikowski 1992).

According to Orlikowski (1992) there are two modes of human interaction with technology: the design mode and use mode. The temporal and spatial distance between the design and use modes determines the degree of interpretitive flexibility of technology; the wider the distance the less flexibility there is. This means that if the users and use of the technology are kept close to the design, there is more flexibility in the use of that technology, and the design and use modes can benefit from each other through interaction (Orlikowski 1992).

Moreover, Orlikowski (2000) distinguishes between technology as an artifact and technology-in-practice. Technology as an artifact refers to a device

or software code, whereas technology-in-practice refers to how people use the technology in the organizational settings. For our research the notion of technology-in-practice is of particular interest, as it is in the social practices where the interpretations are made by the users and where the properties of the technology become constituted through shaping the users' actions. The users not only choose to use (or not to use) a technology but they also choose the way they use it. The users may choose to use the technology as it was designed, but they also may use it in surprising and unanticipated ways. The use of technology is affected by user's and also by other uses' or actors' interpretations of it. Thus, the use of technology is formed and structured through user's prior knowledge and experiences, meanings and interpretations, contextual factors, and the technological artifact they are using. (Orlikowski 2000)

To sum up, when using the technology as a part of their practices, the users constitute the technology-in-practice, and the actions are shaped by the past uses, or enactments of the technology-in-practice. Thus, each enactment of the technology-in-practice reinforces itself, and gradually, becomes "taken for granted". In their recurrent practices the users shape the technology-in-practice that in turn shapes their use (Orlikowski 2000).

ORGANIZATIONAL CONTEXT

The setting of the study is in a globally operating North-European heavy manufacturing and service company and the focus of research is in its front-end of new product development. The company maintains several R&D units in various countries and each of these has their own organizational culture and historical development paths. Some of them are established by the company and some are incorporated through company mergers. These units are responsible for creating new technological, process and service innovations resulting in outputs such as new patents, products and product concepts or services. Since late 2009 the organization has adopted a new strategy for sharing and screening early ideas between these units. The initiative came from the realization that new product ideas are increasingly created in other contexts than in that of a centralized R&D unit and therefore communication of and around ideas between the units should be strengthened.

The company has piloted a digital tool which allows its users to enter, comment, evaluate and screen ideas. An innovation process has been defined that guides the use of the tool in the work context and includes pre-defined system roles of users, champions and owners. *Users* can enter new ideas, comment on existing ones and evaluate ideas by giving them positive or negative votes. All the ideas are accessible to them via a web-based interface, and idea generation is encouraged with regularly published "idea challenges". These challenges are organization-wide campaigns that aim to encourage ideas concerning a specific predefined topic such as ecological building materials. All of the ideas and related comments and evaluations are then screened by *champions* for interesting ideas that could be further developed. Together with the *owners* they choose which ones are accepted to the next stage in the process. Currently the tool is used by some 800 users and the user base is gradually being increased to also include members from outside the R&D function.

The management expects that through this new innovation process they are able to generate a wealth of ideas that can be shared among their R&D staff. Of these ideas, the best are filtered for further development and those that are seen has having less potential or that are being introduced at the wrong time are archived for later use. The central metaphor that emerges from interviews with the management of the process is that of a linear "assembly line", in which ideas are seen as a special type of products that go through various steps and are assembled into innovations. This way of seeing innovation puts emphasis on ideas, but assumes little interaction between the participants. In a similar vein, employees are seen as handling the advancement of ideas, refining good ideas, weeding out the less successful and implementing the best. In reality, the practice of innovating is much messier. It includes non-linear processes such as iteration and requires rich interaction between the participants. In our research, we have recognized various differing and sometimes conflicting meanings and interpretations of the system stemming from employees residing in different parts of the organization. This process of negotiating meanings can be placed within Wenger's (1998) framework of participation/reification duality and Orlikowski's (1992) view of technology as practice.

DATA COLLECTION AND RESEARCH METHODS

Constructing new innovation practices in organizations can be viewed as a wicked problem (Rittel & Webber 1973) for which there are no clear-cut problem formulations or definite solutions . Our role as action researchers is, in addition to collecting empirical data, to facilitate the company in the process of establishing the innovation tool and new practices alongside with existing innovation practices. To achieve this, we have iteratively created a process model which describes the current view of management on how the system should work. In addition, we have carried out group and individual interviews with employees from different units and operating regions in which we have focused on practices and meanings that they give to the tool and the innovation process. The data from the individual interviews forms the core of this research paper. In each interview there was an interviewer, interviewee and a note-keeper, and the interviews were recorded in audio and text format. Later on the interview data was transcribed into text from audio. We have also organized a process simulation workshop based on the SimLab business process simulation method with the aim of discussing how ideas are created and processed in the organization using a dedicated web tool.

The interactive and participative SimLab process simulation method (Smeds 1997, Smeds & Alvesalo 2003) contains elements from case study (Eisenhardt 1989, Yin 2003), action research (Stringer 1999), and constructive research (Lukka et al 1993) approaches. The process simulation method is used both for collecting empirical data for research and for facilitating the case organization in its development process. A simulation project, typically lasting 3-4 months, begins with a kick-

off with the participating organization, where the goals are negotiated and set. Then, initial process modeling follows, in collaboration with researchers and representatives from the partner organization. After the process modeling, thematic interviews are planned and carried out. These can be both individual and group interviews, as was the case in this research. The interviews are essential for collecting data from the various stakeholders in order to prepare the actual simulation day, which is typically a one-day workshop with a facilitated walk-through of the process with the help of a visualized process model, facilitated discussions related to the process, and group work that aims at collaborative knowledge creation. The simulations are at the same time collaborative knowledge sharing and creation and process development workshops for the partner organization, and a data collection opportunity for the researchers. In the simulation we combined the business process simulation method with techniques commonly used in the field of user-centered design, such as personas and use-scenarios. By incorporating design methods we aimed at stimulating empathic understanding of the process (Salmi, Kronqvist & Pöyry-Lassila 2010).

At the time of writing we are conducting a series of workshops in which the participants are co-creating a vision of new work practices focused around the use of the new tool. These are described in the fifth chapter. In our action research approach we intend to utilize the different interpretations of technology as premises for developmental change instead of problems hindering tool adoption. We believe that this approach is critical, considering that the aim of the research is studying systems for supporting complex innovation practices instead of simple routine tasks.

EMERGING MEANINGS

Various interpretations for the idea tool emerged from the data collected in the interviews and the process simulation. Regardless of the efforts of the organization management to construct a single innovation process, the innovation tool gives rise to different meanings in its different users. Given its inherent complexity, it would be foolish to expect a clear cut meaning for a complex social system such as an innovation process in a large organization. People have different ways of being creative, that are highly context-dependent. Even though these processes can be very similar, differences emerge even with people working closely together. While some prefer creating ideas while traveling, some might schedule a specific time for ideation. Some are at their brightest when brainstorming with their team and some choose to work alone and emerge with a detailed plan for the innovation. Others might have a specified technology to focus development work on while others look for new concepts based on emerging user needs. Some choose to operate in their familiar field and delve into highly specified topics while others courageously experiment in unfamiliar territory thinking about themes that are rather foreign to them. Given the multiple meanings for innovation, it then is no surprise that an innovation-support tool is put to use with various different expectations.

In the process of creating the personas and scenarios for the simulation, special attention was paid to incorporating these different ways of comprehending and using the system. This was done in order to enable the participants to become aware of the various perceptions and to elicit further discussion for sharing and expanding views. When analyzing the material we noted that most of the meanings that people assigned to the system supported each other and built a somewhat integrated image of the tool but some were also in clear conflict with each other. We also observed that similarities in the meanings assist the building of communities of practice around the tool, but contrasting ones slow the adoption process.

VALUABLE IDEAS

"You know, when I have a good idea, or if somebody has a good idea, they always think about protecting that idea to the point where they can patent it, and, just because at the beginning you put it out there, you know, half-baked, and a lot of people comment on it, now all of a sudden you may have a patent, and may have 50 different people claiming responsibility for it." - male, user role.

It became clear from some interviews that ideas can be viewed as a valuable commodity that one comes rarely by. Following this view, early front-end innovation becomes activity that aims as pruning and protecting the idea until it is ready to be presented to others. If one releases the idea too soon, it becomes exposed to dangers such as loss of ownership, damages to professional identity or leaks to competitors. In a way, this view assumes that an idea only has value if it is protected and carefully constructed and only shared once it has been developed enough.

The roots of this meaning for ideas can be seen as stemming from the patenting processes of new technological innovations, which already are strongly reified within the organization. The firm has established processes and dedicated departments for evaluating ideas for possible patents. In addition, the company has historically tied these processes together with incentives such as monetary rewards for awarded patents. Together these systems support the meaning of "rare and valuable ideas" that on the other hand can also cause significant damage to the employee and the company.

This meaning is to a great extent in conflict with the underlying assumptions of the new innovation tool, in which ideas are only seen valuable once shared with other users for comments and evaluations. The tool represents a view in which a certain quantity of ideas is required before quality can emerge. New value can be found in ideas through exposing them to different users with different backgrounds. If they are kept hidden until one is certain of some of their value, all these varying viewpoints are lost. Also importantly, how can one be sure that no-one else is secretly developing exactly the same idea?

IDEA WAREHOUSE AND PROBLEM BANK

"I think that the tool is really great, because it means that now at least I can let go of the idea." - female, user role.

Many users thought of the tool as a memory extension, which is used to write down ideas, problems or user needs that one has found at work. Some viewed it as a place for all those ideas that one could not implement in one's own work, but that could still

have value in some other context. On the other hand, some others saw value in it for storing ideas that one should come back to. Some users extended the meaning of an idea to include technical problems and user needs that they have found in the field.

In a way, many of these views are in opposition to the valuable ideas meaning in a sense that the users felt that they get too many ideas to keep in their heads at the same time. These meanings exemplify a view of the tool as a static database and a process in which work is "thrown over the fence" for the next person to process. Some of the interviewees pointed out that they haven't really been using the system for communicating or collaborating with other users. The conflicts between the database view and assumptions of collaboration become apparent when interviewing owners that express their frustration at the system being a "wishing well" in which users throw half-baked ideas or problems that need solving.

Through these interviews one builds a view of the system as a place in which ideas are dumped and where no-one ever goes to see them. One interviewee, a user, female, noted: "*Is there anyone who would go and look at [ideas]? In a way they are left lying there like in a graveyard.*" This interpretation is also linked to the experience of lack of feedback. Many interviewees brought up that they had entered an idea to the system but even after six months they had not received a response either from another user or a champion. This caused them to feel frustrated and doubtful about the usefulness of the system for ideation. Based on the data it seems that for many bringing own ideas out and under discussion is a demanding personal investment and if the ideas do not elicit a response from others it feels hurtful.

How could the conflict between the database and collaborative meanings be solved? Many interviewees expressed that they are motivated by problems that need to be solved. In addition to ideas, could the system have a category for problems or needs that one can use as an inspiration for innovative products or services?

IDEAS AS WORKLOAD

In the interviews it became apparent that for the champions new ideas entered into the system mean additional workload. The current structuring and division of work proposed by the system clearly puts strain on champions since they are the ones that screen the ideas and present them to the owner for decision making. Together with the owner they resolve whether to reject or further the idea. For the champion reading through and commenting the ideas in a constructive way takes time and energy. As one of the interviewed champion, female noted: *"At the back of my mind I have 34 ideas that I'll just start roughly going through."* The words that the champions used for describing what the system means for them included 'burden' and 'load'. These meanings carried with them a sense of guilt for the ideas that were not yet processed. For some champions the processing of ideas happens in addition to other work, while for others there was time put aside for this activity. The present role description of the champion leaves little room for supporting the user who created the idea in elaborating, redefining, connecting to other similar ideas or in contacting knowledgeable subject matter experts. Even now as the user base covers approximately 800 employees, it is hard for the champions and owners to keep up with pace of ideas entered into the system. As the user base of the system grows it will eventually become impossible for the champions to go through every idea entered.

COLLABORATION IN THE WILD

"*Virtual teamwork and team sports are always better than solitary work in these environments. It's because the more comments and viewpoints you can gather for ideas the better the end result becomes.*" - male, owner.

Many users expressed hopes for increasing collaboration within the system through active commenting. Comments were seen as contributing positive encouragement for the idea creator or constructive feedback that builds ideas forward. Interviewees who shared this meaning also shared the belief that the best ideas are created through collaboration of experts. What differed somewhat is the extent to how much and at what point this collaboration should take place in the open. Some viewed that ideas should be entered in the system regardless of their stage of development. In this way they would be exposed for comments and collaboration from the start on. Others mentioned the need for closed work spaces for a groups of experts in which ideas could receive feedback from trusted colleagues before publishing it in the open. One interviewee stated that this is an existing practice in the organization. There is a strong tradition of working in teams and innovating in small groups. An owner, male describes "Here we have people working together in a certain project. They can toss around ideas with each other because they have an internally formed network. It can be bad in a sense that no influences come from outside." One interviewee, male, user, compared innovation activities to building a snowball: *"Start with a small ball of snow, and as they roll it, it becomes bigger and bigger."*

The need for closed working spaces also connects with the wish of some interviewees to have the possibility to present themselves as anonymous in the system. This is true especially when evaluating others' ideas using the up/down arrow functionality, that loosely corresponds to "thumbing" in other collaborative and social media applications. Many said they only use the positive arrow-up feature of the system to avoid hurting the feelings of the idea creator.

This view presents a more dynamic view of innovation activities. It recognizes ideas as something that can and should be developed in collaboration and that are not dependent on the original intentions of their inventors. Through collaboration ideas can change and combine with others to create entirely new meanings. Participants are motivated through responses from other users and they give out encouraging comments for other users as well. However, many interviewees expressed frustration at the static state of collaboration in the system or non-constructive communication either in the form of evaluations or critical comments to ideas. On the other hand, the wish for anonymity highlights the difficulty of giving or receiving negative feedback. In addition to features that aim at constructing ideas, the system should more clearly encourage emo-

tional communication such as statements of support and encouragement or constructive feedback.

CONNECTIONS AND PROFESSIONAL IDENTITY

In the interviews we found a case in which one user had connected with another user working in another location through the system. The users had been tossing ideas in the system around a common topic for some time and when the other user had visited the other's country, albeit in errands unrelated to the actual idea, they had arranged to meet. The interviewee said that without the system it would have been improbable that they would have met or even known about each other. The system seems to have potential for connecting people working in geographically distant units of the company and bringing together the skill and expertise of these people. This possibility was brought to the fore by many interviewees. The fact that the system can be used to connect with employees from different units was seen as positive, even if still challenging.

Some interviewees found that the system enables connecting with people that have similar interests and that work on tasks alike. A user, female stated: *"I discovered that you can actually find people that have an interest similar to what I'm doing. I think that I will actually look much more in detail [into that]."* She found it motivating to notice other like-minded people using the system. Clearly, the system has the potential for fostering the building of a professional identity, in communicating one's expertise to other users and through these creating an arena for meaningful professional collaboration. The tool expands in meaning from a mere collaborative work space into a forum in which social contacts can be made and in which identity as an expert in a certain field can be built.

ACCESS AND OWNERSHIP

Even though in this research we were particularly interested in those people's perceptions that were actual users of the system we acknowledge that the ones that did not yet have access to it were also affected by the system's presence. In the data we saw that the gradual introduction of the system raised thoughts of exclusion and inclusion in some interviewees. The ones that were interviewed were all included in the user base but they brought up that the phase-by-phase introduction of the tool has given rise to practices that allow access for selected few. One interviewee acknowledged that some people working close to the customer do not have admission to the tool, or that they do not necessarily have access to a computer. Another interviewee told about a practice that had evolved around a challenge. In this case a project manager who was also a champion collected ideas outside the system through e-mails, workshops and in the office corridors and eventually entered the ideas in the tool on behalf of the employees who did not have access to the tool. Introducing a technology in an organization brings about a process of meaning negotiation and emergence of new practices and this process may evidently also touch on non-users.

These differences in job descriptions and conditions brings to light a critical challenge for organizing participatory innovation. If ideas are to be generated in and collected through an ICT system a possibility for using a computer connected to the Internet should be organized. Also providing these people with the necessary technical and communication skills should be taken into account. These issues are not trivial from the point of view of innovation since many interviewees thought that the employees that have the closest connection to the needs of the customer are a valuable resource for new product and service ideas. Keeping this in mind it is not only the R&D department of the organization that should be viewed as capable of innovation.

FUTURE DIRECTIONS

The multiplicity of interpretations opens up an interesting arena for research into emerging practices forming around an innovation tool introduced in an organizational context. The meanings described in the chapter above represent a part of the findings from our study. While it cannot be stated that they are fully representative, they constitute a picture of the current situation the organization finds itself in. As they exist currently, the tool and innovation process do not take most of these emerging meanings into account which significantly harms the efforts for developing new innovation practices. What is taking place is a renegotiation between the meanings originally reified by the management and the meanings emerging from the contact of the new tool with existing innovation practices.

The first simulation project aimed at creating an understanding of the as-is situation of the front-end innovation process. In the current research phase the purpose is to grasp the future in the form of a to-be situation. At the time of writing, as part of an action research-oriented approach, we are organizing a series of three *tangible innovation workshops*. While the SimLab method centered on modeling existing processes, the aim of these workshops is to bring the identified meanings under discussion and elaboration. We intend to support the reification/participation process by providing a facilitated co-design setting in which the participants reflect on their innovation practices and construct various artifacts embedded with meanings, values and practices. The designed artifacts include personas, process models and interface concepts for new tools or features. We assume that through these activities the participants can explore possible futures for their innovation activities which are based on their own input. Furthermore, through participating in the workshops the management is able to create a more thorough understanding on which future decisions can be based. Although the workshops are still ongoing, the initial feedback is very positive and the participants seem motivated and committed to the solutions. We will report the results of these workshops in later research papers.

Possible future research directions can be the study of actual work practices: collaborative workshop settings, use of digital communication tools and other activities that can be observed in context. By conducting these studies, it becomes possible to describe how current meanings actualize in practices. Another research direction could be the study of social groups and communities of practice that share meanings and practices. These research results could contribute towards the design of better tools that take in regard different understandings of innovation and

allow for it to be connected to various practices found at the work place.

CONCLUSION

In this paper we have described results from a research project into an organizational change project. We have identified several meanings that participants have given to the innovation tool and process. The world of meanings in our data is intricate in its composition. We observe a complexity of quality, quantity and direction. It seems that certain meanings are more reified than others. But we also see that there are opposite interpretations. There is potential that the opposite meanings may create disruptions if they are not taken into account in the design of the tool and planning of the innovation process, and even more so if they are seen as false interpretations. If the polarities are not recognized and collaboratively negotiated the tool may become marginalized in the daily working practices. It could cause a gradual fading out and eventual abandonment of the tool. The way the system is currently constructed and which practices it currently supports is in conflict with the meanings that have emerged from actual work practice. This discrepancy between the rigid system that is guided by a strongly reified linear innovation process and the different innovation practices of the employees is reflected in the critical views of many users of the system, whether it is the burden experienced by the champions or lack of constructive feedback of the users. Here, we identify connections to the notion of interpretative flexibility (c.f. Orlikowski 1992) as the distance between the design and the use of technology seemed to have an effect on the way the tool was experienced. In this case management implemented a tool that was a commercial off-the-shelf product purchased from outside, and even if the tool was modified somewhat to meet the needs of the organization, it was received with reservation and taken into use somewhat hesitantly. This would indicate that the interpretative flexibility of the technology was affected negatively by the distance between the design and actual use of the tool; in other words, the technology allowed only for certain kinds of enactment or appropriation of the technology-in-use (c.f. Orlikowski 2000). Furthermore, the identified discrepancies between the technology-in-use and the idea creation practices of the users could explain the inconsistent meanings attached to the tool. Knowing what the meanings are that employees base their activities on should assist the redesign and reification of the tool and its related work processes.

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TRACK 4

DESIGNING INNOVATIVE BUSINESS MODELS

CHAIRS

Jacob Buur, Robb Mitchell, Bart Wozniak

KEYNOTE SPEAKER

Peter Hesseldahl, Universe Foundation

The very model of how to make business is at play in most innovation projects today, in particular with the advent of Internet commerce. Even traditional manufacturing companies with conventional product sales are presently challenged to consider alternative business models: Service design, project sales, direct sales etc. Public organizations are under increasing pressure to consider themselves businesses, with all that this entails in terms of new terminology: Customers, offerings, cash flow etc. In Participatory Innovation the core assumption is that people outside the organization – especially users – can contribute to innovation. But is it possible to open up the process of business modeling to participation from a wider circle than those marketing managers that typically devise new business schemes? Which opportunities does this provide? And what are the consequences of such a move? To allow people without formal business education to take part in business model discussions means moving beyond text and spreadsheets.

The authors in this track provides both insight and practical techniques for what we might call Participatory Business Model Innovation. Five business cases describe a variety of innovation challenges for single companies, for groups of companies, for

an NGO, and for combinations of public and private organisations. Other authors respond to these cases. Business researchers offer frameworks and perspectives on value, business process and innovation platforms. Design researchers propose ways of 'designing' business models by means of extreme sketching, tangible models, role-play, and even video games!

Altogether the papers outline a new and very promising approach to establishing collaboration between design, business and management.

BALANCING VALUE IN NETWORKED SOCIAL INNOVATION

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ABSTRACT

Innovation increasingly takes place through co-operation. Even more so in the case of social innovation, where profit and non-profit organisations collaborate to create solutions for societal issues. For these innovations to become successful, already early in the process it needs to be clear to the participating organisations that they will be able to gain value in return for their investments in the creation of the service proposition. This means that, together with the proposition, a business model needs to be designed, that provides insight in the feasibility and attractiveness of the total proposition, as well as in the value for the various participants separately. Building on existing methods, a 5-step approach was developed to support the process of refining the overall proposition together with the participating organisations, and at the same time checking the balance in value flow for each of them. This paper describes the approach to balance value in networked social innovations using one project as example.

INTRODUCTION

There is increasing attention for collaborative innovation and innovation in networks. Many organisations recognise the opportunities to bring richer value propositions earlier to the market when including competences and services from others. Next to the opportunities that can be derived from a corporate strategy, there are even bigger opportunities in the societal challenges that we are faced with today: the greying population and the related increase in healthcare costs, the end of the fossil energy age, the unhealthy lifestyle of many people and increasing criminality. Finding real solutions for these societal problems requires the combined knowledge and experience from various parties, both profit and non-profit organisations. The combined knowledge enables the definition of a richer value proposition that is based on better insight in the unmet needs of the end-user and a wide range of available technologies. Typical value propositions for societal challenges are a system of products and services that are jointly developed and provided by a network of organisations. For these organisations it often means that they need to go beyond their current portfolio and business models.

For the participating organisations in networked innovation is important to be able to check not only the feasibility and attractiveness of the total proposition (as it is in any innovation process), but also what value it will deliver them in terms that are relevant to them. As participating organisations are both profit and non-profit organisations, value is defined in different terms: next to economical value, other values, e.g. knowledge or reputation, are important in the decision to commit to the innovation. Good insights are needed into the tangible and intangible benefits for all relevant participants, both initially as well as on the longer term.

In the Netherlands, Design Initiatief is actively pursuing networked innovation for societal issues, by initiating projects and partnerships. While supporting these projects it was found that these projects have a high complexity, due to the number of participating organisations and the dynamics in the network. A 5-step approach was developed and implemented in the early stages of six projects.

This paper describes how the 5-step approach can support the front-end of networked service innovation. This will be illustrated by an example of a social open innovation project in which the approach was used to facili-

tate the definition of the value proposition as well as the business model with the network of organisations.

LITERATURE AND THEORY

Networked social innovation integrates theory and practices from multiple research perspectives. Literature from a wide range of areas, such as business management, organisation science, innovation management, service design, sociology, and engineering contain relevant insights. Nevertheless there is not one area that provides an integrative approach for networked service innovation.

Social innovations are defined as innovative activities and services that are motivated by the goal of meeting a social need (Mulgan, 2006). Therefore they do not start from a certain company's perspective. Pol & Ville (2009), emphasize that social innovation (new ideas improving quality of life and/or quantity of life) and business innovation (profitable new ideas) are different, yet overlapping concepts. There are immense opportunities in the overlapping area, where business can go hand in hand with improving quality of life of people. Visionary businesses can play a role in creating new business models that open up new markets, and simultaneously attend to societal wealth improvements. In a 'virtuous cycle' businesses can benefit from greater profits and grow their business faster, thereby reaching more people who's poverty and human suffering are then alleviated (Thompson & MacMillan, 2010). Yunus et al. (2010) indicate that social business models not only require new value propositions, but new value constellations and new profit equations as well.

In general, these social innovations need the participation of a number of organisations to identify the unmet needs, generate the ideas as well as to realise them. Diverse collaborative networks bring more novel solutions (Nieto & Santamaria, 2007). It is assumed that flexible value webs or value networks will replace the traditional, static and linear value chains (Allee, 2008; Stathel et al., 2008; Tapscott et al., 2000; Riedl et al., 2009). Business networks enable the achievement of greater value than organisations can achieve on their own (Blankenburg et al., 1999). But businesses participating in networks also need to appreciate some of the paradoxes that are intrinsic to the nature of business networks (Hakanson & Ford, 2002). As there are different roles and organisations with different needs involved, value models are needed that will combine tangible and intangible values for the dynamic network of participating organisations. Already decades ago marketing literature mentioned the reality that often, next to direct transfers of tangible entities, indirect, intangible and symbolic aspects are involved in exchanges between parties that have a social relationship (Bagozzi, 1975). Back then; a manufacturer-retailer-consumer system was already considered a complex chain. The multi-party systems that are inherent to social innovation are far more complex, but nevertheless the ideas on value exchange are still applicable. Value exchange and balancing value of both tangible and intangible assets is needed (Allee, 2008).

Morelli (2006) indicates a shift from the provision of finite solutions (products) which are often relieving people from their own tasks and responsibilities to the provision of semi-finished platforms including products and services, that will enable people to create value according to their individual needs. Value creation becomes a synchronic and interactive, non-linear and transitive process in which customers other actors co-create value (Ramirez, 1999). The resulting value proposition of the collaboration of profit and non-profit organisations is often not a single product or service but rather a socio-technical service system. Such a system includes anything that is necessary for performing its intended function, including its environment and social context (Kroes et al., 2006). It combines products and services in their social context. Service innovation is in itself not new: designing services is probably as old as humanity. However, the experience economy (Pine & Gillmore, 1999) and evolution towards human value-centred innovation, has shifted the thinking towards a serviced based approach. This led to a global shift in many organisations to rethink their operations and strategies towards a service-centered point of view which is intangible, user oriented and relational (Vargo & Lusch, 2008). Existing methods have extended from the field of interaction design to a more holistic approach based on design thinking aiming at novel solutions that dramatically improve existing ones (Miettinen, 2009). Osajala & Osajala (2009) distinguish business competence in service innovation from service design competence, and see the creation of innovative value propositions as an important step to link service strategy and service design. As such there is a strong parallel between innovation in products and services in the front-end of the processes, where a value proposition is defined. Recently there is an explosion of tools described in literature to map the various stakeholders in conceptualising services (Miettinen and Koivisto, 2009; Stathel et al., 2008; Tollestrup, 2009; Diana et al., 2009; Wreiner et al., 2009; Kronqvist and Korhonen, 2009). Ballantyne et al. (2010) argue that reciprocal value propositions reveal opportunities for engagement with suppliers, customers and other beneficiaries beyond sale/purchase transactions. Reciprocal value propositions are positions as a communication practice that brings exchange activities, relationship development and knowledge renewal closer together. Although they do not specifically address social innovations, their suggestions fit very well with networked social innovations.

Open innovation is mostly seen from the perspective of one company (Chesbrough, 2003; Chesbrough et al., 2006). A recent, extensive overview of open innovation literature by Dahlander & Gann (2010) derived four types of openness: inbound and outbound innovation based on pecuniary and non-pecuniary interactions. This shows that the company's strategy and it's funnel of innovation projects is leading in strategic decisions. There is a lack of literature on a more pragmatic level, supporting concept and design decisions. Research by Pisano & Verganti (2008) on collaborative innovation distinguishes four basic modes of collaboration, which are defined by the openness of the network (open vs. closed) and its goverance (hierarchical vs. flat).

Although this supports selection of a collaboration strategy, it does not provide relevant clues for implementation of a strategy on project level.

The dot.com era resulted in an enormous increase in research on business models. Literature covers many aspects of business models: what they are (Osterwalder, 2004; Osterwalder et al., 2005; Doganova & Eqyuem-Renault, 2009), what they do (Pateli & Giaglis, 2004) and what their power is (Magretta, 2002; Shafer et al. 2005), which ontologies exist (Gordijn et al., 2005; Akkermans et al., 2004), how business models can be reinvented (Johnson, 2010) and how they connect to strategy and innovation management (Teece, 2009). Most of these authors use the term "value", but use it to indicate "financial profit". Business models are viewed as a means to find new ways to reach and address the customer, and as such are seen from the perspective of one company with an existing business in an existing market. As such the scope is too limited to cover social innovations. Yunus et al. (2010) indicate the need for new profit equations for social business models, but largely focus on the recruitment of social profit oriented shareholders. Business models that address the intangible values explicitly seem not (yet?) to exist in literature.

The challenges in the creation of social innovations in flexible networks can benefit from the research mentioned above, but as the projects start in the so-called "fuzzy front-end", the proposition is still under construction, the network is not yet stable, and organisations might leave the party while others come in at a later stage, bringing new insights to the table. The iterations that take place in these early stages are needed to enrich the proposition and validate the feasibility both technically as well as economically.

EMPERICAL RESEARCH

To better understand the issues and dynamics of social innovation in flexible networks an empirical setting is needed. Design Initiatief is a Dutch national program of projects driven by the ambition to create business-generating solutions for future markets through networked innovation, in which knowledge institutes, design firms and businesses participate. Design Initiatief aims at the ideation/ pre-seed phase of new business development and makes use of the strong design and development reputation of the Dutch creative industry and knowledge centres in this area.

The starting point is societal changes and issues, for which future potentials for the Dutch economy are explored. Potential network-partners are invited to participate in jointly creating and developing breakthrough solutions. Design Initiatief had initiated and facilitated over 60 projects in less than two years and learned about the differences in networked social innovation compared to 'regular' innovation projects. These differences lead to new requirements for the process in the front-end of social innovation in networks:

- Societal issues are the starting point of networked social innovation. Defining a suitable value proposition for future needs is the first step that leads to defining and building the network of companies and organisations to realise the proposition. In this creative step multiple organisations are needed to define a value proposition that integrates as much knowledge and experience as possible. This is an iterative and dynamic process, in which knowledge is exchanged and developed and advancing insights are resulting in adaptations to the value proposition;
- The arising new value propositions often require reconsidering the current business model and context. Therefore the proposition, the business model and the partner-network are designed concurrently. The consequence of this is that the partner-network is not a pre-defined starting point, neither a closed system. The network is flexible and changes during the innovation project as goals develop and values for the players become clearer every step: during the process different scenarios need to be explored, and this may lead to some partners stepping out of the network, because the proposition does no longer provide sufficient value for them, and others entering at a later stage, bringing in new assets and needs;
- To ensure a sustainable commitment from the participating organisations, each organisation has to be able to balance the value he brings to the network with the value that he can obtain from the solution, in terms that are important to him. Next to economical value, other intangible values may be influencing the decision to commit, e.g. knowledge or reputation. The expected balance may be different for each of the potential network-partners.

Design Initiatief aims for better support for her networked social innovation projects. The research project is therefore set as an action research project. Six projects were actively supported in the process to balance value for the participating organisations.

RESEARCH QUESTIONS AND APPROACH

Networked social innovation projects – as done through Design Initiatief – require an adapted innovation process. Based on the literature several methods were identified that offer partial solutions: the exchange theory from marketing perspective (Bagozzi, 1975), the business model ontology (Osterwalder, 2004), the e3-value ontology (Gordijn & Akkermans, 2001; Gordijn et al., 2005; Gordijn et al., 2006), the business model canvas (Osterwalder & Pigneur, 2010), the reciprocal value proposition approach (Ballantyne et al., 2010), the actors' network maps (Morelli, 2006) and the value network analysis (Allee, 2008).

The research question for this paper is to define a process for balancing value for social innovation in flexible networks that enables:

- Enriching an initial value proposition starting from a societal issue and future insights, and building on knowledge, experience and skills of multiple organisations;
- The inclusion of a complex and dynamic network of a variety of different types of organisations and individuals;
- The inclusion of different types of value (tangible and intangible).

Elements that were applicable from literature were combined in a 5-step approach to balance value:

1. Enriching the initial value proposi-

Figure 1: Initial value proposition of the Savera project

tion;
2. Creating the value flow model and partner-network;
3. Balancing value for network-partners;
4. Refining the value proposition;
5. Detailing the business model canvas for each network-partner.

The approach was implemented in six of the Design Initiatief projects. To be able to go into more detail in the description of the results, we will only describe one of the six projects in this paper.

RESULTS OF THE EMPERICAL STUDY

One project, the Savera project, will be discussed in detail to clarify both the research approach as well as the approach to balance value.

CONTEXT OF THE SAVERA PROJECT

Currently, the majority of India's population, 730 million people, resides in rural areas and depends on government health workers in primary health centres. Despite government human and financial investments, health conditions of women in rural India are poor. The mortality rates of babies and pregnant women are a significant problem in rural India (Parmar et al., 2009). This social issue is used as the starting point for the Savera project.

Step 1: Enriching the initial value proposition

Design Initiatief brought together different organisations and provide more information on the context, current problems, solutions and insights.

The participants were people from non-profit aid organisations, knowledge centres, universities and businesses in the healthcare industry. This multidisciplinary group covered knowledge on rural India, and specifically the situation of pregnant women, experience in doing business in the bottom of the pyramid, as well as technological options. The participants started with identifying unmet needs of the target group: pregnant women in rural India and the community health workers who provide care for them. From the input an initial value proposition was created that aims for a knowledge based service solution to advice pregnant women on location and detect potential dangers in order to be able to proactively overcome them (figure 1). This initial value proposition was discussed with the participants in an interactive workshop, using the business model canvas (Osterwalder & Pigneur, 2010) as guiding principle. The business model canvas supports the discussion on what is offered to whom, what resources are required to deliver such a value proposition, and what the potential revenue model could be.

The resulting value proposition is strongly based upon improving the information exchange mechanisms between medical experts, health workers and rural women. A continuous interaction between all these stakeholders will generate a database, which will be useful to government and AID organisations to offer dynamic content and reduce mortality of both women and babies.

Step 2: Creating the value flow model and partner-network

With the interested participants of the brainstorm session, a first value flow model was made, to create an overview of all relevant stakeholders and the value flows between them. First all relevant stakeholders are identified and put on one sheet. Then the main flows of value are mapped. Starting with the best-known value flows (such as physical goods and money), and subsequently adding other flows, such

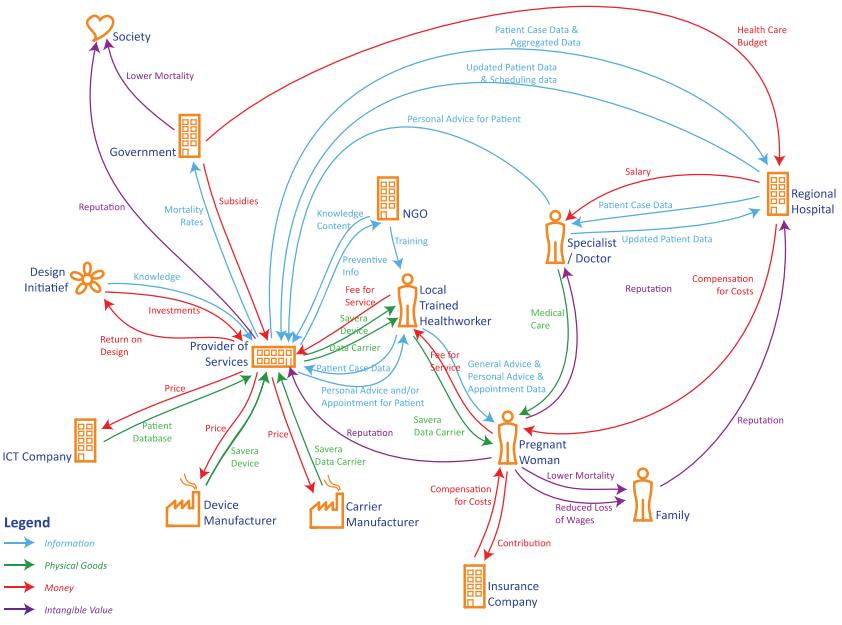

Figure 2: Value flow model for Savera project

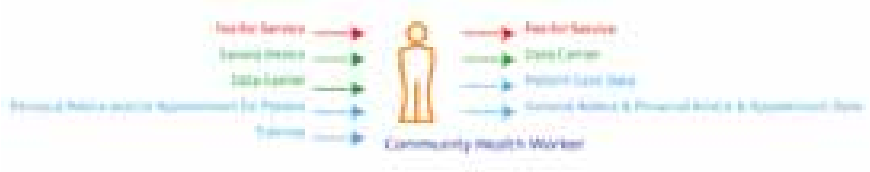

Figure 3: Balancing value flows for community health worker

as intangible values. By continuously asking what values were important for each of the stakeholders to participate, the model was enriched.

In this step the provider of the new service is indicated as a separate entity on the model. This enables the mapping of all relevant new values created by the new service.

With the model, organisations were identified that are important for the innovation to become successful. These organisations were approached to participate in the project. With the relevant potential network-partners discussions were held and an iterative process of refining the value proposition was started, building on the knowledge and experience of the potential partners. The resulting value flow model (figure 2) is a representation of the refined service proposition, including all relevant network-partners and the value flows between them.

Step 3: Balancing value for network-partners

In this step for each potential network-partner a check is made on the balance in the value that is brought the network with the value that can be obtained from the solution. An example of a detailed picture of the balance in value flows for the community health worker is shown in figure 3. With each of the stakeholders dialogues were held to identify if the balance in value felt OK to them, and this evoked discussions on especially the intangible values such as the type of information they needed, as well as elements like reputation.

As the values that flow to and from a stakeholder can be different in nature (tangible and intangible), balancing is not just a mathematical exercise. In smaller workshops the details for each network-partner are defined, providing insight in the sustainability of the proposition for the partners. In those smaller workshops typically more intangible values are unveiled such as the value of lower mortality rates to the various stakeholders in the picture.

Step 4: Refining the value proposition

In this step the value proposition is refined to ensure all values are included and maximum value is generated with the new service proposition as a whole. Through workshops with the all the network-partners, a mutual understanding is of the total value of the proposition and the specific stakes of the various partners therein. This step provides insight for each of the potential network-partners on their role and their specific contribution to the overall value proposition. This is an important element in building commitment of the network-partners towards the overall solution.

Step 5: Detailing the business model canvas for each network-partner

In this step, each of the network-partners uses the refined value proposition and value flow model to work out the details for his organisation on the business model canvas. Depending on the position in the overall network, customers for one of the partners can either be the end-user, or other network-partners. Each partner will need to ensure that the key activities and key resources he needs to fill in his part of the overall proposition can be realised against a cost structure that is in line with the expected revenues.

This is a last check in this front-end of the innovation process. After this step, the consortium will be officially formed, and activities to realise the new service will be starting, and real investments will need to be made.

FINDINGS

Implementing the 5-step approach for the six projects of Design Initiatief, gave insight in the typical aspects of designing services for social needs in a flexible network. Important learnings are:

- These projects require a constant switch between the total value of the proposition for the end-user and the value for each of the network-partners. Both value flows, on top-level as well as on individual level, must be positive, sustainable and in balance. Switching between the business model canvas and the value flow model helps to zoom in and out during this process.
- Participating organisations cannot simply be divided into suppliers and customers of the value proposition, as the business model canvas suggests. Many stakeholders are both supplier and customer, e.g. users of the service are also the sources of the data required to build the knowledge system. Linear models for value flow are therefore not appropriate;
- Interdependency is a main driver for the success of social innovation in flexible networks; commitment to collaborate is much easier achieved when there is value for all and dependency on all;
- Intangible value appeared to be especially important for governmental bodies as well as end-users (e.g. mother and child in the case of Savera);

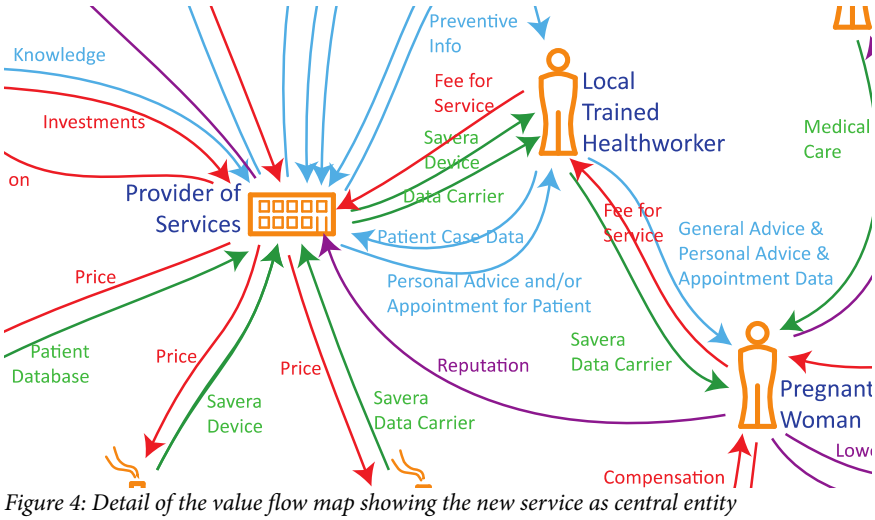

Figure 4: Detail of the value flow map showing the new service as central entity

- During the iterations it proved that keeping the new service providing entity centrally in the value flow model helped to be flexible in the definition of the added value of the overall proposition. We experienced that the discussion was more open, than when it seemed that there was a natural fit with one of the existing organisations. Leaving it open if a new company needs to be set up helped for the participants to be freer in adding services outside the scope of their current businesses. Later on in the process, a check was made if one of the companies would see a good fit to provide the total service, or that it would be better to create a new (joint) company to provide the new service.

CONCLUSIONS

Designing new services for social issues in a network of organisations puts specific challenges to the innovation process. The complexity is higher, because the value proposition in itself is more complex: when more parties bring in value in terms of knowledge, products and services a richer value proposition can be defined, that addresses the needs of more stakeholders and ensures a better anchoring of the solution in society in the longer term. The complexity is also higher, because different types of values have to be incorporated in the overall model: next to the tangible values, such as the physical goods and money flows, also intangible values need to be made visible, especially for non-profit stakeholders. On top of that, the puzzle to ensure a sustainable positive balance in value flow for each of the relevant stakeholders is inherently more difficult.

The 5-step approach developed and implemented in six projects, has proven to be useful in supporting the process of capturing the maximum value of the overall service proposition, as well as in balancing the value flows for each of the network-partners. The combination of the business model canvas with a value flow model, allows for an iterative process of constantly zooming in and zooming out.

The approach also supports the definition of completely new services, by keeping the new service as a separate entity central in the model, the added value of the service can be defined and refined in the iterative process, and different scenarios for whether the service will be provided by one of the existing organisations, or a new company should be set up can be explored.

Further development of the approach will be done through action research in other Design Initiatief projects, as well as other social innovations.

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PRINCIPLES FOR BUSINESS MODELING WITH NOVICE USERS

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ABSTRACT

Business modeling implies to frame the organizational knowledge using a particular thinking tool. Applying those thinking tools requires education and experience, i.e. expert knowledge. In participatory design sessions most users are novices to the thinking tool that is used.

This paper identifies guiding principles for experts working with novices in participatory design sessions. We illustrate the application of our principles to business modeling approaches by examples.

INTRODUCTION

Business modeling aims to create a shared view on an organization. Various thinking tools are used to frame the knowledge of the organization into concepts such as the organizational structure, processes or product life cycles. Applying those thinking tools requires education and experience. Thus, it is typically done by external experts rather than people within the organization.

But how can we make those expert thinking tools available to the people in the organization to work out solutions in participatory design sessions? We believe experts can use their thinking tools together with those novices. They can facilitate a business model design session by following some principles for application.

In this paper, we first outline the scientific literature that influences our work. From there we derive a set of guiding principles for experts that want to facilitate participatory design sessions. We then show how we used these principles to transform IT-driven business process modeling (Weske 2007) into a participatory approach and we outline how Cradle to Cradle (McDonough & Braungart 2002) lifecycle modeling might be done by following our principles. We conclude that these principles are not complete but a starting point to design participatory business modeling sessions.

RELATED SCIENTIFIC LITERATURE

We get informed by scientific literature from cognitive science, design research and participatory design. We outline theories from these areas that contribute to our goal of using expert thinking tools with novice users. We condense this knowledge in the next section into a set of principles.

COGNITIVE THEORIES

Research in cognitive science investigates the nature of the human mind. It seeks to understand perceiving, thinking, learning, understanding, and other mental phenomena (Stillings 1995). The goal of this research is to find and describe effects that are consistent in human information processes. We use cognitive science research to learn about the effect of information representation on participants.

The cognitive load theory refers to the limitation of the human brain as an information processor (Kirschner 2002). In 1956, Miller was one of the first to describe the limitations of the human brain for its ability to process single-dimensional information. He demonstrated that the average person can hold on to "seven, plus or minus two," (Miller 1956) single dimensional stimuli at a time. Miller also showed that the ability to remember and discriminate information can be expanded by adding dimensional stimuli. Dimensions for stimuli can be color, sound, material or space.

Building on this, Sweller and Chandler (1991) proposed a cognitive load theory that describes the mental effort of learners. The capacity of the brain available to process new information is described as the *working memory* which is consumed by three factors, namely intrinsic load, extrinsic load, and germane load (Sweller 2005). Reducing the effort of the learner, e.g. simplifying the interaction interface to reduce extraneous cognitive load, frees working memory available for the oth-

er two aspects.

The *cognitive fit theory* postulates that the representation of a problem determines the thinking model applied (Vessey & Galletta 1991). In other words, what we see determines, how we think about it. It was shown that representation impacts the problem solving performance. As one example, Agarwal et. al (1996) measured task performance when process-oriented vs. object-oriented methodologies were applied to process-oriented vs. object-oriented problems. Like others, they found significantly superior task performance when problem and method match, i.e. they emphasize the same information.

The *dimensions of notations* were introduced by Green (1989) and Blackwell et al. (2001) as a framework to describe aspects of visual representations. Originally meant as an approach to understanding programming notation systems, it was extended to examine other notation systems as well including music notation and physical prototypes (Blackwell 2008). From the fourteen cognitive dimensions in the framework, three are most noteworthy for us: viscosity, premature commitment, and provisionality.

Viscosity is the "resistance to change". A highly viscous system requires many actions to change the current state of the system into a consistent new state. "Environments containing suitable abstractions can reduce viscosity" (Blackwell et al. 2001). Premature commitment refers to the constraints imposed on the order in which things can be done. Finally, provisionally is the degree of commitment to a state or action. Provisional action can allow sketching ideas or playing "what-if" games.

DESIGN RESEARCH

Design Research is the scientific investigation of the design process through cognitive, qualitative or ethnographic methods (Laurel 2003). Theories built from this research aim to explain the design process, the roles involved and the objects used. We focus on the latter ones.

Media describes the external embodiment of information, e.g. in language, software or hardware. The embodiment determines the affordances. By affordance we refer to the work of the perceptual psychologist J.J. Gibson (1977), who coined the term as a way of discussing perceptual cues of an environment or object that indicate possibilities for action.

Boujut and Blanco (2003) describe shared media as intermediary objects that afford distributed cognition. Shared models may be considered as enlistment devices, either allowing or baring access to collaborative participation (Blanco et al. 2007).

Media Models Framework is built on top of these theories by Edelman (2009a). The main idea is that media models steer the conversation in design. A media model is an artifact that represents the design of a product or service. He identifies the dimensions resolution and abstraction to impact the conversation. Abstraction is defined as the highlighting and isolation of specific qualities and properties of an object, such as color, size or functions. Fewer represented properties indicate a greater abstraction. Resolution refers to the fidelity with which an object is defined with respect to its final form.

Similar to the cognitive fit theory, resolution and abstraction impact the way designers think about the model. However, Edelman describes the framing and steering effect that the media choice has on design conversations. As an example, discussions about CAD models are different to those provoked by a plasticine model. In general, less abstract and highly resolved media models focus the discussion on parametric changes while highly abstract and less resolved media models afford paradigm changes. The interplay of both dimensions leads to the "ease of change" (Edelman 2009a) which is the effort required to make consistent changes analogue to Blackwell's viscosity dimension (Blackwell et al. 2001).

Tangibility as a quality for interaction is studied in multiple disciplines such as HCI (Ishii & Ullmer 1997) or industrial design (van den Hoven et al. 2007). Tangibility is typically referred to as the physical experience of information. In the words of Miller (1956) it is information with multi-dimensional stimuli. In design research, tangible prototyping is used to get extensive feedback fast. It is therefore seen as a key enabler to collect feedback and iterate in early design stages (Buxton 2007). Similarly, Clark (2008) suggests that thinking doesn't happen only in our heads but that "certain forms of human cognizing include inextricable tangles of feedback, feed-forward and feed-around loops: loops that promiscuously criss-cross the boundaries of brain, body and world".

PARTICIPATORY DESIGN

Participatory design is an approach to organizational change which acknowledges that workers are in the best position to determine improvements in their environment. The body of research describes approaches to enable people within the organization to take part in the creation of improvement ideas (Schuler & Namioka 1993). From participatory design literature, we learn about frameworks for group facilitation.

The system theorist Russell Ackoff (1974) describes three success factors for "design-by-playing" as an approach to participatory design. In particular, Ackoff proposes to (1) make a difference for the participants, (2) have likely implementation of results (3) make it fun to participate.

Ehn and Sjogren (1991) investigated the aspect of fun in participation and describe the principle of a language game. By playing a game the participants conduct a learning process that helps them to "create a common language, to discuss the existing reality, [and] to investigate future visions". In one sample case, she introduces a game kit with cards of different color and shape, "easy to move around in the common playground". When using the cards, people have to agree on their meaning and the rules for their use. By doing so, they establish the common ground for discussion.

Finally, Hornecker and Buur (2006) propose four qualities to improve group interaction. They call for (1) tactile manipulation of information as well as (2) spatial interaction, which is the movement in space. The (3) group facilitation should be embodied in the material used to direct group behavior and (4) the representation should be expressive with respect to the information that is to be embodied. The last quality is analogue to the cognitive fit theory (Vessey & Galletta 1991) and the media models framework (Edel-

man 2009a) from design research. They all suggest that representation steers the thinking and conversation about an issue.

In summary, these three research areas have similar ideas, which we condense into a smaller set of principles that can be used when working with novice users of a tool.

SEVEN PRINCIPLES FOR USING EXPERT TOOLS WITH NOVICE USERS

Members in participatory design sessions are typically novice users of the thinking framework applied. They need facilitation to work out a solution together. The following principles shall guide experts of a tool that facilitate participatory design session.

P1: Map out the information

People have limited information processing capacity (Miller 1956, Kirschner 2002). Mapping information can help to reduce the cognitive load and extend capacity to hold on to details by adding new stimuli to the information.

P2: Make it intuitive to use

The available working memory is consumed with different types of load (Sweller & Chandler 1991). Reducing distracting noise (external load) frees capacity for other concerns (Schweller 2005).

P3: Choose an expressive representation

The representation impacts the task performance (Vessey & Galletta 1991). Therefore a representation should fit the problem domain (Agarwal et al. 1996; Hornecker & Buur 2006).

P4: Choose a small set of concepts

Participants have to agree on the set of concepts to be used (Ehn & Sjogren 1991). Less concepts and less resolution of details can help to make the agreement process easier (Edelman 2009a). The further apart the participants' disciplines, the smaller the set of concepts that they may share.

P5: Choose easily changeable media

Low viscosity, high provisionally, and low premature commitment all reduce the overhead associated with changes (Blackwell et al. 2001). From a different perspective, the media chosen implies the ease of change, characterized by the abstraction and resolution of the representation (Edelman 2009a).

P6: Play a game

Games are fun to participate (Ackoff 1974). While playing, explicit rules are set that help to build a common understanding about the concepts and terminology (Ehn & Sjogren 1991). A game is an artificial problem to be used with the thinking tool while deferring arguments about the real case.

P7: Make it tangible

Tangibility is physical embodiment of information that enables haptic manipulation and spatial interaction (Hornecker & Buur 2006). A physical embodiment makes the idea accessible for others and provokes feedback (Buxton 2007). Physicality also stimulates different thinking styles (Clark 2008).

APPLICATION TO BUSINESS PROCESS MODELING (BPM)

THE CURRENT SITUATION IN BPM

Business process modeling (BPM) is the act of visualizing work flowing in organizations (Grosskopf et al. 2009a). It implies mapping the as-is situation but also designing the to-be process. BPM is a business modeling approach that focuses on tasks, their routing order, assignment of responsibilities, and required data in that context (Weske 2007). Taking the process frame to analyze and improve organizations has increasingly been influenced by the use of software systems (Smith & Fingar 2003). Thus, this approach is also very popular to communicate requirements and possibilities between business and IT departments.

At present, business process modeling is a special skill for business process consultants. They elicit processes during interviews and classical workshops. The consultant subsequently transforms the information into a process diagram. The quality of process models, the basis for discussions, heavily relies on input and feedback from domain experts, people within the organization that carry out the process on a daily basis. Often enough, the domain experts are left behind (Grosskopf et al. 2009a). They do not sufficiently understand the notation to assess implications or correct mistakes.

TANGIBLE BUSINESS PROCESS MODELING (T.BPM)

We created a haptic toolkit for business process modeling (Edelman et al. 2009b; Grosskopf et al. 2009b). It consists of acrylic shapes that reflect the basic BPMN (OMG 2009) iconography, a well adopted process modeling notation (P3). The toolkit (see Figure 1) is used in process elicitation and design sessions with people from the business and IT departments to facilitate the immediate discussion. Business users can directly map out (P1) their daily experiences with the process. IT users can better understand business needs and illustrate the options offered by technology. The t.BPM tool can be used with no new interaction knowledge beyond kindergarten (P2).

The immediate mapping eases the cognitive burden and fosters instant feedback. The haptic and spatial interaction (P7) at the table engages participants, hence the name tangible BPM

Figure 1: t.BPM approach - processes modeled with acrylic shapes

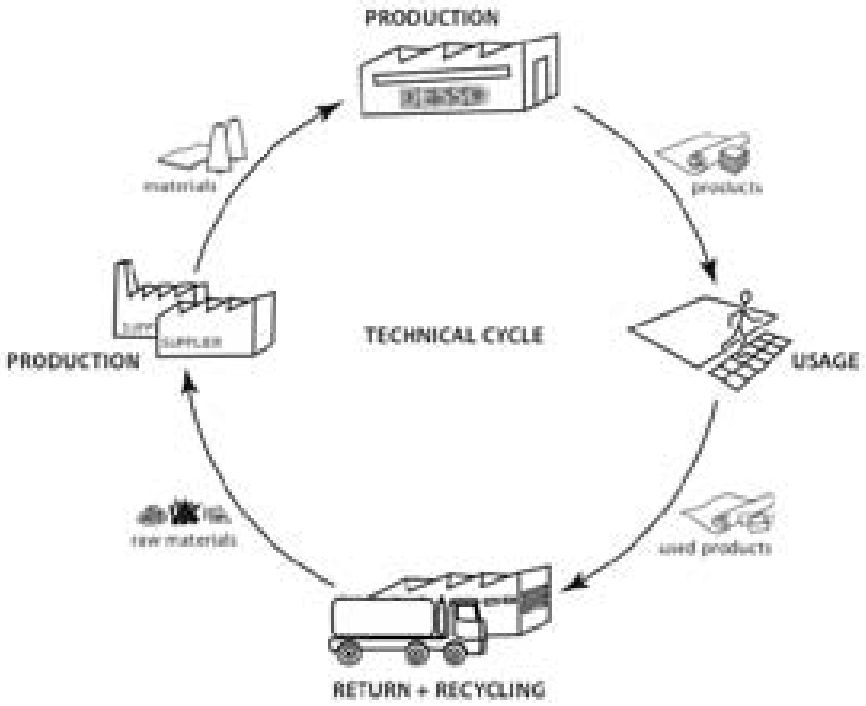

Figure 2: Technical C2C lifecycle taken from http://www.desso.com

(t.BPM). The intuitive interaction concept enables everybody to participate. The inscriptions are done with whiteboard markers and can be changed easily (P5).

We reduce the concepts of process modeling to a minimal set (P4) and introduce more as needed during the session. However, we stay within the frame of processes to foster process thinking. This is exercised by a playful mini sample example (P6) that we use to introduce this thinking tool to all participants.

APPLICATION TO CRADLE TO CRADLE LIFECYCLE DESIGN

DESSO: A COMPANY IN C2C TRANSFORMATION

Desso, a Dutch based multinational company, is in transition to re-design their business based on Cradle to Cradle (C2C) philosophy (McDonough & Braungart 2002). This approach classifies each product ingredient to belong either to a biological or a technical lifecycle (see Figure 2). Product ingredients in the biological cycle must be fully processable by the environment. Product ingredients in the technical cycle must be fully recyclable for reuse. The overall goal is to produce goods in balance with the natural ecosystem.

The implementation of C2C effects the entire organization and its ecosystem, including key partners, customers and supplier. To holistically transform a large organization, management has to define and monitor intermediary goals towards the long-term vision. Supplementary, small teams of domain experts have to work out and implement new manufacturing approaches on the operational level. These teams should be setup in projects that work out one particular aspect and are guided by a C2C expert. Finally, there needs to be coordination between the different teams working in parallel.

FACILITATION OF C2C PROJECT TEAMS

We propose to facilitate team meetings with a Cradle to Cradle (C2C) expert using the principles presented in this paper. In particular, a game should be played (P6) that illustrates the principles of C2C to the novice applicants of the tool. Materials used in these workshops should be easily changeable (P5) and intuitive to use (P2). Moreover, these materials should be C2C conform to function as a role model and make C2C production tangible (P7).

Existing lifecycles and new ideas should be mapped out (P1) to reduce cognitive load on the participants and allow them to (mentally) drop in and out of discussions. The main visualization must be a lifecycle (P3) as this is the thinking framework applied. However, value chains or process models might be applied to frame aspects of the overall solution. Here, approaches like t.BPM can be used to facilitate parts of the discussion. The thinking tool should be reduced to the minimal set of concepts needed to solve a particular task (P4). The goal of the workshop is not to make the domain experts C2C experts, but to empower them to reach their project goal.

CONCLUSION

This paper proposes seven principles for experts of a thinking framework working with groups of novice users. These principles are derived from literature in the field of cognitive science, design theory and participatory design. We show how the principles can be applied to the area of business process modeling and Cradle to Cradle lifecycle design. We think the principles discussed here can be transported to more cases of participatory business modeling. We do not propose that the framework is complete. It rather offers a starting point to think about the setup of participatory design sessions.

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BUSINESS CASE: SUSTAINABLE ENERGY FOR DE-MINING OPERATIONS

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ABSTRACT

It is very difficult for companies in the industrialised West to establish business in developing countries, both because of lack of knowledge of local conditions and procedures, and because there is less infrastructure to rely on. This paper describes a case of an innovation project in which four small, Danish companies work with an NGO and two university partners to develop a sustainable energy solution for humanitarian landmine removal in Angola as an alternative to the presently used diesel generators. I will discuss the challenges that face the companies, if they are to bring the project through to establishing successful business. The challenges include defining what the value proposition actually is, picking customer segments, building customer relations, and finding ways of financing and organising a joint venture.

INTRODUCTION

In the business case discussed in this paper, four Danish manufacturers of alternative energy systems, such as solar panels and fuel cells, collaborated with DanChurchAid, a non-governmental organisation (NGO) that provides aid to developing countries. The goal is to develop an environmentally sustainable energy generator that can replace noisy and fault-prone diesel units in camps in development countries. The concrete example are camps for that house landmine removal teams in Angola in what the NGO would term 'demining operations'. A main challenge for this effort to succeed is that the distance between de-miners ('users') in Angola and development engineers in Denmark is huge, in kilometres as in perspective. The project 'Sustainable Energy for De-Mining Operations' runs over a period of 1.5 years, in part with public funding. It was originally proposed by Access2Innovation, an innovation initiative located at Aalborg University with a particular focus on solutions that target specific, urgent demands in developing countries.

The project is organised as a participatory innovation effort in the sense that care is given to involving the voices of potential users and other people with a stake in the new product, and there is a focus on the building of new business relationships between partners.

SMALL-SIZE INDUSTRY PARTNERS

The four industry partners are all small enterprises with between 6 and 30 employees. They are located in the region of Southern Denmark:

IRD Fuel Cells is a producer of small fuel cells for private households. It is a research-based enterprise with strong focus on development of this new technology. The company has a limited production in house for test systems and pilot plants. The expectation is that the company will be sold, once the technology is sufficiently mature for running production.

SunSil develops high efficient solar cells. Like IRD, it is a research enterprise with leading-edge innovation of the electronic circuitry that processes the solar cell outputs. To sell pattents is part of the business model. A manufacturing plant is planned for the production of integrated solar cells. One would characterize both theses companies as high-tech development startups, still investingheavily in development with a view to creating a profitable business in the future.

Sol-Energi Kobbervarefabrikken manufactures solar heating systems for domestic use in Denmark and some European countries. In contrast to the first two, this company has a base in skilled competence, rather than high-tech, and it has a running production of solar heating systems. The systems are tailored to the needs of each cus-

Figure 1. The combo concept. All components of the sustainable energy generator packed in one box to be transported by truck. Sketches and models are based on viewing video footage.

tomer and installed on-site.

Hannemann Engineering, is a developer of automatic manufacturing equipment for larger production plants. The company typically is invited to give bids on special equipment, and it has a number of solid customers in the local region. Hannemann participates in the project with the responsibility to design enclosures and support structures.

Of the four companies, Sol-Energi and Hannemann have started building export relations to South Africa and Tanzania (pilot plants), but other than that, none of the commercial partners have any experience with developing countries. Besides the companies and the NGO the team includes three other partners:

Aalborg University brings expertise in power grid management and is expected to develop the technology required to transform sustainable energy inputs to electricity mains.

SPIRE with its competence in participatory innovation is responsible for the study and involvement of users throughout the innovation process and for the design of the user interface of the generator.

South Denmark European Office, a lobby unit financed by the local region to support companies in ensuring EU funding, acts as project manager.

The project team thus brings together a significant variety in development practices from concrete customer adaptation via high-tech development to university research.

FIELD VISITS AND WORKSHOPS

Already rior to the planned field visit in Angola, SPIRE organised a first design workshop using video to represent user perspectives from demining camps. The goal of the workshop was to start the search for solutions with focus on critical issues such as user operation, maintenance, transport, instructions etc. The video footage was borrowed from a TV photographer, who had visited demining operations in Congo two years previously, and it was employed to ensure that initial ideas would not be grounded solely in Western preconceptions of life in the developing world. The team produced two possible design directions: An integrated unit in the form of a box, from which solar panels would unfold, or a set of smaller, portable units to be connected on-site, Figure 1 and 2. The team also made the decision to prepare a simple mock-up in time for the Angola fieldtrip.

The fieldtrip was organised by the NGO partner 4 months later. Five team members joined the 10-day travel that included observations in demining camps, interviews with deminers and managers, studies of local generators

Figure 2. The module concept. Each part of the generator are transported piece by piece and then assembled by technicians in the camp.

Figure 3. Deminers and NGO managers map out electricity supply options in Angola.

and local consumption patterns etc. During several workshops following the Angola fieldtrip the team came up with the a plug-and-play power converter module that can take the energy from any alternative source (sun, wind, water turbine, fuel cell) and turn it into a reliable power supply for camp operations. Over the course of 6 months the partners developed a prototype generator for test in Denmark and later in a de-mining camp in a developing country.

The fieldtrip and subsequent negotiations with the NGO has however made clear that there are many obstacles to making this innovation become a success beyond the design of the generator: There is the attitude towards relief aid in the local government, the non-existing 'energy savings culture', procedures in NGO camp management, procurement practice when setting up a new demining operation etc.

At two later workshops the team discussed potential business models. The main business challenge at present is to find a way of organising a company or company network to develop the project further. Also, to strike partnerships with NGOs seems crucial both to develop an attractive solution and to develop business. In the following I will discuss what appears to be the prevailing challenges in relation to creating a viable business model for the project.

ANGOLAN GENERATOR CULTURE

One of the observations that came out most clearly from the field studies in Angola is concerned with how locals relate to energy consumption. We came to talk about this as a 'generator culture'. In many areas in Angola people cannot rely on a city grid of electricity supply. In areas where public supply is available at all, it may be unreliable and only work for intermittent periods

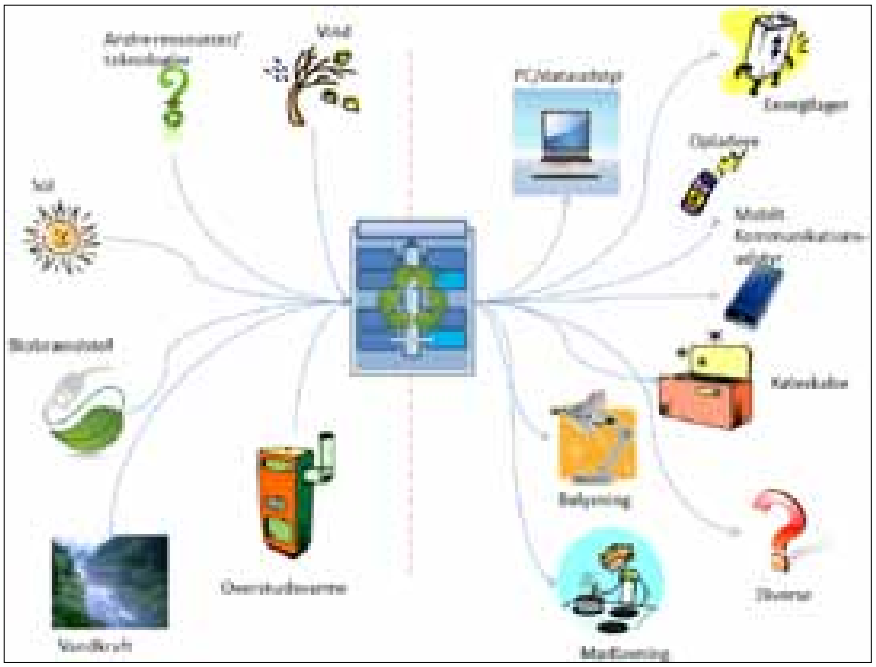

Figure 4. A schematic put forward by the electricity grid researchers. It shows the converter unit as a central element in converting electricity from energy sources to energy consumers.

of the day. Instead, many families and organisations rely on their own small gasoline fuelled electricity generator, just like the demining operations do. These generators will typically run for a couple of hours in the morning and in the evening.

This has implications for the project: On the one hand, local people do not have a concept of 'energy saving'. For instance, most lights in the camps and elsewhere do not have on-off switches, because there is no need: When the generator comes on, all the lights turn on. When it stops, all the lights go out. With an alternative energy source yielding to 1-2 kW, compared to the 6-8 kW of a regular camp generator there is a serious challenge to make the power suffice. The lower power level may be feasible, but only with a combination of technical measures (low-energy lamps, for instance) and energy savings behaviour (to even out consumption periods). A change in behaviour may be very difficult, but a way forward may be offered by the fact that demining camps are managed by strict protocols; they are run much like a military operation. So potentially energy saving measures could be spelled out in camp procedures.

On the other hand, local people in Angola do understand that there is a direct relationship between electricity consumption (lights, TV etc.) and electricity production (their generator), a relationship, which has long been lost in Western societies. To us Westerners, electricity seems available from wall sockets in constant and limitless supply. Even large economic incentives in the form of low-tariff periods persuade few Western householders to schedule their use of washing machines to night time, off peak production periods. In Angola, there might be an opportunity to utilize this production-consumption understanding in the design of a new system, rather than produce a design that mirrors the detached system of the West.

THE UNIT WITHOUT A NAME

What is the value proposition actually? From the outset, the energy grid researchers suggested that the core challenge of this project is to develop a grid unit that converts the DC current from the various alternative energy

Figure 5. Angolan deminers test the handling of a mock-up of the converter unit, at a time when measurements were yet unknown. The mock-up was simply an empty plywood box 100 x 100 x 50 cm containing batteries for weight. Based on this experience, all agreed that this size was far too big for easy handling.

Figure 6. A scale-model of the converter unit design, now with wheels for easier transport. Both size and weight actually turned out larger than those of the mock-up.

sources into AC current for the camp consumers. The visualisation in Figure 4 has been so powerful in steering the project that most attention from the project partners has been focussed on developing this unit. Paradoxically the 'unit' through the entire process hasn't found an appropriate name. This indicates that it might be difficult to verbalize precisely what the value proposition actually is. Technically, it can be explained that an energy conversion needs to take place, but as this unit (in the prototype version, Figure 6) is several times as heavy and many times as expensive as a conventional diesel generator, and as it is actually *not* a generator in itself, it is a challenge to think of *unique selling points*. Add to this the challenge that a move to alternative energy sources necessitate a shift to low-energy devices and an energy conscious behaviour of the operating staff, this project has serious obstacles to overcome. The total offer may thus be a combination of:

- Alternative energy sources (solar panels, wind turbine, fuel cell etc.),
- The grid converter unit,
- A plan for optimizing energy consumption in the camp, and
- A concept for changing consumption behaviour among camp staff.

CUSTOMERS & SALES CHANNELS

There are different target customers:
Non-Governmental Organisations is most obvious, given the project premise of supplying a system to camps in off-grid areas in developing countries. For NGOs to purchase a sustainable energy generator would require them to include an offer in their bids for contracts. This has the advantage that investment and running cost are calculated together, the generator is an expensive investment, but cheap in operation. A green image could count as unique selling point, although not as a decisive one. Generators would likely need to be tailored to each location.
Emergency relief camps are another potential market. These camps, also run by NGOs, are established practically over night, when disaster strikes. But the requirements are different. To supply this need would require standard, container packed generators available in stock for air transport within days.
Commercial enterprises (e.g. building contractors of new supermarkets) in developing countries could be a third customer segment. This would, however, require very strong arguments on the investment/ running cost balance, as these budgets are often kept separate in the construction industry.
An important insight gained in the business modelling workshops was that a sales effort would require assisting customers (NGOs) in planning the right combination of alternative energy sources, depending on the availability of sun, wind, water streams and the character of the electricity consumption of the operation in the particular region of the world. This becomes much more complicated than today's simple estimate of a maximum kW figure.

WHO CONTRIBUTES RESSOURCES?

The challenge of developing, manufacturing and marketing the sustainable generator can not be tackled by any of the four commercial partners acting alone. For this, the investment required is too large and the risk too big. Some form of joint venture is called for. But the question of 'who is in and who is out?' is a delicate one. The company *Sol-Energi,* for instance, joined the project on the premise that demining camps would have a need for hot water supply besides electricity. This seemed not to be the case in Angola - so this partner naturally is in doubt about their continued participation. However this would be a loss to the project team because *Sol-Energi* has the most extensive experience in concrete customer negotiation and day-to-day adaptation of solutions.
To support this dialogue between the partners, SPIRE solicited graduate students to design a 'tangible business model' that would encourage the companies to explore investment options in a playful manner. The students developed a brick game in which each of four company owners contribute resources (coloured bricks) to a joint venture (tower) in Africa from their own companies (towers) in Denmark, Figure 7. The 'Joint Venture' game has three phases: In the first, the players take turns adding bricks to the shared construct, as an up-front investment. In phase two, they need to grow the shared tower organically by reorganizing bricks, but not adding any more resources from home. In phase three, the players shall attempt to withdraw revenue from the joint venture (the shared tower), without de-stabilising it!
The game did manage to support a constructive discussion. For instance did the colour of the bricks make the origin of the ressources recognizable throughout the process, which triggered the discussion of who-owns-what? And can companies pull out 'their own' ressources (e.g. machinery specific to one partner) again, once they have invested in the joint venture? At the time of writing the future of the project is still open.

Figure 7. Managers of small, Danish companies play the Joint Venture *game. A 'tangible business model' that encourages participants to discuss how several companies may pool resources and create revenue in a joint development country venue.*

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AN OPEN INNOVATION PLATFORM FOCUSING ON DEVELOPMENT COUNTRIES

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ABSTRACT

The objective of the paper was to propose a new open innovation platform focusing on the special needs of customers in developing countries. Although technical infrastructures supporting the utilization of open innovation platforms have been developing rapidly in developing countries, there is a lot of unused potential as regards to using open innovation in developing countries. In comparison to developed countries, the business environment in developing countries is very different and customers demand different products and non-similar product features. Thus, the existing models for platforms can not, as such, be applied in developing countries. In the proposed new open innovation platform, direct contacts with the contributors were amended with contacts utilizing intermediaries such as non-government organizations and various social groups. Money for the platform can be generated at least from three different revenue sources: telecommunication companies, companies using the platforms, and website advertisements.

INTRODUCTION

Open innovation entails combining internal and external ideas as well as internal and external paths to market in order to advance the development of new products. In contrast, in the traditional closed innovation, new product development takes place within the firm boundaries.

In practice, external ideas for new product development are collected, for example, by means of websites on which customers, suppliers and other external parties can submit their new ideas. Such on-line points of interactions between companies and their external partners are called open innovation platforms. Companies set up open innovation platforms for creating and supporting profitable business.

Utilizing open innovation has become an integral part of research and development activities in almost all multinational companies. In open innovation, however, companies are collaborating mostly, if not totally, with customers residing in developed countries. Consequently, the voices of a large number of customers are not heard – these are the customers who are living in developing countries.

In many cases, the needs of customers in developing countries are different from the needs of customers in developed countries. Customers in developing countries need various products and services that may have no market demand in developed countries; furthermore products and services targeting to satisfy customers in developed countries do not readily fulfill the needs in developing countries.

The number of people living in developing countries is much higher than the number of people living in developed countries. Even though the current per capita purchasing power in developing countries is relatively low, the total market potential in developing countries is huge.

Possibilities to utilize open innovation in developing countries have increased considerably in the recent years. In developing countries, the number of people having mobile telephones and access to the Internet is growing by millions every year. Rapid development of communication technologies and easy access to information has made customers also in developing countries smarter than ever (Freeman 2007) and they are well aware of world affairs. Especially the advent of mobile phones has predominantly changed the knowledge environment in developing countries, too.

Developing countries differ from developed countries in many respects. Among other things, the culture, educational systems, infrastructure, media

Developing Countries	End Of 1960s	1990	2000	2007
Share in Global R&D	2.0	10.2	21.0	24.0
R&D as percent of GDP	NA	0.7	0.9	2.3
Coverage	Excluding centrally planned economies	Including centrally planned economies and newly industrialized countries (NIC)		

Table 1: Share of developing countries in global research and development (R&D) activities. Source: Kaplinsky et al. 2009 and Bagley 2009

as well as the roles of non-government organizations and the government are very different. When designing the utilization of open innovation such differences need to be carefully investigated and taken into consideration.

The large potential that open innovation has in developing countries is mostly untapped by business enterprises, and open innovation in developing countries has been discussed only very scantly in academic literature. Thus, the objective of this present study is to propose a new open innovation platform focusing on the special needs of customers in developing countries. Important consideration in the design of the platform is that the platform has a sustainable business model.

POTENTIAL OFFERED BY DEVELOPING COUNTRIES

It is widely acknowledged that developing countries is a major vehicle of growth in the future. Multinational companies expect around 70% of the world's growth over the next few years to come from emerging markets (The economist 2010).

At the moment, about half of the world's population live in acute poverty and around 4 billion people live at the bottom of the pyramid earning less than US$ 4 a day, Table 2. However, even without any growth the cumulative purchasing power of people earning less than US$ 4 a day is as much as US$ 5 trillion a year (Falcioni 2009; Gardetti 2010; Johnson 2007; Hart 2005).

Multinational companies have increasingly shifted their research and development (R&D) activities into developing countries (von Zedtwitz 2004). From 1970 to 2007, Table 1, the share of low-income economies in global research and development (R&D) activities increased from 2% to more than 24% (Kaplinsky et al. 2009; Bagley 2010). India had attracted over 100 of the Fortune 500 companies to conduct a part of their research and development (R&D) activities in India by 2003 (GOI 2003). As an example, multinational companies like SGS-Thomson Microelectronics, AstraZeneca, Texas Instruments and Daimler Benz have stationed research and development centres in India (Reddy 1997). From 1998 to 2003, India received US$ 4.65 billion from foreign companies in research and development (R&D) investments (GOI 2003).

As part of the extraordinary shift in the global innovation landscape, low-wage country involvement in incremental innovation has also increased considerably (Li & Kozhikode 2009). A favorable consequence of conducting research and development (R&D) in developing countries is that it makes easier for the companies to set up production facilities in these low-cost countries.

A huge pool of talents is available in developing countries, typically for less than a fourth of what it would cost in developed countries (Ernst 2006). Many Western educated researchers are returning to their home countries. This new shift is termed reverse brain drain (Reddy 1997). The growing importance of developing countries can also be seen in the number of patent applications. According to World Intellectual Property Organization (WIPO) report of 2007, eleven of the top twenty countries in terms of patent applications in 2006 were from emerging economies, including eight of them from Asia.

EXAMPLES OF INNOVATIONS IN DEVELOPING COUNTRIES

A vast number of examples can be listed of products that are geared to the special needs of people in developing countries. There may not be any market for these products in developed countries but in developing countries the market potential is enormous. Such products cannot be developed as modifications of products offered for customers in developed countries. The development of these products requires understanding of local customer needs and local special conditions.

Around one billion people in the world have no access to clean water (The Economist 2010). Hindustan Unilever and TATA are providing special water filters at a very low price in India (Ahlstrom 2010). According to Hart & Christensen (2002), more than 3 billion people are in lack of telecommunication services around the world. Qualcomm, in partnership with Grameen Foundation, is successfully providing mobile phones to poor people in Indonesia (Altman et al. 2009).

It has even been referred to as a revolution when TATA recently introduced the TATA Nano car, the cheapest car in the world (Guru 2010; Brown & Wyatt 2010). Proctor and Gamble (P&G) has developed an array of special low cost products for the Brazilian market (Kanter 2010). Many other companies are striving in similar manner. Examples include cheap ice cream in India (Prahalad 2002), Laptops with a price tag of about $ 100 and cheap smartphones (Ahlstorm 2010), inexpensive LED lamps, and low-cost wind turbines. All of these products are specially targeted to the markets in developing countries (www.SingaporeSessions.com).

Low prices give opportunities to the poor to avail new products; otherwise the poor would be left out entirely from the market (Hart & Christensen, 2002). Low priced products for de-

Issue	Wealthy	Emerging Middle Class	Low Income Markets
Income Level Per Annum	More than US$ 15,000	Between US$ 1500 and US$ 15,000	Below US$ 1500
Population in Millions	800	1,500	4,000

Table 2: Market distribution based on the income level of the world population Source: Falcioni 2009

veloping countries have often been profitable for the companies designing, producing, and distributing them. Low-priced Chinese products are an evidence of this.

Many opportunities for business are imminent in developing countries. Promising fields of business include telecommunication, customer electronics and energy production, among many others (Hart & Christensen 2002).

BENEFITS OFFERED BY OPEN INNOVATION IN DEVELOPING COUNTRIES

Conducting research and development in developing countries is a means to extend the potential markets beyond the wealthy and emerging middle class segments. Otherwise it would be more difficult to reach the low income markets that comprise as many as 4 billion people.

Many multinational companies are facing the necessity to adapt their products and services to the large and mostly untapped markets in developing countries, especially in Asia. This adaption requires extensive local knowledge (Li & Kozhikode 2009).

The innovation process in an individual company is of great importance not only to the company itself but also to the growth of the national economy in which the company operates (Sundbo 1998). Engaging customers in developing countries in the new product development processes of companies can play a vital role in the development of the economies of those countries. In accordance, developing countries are growingly formulating policies to support innovation (Aubert 2010).

In addition to generating new ideas, utilizing open innovation in developing countries offers many other benefits. The company gains access to target customers so that the company during the development process becomes aware of local market information in depth. The company is better able to assess the value of the product and is more prepared to make correct pricing decisions. Through participation in the open innovation process, potential customers become aware of the future product. The information of the future product spreads also to other potential customers through informal connections that the people have. This serves as product marketing without expenses. A deeper involvement of customers with the product development process often persuades the customers to use the product. Customers who continuously engage in product development often grow to become long-term loyal customers.

Despite the benefits that open innovation can offer for generating new products for developing countries, there are only few examples of its successful use for the benefit of developing countries. One example is the development of the BOGO solar light. This light is increasingly becoming popular in developing countries where more than 2 billion people live without access to dependable electricity and are forced to use traditional lighting like kerosene lamps, candles, flashlights etc. (Hart & Christensen 2002). The BOGO light is a product of Sunlight Solar Company. Targeting the markets in developing countries was the original aim of the company. At the initial stage of the development project the company contacted InnoCentive which is a premier open innovation platform, having its headquarters in the USA. Consequently, the challenge of the BOGO light was posted in the InnoCentive open innovation platform. The contributors in this platform were able to solve the development issues taking into account the special needs of customers in developing countries (www.bogolight.com).

Another example of using an open innovation platform for generating a new product for customers in developing countries is a water purifying bottle that uses ultraviolet light to sterilize drinking water. This product will help people in developing countries who have no access to pure drinking water (BBC 2010).

CHALLENGES IN UTILIZING OPEN INNOVATION

In a study, Enkel *et al.* (2009) have investigated special challenges that are inherent to open innovation by interviewing companies that have utilized open innovation. The following factors were identified as major risks (the percent figure in parenthesis refers to the share of respondents who mentioned the corresponding risk): loss of knowledge to external stakeholders (48%), higher coordination costs (48%), and loss of control and higher complexity in operations (together 41%). Barrett (2010) has identified additional important challenges associated with utilizing open innovation: assessing the cost/benefit impact of factors like projected value creation, different time schedules, various types of risks, licensing costs, opportunity costs, and technology integration.

Open innovation is also confronted with the same challenges that are characteristic to traditional innovation activities. The inability to change the old business models as required by the new innovation and the inability to meet customer needs with the new product better compare to competitors have customarily been named as major challenges associated with innovation (Frigo & Ramaswamy 2009).

The challenges of open innovation are very much dependent on the context. Challenges in developing countries are different than challenges in developed countries. The special context of developing countries needs special attention.

Intellectual property rights (IPR) are an example of a matter that needs special attention in the context of developing countries. In many developing countries, laws concerning intellectual property rights are not well established. In some cases even when appropriate laws are in place, there is no proper implementation of the laws. Good news is that the situation is improving very rapidly and the World Intellectual Property Organization (WIPO) is stressing upon assisting developing countries continuously in this pursuit (WIPO 2010).

The political situation in each country needs special consideration. It has been said that typically in developing countries, the nexus between politics and the business world is closer than that in developed countries.

PROPOSED BUSINESS MODEL

The existing models of open innovation platforms from developed countries are not directly applicable for developing countries. Thus, with no previous examples directly to refer to, taking the special needs of developing countries into consideration, a new

model for an open innovation platform was developed, Figure 1. Non-government organizations, phone companies, social groups, media, government welfare departments and universities, along with potential contributors are included as salient stakeholders.

The role of non-government organizations in the business model of the open innovation platform is essential. A great percentage of foreign aid to developing countries is distributed through non-government organizations. One reason for doing so is the intention to avoid problems of governmental bureaucracy. So, partnering with non-government organizations in any business model targeting to large numbers of customers in developing countries is most useful. Non-government organizations are everywhere in developing countries and they have everyday communication with masses of people there. They have established strong networks with local governments and international aid agencies aiming to mitigate social problems. Non-government organizations are considered as best actors when integrating businesses, governments, and charities. The number of non-government organizations in developing countries is extremely huge. It has been estimated that there are as many as 1.2 million non-government organizations in India. This estimation is based on the presumption that about half of the non-government organizations are unregistered in India (PRIA 2003). In Bangladesh, the number of registered non-government organizations is more than 2,000 (NGOAB 2010).

Infrastructure favourable for open innovation is developing rapidly in developing countries. People are talking on the mobile phone, sending text messages, blogging, tweeting, uploading and downloading files everywhere (Wilson and Murby, 2007). Astoundingly, in India, the figure of mobile phone subscribers was as high as 700 Million by July, 2010 (TRAI, 2010) and the mobile phone sector is one of the most profitable business sectors in India (Balan 2007). As other examples, the number of mobile phone subscribers is 100 million in Pakistan (Mahmood 2010), 70 million in Bangladesh (BTRC 2010), and 15 million in Sri Lanka (Tele Trends 2010). These

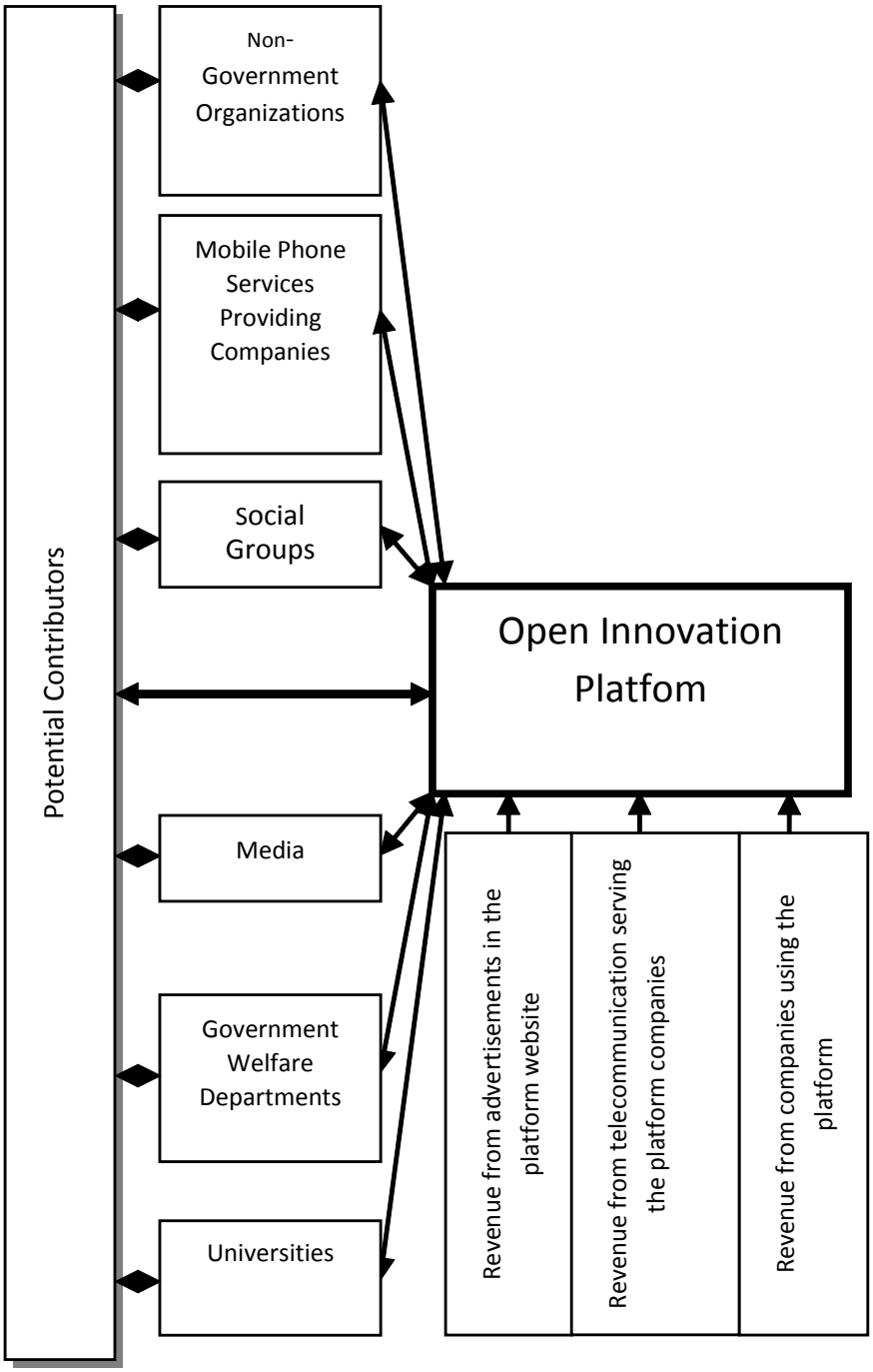

Figure 1: Conceptual Business Model for open innovation in developing countries.

figures tell about the importance of mobile phones in developing countries. Apart from mobile phones, telecommunication field includes broadband devices, digital subscriber links, wireless links, VOIP connections etc. All of these fields are flourishing in developing countries. Growing usage of mobile phones and laptops is changing the future scenarios of the developing world swiftly. Moreover, increasing use of desktop computers in offices and homes is influencing the work environment and facilitating a shift towards wide utilization of information and telecommunication services. Social networking platforms like Facebook, LinkedIn, and Twitter are attracting people and the numbers of users are growing swiftly. All this considerably facilitates the use of open innovation platforms in developing countries.

Users in developing countries want different services than users in developed countries: They usually do not look for information of journey schedules or offerings of nearby restaurants and seldom do they make online purchases. Instead, users in developing countries typically want information regarding

healthcare, crops and product price disparity in different locations.

Various social groups have a very substantial impact in policy making and spreading awareness among the masses of people. Local media has high esteem for the opinions of various social groups. Apart from partnering with above described stakeholders, for open innovation, it is necessary to build lasting relations with potential customers through partnerships with social groups.

Media is experiencing increased freedom in many developing countries and helping in speedy dissemination of information. Partnering with local media gives opportunities for increasing awareness of open innovation platforms among the potential contributors. Product marketing can be accomplished with low cost by partnering with local media. Moreover, the emergence of electronic newspapers is changing the media world and leading to new patterns of customer behaviour. Many companies are replacing paper media by electronic newspapers when communicating with customers. Overall, people are becoming increasingly knowledgeable in using electronic media services.

Partnering with government organizations is not only prudent but avoiding them may result in adverse consequences. Moreover, international donors and financial institutions are putting conditions while allocating financial aid to governments in developing countries and, thus, they play very important roles in societal improvement. Above all, governments are making their plans considering newly emerging needs. Governments are becoming increasingly flexible to collaborative innovation. Also importantly, governments of developing countries are supportive to various innovation activities especially to such that have potential to improve people's living standard.

Local institutes of higher education in developing countries are partnering with institutes of higher education from all around the world. Surprisingly, partnering with domestic universities and research institutes has not been deemed to be as important as it is in the case of developed countries. However, local universities are important in motivating technology savvy students to contribute to innovation platforms. Moreover, Western educated researchers blended with their local knowledge can be utilized at lower cost and local researchers may be available at an even lower cost. In general, a large percent of the population of any developing country is comprised of youths who are communicating globally and adopting new technologies instantly. Mobility programs by institutes of higher education and international leisure travelling are driving them to the world of technology and innovation.

Money for the proposed open innovation platform can be generated at least from three different revenue sources: telecommunication companies, companies using the platforms, and website advertisements, Figure 1. Mobile phone companies are partnering with many other companies with the aim of attracting larger numbers of additional users for their telecommunication services, especially to utilize off-peak time excess capacity. People are inclined to contribute to open innovation during times when there are no other important things occupying them. Correspondingly, these times mostly are off-peak times when mobile phone service usage is low. It is a good opportunity for phone companies to be involved in open innovation communication networks. The open innovation platform organization can demand a share of the revenue from the telecommunication company. Companies which will post their problems in the platform will pay a service charge to the platform organization. InnoCentive is a well-known example of how this revenue model has been implemented successfully. Moreover, as open innovation platforms will be hubs for large traffic flows, it will be possible to attract platform advertisements. It is important to note that the cost of setting up and maintaining an open innovation platform is very low and, thus, there is hardly any chance for a larger loss when using this business model.

CONCLUSIONS

Innovation is considered as lifeblood for profitable business. Open innovation is a recently emerged idea for actively involving users in the innovation process. This idea has already got momentum in developed countries. However, despite its high potential also in developing countries, open innovation has only scantly been utilized in developing countries yet.

As part of the present study a new open innovation platform focusing on the special needs of customers in developing countries was proposed. This model, among other things, depicts communication channels between different stakeholders. Communication with potential customers takes place directly and through intermediaries like non-government organizations and various social groups. A unique advantage for developing countries is low cost.

In developing countries, there has been a strong improvement as regards to factors that are necessary for the operation of open innovation platforms and open innovation platforms will increasingly be used in developing countries. Such platforms are an effective way to hear the voices of the large number of untapped customers in developing countries.

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ARTICULATING VALUE PROPOSITION THROUGH VIDEO GAMING

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ABSTRACT

Video gaming is emerging as a strong communication medium. As its adoption becomes more widespread, corporations that are looking at alternative methods of internal and external communications would benefit from participating in conversations facilitated by gaming. H.E.R.B. is an experimental interactive narrative that aims to communicate the unique value proposition of Servodan's flagship Luxstat LED Luminaire system. Simultaneously, H.E.R.B. is also a proof of concept that suggests that there are other potential practical applications of games to help assist using the language of gaming.

INTRODUCTION

The corporate environment is increasingly recognizing the value of design competencies. The UK Design Council researched the tangible value of design in business (Design Council, 2005), tracking a number of companies termed as the Design Index that had integrated design practices into their business. These companies displayed a significant increase in share value compared to the FTSE 100 over the 1994 to 2004 period, gaining a 200% difference in share prices. Design strategy is now a necessary core component in a business infrastructure rather than a peripheral addition.

Game design, particularly with video games' increased proportion of consumed media, now holds an important role in the continued diversification of media. Video games as a medium is emerging as the dominant contemporary communicative paradigm as demonstrated by video games sales surpassing box office and DVD sales in the United Kingdom in 2009 (Chatfield, 2009). The corresponding increase in game literacy and familiarity with the ubiquitous video game phenomenon means that games are becoming more relevant to newer communication methods. This signals a strong communication scheme for engaging a new audience as they spend more time absorbed in this media.

Video gaming has the potential to be a very persuasive medium (Bogost, 2007, p.46-64) that utilizes empathic connections to the audience through the interactivity and engagement inherent to the medium. In this case, it is also adaptable to facilitate multiple audiences to engage with a variety of abstract business model discussions. The flexibility allows it to fit in to a wide variety of internal and external corporate communications.

H.E.R.B. explores the early potential of using the language of video gaming for the facilitation of business dialogues. Specifically, H.E.R.B. is an interactive conversation designed to communicate Servodan's unique value proposition. H.E.R.B. also explores the core values of the product, and helps articulate the Luxstat LED Luminaire System's position within the company's product portfolio.

As an early proof of concept, H.E.R.B. is an active method that currently visualizes the Luxstat LED Luminaire System's value proposition, particularly its health and productivity benefits (Servodan, n.d.), and sets it within the larger, more holistic context of a healthy building environment. This conversation starts to actively engage players with Servodan's value proposition. This interactive dialogue can leverage video gaming's communicative platform to build stronger connections with the player.

Other examples of game-facilitated conversations already exist as training simulations that are already in use for more technical training aspects within an organization. Union Pacific's R*ail Operations Simulation* program (Davis, 2009), which trains employees on how to maneuver rail carts in a rail yard is a great example of virtual training, as is IBM's INNOV8 program, a game designed to teach graduate students business and IT skills (IBM, 2010). These are early examples of how corporations

are increasingly exploring the potential of gaming in a technical capacity.
H.E.R.B. diverges from the technical training paradigm by applying gaming principles to other more abstract business dialogues. By choosing to engage with these higher-level business discussions, H.E.R.B. can be an early pre-cursor to more in-depth and transparent presentations of company processes, high-level strategies and goals.

H.E.R.B.

H.E.R.B. is an interactive visualization designed to communicate Servodan's unique value proposition from an alternative perspective. It also functions as a proof of concept of the potential for a wider engagement with external business partners through game design. H.E.R.B. focuses on how the Luxstat LED Luminaire System plays a key role within a holistic view of a healthy building eco-system. The game implicitly articulates the productivity and health benefits of a comfortable indoor working climate through what Bogost calls "procedural rhetoric" (Bogost, 2007, p.28): a method of communication through engagement with processes. In this case, player engagement with the game reveals the multiple components required for a healthy building.
As part of the initial design challenge, this design researcher was assigned with addressing the specific issues facing Servodan. These challenges included: positioning the Luxstat system within the Servodan product portfolio, considering the value proposition, clarifying the respective product scenarios and value offer, and the core needs of the identified target markets (Wozniak, 2010) among others. After researching the company's challenges, the design research team decided that the value proposition challenge stood out as the most salient issue that the company was facing. An interactive narrative to articulate the unique value proposition of Servodan's LED Luminaire system was proposed as an interesting experiment. This approach had the potential to engage the external audience that Servodan had identified, such as building managers, interior architects, or lighting designers that were the parties that could specify and implement Servodan's system.
Multiple game mechanics were explored during the ideation phase, such as a building-centric 3D isometric *Sim City*-esque game play, where the player gets construct a model of a building lit with the Servodan product and test it out, and a role-playing game where the player embarks on a quest to discover the Servodan product. Ultimately, H.E.R.B. was designed as a simple 2D side-scrolling platform game. This was to leverage the ubiquity of the game genre. Most players possess enough game literacy to immediately understand the mechanics of a 2D platform game, and this low threshold of player ability required (Andersen, 2010)(Juul, 2010, p.40-42) allows for maximum participation of a wider audience with the game. The interface is however primarily mouse-centric, a small deviation from the standard keyboard controls to allow for minimum hardware requirements.
Player engagement is encouraged by rewards at the end of each successfully completed task. The rewards are subtle changes in the game environment, which mark the progression of the building through its improving health states. These moments of delight, where the player recognizes these patterns of progression (Koster, 2005), are immediate positive feedback for appropriate actions.
H.E.R.B. was inspired by contemporary re-interpretations of 2D platform games from the 1980s. These games inspired a new generation games with similar game mechanics and aesthetics for mobile platforms. Games like the *Super Mario* series (Miyamoto, 1981) have unique aesthetic sensibilities and a defined interactive paradigm. The constant left to right scrolling, easily accessible game mechanics, and the height, distance and timing of the character's jumping motion are ingrained into most players. Their successors such as *Canabalt* (Saltsman, 2009), or *Little Big Planet* (Healey & Smith, 2008) have introduced slight variations in game play and mechanics, but the core interactions remain similar.
These video games are part of our mainstream cultural vernacular. As more popular games emerge with their simple mechanics and lower knowledge threshold, they are reaching a more extensive audience beyond the traditional digital gaming fraternity. This position of influence is reflected not only in a general increase in game literacy, but also signals a strong new communication scheme for engaging a wider audience.
H.E.R.B. is currently a speculative and untested prototype that is attempting to extend gaming's cultural capi-

Figure 1: Final H.E.R.B color palette and proportion concept art

tal into a new application. Play testing and user evaluation of the game, particularly around the user interface and communicative properties of the game, is the next phase of the iterative design process. Specifically, user testing on players from inside and outside the company is necessary to ensure that the value proposition is understood and communicated from the inside out. Play testing in this case was not achievable within the pre-existing time restrictions.

GAME AESTHETICS

H.E.R.B. has a consistent aesthetic language that is designed to be easily legible. The art direction prioritized stylistic off-kilter proportions as opposed to realistic visual assets following concept developments from the original precedents. The game's visual assets were designed to be consistent, with aesthetic constraints guiding the design of every asset.

The main character is deliberately simplified to help players identify with his motivation. This allows the players to project their own mental image on to the abstracted caricature (McCloud, 1993). At the same time, the character's silhouette and movement hint at the character's role the game progression.

The game environment primarily uses a generic indoor office setting contained within a larger cityscape that magnifies the working conditions and its effects on productivity. The desaturated grainy pessimism of the early levels is designed to set a depressed atmosphere for the game. In contrast, the player transitions to later levels that introduce a brighter color palette with a finer surface. The variably textured treatment softens the hard-edged aesthetic typical to vector-based games and introduces visual tactility to the game. The game audio subtly supports the narrative by progressing from the amplified office cacophony to sounds that are more natural and soothing.

The aesthetic precedents for this project were projects such as the critical *Every Day the Same Dream* by Molleindustria (Experimental Gameplay Project, 2009), a game designed for the Experimental Gameplay Project and *Gentrification Battlefield* (Beekmans, 2010), a video-based installation by Golfstromen in collaboration with Coen Rens. *Gentrification Battlefield* is currently on display at the Mediamatic in Amsterdam.

GAME MECHANICS

The player's goals are to improve the building health appearance and workers' productivity. They achieve this through installing building upgrades that they get from an external source. The player interacts with the game through a mouse-centric interface. This slight variation allows for a click-drag interaction, where the player can select an item and drag it to the target location.

The player progresses through the levels by adding lights, indoor plants and providing water, which are all required for a more productive environment. Lighting conditions in particular plays an important role in office occupant productivity and well being (Begemann et al, 1997)(Partonena, 1999) (Fisk, 2000).

Discrete upgrades mark the progression through the multiple states. At the completion of each upgrade, the player is rewarded with a change in the level of illumination. This instant feedback helps the player to construct their understanding of improving building health and office productivity. The game ends with the addition of Servodan's Luxstat LED Luminiaire System. The final win screen allows for a simple virtual demonstration of the product's controllable lighting system, allowing the player to tweak the tint and intensity of the installed lights.

CONCLUSION

Video gaming is an excellent medium to not only reinforce corporate values, particularly in communication to a business's many partners, but to also strengthen the engagement with a brand's value proposition. The interactive medium is flexible enough to engage in various conversations within and without a corporation.

Video game inspired thinking can function as an alternative design strategy. The internal value network gets to apply design thinking to their processes, and begin to approach traditional business discussions with a framework that includes principles of play. As gaming further permeates the mainstream, this method of applying game thinking is going to extend to more areas.

H.E.R.B. serves as a prototype interactive visualization of Servodan's Luxstat LED Luminiaire System, which initially explores the benefits of the system within a generic indoor office setting. The game places the Servodan product within a more holistic view of healthy indoor spaces. H.E.R.B. aims to communicate the specific benefits of Servodan's flagship product in an alternative medium.

H.E.R.B., in its current form, is an extension of videogame rhetoric that Bogost terms as demonstrative advertising (Bogost, 2007, p.153-154), as it articulates the tangible benefits of the product. It is taking traditional marketing rhetoric, and re-applying it through an interactive medium that can convincingly convey the value proposition of the Luxstat LED Luminaire system. By utilizing the interactive medium to let a player actively discover the message (Bogost, 2007), the player is allowed to digest the emergent narrative (Salen, 2004, p.382-387) that is embedded within the game.

This game has scope to be extended beyond the generic office environment discussed here. Other potential practical applications include focusing on target markets that Servodan has already identified, such as hospitals and schools, and other public consumer spaces such as supermarkets and shopping complexes. Further refinement in different revisions of the game can help articulate the specific benefits of the Luxstat LED Luminaire System for each space.

These revisions can be modular packages within a larger game to assemble a more holistic view of the company's product portfolio, as well as a more transparent view of the company's many processes, such as the relevant target markets or strategic marketing initiatives. This larger collage of experiences can help communicate a consistent brand vision for the company, both internally and externally.

Games can be designed to challenge players to approach abstract discussions, such as clarity around the product's value offering or an appropriate business model. Future developments branching off H.E.R.B. could include a more participatory design phase,

where multiple iterations are discussed with appropriate stakeholders. A valuable development phase where input from internal stakeholders is during the ideation of how a game might articulate the position a product has in the company portfolio. A strong internal understanding will help solidify an external communication. Another valuable phase is the identification of the target market. Gaming has a stereotypical demographic that is rapidly expanding. If gaming were to be used as an approach, the game design needs to be tailored to consider the needs and abilities of the target market. These conversations do not necessarily have revolve video games specifically, but the development and thinking around this problem-solving process could be informed by the principles of play and engagement.

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BUSINESS CASE: DAYLIGHT SYSTEMS OF SERVODAN

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ABSTRACT

This paper presents the case of presents the case of a Danish company- Servodan and the challenges that the company is to face with its new product called 'daylight'. The case is based on the cooperative project between the company and University of Southern Denmark. The paper provides a general introduction to the company activity and product characteristic. Next, the background of the project and data gathering processes is briefly described. The evaluative part of the case opens with indicating the Servodan's contingency and the core of the challenge that company faces. Subsequently, the base for an analysis framework is developed and ideas for value offer proposed. The case ends with a concluding questions and the invitation for further analysis for conference participants.

INTRODUCTION

Servodan is a local Sønderborg company, established in 1958 (http://www.servodan.dk). The company manufactures intelligent lighting control equipment for office buildings and business environments, e.g. movement sensors, day night switches and light controls. In 1983 the founder's three sons took over, and in 2008 Servodan became part of the larger Niko Group based in Belgium.

Recently the company has developed a new product system based on LED lights. The lighting modules can be digitally controlled to provide light in the tone of daylight, and they can be programmed to change colour balance in the course of the day – say, from reddish light in the morning to more bluish in the middle of the day. Accordingly, this product has been given the name 'daylight'. At this moment, Servodan manufactures a ceiling mounted light (with a 3D image of the sky) and an artificial window (with a countryside image), both of which provide rooms with a near-natural lighting experience. LED luminaries and 0-10V ballasts are used for daylight control. The sense of reality is achieved through a process that combines filter boosting 3D effects, real window frames, flat multi-channel light sources and specific lighting scenarios and effects. The system includes wireless switches, sensors and computer control for easy installation. The main sales points are to offer increased wellbeing even in window-less rooms, and electricity savings through the LED technology and sophisticated control.

The system is relatively new to the market, and although Servodan has been in the lighting business for many years, those are the first modules they manufacture. As the primary markets, Servodan wants to focus on five areas: hospitals, banks, hotels, schools and lighting OEM (original equipment manufacturers).

It was clear to Servodan that this new technology requires a new way of thinking about their business. Some of the initial questions for the manufacturer were: Which market and how? How can a component manufacturer switch to systems sale?

There are two challenges in need of attention: (1) The business model for the new market(s) in terms of target customers, distribution channels etc. and (2) the use scenarios and the product service concept. The goal of this project is to study market, users, and company, and to develop proposals for both challenges simultaneously.

COOPERATION WITH UNIVERSITY OF SOUTHERN DENMARK

Some initial steps, on the way to the project goals, were taken already.

At the outset of the 'daylight' challenge Servodan contacted Mad Clausen Institute (MCI) at University of Southern Denmark (http://www.sdu.dk/mci) to assist them in developing the idea of the new product and the process of exposing it to the market. The cooperation was carried on within the

Figure 1: The vision of a daylight office, as the company shows it in its sales brochure. An office environment with skylight illuminaires in the ceiling and an artificial window in the darker corner.

'Business of Design' interdisciplinary class which merged graduate students of 'IT Product Design' and 'Innovation and Business' into the research group. It encompassed intense three weeks of work on the company project.

Activity was organized in the matrix design (Galbraith, 1971) so each member of the student research group was in both functional and project teams. Functions were design oriented: user research, lighting design, service design; as well as business oriented: business research and business modeling. Teams were divided based on assigned markets that Servodan concluded as possibilities (hospitals, banks, hotels, schools and OEMs). This set up ensured market focus as well as the objectives concentration around the project goals. The initial work of the teams consisted of gathering the data and analysis for the project. That involved brief field interviews, contacting potential users and customers, study company position etc. This was accompanied by Servodan coaching sessions, where necessary information was exchanged between the research group and company's representative. The meetings helped to assess the company situation and also ensured that the groups know what company knew already.

After three weeks of a limited study of the company, industry and product's aspects, there was an official presentation of the results to the company. This included the sketches, drawings, results of the surveys and interviews, and scenarios ways of presenting users and ideas, drafts of business models and the discussions around business model options. The CEO and three managers were quite enthusiastic about the demonstration and therefore students were asked to come and present the outcomes at a meeting with the board of directors two weeks later.

Naturally, this cooperation did not provide very extensive analysis, nor fully grounded recommendations. However, it delivered considerable material for the project and numerous ideas for the value offer of the product. Most importantly, it enabled to assess the Servodan's situation, and indentify the main challenges. As it exposed the questions about company strategy and business model, what allowed preparing a thorough analysis framework. Fundamentally, the data gathered worked as a base for the following sections of the case.

ESTABLISHED BUSINESS VS. EMERGING OPPORTUNITY

The core of the case considerations could be the fact that Servodan has the established business in lighting control systems and their proven business formula to act as a supplier to OEMs. Accordingly, it could be difficult for them to adopt new way of looking at the business within their conventional business perspective. Furthermore, and very importantly the resources that they have today will not be enough for the new business model. There exists a certain organisation inertia that might possibly make it more difficult for the company to look on the new opportunity that does not directly follow current company logic.

Essentially, the 'daylight' product is totally new to the company. The invention itself happened rather accidentally, while R&D group were playing with control of light scope. In a way, it surprised and challenged the company's management. If Servodan decides to follow up on the 'daylight' product they stand in front of the core decision- what is to happen next? One way could be creating a kind of corporate venture that deals separately with daylight product. On the other hand, they might embed the 'daylight' in the existing organisational framework. Either scenario is most likely to involve rethinking the strategy, redesigning business model and subsequently business processes.

How can they think about the day light solution as a business model innovation? How can they coin this strategic puzzle of what to do with the spinoff that does not completely fit with what they do today? These are some of the core questions and dilemmas that company in all likelihood will have to face.

Therefore, one should take into account the challenges exhibited in the following section - a few of many that the company needs to deal with at the outset of the further business analysis.

CHALLENGES - A BASE FOR ANALYSIS FRAMEWORK

Servodan has several strategic and business model related challenges to resolve. The very first generic challenge on the strategic level is the portfolio match; and the question- is 'daylight' something that they would really like to do and how does it fit to their current business? Accordingly, how can this enhance their company productivity and profitability by any potential synergies that could emerge?

Consequently, business model elements (e.g. Osterwalder and Pigneur, 2009) need to be considered. A starting point is to be the value proposition. At the outset it might follow one of standard Drucker's questions: who are the customers and what are their needs? Even though Servodan has prechosen the few markets as their priority (hospitals, banks, hotels, schools

and lighting OEM), the implications of those choices are more important. So far, the company has worked mainly with OEMs and now most of their prechosen markets involves end customer, however they have a little experience in dealing with this type of the client. Furthermore, their value offer and product scenarios have to be clarified- what problems do they exactly solve and what needs the product responds to? Is it the energy saving; solution for windowless rooms; well-being or the unique experience that 'daylight' provides? It might also relate to Servodan's focus- either on the product development or service design. Do they invest most in product development in direction of scientific argument towards well being or towards design and convenience of the solution? (A few general ideas around the quality of the value offer are described in the next section of the case.) Subsequently, how far the company would like to diversify their offer to different segments or rather focus on particular niche at the outset- is another challenge. The last part of value proposition is the question what is the most suitable way of generating the revenue streams. From Servodan experience with OEM market they are used to sell the product as commodity within the pricing mechanisms. However, the other options as usage fee, leasing or even licensing might be considered for a specific character of the offer and segments they approach.

On the other hand the evaluation of the competence base and resources to deliver the value is the vital factor. What core assets, knowhow and expertise that Servodan already possesses could be used for the 'daylight' and what is missing? For instance, the more in house marketing and sales force might be needed for promotion and acquiring new customers. In general, the extension of staff might be necessary. For example, additional technicians who have to set up the 'daylight' might be a critical choice for external image of the company and the final success of the product. In contrast, some of the activities might be outsourced to the existing or potential partners. Consequently, the assessment of the value network that can support Servodan's business is necessary - both in horizontal and vertical value chain.

Finally, from strategic perspective the competitive market environment (e.g. Porter, 1996) is vital for Serovdan. As the product is new to the market the competition is relatively small and there were only two big players found on the global market. It creates a great opportunity for Servodan on the Danish market where the competition is not established, yet. However, the volume of the national market and the perspectives of the expansion have to be considered. At last the new entrants and the dynamics of the competitive environment might become a challenge in the near future.

In very general, the challenges could be summarised as the strategic issues of portfolio match and competitive envronment, while on the business model level the matters of value proposition, resource base and value network.

THEMES FOR THE VALUE OFFER

One of the starting points of further analysis might be the assumption of the certain strategic choices and clear articulation of the value that the product offers. There are numerous ways to approach this issue- as touched on in the analysis framework. Here, there are exhibited several value offer themes that one could use for either inspiration, or consideration for further development of the analysis or design.

The technical characteristic of the product, having high light quality and energy saving already articulates the value. However, in order to focus and develop specific value proposition around it, one could consider certain value qualities, types to add on and expose.

First, further development of 'daylight' can result in the fact that product will give the healing effects, the same as the natural light. This means that it could, for instance, help patients in the recovery process, assist in a fight with a depression symptoms or in general influence the state of the user in a medical sense. However, this would involve a thorough research and medical evidence. Therefore, one could define it as a quantitative type of the value offer, where numbers and strong evidence matter.

On the other hand, the strong qualitative type of value offer might be expressed with the unique experience while using 'daylight'. That would involve more artistic and design approach to the product. The attributes, then could be articulated by colours, different shapes, customized installations etc. Additionally, the blend between the visual and audio experiences can be offered. In general, various product scenarios that ennoble the product with a unique touch and intangible quality of experience might be considered. Yet, this again would have to involve an additional development of the product- not technologically or scientifically, but more design-wise.

Finally, the offer could focus on the qualities of convenience, comfort and wellbeing. Here, the embedded feature of high light quality and energy saving might have been almost enough if the company offered a value that emphasize a practical use. That could involve set ups for windowless room, but also enhancing the quality and comfort of being in any room of the building including working offices. This idea is directly related to improving the so called 'building ecology' and working environment. The range of factors influencing office wellbeing relate to: adding the plants to the office, monitoring the air condition- temperature humidity; design of furniture etc. 'Daylight' product could be undoubtedly the vital ground for the improved work place environment. This theme adds intangible value of convenience and wellbeing, while explicitly articulating the embedded technical characteristic of the product. This value offer would be positioned in between the strong qualitative and quantitative types mentioned earlier.

The above examples are to work more as ideas and stimulation for further analysis, leaving the heart issue open- What value offer could be the one of Servodan's 'daylight'?

CONCLUSION

This paper attempts to introduce the case of Servodan and the challenge of dealing with the innovative product of 'daylight', the company accidentally came up with. Sketching the background of the Servodan and the product characteristic through analysis framework and some brief ideas on value offer, the ultimate intention was to evoke the sense of interest to look into it further. It is specially addressed

for potential business analysis as well as design intents.

Certainly, Servodan is in the difficult position with numerous options to choose between. If one was to boil down all the questions to one issue it would be the Servodan's strategy and business model in very general sense. Therefore, it leaves a great space for further business analysis to investigate contingencies and coming up with recommendations. Furthermore, because of the high variety of challenges and vivid product character it gives an immense chance for designers' contribution. Thus, it might involve visualising certain specific dilemmas, expressing the value offer or proposing product scenarios- just to mention a few possibilities. Accordingly, business analysts as well as designers should find the comfortable space for a contribution.

Ultimately, this work aims to contribute to the discussion on innovative business models in a cross-disciplinary environment of PINC conference, 2011.

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BUSINESS CASE: THE NGO HERRGÅRDS KVINNORFÖRENING

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ABSTRACT

This case explores how a non-governmental organisation (NGO) of immigrant women, Herrgårds Kvinnoförening (HKF), living on social security could become an entrepreneurial group offering services and products based on their skills and competences. In this way they could challenge the role of immigrants in Swedish society, from being a burden to become a socio-economical resource.

HKF has some peculiar characteristics that have to be taken in consideration in a successful business: they are strong as a group but weak as individuals and they have intangible qualities that cannot be externalised as proper skills. Another crucial issue for a possible business proposal is how to structure the relationships with the system of actors surrounding HKF that could support them in overcoming their weaknesses.

The case has been developed using a participatory design process. Some prototyping and trying out of possible offers have been carried out using co-design methodology.

INTRODUCTION

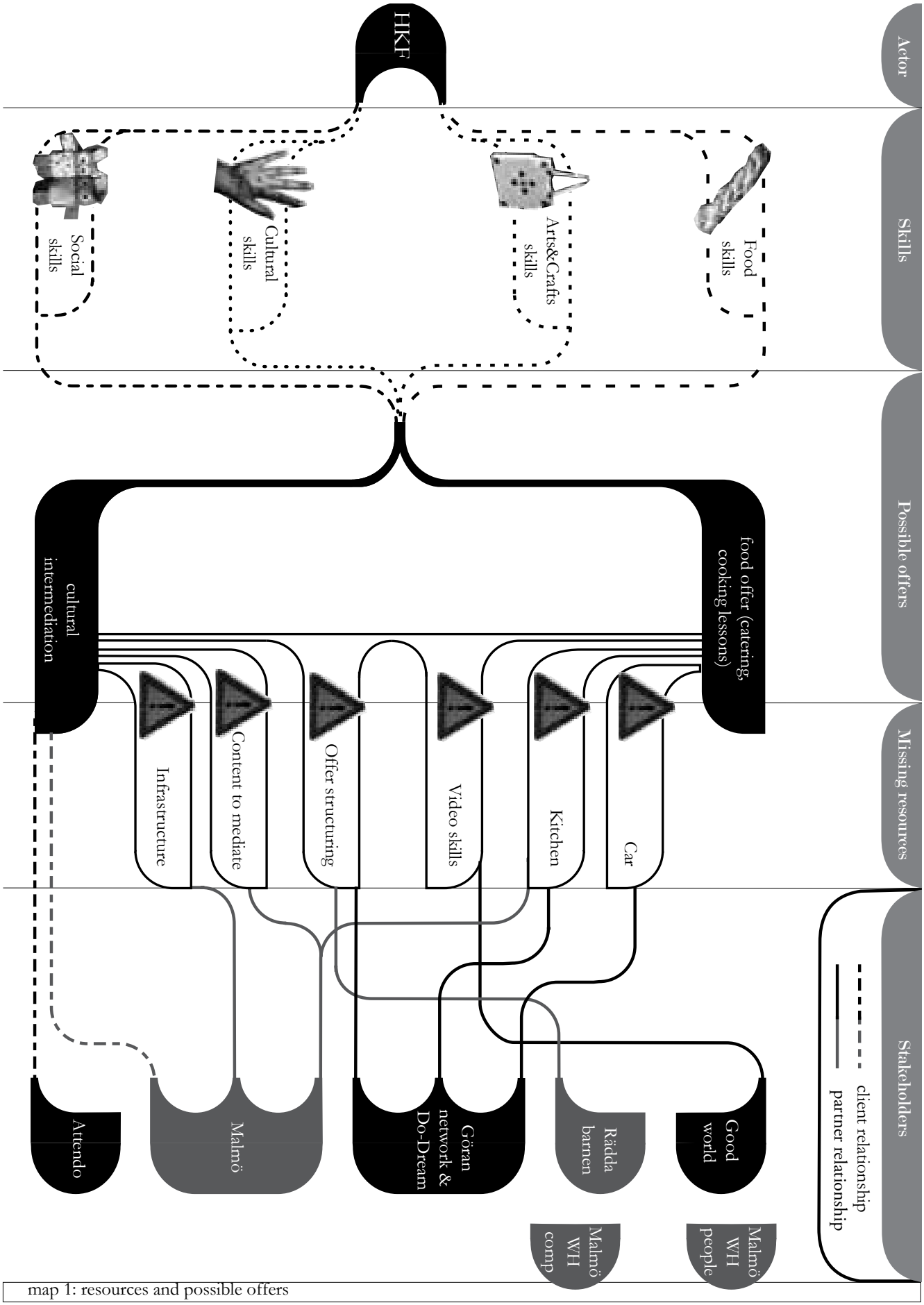
Herrgårds Kvinnoförening (HKF) is a NGO of immigrant women living on social security funding. Their goal is to become less dependent from the public funding by offering services and products based on their skills and competences. By turning their activities, now considered to be "leisure", into a sustainable business HKF could become a concrete example showing how immigrant NGOs could become a socio-economical resource for the Swedish society. However it is still unclear how far they are willing and able to go as entrepreneurs.

The case has been developed using a participatory design process (Björgvinsson, Ehn, Hillgren 2010) in which researchers, HKF and other stakeholders have collaborated in order to map the qualities and possible offers of HKF. This collaboration has created strong relations and mutual trust between the actors. Moreover some prototyping and trying out of the possible offers have been carried out using co-design methodology. These performing collaborative experiments allowed to visualize their qualities and potential offers and to articulate the relationships between skills and offers (see map 1), a possible actors network (see map2) and a SWOT analysis (see below).

The challenge in this case is to find a business model that fits the internal characteristics of HKF as well as the specificity of the context they are dealing with. It will be critical for the success of the business to embed in the possible offers the peculiarities of HKF by making visible and measurable the soft qualities that characterize them. It will also be crucial to structure the relationships with the surrounding actors that could support HKF in developing a self-sufficient business.

BACKGROUND: HERRGÅRDS KVINNOFÖRENING (HKF)

Five women started the Herrgårds Women association eight years ago in Rosengård Malmö as a response to feeling excluded from the Swedish society. The association has approximately 200 women (and 200 children) as members.



map 1: resources and possible offers

The nationalities include Afghan, Iranian, Iraqi and Bosnian women (majority Afghan). Many have limited skills in Swedish, many are illiterates, and most lack higher education. Their activities include working with health issues (eg. sexual health) and social issues (eg. honour-related violence), food catering, small-scale clothing and textile design as well as carpet design/production. The core group of 5 women meets regularly and depending of what kind of activities are carried on other members participate.

KEY CHARACTERISTICS

The HKF has some peculiar characteristics that have to be taken in consideration while developing a possible business model. They are *strong as a group but weak as individuals*. The women would never be able to become entrepreneurs as individuals, but as a group they are strong enough to take that step. The women have some *intangible qualities,* peculiar and interesting characteristics that cannot be externalised as proper skills but could still play a strategic role in the possible business. They are curios, proactive and have a strong "mum-attitude". They are really welcoming, able to create comfortable situations and skilled in dealing with people. The association also have a strong *social role* within the immigrant community. For some of them they represent a reference point and a trustable group, but other elements of the community consider their activities and behaviours unconventional and inappropriate. At the same time the Swedish society and its key actors (public institutions, civil servants) does not recognize their potential value and they treat them as a problem and not as a possible resource.

SKILLS AND OFFERS (see map 1)

HKF members are really skilled in *preparing and serving Arabic, Afghan and Middle-East food* and they already did some trials of a catering service that beside the delivery of ethnic meals, includes the setting up of a true cultural eating experience. This could be further enriched with cooking lesson about Arabic, Afghan and Middle-East food. Some of the HKF members also have gardens where they grow the groceries they use for cooking. This ability could be used inside an educational service about gardening and nutrition.

They are also skilled in *sewing and weaving*. They could offer services around the production and maintenance of carpets as well as traditional clothing. They also did some experiments designing and producing more contemporary goods using an ethnic style (eg laptop covers).

HKF is characterized by unique socio-cultural skills: they have a *strong cultural heritage* not yet mediated by the Swedish environment. They also have a genuine and spontaneous approach in presenting their culture and habits. In terms of social capabilities the members have intercultural competencies and credibility within the immigrant community. Therefore they could act as *intermediators* between the Swedish society and the immigrants community.

The cultural mediation activity could be particular interesting both for private companies working in the social-health sector (eg Attendo) and for public agencies (eg Swedish Migration Board, Work and Unemployment office). HKF is already involved in educational health programs organized by Malmö municipality, where HKF is in charge of organizing and leading meetings about different themes (e.g. sexual health) within the immigrant community.

OFFER PROTOTYPING

Several prototyping experiments about possible offers have been carried out, mainly addressed to explore how to structure a catering service and a cultural intermediation service.

In the first case HKF worked for different clients offering catering service of Arabic, Afghan, Middle-East food. An interesting aspect was the unique cultural experience embedded in how the women prepared and served the food. At one occasion they offered to the catering guests traditional henna tattoos. These experiments also highlighted some of HKFs weaknesses in structuring their offer. They does not have different menu proposals from which the client could choose according to their taste, the number of participants, or to the budget. This can create some difficulties and misunderstandings with the clients.

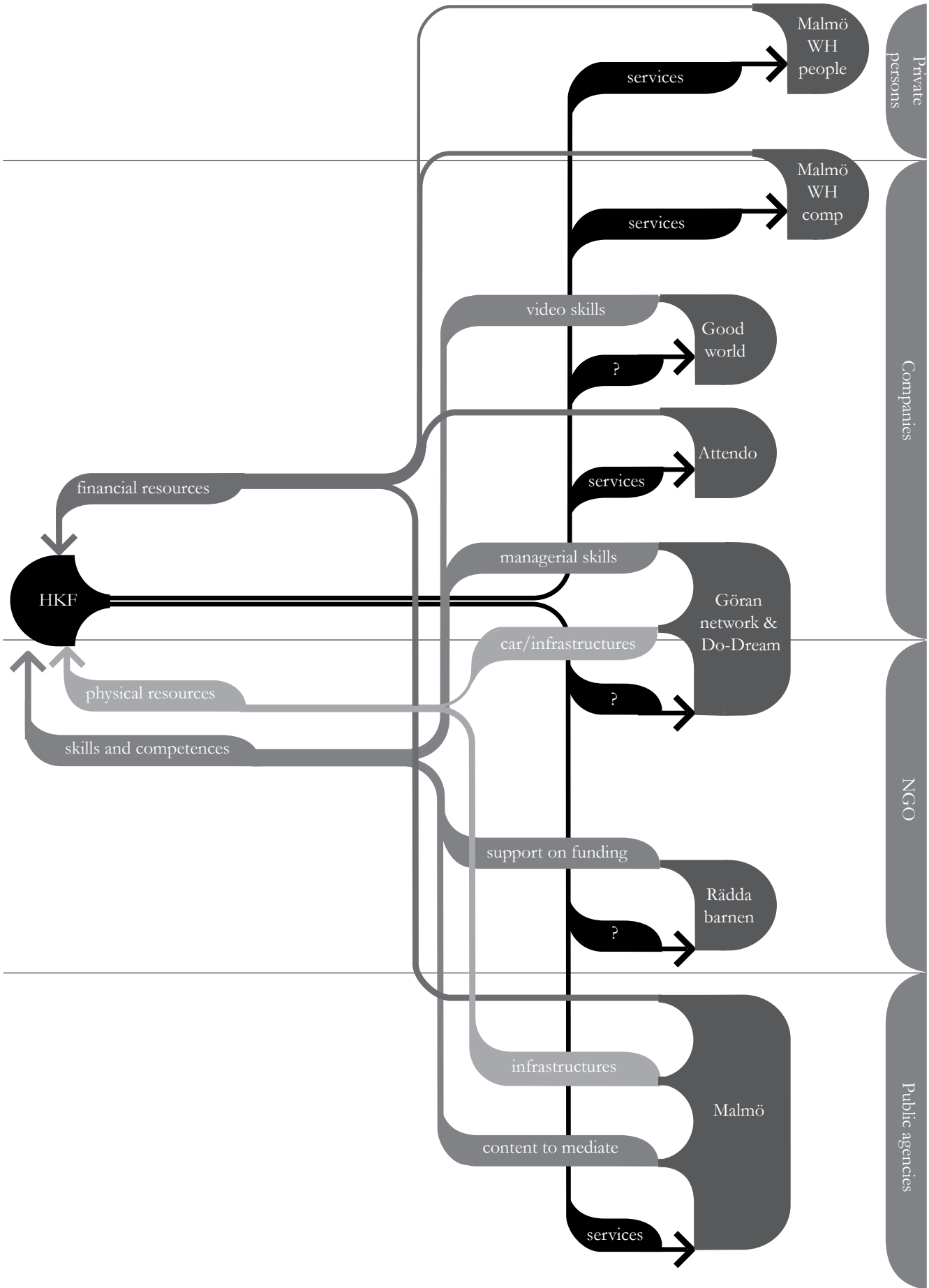
In the second case HKF had some meetings with refugee children belonging to the same cultural background, hosted by Malmö city through the care company Attendo. During the meetings HKF cooked for the children and involved them in some cooking lessons. At one occasion the cooking lessons where held at Good World (a media company) and the kids had the opportunity to interact with media professionals.

These meetings were particularly appreciated by all the involved actors. The kids were happy to have the possibility to get in contact with somebody sharing their cultural background and, moreover, that could represent some kind of parental figure. Attendo, the company looking after the children, appreciated the role of the mediation of HKF however they pointed out that they can not pay HKF for just meeting the kids and that the offer should be more structured. They also said that they can not outsource the meal preparation to HKF since they do not have the infrastructure and experience to deliver this service.

In terms of possible business opportunities new media could play a significant role. On the catering/food offer some prototyping has been done about creating video cooking lessons. These videos could be offered as a product in themselves, or as part of a broader service of culture intermediation targeting, for example, the refugee children. Indeed most of the kids are in transit, which means that they will be moved to other parts of Sweden or abroad. Using videos as well as social media and the web could be a way to create a long lasting relationship between the kids and HKF which could provide their service as cultural intermediator also on remote. The members of HKF have also a rich oral tradition and some of them suggested that the stories of the refuge kids presented by some of the older ladies could be recorded and made available on the Web.

The prototyping activities enlighten some key issues about the offers but until this moment it has not been possible to structure the value proposition in a clear way (see both map1 and map 2). On one side, there is a difficulty in framing the offers since the complexity of certain elements (socio cultural skills) and a lack in entrepreneurial and managerial skills. On the other side, the actors mainly involved since now (Attendo, Good world) could offer some kind of insights such as being a client or adding specific skills but could not support HKF in structuring their value proposition.

This tends to create a vicious circle: the offer is fuzzy because it is not possible to define it precisely until the partners are defined. But at the same time these fuzz-



map 2: first draft on the stakeholders exchanges

iness does not allow the possible stakeholders to understand how they could contribute and what kind of value they could offer and claim for.

POSSIBLE ACTORS INVOLVED

(see map 1 and 2)

There is a complex system of actors around the association that could represent business partners or clients. Some of them have been involved during the activities of the offer prototyping.

Attendo is a commercial care and social care company which is funded by the municipality for looking after the refugee children in the city of Malmö. These kids are usually between 13 and 17 years old and they have been sent on their own to Sweden. The role of the company is to look after them and at the same time give them some basic skills about how to live in Sweden. Attendo is both a *possible client and partner*.

Malmö is characterized by a strong presence of immigrants, they are around one third of the population. This situation has raised a number of socio-economic issues for *The city of Malmö* that traditional approaches seem unable to address in a satisfactory way. They could become both partners and clients for the women.

The *Göran Network* is a network of women entrepreneurs aimed to create support for their activities. They express their interests in enlarge their network towards group of women similar to HKF. Göran Network is an **i***mportant business partner*. Also *Good World/Do Dream* can become an important business partner. Good World is an independent film production company of which the CEO is also part of the Göran Network. The CEO is particularly interested in HKF and she would like to support them, also in terms of financing. Recently the CEO of Good World founded Do Dream, a website platform aimed at support grassroots initiatives by facilitating matchmaking between different stakeholders. They could possibly also support media production.

Another possible business partner is the NGO *Rädda barnen* (Save the children) who met HKF during a workshop aimed at exploring how the cultural intermediation offer could be developed into services for the refugee children. Rädda barnen expressed their interest in supporting HKF in their activities.

There are other possible stakeholders that have not been involved yet.

Some *Malmö western harbour companies* could become *mainly clients but also possible business partners*. This recently developed Malmö area is becoming a reference point for the knowledge economy actors (university, ICT companies, media companies, design and architecture studios). They are generally small companies connected one to the other by a thick fabric of commercial, social and cultural relationships. Some of them had been in contact with HKF and respond quite enthusiastically to the NGO intangible qualities and cultural heritage.

Conceivable as **mainly clients** is *Malmö western harbour people*. This group is tightly connected to the previous one since most of them are working within the western harbour companies or are living in that area. They are a group of people with a high level of education and an over-the-average income, which could be particularly attracted by intangible qualities and cultural heritage characterizing HKF.

SWOT

Summing up the peculiarities of this case.

Stregths:

- intangible qualities of the group of woman (genuity, curiosity, mum attitude, imaginative)
- skills (related to cooking and arts and crafts)
- strong and genuine cultural heritage
- intercultural competencies
- strong as a group (every individual contributes with different skills and abilities)
- crucial role within the immigrant community

Weaknesses:

- lack of entrepreneurship skills
- lack of skills required by Swedish society (language, laws and regulations, education)
- weak as individuals (individuals are unable to carry out the activities they carry out as a group)
- no credibility within the Swedish society (they are seen as leisure group, not as a possible resource/ entrepreneurs)
- intangible qualities (how to quantify them and package as a possible offer?)
- missing of physical infrastructure (they don't have a kitchen or spaces to carry on their activities as a proper company)
- lacking of financing opportunities

Opportunities:

- credibility within their community
- capacity of being a bridge between Swedish society and their original culture/society
- possibility to offer a true cultural experience
- offering skills that Swedish society is lacking
- Attendo corporate social responsibility (need to rebuild their credibility)

Threats:

- community and family pressure/obligations (their social group could not accept that they become entrepreneurs; as women in their community they are in charge of family and house management)
- resilience (intended as the possibility that they don't have the energy and resources for working full time and carrying the responsibilities of a business)
- social security money (if they decide to establish a company after six months they will loose the right to receive the monthly financial support that Swedish state is providing them)
- Swedish laws and regulation (which are individual driven and therefore are not considering the possibility to support groups to become entrepreneurs).

SUMMING UP

To conclude, the questions around this case are: what kind of resources, infrastructure and business model are needed to create an economically self-sustained reality?

Which win-win relationships could be established to build up an economical reality that values the specific qualities of the group (eg intangible qualities, strong as group weak as individual)?

How could the "cultural intermediation" become a service whose outcomes could be measured and therefore become a valuable offer for Attendo and/or the City of Malmö?

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USING EXTREME SKETCHING TO HELP REFLECTIONS ON BUSINESS

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ABSTRACT

The paper presents extreme sketching as a sketching method that uses humour and extreme situations to aid thinking, talking and memory. The paper reports on two cases where extreme sketching was used to aid business thinking in small companies, specially focusing on how the sketches were used to inspire reflection in situ and how they were later used as memory aids and inspirational documentation.

INTRODUCTION

Nokia's slogan "connecting people" is short, to the point and easy to understand. Or is it? Actually, it may be understood one way when put in plain words but in quite another if sketched as a big corporate building with arms handcuffing three people while a fourth is running away terrified. Such an interpretation might provoke the spectator to explore some of the uncertainties or underlying assumptions that stand out clearly in an extreme sketch but not so much in text or spoken word; With what does Nokia connect people? Does Nokia connect everybody at the same time, or simply one person to another? Is Nokia connected also? What if one doesn't want to be connected? This paper is about using the method extreme sketching to do just that.

Sketching is often understood as the production of early paper sketches of the type described by (Goldsmidt, 1991 and 2003) and recently (Buxton, 2007). Such sketches are often produced by architects, industrial designers, and other professionals who work with the form and function of things. To explore other aspects of a design, other types of sketching may be deployed including using enactment to sketch physical interactions or deploying low cost electronics to do hardware sketching.

In design, sketching holds a special role when it comes to facilitating new ways of thinking about well-known or mundane concepts. In the design process sketching is often used to generate ideas and to help designers discuss abstract notions with peers. Sketches that facilitate such uses are referred to as thinking sketches and talking sketches in the literature (Ferguson, 1992). Later in the process, the sketches might be used to make abstract ideas understandable to outsiders, and are then referred to as prescriptive sketches (Ferguson, 1992). Finally, sketches may serve to trigger the designer's memory (Ullman, Wood, & Craig, 1990; McGown & Green), because the visual documentation of the idea is far richer than a textual description of the same.

Both in the literal and the metaphorical sense, sketching helps the sketcher and the spectator see things in new ways. This attribute should make sketching useful outside the traditional context of design, for example in the context of up-coming businesses, because when entrepreneurs start a business, the ability to get ideas and reflect on their consequences is crucial for the success of the company.

Next, we discuss the specific qualities of extreme sketching before reporting on how this sketching technique was used to facilitate reflections on business models.

WHAT DOES EXTREME SKETCHING LOOK LIKE?

Buxton (2007) describes the qualities of sketching as a rapid activity that produces sketches, which are evocative, provokes new questions, and provide the possibility to explore different aspects of a design at a low cost. These attributes go for all types of sketches, but extreme sketching has other qualities that suggest use potentials outside the context of physical design:

- Extreme sketches use humour as a means to engage users in discussion. Humour is a well-proven rhetorical tool that makes examples, problems and challenges easier to understand and remember.
- Extreme sketches use extreme or reverse situations. The power of extreme examples or 'reverse thinking'

Figure 1: Examples of extreme sketches including close-ups and participants discussing details and interpretations.

has been described in for example (De Bono, 1972 and 1990) as effective means to boost new thinking.

- Extreme sketches work as tickets to talk (Sacks, 1992) because they make people look, gather in groups, reflect, and talk about why a sketch is fun, wrong, to the point, or how it should be improved.
- Extreme sketches are visible and plentiful, and demand attention in the physical space. Their presence in a room suggests to spectators that this is a place for exploration, ideas and new interpretations.
- Extreme sketches are hand drawn. They use colours, symbols, annotations, layout, speech bubbles etc. to make discussions come alive. They have a distinctly different "feel" from clip art or models drawn with software.
- Extreme sketches are physical. They are made with pen on paper, which makes them flexible to use, change, and move around and use actively in a discussion.

For examples of extreme sketches, see figure 1.

To describe the use of extreme sketching we next present two cases where extreme sketching was used to support up-coming entrepreneurs reflect on business issues.

CASE 1: THE JEWELRY DESIGNER

To explore how extreme sketching might facilitate new thinking about the business model of a creative start-up company, we arranged a session with a newly educated Copenhagen based jewelry designer. Her products are made from precious metals, recycled everyday objects and found materials. The products are primarily displayed in art galleries and sold to investors and art collectors. To help the designer reflect on the implications of various business models for her company, we conducted a four hour-long session, which—besides the designer—included an interviewer and a sketcher. The session was videotaped for further analysis and documentation.

METHOD OF EXPLORATION

First, the interviewer used examples from the industry to explain and start a discussion about what a business model is, and how different models work differently in terms of value propositions, relation to customers, expenses, etc. The interviewer then proposed seven different business models—one at a time—and prompted the designer to reflect on what her company might look like if using that particular model. The models were a mix of models that the interviewer and the sketcher found either suitable or somewhat challenging, and comprised:

- Auction model,
- Subscription model,
- Rental model,
- Bait and hook model,
- Co-innovation model,
- Collective model,
- Direct selling model.

After the designer had reflected on how the seven business models would work for her company, the interviewer prompted the designer to explain how her current business worked in terms of value propositions, partners, activities, cost structure, and other business concepts described by (Osterwalder & Pigneur, 2009). The designer then identified the Direct Selling Model as a business model she would like to explore further, and the interviewer guided her through questions like "what would be the first steps of implementing this model?", "what would happen

Figure 2: The setup for sketching and close-up of participant from sketching session.

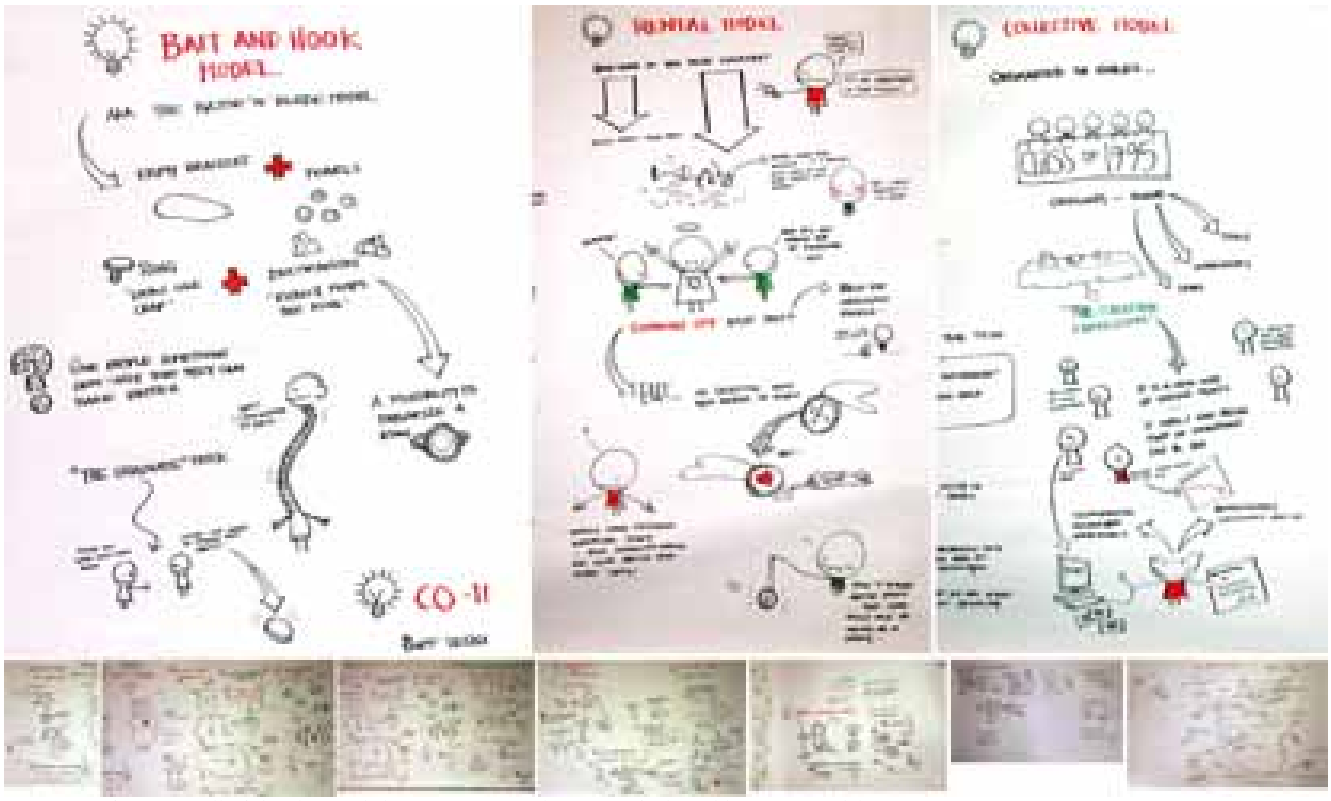

Figure 3: The 8m scroll of sketches and close-ups on visualisations of selected business models.

then" and "what would it take to reach this point?". Lastly, the interviewer engaged the designer in a discussion of what the use of extreme sketching had brought to the session, and how one might use extreme sketching when discussing business models with upcoming business entrepreneurs.

Simultaneous with the interview, directly in front of and visible to the designer, the sketcher interpreted the entire discussion using extreme sketching. The materials in use were various black, red and green pens and a large scroll of paper, which gradually filled the whole room with tangible documentation of the designer's reflections (see, figure 2). This resulted in a 0.75x8 metre long documentation of the discussion, showing the stages and the chronology of the interview (see, figure 3). The sketches used simple icons, human characters, arrows and text, and sought to visualize the discussion by using twisted and exaggerated examples, and linking related topics with arrows and spatial layout.

RESULTS

The video documentation shows how the designer uses the extreme sketches actively when reflecting and explaining how certain business models might work for her company. As the scroll grows longer and takes up more space in the room, she walks back and forth along the scroll as if to physically navigate back and forth in the discussion. When referring to concerns or ideas voiced earlier in the interview, she points or walks to the point on the scroll that shows this particular moment, and continues thinking out load while studying or referring to the scroll. This action points to the sketches' ability to trigger memory, similar to what is described by (Ullman, Wood, & Craig, 1990).

When explaining what extreme sketching might bring to a discussion, the designer walks to the end of the scroll and points at an illustration of a membership agreement:

"It makes me think about things in a new way, like this (she points to the illustration of a legal document), *I thought, hmm, is that the kind of membership that would fit me?"*

On the matter of how the extreme sketching affected her thinking the designer explained:

"I really didn't like this one (she walks to the illustrations of how a party plan might work for her company) *because, I don't like this, the selling part* (she points to an illustration of a sales woman ringing on a door) *but then…this I think is a really good idea* (she points to an illustration of a champagne and cupcake party), *and I thought that this model could really work for me. I also like this one* (she moves to a previous part of the scroll and points) *I think I like this the most, and then that one* (points) *and I think I might combine them* (she looks back and forth in silence as if she is thinking further)."

Both quotes suggest that the sketches are being used to help thinking.

About the provocative nature of some of the sketches the designer explains:

"I like them…they are funny….and really good for someone like me who is very visual (...) In the beginning I was quite provoked because she drew this (she walks to the start of the scroll and points) *and I thought, wow, that's a harsh way of putting it…that I have to cut out my heart to make money. But I can see that I need to find a model where I can earn money and still have time to do the stuff I think is most fun".*

The video documentation shows that when sketching how the Direct Selling Model might work for the designer's company, it became visibly clear that if choosing this business plan the role of the designer would change. One consequence of this was a dramatic reduction in the time she had to de-

Figure 4: Sketching during workshop at STPLN.

sign and create jewelry. This sparked a discussion about what kind of job role would be desirable for the designer to have in the future, and what skill sets she needed to make this happen. The debate about the possible change in job roles points to the extreme sketches' ability to facilitate talking.

When reflecting on how extreme sketching might be used to help other upcoming entrepreneurs, the designer pointed to the value of the information being made tangible and argued that the value would be quite different for groups of participants, because they would then have to agree on a common picture/understanding:

"If (colleagues) were here, I think this would look quite differently. I don't think they see the world exactly like I do".

CASE II: STPLN CULTURAL ARENA

To explore how the use of extreme sketching might benefit a group discussion, we participated in a workshop arranged by the Swedish scene for open culture Stapelbäddsparken | STPLN, that met to discuss how an internal currency system should be designed to suit the different small businesses and private creators. STPLN is a space that serves as platform for established and new creators on the cultural scene. STPLN provides space, equipment, facilities, process coaches, mentoring and tools to realize ideas and projects, and is managed by nonprofit organizations and sole individuals in close cooperation with the municipality of Malmö, Sweden.

To help STPLN discuss the design and deployment of an internal currency system for its users and contributors, a sketcher participated in a four-hour workshop, organized and lead by STPLN. Besides the sketcher, seven key organizers/users from STPLN participated to present and discuss solutions and ideas (see, figure 4).

The session was videotaped for further analysis and documentation of how and when the sketches were used to inspire or provoke the discussion.

METHOD

During the workshop, participants presented and discussed four examples of internal currency systems deployed by other companies. Further, they developed an overview of how potential user groups might contribute, what they would need in terms of resources, and what they could be expected to produce in terms of output. Parallel to this, the discussion was interpreted using extreme sketching on seven A1 sized posters (for examples see, figure 5) displayed visibly next to the participants.

RESULTS

Despite participants clearly stating that they found the sketches inspiring and of valuable contribution, the video of the workshop do not support this impression clearly. During the discussion participants glance at the sketches, and during breaks they go and take a closer look or even take pictures, but at no point are the sketches referenced or used directly in the discussions. They seem more to be a background tapestry that evolves with the discussion. These results suggest that perhaps reflections in groups need not to be inspired or provoked by additional input, such as extreme sketches, or that perhaps the combination of participants or the nature of the theme rendered the contribution of the sketches minor. Following the workshop and by request of a participant, the posters were digitized and distributed to the participants as a documentation of the day, and the originals were displayed in the office of STPLN as a means to keep the discus-

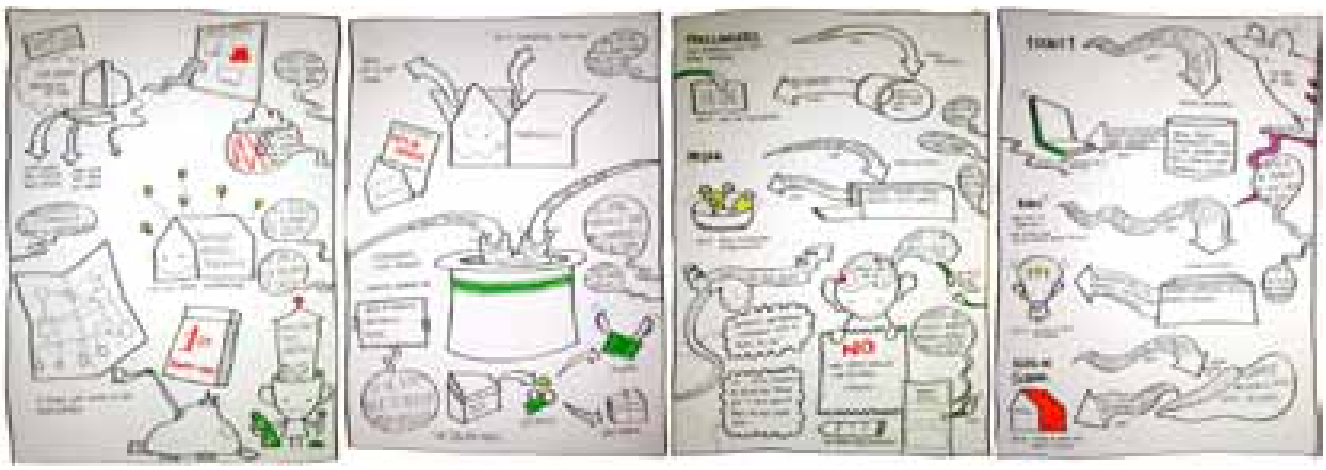

Figure 5: Examples of extreme sketches made at workshop with STPLN.

sion alive. While the results of this use of the sketches is still being reported, preliminary results suggest that while the sketches did not serve as thinking or talking sketches at the workshop, they did serve as memory triggers for participants, and found use as prescriptive sketches that helped explain what STPLN is all about to new users and colleagues.

DISCUSSION

We have described the use of extreme sketching as an aid to discussing the implications of various business models for an upcoming jewelry designer. Based on the video material from the session, and the evaluation made by the designer, we argue that extreme sketching holds a potential for helping people think in a structured manner about complex business matters. The material suggests that extreme sketching has value as and aid to both thinking and talking, and that the sketches produced made it easier to navigate in a discussion, refer to past events, and to use previous discussions as inspiration to continue reflection.

Extreme sketching seemingly have a different role when deployed in a group, as the second case suggests. Here, the sketches were not used directly in the group discussion but contributed afterwards as a means to aid memory. Based on comments from participants, this is primarily because of the sketches aesthetic and provocative nature that makes participants want to share them in their office space and with colleagues.

As with all techniques, the usefulness of extreme sketching is dependent on the skill of the person using the technique. First, extreme sketches are highly personal, more so that traditional pen and paper sketches, because they use humour and provocation. Secondly, because the sketches are made real time in front of the participants the sketching is a sort of simultaneous interpretation of the ongoing discussion, and thus highly dependent on which first impressions are formed in the sketcher's mind, how well they are translated into visuals, and how much these visuals speak to the participants. Accordingly, the technique most likely works differently with different participants, just as, for example, interviewing and brainstorming techniques.

The cases presented in this paper shows two different ways of using extreme sketches, either actively in a session to help thinking and talking, or after a session to help memory and talking.

In conclusion, the cases suggest that extreme sketching does have a potential for supporting thinking, talking and memory when discussing business issues with up-coming entrepreneurs. The contribution of the sketches seem however highly dependent on the dynamics and contributions from participants and sketcher, for example the participants' ability to actively use the sketches in the discussion. Future work will look closer at these dynamics to improve our understanding of how extreme sketches can aid business development.

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BUSINESS CASE: DIGITAL MAP SERVICES FOR OUTDOOR LEISURE

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ABSTRACT

This paper presents a collaborative project, where novel business opportunities for new kinds of map services are explored. The companies involved are facing a challenge: how to survive in the change of fundamental structures that underlie their business? The project will explore opportunities related to a new kind of service platform, which enables new places for organisations and users to encounter in fruitful collaboration. Due to the extensive complexity of the networked situation, good planning is very valuable in order to discover feasible business opportunities in the whole. The paper introduces the partners including their motives, the new platform, and the intended overall process.

INTRODUCTION

MenoMaps II – (Map services for outdoor leisure activities supported by social networks) is a 2,5-year project, which aims at creating a novel map-based platform to support outdoor leisure activities. The platform was designed conceptually in the MenoMaps I project, which focussed on the construction of a new service concept on the basis of multi-channel map publishing. During the MenoMaps I the design concept was articulated through a user-centred concept design approach.

The platform is based on the idea of multichannel publishing. A channel is an information instrument, such as a mobile application, touch-sensitive wall, or a printed map, which enables the delivery of an interactive map to the users. Technical prototypes were built on a MultiTouch wall display and on the iPhone. Data matrix technology was tested to link printed maps, the MultiTouch map and the mobile application (a functioning prototype is shown in Figure 1). With the background of the MenoMaps I project new funding was received to develop the platform further. The key challenge in the further conceptual development of the system is the integration of business thinking into the whole.

The MenoMaps II project features in total 10 industrial partners, two cities, two research organisations, and an association for outdoors enthusiasts. This combination of organisations establishes a setting, where potential for several new kinds of business opportunities may be discovered. Some of the partners are commercial, some public, and some third party, and all of them may provide services for each other and for the map users engaged in 'outdoor leisure activities'. However, a subset of organisations was selected for making the effort, which is addressed to the PINC conference contribution, manageable within the time. The subset comprises four organisations that could be easily seen as potential collaborators in realising a functioning service for outdoors leisure activities.

Figure 1. A functioning prototype of the users' task flow was developed in the MenoMaps I project. The user is transferring the planned route from the MultiTouch wall onto her mobile device through UpCode link.

THE FOUR PARTNERING ORGANISATIONS

AtlasArt Corporation is a Finnish map publisher. It has a long tradition of publishing printed maps and wall maps that are utilised e.g. in schools. Recent advances in accuracy and visualisation techniques are making increasingly vivid and detailed maps possible for emergent purposes. Also the ways of delivering the maps are increasing. Current products include map books, historical maps, novel 3D-shaded landscape imprints on custom locations anywhere in Finland, which may be ordered by individuals, associations and corporations. Maps may be delivered on different materials and also framed like paintings. The business challenge for AtlasArt is entering the digital realm and interactive publishing: How should the maps and their potential additional content be delivered to the users in order to ensure that they would also be 'happy consumers'?

Metsähallitus (Forest and Park Service) is a public utility that provides services for nature conservation and for hiking areas, it controls hunting and fishing rights and promotes conservation and recreational use of lands and waters that are the property of the State of Finland. Metsähallitus is providing an increasing amount of services in digital form. The rapid development of demand and application platforms, however, outpaces the creation of well-functioning applications across platforms. Hence Metsähallitus is facing an increasing pressure to finance parts of the digital services on the basis of individual payments to ensure proper resources for the development of digital services. The question is, how would people be 'happy to pay' for the additional services?

Tracker Software Inc. is a Finland-based company that focuses on tracking and telemetry systems. A special area of expertise is the tracking of animals, such as hunting dogs. Tracker's products and systems are sold in Europe, North-America, Australia and Asia. The products include a mobile phone application for hunting and team tracking, and several GPS and RF-based products for locating hunting dogs. The challenge for the Tracker Software Inc. is that the users of the hunting systems tend to be aged people. Currently this user group has not yet well adopted novel methods for paying, even the credit card is too much of a novelty for many. The systems should be highly accessible and easy to use, and be weather proof in environments ranging from the Finnish forests to the deserts of Australia. The development costs of every new piece of service is currently rather high as compared to the revenue per user, whereby, the services should be easily extendable across the globe.

UpCode Ltd. is a globally operating company, based in Finland, providing services to integrate diverse organisations through a technology called UpCode™. The technology is based on a data matrix, which may be optically read by mobile phones, and thus provide linkages across the physical and

Figure 2. The map of the 1790s King's route map is an example of the kinds of products AtlasArt has developed.

digital realities. Despite the technology may be conceived to parallel RFIDs and bar codes, the ways the whole is integrated into a wide variety of business functions makes a difference. On a generic level the technology enables organisations to move from value-chain-based models ('horizontal integration') into network integrations of heterogeneous and multi-layered activity systems ('vertical integration'). The central challenge for the UpCode Ltd. is the discovery of proper position within the novel structures that are currently emerging to uphold new kinds of digitally mediated human practices. One potential technology, which is integrated into the UpCode already, is called 'micro payments'.

Figure 3. Metsähallitus provides facilities and information for people to enjoy the state-owned sceneries and landscapes. The 'outdoors.fi' and 'excursionmaps.fi' are examples of the new digital services by Metsähallitus.

THE INTENDED PROCESS

The track-based model, which is adopted in the MenoMaps II project, resembles the 4th generation innovation process as outlined by Rothwell (1994). According to him (ibid.) the 1st generation models (1950 – mid-1960s) were based on a linear structure and were highly driven by technology push. The 2nd generation models (mid-1960 – early 1970s) were affected by the increasing value that marketing provided for companies. Hence the models in this period are characterised by the market-pull that advertising of products set forth. The 3rd generation models emerged at the times of global energy crisis in the beginning of the 1970s. Companies were forced to develop new models to survive. Rothwell (1994) states that the best practice adopted a coupled process, where communication and integration of internal and external parts of the innovation process was promoted. However, the overall process still remained essentially a sequential. The economic recovery that marks early 1980s gave rise to the 4th generation innovation process. What differentiates the 3rd and 4th generation processes is the transition from a sequential process into parallel development. The parallel development processes were integrated through joint group meetings of engineers and managers. Rothwell (ibid., p. 26) characterises the 5th generation model "as a process of know-how accumulation, or learning process, involving elements of internal and external learning." Rothwell (ibid.) perceives the key aspects of this learning process to be:

- integration;
- flexibility;
- networking; and
- parallel (real time) information processing.

The MenoMaps II project is planned in the form of parallel tracks, which will be coordinated through integrative workshops. Hence, the overall conceptualisation of the process resembles the 4th generation process. It should be noted that the MenoMaps II project is a project, not a process. A project has a beginning and an end unlike a process, which progresses in cycle. Also projects, which are embedded in the 5th generation innovation process setting, need to be planned in a timely chronology. It is now left up to the concrete arrangements taken place in the project to realise the process towards the ideals of a 5th generation process.

The tracks in the MenoMaps II project will be integrated through co-design workshops. In these workshops the people working on the different tracks will meet and contribute to the particular agenda set for the workshop. The project may be considered as an example of what Brandt (2001) calls event-driven. The events form milestones, where information is exchanged between the tracks.

The main development tracks are the following:

T1. Concepting interactions and developing related user requirements
T2. Concepting the social data gathering and developing related user

Figure 4. Tracker Software Inc.'s new MyWaytm product family addresses the needs of people who love to make their own paths.

Figure 5. The Minister of Justice of Argentina presents a driving licence that features the UpCode data matrix, which enables the linkage of the physical card to virtual services.

requirements

T3. Concepting business opportunities and new services and outlining related requirements

T4. Technical implementation and integration

Track T1 focuses on the novel forms of map-related interactivity on the MultiTouch platform. The platform allows for many simultaneous users on a shared screen while recognising each user's detailed hand gestures. Task T1 is set to explore alternative ways of interacting with the map content and plans through MultiTouch display and to define requirements for the implementation of the prototype.

Track T2 develops new models for users to interact with the multi channel system where they may contribute to the map data. This track addresses a problem with the accuracy of map information. Current map systems provide map data for users on a level of accuracy that fits well activities, such as car navigation, but which is poorly suited for the needs of people on the move by foot. The micro-level information of the pathways in forests is a potential area, where the users of map systems could benefit and contribute to more fine-grained information about the areas outside road networks.

Track T3 explores the opportunities for developing new businesses in the new combination of technical possibilities and of practical uses that the multichannel network of interactive maps may facilitate. The methods for developing concrete visions of such opportunities that will be employed in the project, are tangible business modelling (may be explored at the PINC conference), interpretation frameworks, which are used to analyse business opportunities, and critical design methods, which aim at distilling the relevant by exaggerating ideas about reality.

Track T4 is the backbone that will function as a measure for what will actually make sense for the actualisation of the plans. In this track, four channels, the MultiTouch wall, the iPhone application, the Web 2.0 service, and printed maps, will be developed into an integrated and functioning prototype of the service. Also during this track one additional channel with a novel interface will be explored.

IN SUM

The MenoMaps II project provides a real life setting, where a novel network of organisations will explore the new business opportunities that an emerging multi-channel map service may provide. The project has just started and will be carried out in co-operation between the Finnish Geodetic Institute, Department of Geoinformatics and Cartography, and the Aalto University, School of Art and Design, the Department of Design.

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MULTICHANNEL CO-CREATION IN WEB-BASED ENVIRONMENTS

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The concept of user or customer co-production (or co-creation) has been mentioned in the managerial and in the service design literature on several occasions. It has been discussed in the marketing literature because of its perceived importance as a tool for increasing customer satisfaction and product success in the market, in other words, converting customers into co-producers is a very powerful tool to generate competitive effectiveness (Kelley, Donnelly and Skinner 1990). In design literature, a strong emphasis has been given to the tools that can ease the access to participatory design by users and customers (Bødker and Buur 2002; Battarbee 2003) and improve their overall experience (Allen 1993; Cain 1998; Forlizzi and Ford 2000).

The adoption of the co-production approach is a radical shift in the way in which firms establish relationships with customers. Customers are no longer considered as receivers of the values, products and/or services provided by companies. Rather, customers are regarded as active partners in the production process (Bettencourt 1997; Wind and Rangaswamy 2001; Prahalad and Ramaswamy 2000; Hamel 2002; Bendapudi and Leone 2003; Mooney and Rollins 2008). The production process to which customers take place as co-creators is no longer limited to the production and distribution of products and services but is related to the creation of rich branded experiences (Smith and Wheeler 2002; Shaw and Ivens 2002). In this sense, customers have shifted their role from the one of receivers of services and products to the one of part time employees or co-producers (Von Hippel 2001; Honebein and Cammarano 2006; Pini, Noci and Boaretto 2008). A good explanation of the concept of co-production could be Solomon's (2004) theatre analogy: the service performance is seen as a theatre that has a front stage (service delivery) and a back stage (service production) on which audience (customers) and actors (the firm) share the performance.

The co-creation process naturally reshapes the traditional boundaries of the firm as it takes place in a participatory environment, where the traditional hierarchical model of innovation management cannot take place. The internal, totally controlled, functional based model of innovation management is substituted by a "community of creation" (Sawheney and Prandelli 2004), a permeable system with ever-changing boundaries.

In order to facilitate the positive interaction between customers and the company to generate co-creative processes there is a compelling need of developing adequate environments in which co-creation can take place. These environments, called participatory environments, have been fostered by radical innovations in network technologies. In particular, the mass adoption of Web 2.0 and mobile Web 2.0 technologies brought participatory environments to a scale hard to imagine only a decade ago (Boaretto, Noci, Pini 2007). In order to establish an adequate relationship with co-producers, the company needs to set an environment in which to share some information with the customers in regard to its resources and capabilities, the risks that customers may encounter while using the products, and any other information about the products' technologies and business systems. Web 2.0 environments allow customers to adopt a very wide range of different interactions, depending on their particular goals and needs, the level of involvement they want to achieve and the role they want to play in virtual communities (Pini, Noci, Boaretto 2008; Boaretto, Noci, Pini 2007; Hagel & Singer 1999; Hoffman & Novak 1996). This variety of stances and motivations allows companies to establish different and over time changing levels of interaction with their customers depending on specific goals and perceived payoffs. The quality of the management of participatory environments and of the relationships between company and co-creators is crucial in generating positive responses and an adequate level of commitment to the co-creation practices. Managing relations in participatory environments forces companies to

be more focused on the preparation of the conditions that allow co-creation, rather than on the delivery of final solutions. In this sense, the product or service offered to the market should allow a space for co-creation and adaptation from customers, becoming more a platform to work on than a closed project. In order to stimulate co-creation there is need of augmenting the occasions of interaction between customers and the company. The design of the touch-points and their integration in order to deliver a superior integrated brand experience is crucial to the success of any kind of co-creation activity. As the number of touch-points increases, and the level of unpredictability of customer behaviour grows dramatically, there is a strong need to integrate information and communication in objects, products and spaces in order to bring the access to co-creation and knowledge sharing closer to the point of inspiration. Multi-channel customers, in this sense, are very active in the search of information through different channels and media and are proactive in the way they set up relationships with companies in all the stages of the purchase process.

The project named MenoMaps II described by Salu Ylirisku, that will be presented and discussed during the Pinc 2011 Conference, concerning the construction of novel map-based platform for multichannel publishing through which multiple parties, some of which are commercial, some public, and some third party, may provide services for each other and for the map users, who are engaged in 'outdoor leisure activities', could be a good test ground for developing a multi-channel co-creative approach to building value through customer experience. MenoMaps II is a collaborative project, where novel business opportunities for new kinds of map services are explored. The companies that are involved in the project are facing a challenge: how to survive in the change of fundamental structures that underlie their business? In this sense, the co-creative approach to customer experience could address some of the issues related to: a) the definition of new business opportunities provided by the interaction techniques of the map services, b) the creation of the right business model to exploit them and the design of the multichannel platform and its interfaces.

Before taking into consideration the role of co-creation in delivering superior customer experiences and fostering innovation in services, there is the need of reconstructing MenoMaps II business model. The tool chosen is the business model canvas (Osterwalder e Pigneur 2009) as depicted in exhibit 1, as it allows a very visual and immediate perception of the links between the different parts of the business model and highlights the missing ones. Once the MenoMaps II business model was reconstructed through this model it has been possible to better address the elements underlying the weaknesses in the different parts of the business model. These elements could be summarised as follows:

a) *Room for development of a clear value definition.* The service depicted should be of some value for "people engaged in outdoor leisure activities" though it is not clear or evident which kind of customer experience should this service provide to these people and which are the conditions under which these experiences are taking place. The lack of a central value proposition could also be related to the need of a deeper understanding of the experiences that potential customers might consider valuable in using this new service.

b) *Challenge to rethink customer role in the service usage.* In this sense, under the generic definition of people engaged in outdoor activities, there might be a wide range of activities that customers or users might like to undertake. All these activities could be achieved through the use of very different tools, from physical maps to local social network such as Foursquares or Gowalla, from Google Maps to car navigators. How does this new service integrate with this existing array of activities, experiences and devices? On the other hand, outdoor activities might start with very "indoor activities" such as checking weather forecasts, viewing comments, pictures, videos or other kind of contents from people that have already visited the places on a pc or even an internet television set. Are these activities part of the service and if not, how does the service integrate these activities?

c) *Room for design of innovative revenue models.* Despite the description of the different roles of project partners it is not defined which are going to be the revenue models and the price structures underneath them.

d) *Development of multichannel approach to the design of touch point roles and functions.* The multichannel approach could provide a strong support to the customer experience and this is somehow clear both in practice and literature, but it requires a clear definition of the content and functionalities of each touch point and the channel chain that links touch-points together to

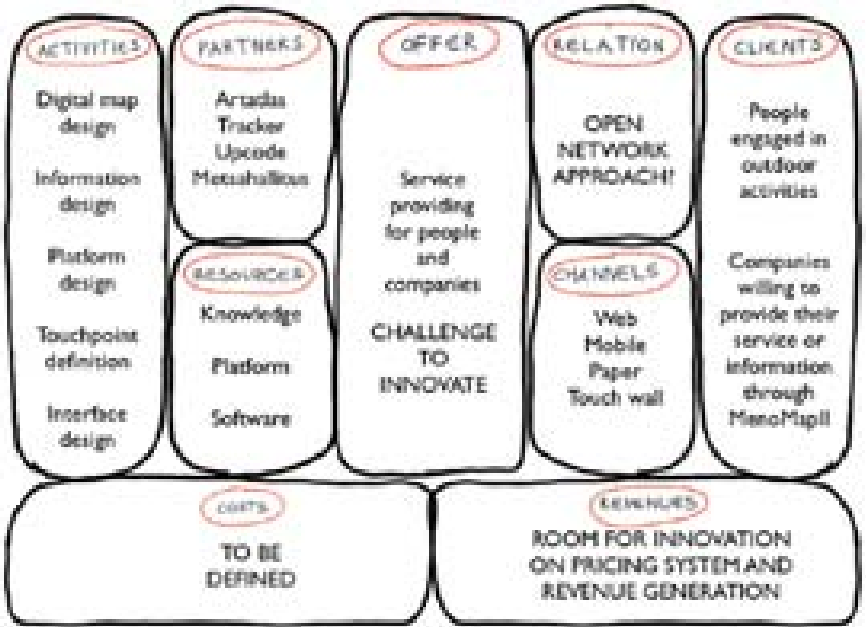

Exhibit 1: the MenoMaps II business model canvas

generate a coherent and valuable customer experience.

In order to address the above mentioned issues and define some future lines for the business model development, it could be used a frame of analysis that is based on the concept of multichannel co-creation as it is presented in the first part of this work. The use of this framework is twofold: a) it could be used to better define the concept of customer experience in multichannel environments and b) to investigate the actual experience managed by people when engaged in leisure outdoor activities and exploit their knowledge and competencies to build better services and foster innovation.

DEFINING CUSTOMER EXPERIENCE FOR MENOMAP II

One of the most critical aspects of MenoMap II project could be identified in the definition of customer experience and the role that a multichannel approach plays in generating such an experience. The value issue and the revenue models one, as depicted above, could be somehow easily dealt with once the customer value issue has been clarified. Customer experience has been described in the managerial literature in many different ways[1]. Despite the wide range of definitions and contributions to the topic, it is possible to derive some common traits that could represent the customer experience construct: a) experience differs from need satisfaction as it is related to providing customers with "superpowers" (Normann, 2001), i.e. allowing them to achieve their goals and run the activities they wish to perform with the minimum cognitive frustration and physical burden; b) experience is achieved through the direct involvement of senses; c) it is built through the integration of a different set of touch-points; d) it is achieved through relationships not only with the company but also with other subjects and groups. In this sense, the MenoMap II project needs to make these superpowers more evident and to define the big picture within which these superpowers are performed by customers. On the other hand, a better understanding of the different roles of social networks and influence groups in shaping the experience is fundamental in order to define the proper set of services, interfaces and content availability. The value perception of the services and interfaces provided is very much linked to the level of superpower customers could achieve and the quality of the social context in which they can perform their experience and share. Revenue models also depend strongly on these elements and the related pricing structure is very much dependant on the level of customer involvement, social group participation and the quality of the touch-points in reinforcing the customer experience (superpower). In order to define which kind of experience customers want to achieve while performing outdoor leisure activities, the content they need, under which context of use and through what kind of interfaces MenoMap II project could try to exploit customer competencies and knowledge through the different stages of the innovation process as described below.

EXPLOITING CUSTOMER COMPETENCIES AND KNOWLEDGE TO DESIGN A BETTER SERVICE

Web 2.0 environments allow companies to establish rich relationships with a much larger number of customers at a very high speed and in a very persistent manner. In these environments interactions take take place at a very low level of cognitive and physical effort from both sides. Virtual environments might also enhance the firm's capacity to tap into the social dimension of customer knowledge, by enabling or supporting the creation of virtual communities of consumption and practices (Kozinets, 1999). The relationship of the firm with different kind of virtual communities (consumption communities, brand communities, etc.) allows the firm to immerse itself into the experiential contexts of customer consumption and product perception on an ongoing basis, rather than on an episodic basis that characterises traditional ethnographic customer research (Cova, 1997). By accessing these new "cultural and knowledge intermediaries" companies can reach non customers or perspective ones. On the other hand, this mediate relationship allows firms to take part to conversations with subjects that might not be interested in dealing directly with them through company managed channels and touch-points. Web 2.0 environments allow customers to adopt a very wide range of different interactions, depending on their particular goals and needs, the level of involvement they want to achieve and the role they want to assume in virtual communities (Pini, Noci, Boaretto, 2008; Boaretto, Noci, Pini, 2007; Hagel & Singer, 1999; Hoffman & Novak, 1996). This variety of stances and motivations allows companies to establish different and over time changing levels of interaction with their customers depending on specific goals and perceived payoffs. Participatory environments based on Web 2.0 platforms can contribute differently to the process of innovation and value creation of companies. In this sense, following the works of authors such as Rizzo (2009), Sawhney, Verona and Prandelli (2005), it is possible to classify them depending on two variables: a) richness of the interaction; b) Role in the innovation process.

Firms can use these environments to acquire insights and generate ideas or simply exploit them to validate pre-existing hypothesis with a large sample of their customer base. In this sense, participatory environments can be used to generate ideas and define concepts (idea generation stage) or to test or customise already created solutions (deployment stage). Due to the flexibility of Web 2.0 environments in terms of use and purpose, it is again a strategic company decision the way to exploit their potential (Exhibit 2).

In this sense, the usage of co-creation, from experience definition to the whole innovation funnel, could be supportive in the definition of the MenoMap II business model and its implementation. In particular, at this stage of the project, MenoMap II project team could reconstruct the role of information in outdoor activities and the experiences that informations and landmarks support through the tracking of conversations taking place in blogs and social networks through tool such as Nielsen WebBuzz or ViralHeat software and eventually through direct participation into these conversations. In order to run this kind activity the team should first turn the business idea into a set of keywords or semantic tree that could be used to scan the blogo-

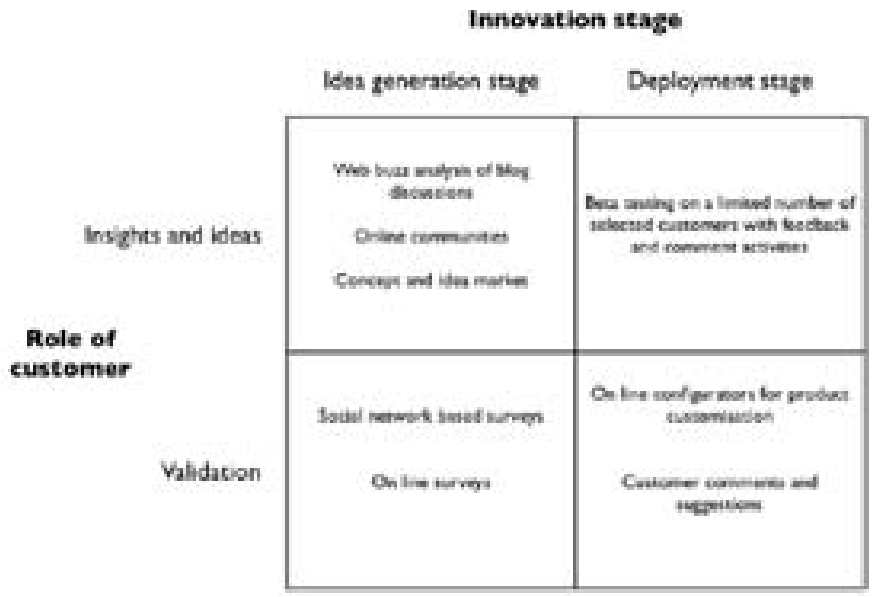

Exhibit 2: the different roles of customer co-creation in product and service innovation.

sphere and the social networks. This activity would allow the team to gain a better and deeper understanding of the different aspects of landmarks and orientation in planning and executing outdoor activities and also of the present set of tools used to run such activities. Once these pieces of information are acquired there could be a better testing of the general value proposition through direct involvement in conversations and the development of social network surveys. Depending on the findings from the survey stage, it could be designed the level of openness of the system to third party and users' contributions as part of the value proposition. The level of integration required could also be a good starting point to asses the relevance of customisation as part of the revenue model and the cost structure. Maps could be used as a visible evidence of different customers experiences and therefore as a support for different contents (photos, comments, etc.) that users might like to add as their outdoor experience takes place.

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NOTES

[1] For a detailed description of the different approaches to customer experience in marketing and management see Boaretto, Noci, Pini, op. cit.

DESIGN LED INNOVATION – EXPLORING THE SYNTHESIS OF NEEDS, TECHNOLOGIES AND BUSINESS MODELS

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ABSTRACT

The term Design is used to describe a wide range of activities. Like the term innovation, it is often used to describe both an activity and an outcome. Many products and services are often described as being designed, as they describe a conscious process of linking form and function. Alternatively, the many and varied processes of design are often used to describe a cost centre of an organisation to demonstrate a particular competency. However design is often not used to describe the 'value' it provides to an organisation and more importantly the 'value' it provides to both existing and future customers. Design Led Innovation bridges this gap. Design Led Innovation is a process of creating a sustainable competitive advantage, by radically changing the customer value proposition. A conceptual model has been developed to assist organisations apply and embed design in a company's vision, strategy, culture, leadership and development processes.

INTRODUCTION

Design enhances the outcomes of numerous innovation activities, bringing benefits such as increased quality of goods and services, improved production flexibility and reduced material costs (Cox Review, 2005). Design is increasingly being viewed as a vital and important strategic business resource (Dell'Era, Marchesi and Verganti, 2010; Gemser and Leeders, 2000). Consequently companies worldwide look to design to help them innovate, differentiate and compete in the global marketplace. Design brings a different way of thinking, doing things and tackling problems to generate novel solutions. The value of design is not just in new products or services, but through employing and skillfully managing and soundly implementing design throughout a company's business strategy (UK Design Council, 2004)

Design Led Innovation further defines the values of design to an organisation. As noted broadly by Verganti (2008) rather than considering design as being solely driven by user needs or technological developments, Design Led Innovation is pushed by a firm's vision about possible new product meanings and languages that could diffuse in society (Verganti, 2008).

This paper presents a conceptual model to allow a firm to explore the value of adopting a Design Led Innovation approach. The paper aims to expand the body of work on this topic with its contribution being to the practical considerations an organisation should consider to explore and adopt such an approach.

DESIGN ACTIVITY

Traditionally, the role design has played within companies has been confined to the manufacturing and production arena or as a styling afterthought. Design is increasingly being viewed as a vital and important strategic business resource (Dell'Era, Marchesi and Verganti, 2010) and consequently companies worldwide look to design to help them innovate, differentiate and compete in the global marketplace. These firms are carefully evaluating, skillfully managing and soundly implementing design throughout a company's business strategy (UK Design Council, 2004). The value design brings is a different way of thinking, doing things and tackling problems from outside the box. In practice design is key to greater productivity, whether by way of higher-value products and services, better processes, more effective marketing, simpler structures or better use of people's skills (Fleetwood, 2005). Design is no longer a niche market luxury. It is the most persuasive priority for solving problems, ensuring

Figure 1: Framing design activity

long term sustainability and gaining competitive advantages (Queensland Smart State Council, 2008).

Although the role of design is constantly evolving, the fundamental underpinnings of design as an activity have remained largely unchanged.

Schön (1983) proposed an "alternative epistemology of practice, based on a constructionist view of human perception and thought process. He sees design as a 'reflective conversation with the situation'. Central to design thinking is that problems are actively set or 'framed' by designers, who take action (makes 'moves') improving the (perceived) current situation". This is in contrast to a deductive or top down thought process which begins with an assumed hypothesis, which is then narrowed down through data collection and evaluation.

The work of Polanyi and Ehn complements Schön's description of design activity. Polanyi (1998) addresses the relationship between enquiry and creativity and the difficulty is bridging the "logical gap" which is found between existing knowledge and any potential significant new discovery or innovation. Polanyi (1998) refers to the need for a leap of illumination, "the plunge by which we gain a foothold in another shore of reality" and assist in visualising new concepts. Ehn (1988) furthers this by referring to the concept of traditional and transcendence outlining how design is concerned with the social and creative activity founded in our traditions. However he contends that design must still aim to transcend these traditional concepts by constructing alternative futures (Ehn 1988).

The work of Schön, Polyanyi and Ehn has formed the foundation of the Design Led Innovation model which is proposed. Central to this approach is the ability of the designer to construct and visualise multiple futures of an unknown complexity, which are then deconstructed to reveal needs and opportunities.

FRAMING DESIGN ACTIVITY

There are many dimensions of design activity which can be undertaken within an organisation. The following framework (Figure 1) highlights the potential value which can be achieved through the application of various design activities within an organisation.

The framework references a company's competitive strategy continuum as the basis to consider the role and value of design within the organisation. A company's competitive strategy continuum has been defined as spanning Customer Value, Technology and Cost. This continuum has been further expanded to separate out incremental and radical innovation activities. This framework is not exhaustive, but provides as simple matrix to describe innovation activities within an organisation.

Activities which may relate to incremental change include: product feature change to achieve cost efficiencies; feature additional when a new technology is adopted; and positioning of the product / service through company branding. Within the radical innovation spectrum, a company may adopt a process change such as the implementation of lean systems to achieve radical cost changes; it may adopt new technology platforms and it may look to new markets and customers for growth opportunities through new products and services.

Mapping these activities to the various design tools and process which are commonly available, will reveal the value in achieving a strategic competitive advantage for that firm. For example User Centre design tools such as user observations have high value when undertaking incremental innovation as it generally provides insights which results in new feature additional and modification. However when applied to radical innovation, this often results in less value as the goal is to create new to the world products and services which observations of existing customers can not reveal. To achieve these radical innovations from new users, the process of Design Led Innovation is proposed.

Design Led Innovation is broadly defined as a method which allows a company to consider and evaluate radically new propositions from multiple perspectives, typically spanning user needs, business requirements and technology demands. The final design solution is not presented as an artefact in isolation, but as an integrated product and service concept which anticipates future user needs, builds future proposals and encourages feedback. Key to this process is that design is core to a company's vision, strategy, culture, leadership and development processes. The Design Led Innovation model which is proposed is currently being

evaluated through several industry projects. It is hoped that this evaluation will demonstrate that this approach is feasible for an organisation to create a strategic competitive advantage through design. It is hoped that this method complements and builds upon existing approaches used within the organisation.

DESIGN LED INNOVATION – CONCEPTUAL MODEL

The proposed model which is presented in this paper has been developed through an action research approach where Design Led Innovation has been explored through several industry and student based projects (Further information on one evaluation of this model can be found in Bucolo and Matthews 2010).

As noted Design can contribute to the development of innovation activities which allows a company to transform the way is looks at strategy. Design methods can be used used as a basis to develop a future vision and then reveal the opportunity and need to a wider stakeholder and development team and to assist in acceptance of the vision and strategy.

A key aspect of the model is in the co-development facilitated by design experts with stakeholders throughout all stages of the process, from ideation through to commercialisation. Stakeholders are defined as both internal (design, engineering, marketing, management) and external (existing customers, future customers, buyers, distributors, supply chain, manufacturers etc...) groups.

Therefore the goal of the model is to ground stakeholder conversations around future propositions which aim to synthesise needs, technologies and possible business models. The future proposition is then refined through continued iterative stakeholder engagement. Therefore the model is better described as follows.

In the context of an industry setting, often a project may start with a defined product/service activity. Therefore the model uses existing understandings of activity as its starting point.

From this perspective internal stakeholders are invited to explore this current proposition. The process starts by looking at immediate user features/ needs relationship, but quickly expands to consider the temporal elements of the activity.

Unlike typical human centred design processes (such as user observation) the goal is not to evaluate the particular features or experience of this existing product, but to relate this to the value proposition and strategic competitive advantage. Therefore the internal stakeholders are encouraged to unpack the product/service in terms of needs, business models and technologies for a particular point in time and then across time.

Due to the diversity and knowledge mix of such teams the role of design visualisation and illustration is used as the common language within the project, not just to record but to present

Figure 3: Common Language Visualisation Example

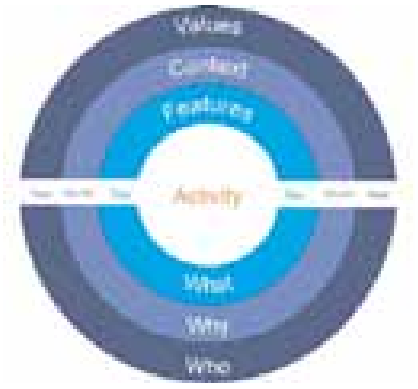

Figure 2: From Product to Temporal experiences

future propositions. Therefore visualisation is central to the model being proposed (Figure 3).

The result from this extremely dynamic process is a multidimensional visual scenario of the user/technology/business model interaction over time.

This process continues until the organisation believes it has sufficient information to release the product/service onto the market.

In undertaking this approach, the organisation will have undertaken and generated the following:

1. Understanding of the social cultural context for the product/service concept
2. Understanding of the spectrum from Product Interactions through to Temporal Experiential Journeys
3. The latent user need(s) of the new product or service
4. An ability to transform the latent user needs into temporal scenarios which embed business models and technology solutions.
5. The development of visual assets to communicate the results/developing the strategy

SUMMARY/FUTURE WORK

To better describe this approach the following illustration and summary is provided (Figure 4).

The application and goal of this model is to map the temporal experience of the product/service to identify the touch points which can be visualised as needs, which in turn can be expressed as business models and brand values of the one system. This interactive approach is facilitated by design experts with internal stakeholders with the discussion being summarised as visual scenarios of stakeholder interactions.

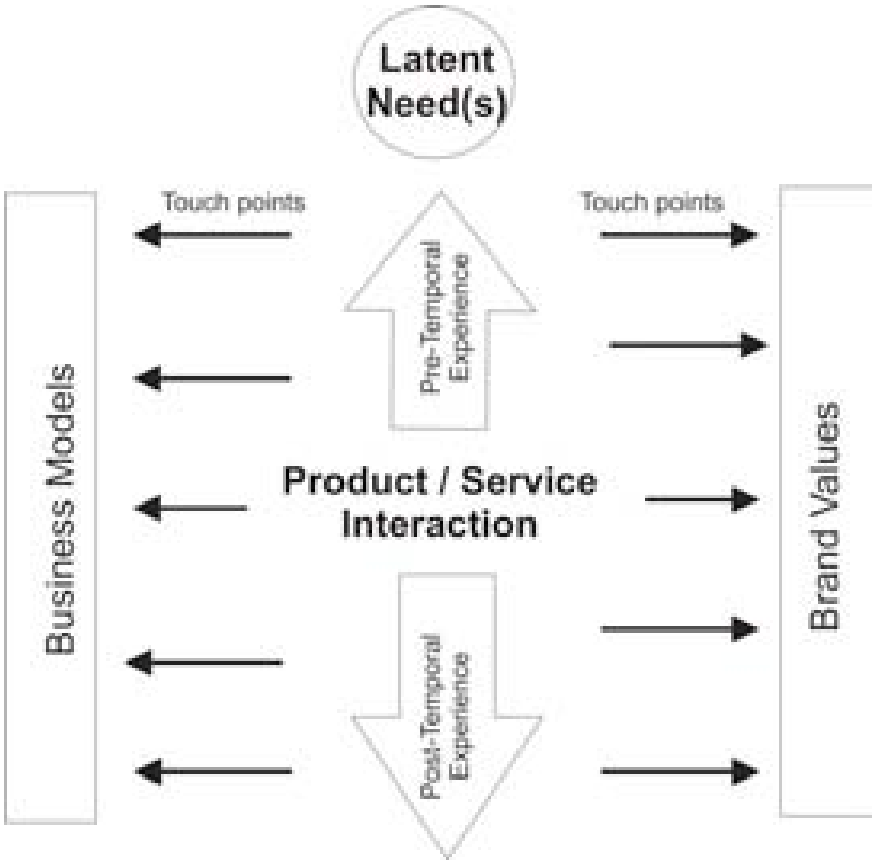

Figure 4: Proposed Design Led Innovation Model

Representing the project within this context often raises multiple questions and opportunities which are then further refined.

These visual assets can then be used to gain wider input from internal and external stakeholders through focus groups and workshops. However the goal of this activity is not to evaluate and obtain consensus of the idea, but to build upon gaps in the future proposition.

The emerging model presented in this paper is highly dynamic and engaging in its approach. It has been explored and refined within several projects with highly successful outcomes from both the development of ideas and stakeholder engagement. Through the PINC 2011 collaboration an opportunity to explore cross cultural stakeholder engagement will be explored within a live industry project. Reflections on the outcomes from this engagement will be documented with the model being further refined.

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COLLECTIVELY STAGING BUSINESS MODELS

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ABSTRACT

Most current methods to visualize business models employ inanimate objects as representations of specific business model elements. Using people as representatives and staging collectively how an organization creates, delivers and captures value, one can produce a unifying picture of the business as well as fresh insights. Building on work by Osterwalder and Pigneur, this paper suggests the Butterfly Model as an alternative template for visualizing business models in up to six stages of construction: (1) basic staging to ensure a general picture, (2) the value chain and (3) the revenue model, (4) the business environment and (5) competitors to complete the view of an organization`s environment. In addition (6) a SWOT can be incorporated as well.

INTRODUCTION

In corporate innovation processes the value of user participation is generally realized. This potential however has not yet been fully exploited for the design and invention of business models - the rational of how an organization creates, delivers and captures value. While understanding that the business model of an organization is its core; there is need for new methods helping to seize the treasures of collecting and integrating the explicit and implicit collective wisdom into business modeling. By moving beyond plain text and spreadsheets visualizations, new methods could not only include people without formal business education, but also to provide room for reciprocal inspiration. Interactive stagings of business models allow seeing the whole business model from many angles – literally.

LITERATURE AND THEORY

Building on Scandinavian legacy of Participatory Design (PD), originating out of Kristen Nygaard's work (Ehn and Kyng 1987, Schuler and Namioka 1993), there are already some examples of visual and even tangible business models building on Participatory Innovation (Mitchell and Buur 2010). Those works have already contributed a considerable amount to both the understanding of innovating business models as well as to the practice of business modeling by animating business model concepts in three dimensional space with various objects.

However, most of the tangible business model sketches use inanimate objects to visualize a business model. By replacing them with human beings the business modeling would become even more interactive. Through collectively staging, interactive business models can be created allowing to collaboratively (re-) design business models.

To identify the core elements of business models, one can build on the work of Alex Osterwalder and Yves Pigneur in the area of business model innovation (see Osterwalder and Pigneur 2010). According to their working hypothesis every business model can be described through nine basic building blocks that show how an organization creates, delivers and captures value (see Osterwalder and Pigneur 2010, pp. 16):

An organization serves one or several *Customer Segments (1)* and seeks to solve customer problems and to satisfy customer needs with its *Value Propositions (2)*, which are delivered to customers through communication, distribution, and sales *Channels (3)*. Thereby *Customer Relationships (4)* are established and maintained with each Customer Segment. The generated *Revenue Streams (5)* result from value propositions successfully offered to the organization customers. *Key Resources (6)* are required to offer and deliver the previously described elements by performing a number of *Key Activities (7)*. Some activities are outsourced and some resources are acquired outside the

Figure 1 The five components of "The Business Model Butterfly"

enterprise through *Key Partnerships (8)*. All those activities result in a *Cost Structure (9)*.

THE BUTTERFLY MODEL

As collective business model stagings need to work both with academics and non-academics as well business people and consumers, the business model canvas developed by Osterwalder and Pigneur proved to be too complex to start with. Therefore an alternative template for visualizing business models was developed: the butterfly model. It starts with only five elements: The center of the butterfly – the thorax - represents the *Value Proposition (1)*, while the right forewing the *Customer Segments (2)* and the left forewing the *Key Resources (3)*. The right hindwing stands for the *Revenue Streams (4)* and the left hind-wing on the opposite side *for the Cost Structures (5)*.

If the organization has not only one value proposition to all customer segments, but differentiated into several different value propositions, then the thorax of the butterfly is divided horizontally by the according number.

The butterfly model with its five building blocks provides a solid and easy to understand groundwork for a basic understanding of an organization`s business. Based on the template of "The Business Model Butterfly" this paper suggests the following six stages of construction for an interactive business model staging.

THE BASIC STAGING

Osterwalder und Pigneur suggest a painter´s canvas, preformatted with the nine blocks, on which new or existing business models can be painted (Osterwalder and Pigneur 2010, pp. 42). If printed out on a large surface, groups can jointly sketch and discuss business model elements. Those elements drawn on Post-it® notes however do not respond – people do. These notes are inanimate objects that are modified and moved around solely by the participants.

To start an interactive staging of the current business model of an organization each of the five building blocks from the business model butterfly is represented by one or more people. If for example three different customer segments are served, then three participants should represent each customer segment separately. By the way: a *group moderator* could bring a little efficiency in this process.

In order to be easily identifiable the representatives of each business block could wear for example a *painter`s overall* on which the customer segment is written in large letters. The painter`s overalls have several distinctive advantages: first one can easily write on them – without destroying the participants clothes. Secondly the participants are much more immerged in their current role. They are not anymore for example employee XYZ or consultant XYZ but now they are speaking as customer segment ABC.

After having assigned representatives for all five elements, the group can start to describe each of them in detail. It is now the job of each representative to ensure a detailed documentation of the detailed description of his or her element, for example on a pin board behind them. (See section "Documentation" for details).

The thorax of the butterfly – the *value proposition (1)* - describes which customer needs the organization is satisfying and what products the organization is offering to each customer segment. Some of the following elements might be helpful when identifying the value created for customers: price, cost reduction, risk reduction, accessibility, convenience, usability, quality, warranty, newness, performance, customization, exclusivity, brand, design, etc.

To characterize the *customer segments (2)*, it helps to clarify first what type of customer segmentation the organization faces: is the value proposition targeted to the mass market, one or several niche markets, segmented or diversified markets or does the organization provide a multi-sided platform. For an exhaustive view of each customer segment not only oral description of the customer segments but also pictures, photographs or paintings help.

The left forewing of the butterfly – *the key resources (3)* – includes the most important assets and activities required to make a business model work. At this point of the visualization only a high level view is necessary. When later on the value chain is, we will map out the details.

The same applies to *revenue streams (4)* represented by one or more participants

Figure 2 International Business Students of the Karlshochschule during a class on business model innovation

positing in the right hindwing. At this level it is enough to clarify for what value each customer segment is willing to pay and how they are currently paying.
When it comes to the last element of the business model butterfly – the *cost structure (5)* – the group works out what are the most important costs inherent in the business model and which key resources are most expensive.
During this initial staging the position of some building block representatives might need to be corrected to come up with a suitable arrangement of all nine building blocks. It could be possible that during this phase insights into the current business model will be evoked as participants have to find a consensus on the "correct" position and line of sight of each building block. The arrangement of the building blocks in the three dimensional space will support a deeper understanding. And the representatives will see the business model of the organization from their building block point of view and provide interactive feedback. This could generate new insights. For example the one customer segment representative might state that he or she does not see the value proposition because he or she is looking in a different direction. Or the key activities representative could be out of sight of the cost structure representative. This way hidden weaknesses or threads are identified. By rearranging the representatives the participants could find alternatives to the current state.
Even though this process can be engaging, it is important to remember that at this phase only the status quo is staged. When it later comes to innovate the current business model, new customer segments or new value propositions for example can be staged.

THE VALUE CHAIN

To produce the value propositions for the customer segments an organization is serving, it needs to perform some key activities utilizing its key resources. Those activities make up what is called the *value chain*. The German term – "*Wertschöpfungskette*" – even better emphasizes the constructive perspective: literately translated it is the value creation chain.
Mapping out the value chain for each value proposition generates the second visualization level. A tangible chain connecting the five core elements is hereby of great help. Depending on the number of participants available for representing the different elements, one could work here with only few representatives or several. If only few people are available, the specific steps of the value chain could also be visualized with objects. An easy to implement option is to write the name of the resources or activity on board cards or post-it-notes and attach it to the value chain. A more refined approach would be to use the actual resources, like for example the advertising used to create awareness or print-outs of the web shop interface for the purchase phase. Each value chain has two ends: starting with the customer segment`s needs and ending with the delivery of the value proposition. In between there are steps like creating awareness through different *communication channels* and allowing opportunities for evaluating the value proposition offered by the organization. Depending on the particular type of business model visualized, the rest of the value chain consists of a sequence of *key activities* required to create and offer its value proposition. Those activities could be for example to produce a good or service, solve problems or provide a network or platform. To perform those activities and to help to create the value proposition certain *key resources* are vital. Not all of them have to be owned; they could also be leased or provided by *key partners* - sometimes even by the customers themselves.
Part of the value chain visualization is also the description of what *type of relationship* each of the customer segments expect the organization to establish and maintain with. This is especially important when analyzing how new customers are acquired and existing customers are retained. The relationship could be for example characterized either by personal assistance, self-service, automated services or co-creation.

THE REVENUE MODEL

All steps of the value chain described above generate costs. Together with the revenue streams generated by providing the value proposition to its customers segments, each organization has a distinctive revenue model. Visualizing it with red board cards representing cost and green for revenue streams produces the third visualization level.
The *revenue streams* are the cash a company generates from each customer segment. There are several ways for an organization to generate revenue streams. The most common way is to sell assets.

Figure 3 Seminar participants at the Karlshochschule, Germany, during a short workshop testing interactive visualization methods of business models.

Figure 4 Discussion among seminar participants during a short workshop testing interactive visualization methods of business models.

Alternatively an organization could charge a usage fee, like for example seen in the logistics industry, or subscription fee, frequently used by gyms. Also lending, renting, leasing or licensing is possible. Among media companies advertising is a common way to generate revenue streams, whereas in the real estate business brokerage fees are frequently used. Each of those revenue streams can have a different pricing mechanism, such as fixed list prices, bargaining, auctioning, market dependent, volume dependent, or yield management.

Cost are generated by performing the key activities of the organization`s value chains and – what Michael Porter refers to as – support activities, such as administrative infrastructure management, human resource management, research and development, and procurement. The **cost structures** can have the following characteristics or a combination of them: fixed costs, variable costs, economies of scale and/or economies of scope. While all business models have cost components, some are more cost-driven than others. For example so-called "no frills" airlines have built business models around low cost structures.

THE BUSINESS ENVIRONMENT

Having up staged the business model and the value chain kind of like something floating in space, the next logical step is to examine the environment in which the business model is embedded. A structured approach to analyze the business environment is to use a PESTEL analysis.

This way the political, economic, social, technological, environmental and legal factors influencing this specific business model are identified. Building on the visualization of the business model, it can now be clearly shown where and how each factor will affect the business model. Participants, objects or post-it-notes representing the factors are linked to the element of the business model they affect. For example demographic factors shaping the customer segment or changing legal requirements determining certain additional production steps.

THE COMPETITORS

An additional level of analysis would be to focus now on the competitive environment. Building on the visualization of the business model, the value chain and the organization`s business environment, the competitors can be identified and positioned. This offers the opportunity to understand, where and how the influence of competitor will affect the organization.

SWOT ANALYSIS

When the participants have mapped out the whole business model – including the business model butterfly, the value chain and its business environment - they can start assessing its strength and weaknesses as well as opportunities and threads. Bright green board cards could be used to represent strengths, while orange card symbolize weaknesses; opportunities could be blue cards and threads yellow ones.

The criteria suggested by Osterwalder and Pigneur might be of help (Osterwalder and Pigneur 2010, pp. 216).

TIME REQUIREMENTS AND SCOPE

Before starting the business model staging process, the group needs to agree on the available time frame and scope of the staging. Such an exercise can last from one hour to several days. Within one hour the basic business model butterfly including the top-level value chain and the basic revenue model can reasonably be visualized. If the group wants to further explore details of the value chain – or even the different value chains serving each customer segment - significantly more time is required. Even longer time should be planed for if the business environment and competitors are mapped out in detail.

DOCUMENTATION

During the different levels of visualization, an extensive documentation should capture insights from various perspectives: In addition to the detailed descriptions of each business model element and the findings from the SWOT analysis, all pictures, notes, movements and dialogues should be recorded by several photo- and video-cameras for later analysis. For example the various distances between the building blocks and their territorial arrangement during the different stages can be measured. Moreover the narratives and discussions could be the subject of later interaction analysis.

Figure 5 Elements of a PESTEL analysis to consider the business environment in which a business model is embedded

Figure 6 Close-up view during a class on business model innovation

FUTURE RESEARCH

These six stages of construction in order to collectively stage business models have been applied and tested during various classes and workshops in the fall of 2010. The participants of these "trail-stagings" were mainly students and academics from the Karlshochschule in Karlsruhe, Germany. Currently both the methods and processes are being re-evaluated, before they will be applied again in workshops with small and medium sized companies in Germany in the spring of 2011.

ACKNOWLEDGMENTS

Interactive business model stagings are engaging experiments depending to a very large extend on the involvement of the participants. Therefore I would like to thank all participants so far – students and colleagues from the Karlshochschule and business people and customers – for their proactive engagement sharing their insights and curiosity with the group.

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ABSTRACT

This paper presents a set of techniques for modelling business in rich, tangible formats. These tangible formats were developed in companies and educational settings and have proven extraordinarily successful in initiating conversations about how to innovate business in cross-disciplinary and cross-functional groups of participants. Our aim here is to provide an overview of the techniques and the state of our research rather than a detailed argument for each of them. This is still work in progress, but the results are so convincing that we offer to publish although some of the factors that contribute to the success we cannot yet explain.

INTRODUCTION

In a situation in which companies increasingly rely on collaboration with external parties to innovate their products and services – users, customers, distributors, public organizations etc. – it becomes essential to establish conversations in cross-disciplinary settings. Such conversations need to concern not only the emerging product and service concepts, but also business concepts, as the business models become increasingly diverse in a changing, digitized world. To bank on physical objects as *boundary objects* (Star 1989) or *things-to-think-with* (Brandt 2005) to support collaboration between disparate groups of participants has been very successful in the participatory design community and there are similar examples in business circles also (Lego Serious Play, David Gauntlet 2007). In this paper we suggest a series of techniques that rely on tangible materials to encourage conversations about business innovation in groups where some of the participants may have no business training, yet could potentially have valuable contributions to make. We present the techniques under the heading of a *business modeling lab* to indicate that collaborative business innovation requires a good deal of experimentation. Whether we think of the lab as an actual physical place or as a temporary setting is of less consequence.

These techniques were developed in ongoing participatory innovation projects (Buur & Matthews 2008) with partners in both large and small companies and with graduate students in university settings. As for research methods we work with a combination of action research and interaction analysis. Action research in the sense of repeated experiments in settings that have an actual purpose of innovating their business (Brandt 2005). As researchers we facilitate the event and include partners in reflecting on the viability of the techniques after wards. The sessions are video recorded for later detailed analysis of the interactions between participants and with the material offered. We rely on the ethnomethodological method of conversation analysis (Heritage 1984).

Figure 1. Tangible value network mapping with 'The Silver Set', a collection of silver coloured bric-a-brac on a black tablecloth. Managers discuss how a a small electronics manufacturer may introduce a new technology to a particular market segment.

MAPPING THE VALUE NETWORK WITH TANGIBLE MATERIALS

Companies are increasingly dependent on other actors outside the organisation to create business. Where Porter's concept of the *value chain* focused on the internal organisation of activities that lead to business (Porter 1996), later research has focussed on interactions in the *value network* between the company and its suppliers, customers etc.: *A value network is a web of relationships that generates economic value and other benefits through complex dynamic exchanges between two or more individuals, groups, or organizations* (Allee 2000). One of the ways in which business innovation may come about, is when new partners are invited into the value network, or if existing partners take on new roles. For this reason it is important to discuss both present and future configurations of the value network, a discussion that can typically take its starting point in mapping what is in place today.

We have developed a very simple technique that invites participants to establish a shared understanding of their organisation's value network: We use tangible material to build 3-dimensional maps.

HOW IT WORKS

We provide bric-a-brac materials from which participants in groups can create a map of an organisation's key relationships, Figure 1. Who are the suppliers? The customers? The partners? The other stakeholders? How are all these actors connected? Once the map is built we ask participants about their choice of materials, how they characterise the actors and relationships. We challenge them to adjust the map in order to consider new possibilities and alternative perspectives, e.g. what is an ideal value network? Or a nightmare one?

Many people find this technique much more stimulating than drawing a diagram on paper. The description of partners and relations inevitably becomes much richer, as participants search for materials that can represent the character of the people they work with, and the experience they have of their relationships. Participants enjoy to articulate aspects of their business that they had not thought of before.

In sessions with representatives from several companies participants find it rewarding to listen to presentations of the tangible maps of other companies, in particular if they do business with each other. One thing we have learned is that value networks are very much a question of perspective: One tends to place one's own organisation in the centre. This makes for a very creative tension, if several company partners try to align their understanding of the value network that they share with one another.

RESEARCH FINDINGS

Through interaction analysis we have studied how participants fundamentally introduce new objects and co-construct meaning when building the tangible value network maps. What an object communicates is a social construct that is in fact dependent on the ongoing social actions in an interaction and the social order that needs to be established or maintained between conversational partners (Heinemann et al. 2009).

What we have found is that participants in our value network workshops generally work to establish agreement about what an object should represent and actively seek to solve any problems on that matter, when faced with potential disagreements. Working with objects seems to actively invite all participants to contribute and share their knowledge, independently of their organizational status and power asymmetries. Every participant manages to contribute his or her knowledge towards creating a complete map of the present and potential collaboration partners for the company and the map becomes a real representation of shared knowledge across the hierarchical structure of the organization.

We have experimented with a range of material variations to see how best to support the team discussion on value networks (Heinemann 2011), Figure 2.

1. Bric-a-brac tinkering material. Although many different materials work (coloured wooden bricks, foam pieces, even organic materials), we have found that business people respond well to a professional looking kit of similarly coloured objects deployed on a surface with a contrasting colour. Objects, which are too heavily coded (animals, figurines), tend to focus the discussion too much towards personal characteristics, and pieces that are too similar (like Lego bricks) do not support sufficient dynamics. We now prefer what we have named 'The Silver Set' of silver coloured metal objects on a black tablecloth.

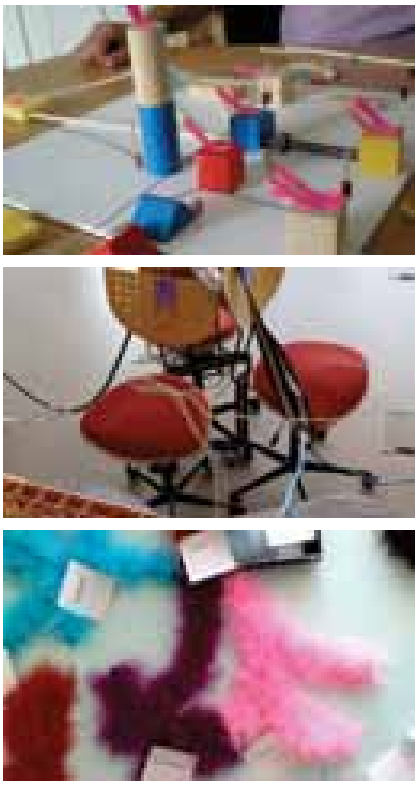

Figure 2. Three variations of material used for building tangible value network maps: tinkering bric-a-brac, life-size materials and starfish-like objects.

2. Life-size materials. Large scale materials such as furniture provide a more engaging embodied experience and provides a map which can be viewed from many perspectives, whilst allowing more space in which to "zoom in" on complex details. The life-size map allows an insider perspective ('What is it like to be a customer?') different from the helicopter view of the tabletop maps.

3. Starfish objects. This is an attempt to break away from thinking of agents and relations as separate entities. With the bric-a-brac material participants tend to represent agents (nodes) and relations (connectors) with different objects, whereas in real life people *have* relations, just like starfish have arms. The materials shown in Figure 2 provoked an emphasis on how stakeholders are connected, but with less opportunity to discuss the objects themselves.

COMPARING BUSINESS RELATIONS USING PICTURE CARDS

The second technique encourages company partners to discuss their professional relationships – and how they might develop. If business is about creating and maintaining relationships to suppliers, customers, installers, users etc, then this discussion is a very important precondition for innovating business. Relationships can become a very personal and delicate matter, so we use picture cards to stimulate conversation.

The concept of relating is key to Ralph Stacey's investigation of complexity in organisations (Stacey 2001). Business can be described as facilitating the exchange of assets for other assets. This involves two or more asset holders relating their valuation of particular assets to the valuation of those that they wish to trade with. Successful relating is exchanging assets with other identities such that one increases one's access to (or control of) the type and quality of assets that one wishes to. It may appear less clumsy to describe such ongoing relating as a relationship, but the verb form: relating draws attention to how the process of valuing assets of self and others is an active process that never completely stabilises.

HOW IT WORKS

We provide three sets of picture cards, Figure 3. To describe how they relate to one another, participants should individually select the one image from each stack, which seems the most accurate answer to the following questions:

Handle: How do you handle the relationship?

Instrument: How do you monitor the relationship?

Tool: How do you think the relationship effects the other person or organisation?

We then encourage participants to select three more images that best describe an ideal version of this particular relationship. When participants are asked to explain their choices to each other we have found that this exercise can reveal how different their view of their relationship may be, and be a humorous means of talking about potentially sensitive topics.

When using this technique with representatives from a company, its suppliers and its customers (Figure 4) we saw that the picture cards helped the participants form a shared understanding of what role personal relationships play in innovation.

RESEARCH CHALLENGES

These experiments came about because of a concern that the value network mapping technique may lead to emphasis on nodal connections by symbolizing relationships with static materials – as if relationships can be switched on or off independent of the agents in question. It may be easy to connect symbolic objects with lollipop sticks, but the skill and sweat involved for both parties in building a business relationship is obscured. Relationships are constantly evolving and often asymmetrical in terms of power and which value each partner ascribe to them. Furthermore the space occupied by depicting a connection on a map can too strongly suggest that the space for relating is limited; that there is a finite amount of relationships.

An important goal for research here is to understand how the picture cards facilitate a change in conversations about relating, and which importance this has for innovation. We hope to be able to report on the interaction analysis of video documentation of the picture card activities at a later point.

Figure 3. Examples of picture cards of handles, instruments and tools used to trigger conversations about relating between business partners.

Figure 4. Representatives form a ventilation systems manufacturer, its customer (building contractor) and supplier (electronics manufacturer) use picture cards to discuss how they relate to each other in daily business.

PAIRING THE TACIT WITH BUSINESS THEORY THROUGH BRICOLAGE

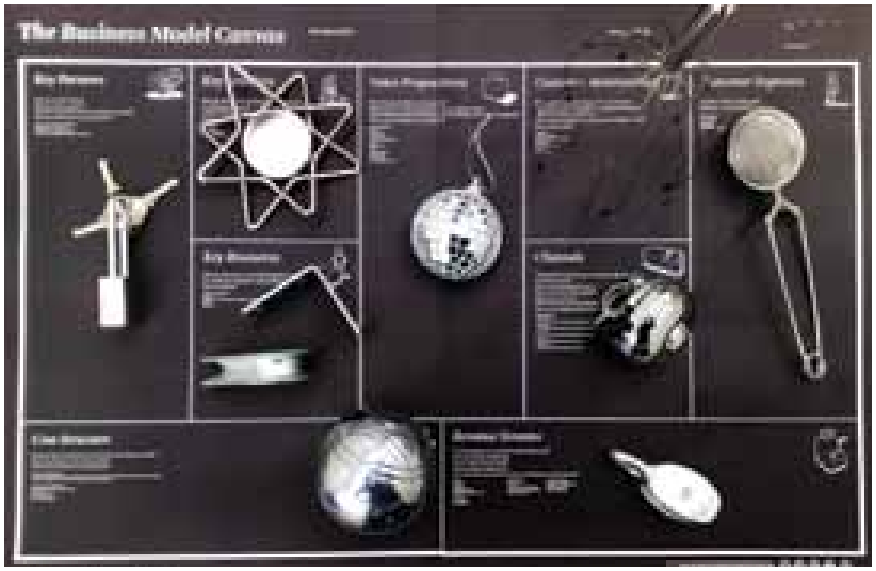

Figure 5. Silver-coloured bric-a-brac placed on an Osterwalder business model canvas to encourage discussions of fundamental business terms.

There are several examples in literature of conceptualising business models in business terminology, Osterwalder's business model canvas being the most widespread (Osterwalder and Pigneur 2009). Based on these we have developed a technique for provoking rich shared understandings of, and new perspectives on an organisation's business model. The technique has been successfully tested both with Danish industrialists, innovation consultants and graduate students. Using physical objects can help make discussing business concepts (like 'value proposition', 'ressources', 'customer segments') accessible and memorable also for participants without theoretical business knowledge.

HOW IT WORKS

We arrange a variety of bric-a-brac objects on a business model canvas work surface with at least one object in each 'cell' corresponding to an abstract business concept, Figure 5. We then ask participants in groups if the objects are a fitting representation of this aspect of their business? We encourage the groups to make adjustments so that the model fits their business better. This could mean swapping objects between cells or drawing upon extra materials.

This technique is a means to two ends: It fosters clarifying discussions of what the abstract business terms mean, and it brings about reflections on how the business of the company is organised at present. Describing accurately the different aspects of a business model often requires participants from different departments of a company to come together to pool their understandings. In essence this is not so different from the post-it activities suggested by Osterwalder and Pigneur (2009), only does the use of tangible objects make the discussion and presentation more concrete and memorable.

A variant we have applied with good result is to ask participants from different organisation in the same value chain to synchronise their individual business model canvases. In business-to-business relations one company will appear as customer of the other, while the other will enter as supplier resource on the business model canvas of the former. By asking the participants to link their canvases, the interdependencies of partners become very apparent, Figure 6.

RESEARCH FINDINGS

By studying video recordings of these sessions, we have shown that participants typically identify one particular salient property of an object and then use that property to create a metaphor about the organization's situation (Heinemann et al. 2011). We categorize the different kind of properties invoked into three: *physical, kinetic* and *iconic*. What particular property is invoked varies according to aspects such as the context in which the objects are placed and whether the object lends itself better to being interpreted in one way or another. Our research suggests that participants, through working with tangible material in fact have a large variety of different paths available to them; paths that affect the narration that is the end-result of these workshops. Participants tend to use the salient properties of objects in very similar manners, namely to create metaphors with what we call 'negative associations'. In other words, the end result, independently of what object is being used and of what property of that object is invoked, is the creation of a metaphor that portrays an organization's relations as fraught with matters of power differences, competition, struggles (Heinemann et al. 2011).

Figure 6. Participants from the ventilation systems manufacturer, its customer and its supplier use silver bric-a-brac to link their three business model canvasses and discuss mutual interdependencies.

EXPLORING BUSINESS MODEL DILEMMAS WITH DYNAMIC SCULPTURES

Following up on the success with tangible value network maps we started exploring if it would be possible to build interactive installations that could provide an impression of the dynamics of a business model: How customers move depending on choices made, how resources flow, how activities develop etc.

HOW IT WORKS

We design a tangible interactive business model based on interviews with the company, value network maps, market research, user research, and sometimes concept design activities. The tangible business model typically focuses on a particular business dilemma as identified in the company research, rather than attempt to cover all aspects of the Osterwalder canvas. It is dynamic in that it encourages experiments with alternative business models.

We employ such a model to trigger a conversation between company managers and key employees about their present and future business. We have found that rather than explain all the intricate details of the model design, it is much more stimulating to ask the participants to play with the model, then explain by themselves, what the elements may mean, and how this relates to their business opportunities.

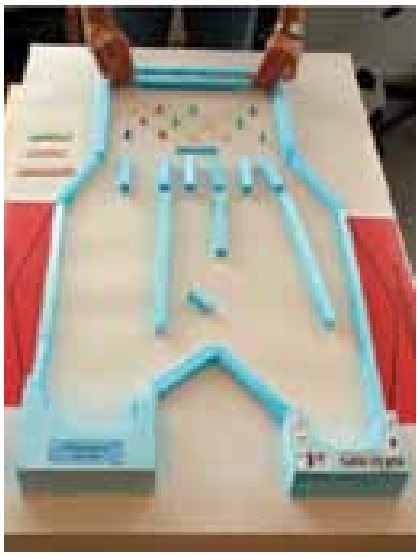

Figure 7. The Hearing Aid Pinball Machine. A tangible business model developed for a hearing aid manufacturer. When a release gate is lifted the hearing impaired customers (marbles) roll down the slope and bounce off various obstacles towards either buying the partnering company's products or those of the competitors. The 'flippers' represent audiology clinics with their inclinations towards specific manufacturers.The obstacles represent product features and services.

One company executive, upon having seen the student presentation of tangible business models, got so enthusiastic about the results that he invited the students to come and demonstrate the models at the next board meeting. Here, in particular the Sales Effort Balance, Figure 8, triggered a discussion of the company's priorities in allocating resources to, respectively, engineering development and sales. Is it really a question of overall balance? Or temporary imbalance? Soon after this meeting, the sales manager was allowed more resources to step up the sales effort.

RESEARCH FINDINGS

When looking at a series of tangible business models built by graduate design and business students and tested in events with business representatives, it became clear that some catch the attention of industry partners and lead to very engaged conversations, others do less so. By analysing the features of these models we have identified some of the characteristics that support engaging group discussions (Mitchell & Buur 2010):

1. The design must present a good alignment between real business variables and the physical entities of the model. But discussing this alignment itself can fuel exploration ('what does this wheel represent?'); so all things may not need to be decided upon at the outset.
2. The design must be dynamic; things should move and change to allow for experimentation.
3. The tangible business model should allow a variety of interactions that will alter the outcome.
4. The design should provide a variety of reactions. Unexpected and unforeseen ways of functioning should be seen as strength, as they fuel engagement and discussion.
5. The design should offer a tricky challenge to overcome in collaboration between participants (i.e. finding the balance, or collecting most marbles).

Figure 8. The Sales Effort Balance. A tangible business model developed for a lighting component manufacturer. A suspended Dowling pole represents the balance between sales resources and development resources. A set of filled cloth bags of different weights allow participants to experiment with adding different types of tasks and investments to achieve a balance.

TANGIBLE TOOLKITS

On several occasions we have experimented with kits of materials for participants to try build a tangible model of their business on the spot. Whereas 'The Silver Set' has proven its value in mapping activities and in the discussion of theoretical concepts, business modelling requires material with *dynamic* properties, material that that allow expression of flow, state changes, balance etc. Sets of balls & tubes, or pulleys & strings, or toy trains & tracks lend themselves to building contraptions that move and react. But so far we have limited success. The load of both finding the core business challenge of a company, expressing this in a suitable metaphor, and building an installation that allows dynamic, reactive interaction is very heavy, it seems. One way to move forward is to include Interaction Relabeling (Djajadiningrat et al. 2000) as an intermediary step between the static mapping techniques and the dynamic, tangible business model. In interaction relabeling, one imagines that the business is a machine: Choose an existing, complex mechanical device (perhaps an old-fashioned typewriter or antique camera) which has many moving parts as an analogy, then ask participants which aspects of their organisation's activities the different levers of the device remind them of. This elicits a conversation where participants finds ways of expressing what we could call the business logics of the company: 'If I do this, then...' or 'The more I turn this, the more...'

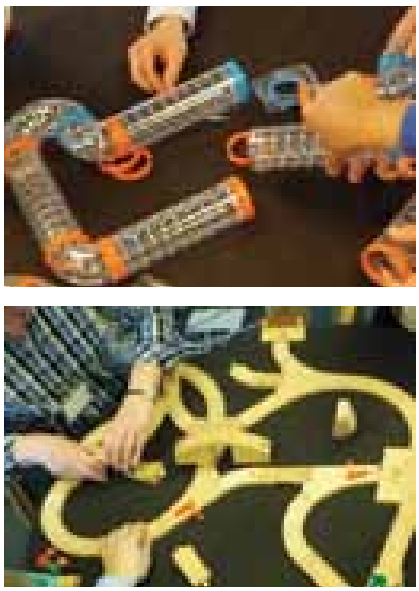

Figure 9. Plastic tubes & balls and a wooden toy train set as toolkit for modelling business dynamics. Company representatives discuss the business model could change in a situation where system manufacturer, building contractor and components suppliers combine their efforts.

CONCLUSIONS

Common to all these techniques is that they keep people's hands busy, which often appears to take the pressure of verbal articulations. The use of objects and images provides an indirect means to commence talking about topics, which may be difficult to approach head on. It seems to even out hierarchical imbalances between participants and allow people to effortlessly contribute with their different perspectives. Providing material as 'things to think with' also seems to provoke more unexpected discussions.

As for future work, we see in particular two challenges: One is to develop our understanding of how to bridge the gap between mapping and business modelling. Where as value network mapping is a rather straightforward participatory activity, the design of tangible business models that encourage experimentation and conversation is a demanding creative intellectual endeavour – about as difficult, it seems, as designing a successful new product concept.

The other challenge would be to 'prove' that the concept of tangible modelling actually has merit for industrial practice. We hope to be able to do this by combining a micro and a macro approach. On one hand to characterise the particular 'quality of conversations', which these models encourage that are supportive for innovation. This is possible through participatory experiments and interaction analysis of video documentation. On the other hand to provide interview studies and surveys of the uptake of these practices in industry.

Business is neither static nor flat. The tangible modelling shows great promise in bringing business discussions into the participatory realm.

ACKNOWLEDGMENTS

We wish to thank our industrial partners for engaging in our workshops, and the graduate students of the IT Product Design and Innovation & Business programmes at the University of Southern Denmark for developing the tangible business models. We thank our research colleagues for engaging in the experiments and urging us to continue the research. Thanks to John Bessant for suggesting the toy train set. This research was funded by the Danish Strategic Research Council as part of the SPIRE Centre.

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BUSINESS CASE: CRADLE TO CRADLE IMPLEMENTATION AT DESSO

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ABOUT DESSO

DESSO started out in 1930 as a Belgian manufacturer producing woven carpets in Oss, the Netherlands, for residential and commercial applications. In 1980, DESSO added artificial grass products aimed at the international sport market to their product portfolio. After being acquired first by a German and then by an American company, DESSO became independent again in 2007. Today DESSO has grown to be a multinational firm headquartered in Waalwijk, the Netherlands with over a thousand employees worldwide. [1]

INTRODUCTION

With DESSO's newfound independence in 2007, came new management and a new vision for the future. DESSO had always been on the forefront of sustainability and had achieved significant results in the area of eco-efficiency in the period leading up to 2007. The company had managed to reduce energy consumption by 30 percent over a period of ten years and already recycled 95 percent of all industrial waste. At the moment of taking office, the new CEO of Dessso, Stef Kranendijk, immediately asked his employees to be on the lookout for new opportunities to take even bigger steps towards sustainability and green business. It was, however, the CEO himself who came across just such an opportunity when watching the Cradle to Cradle (C2C) documentary 'Waste = Food' on Dutch television. Being convinced by the compelling arguments for C2C that were presented in the documentary, the CEO had the DESSO sustainability brochure changed to add the pledge that DESSO would start developing products based on the C2C principles. Thereafter, he contacted Prof. Dr. Michael Braungart, co-creator of the C2C philosophy and director of the Environmental Protection and Encouragement Agency (EPEA), a C2C consultancy headquartered in Hamburg, Germany. The message from the new DESSO CEO to Prof. Braungart left no room for misunderstanding: *'I want my company to be completely C2C by 2020, all of our products, and I need the support of your institute to make it happen.'*[2]

WHY CRADLE TO CRADLE

While being interviewed by a Dutch student working on his Master thesis [4], Rudi Daelmans (sustainability manager at DESSO) explains: *'Our CEO Stef Kranendijk really was the inspirator behind the idea. Before he took office, our Corporate Social Responsibility (CSR) practice was not market focused. We did some things internally but that was a matter of common sense. Kranendijk convinced the company that we couldn't continue without making a radical change in our sustainability program.'*

C2C stood out from other sustainability theories because it covers all aspects of sustainability. Successful implementation of a C2C strategy, requires a complete re-evaluation of all business processes to insure that all company

What is Cradle to Cradle?

C2C is a design philosophy, developed by William Mc Donough and Michael Braungart (2002), which empowers society to model its production processes on the principles of Nature, where quality and effectiveness of material and energy flows are central features. Like we see in nature, in C2C design the concept of waste is non-existent, resources are plentiful, and there are no limitations to production or consumption. Cradle to Cradle focuses on innovation to enhance the quality of products and processes. It is an entrepreneurial concept that starts by determining the intended benefits, instead of just focusing on environmental impacts.

The implementation of C2C is based around three guiding principles, namely:

1. Waste equals food: *When applying the C2C concept for production, all materials belong*

to either a biological or technological cycle (Figure 1). Materials that are consumed during their lifespan should be non-toxic and biodegradable, all other materials should be produced in such a way that they are non-toxic to the user and a hundred percent recyclable or 'upcyclable' after a defined use period. This is in direct contrast to the current 'Cradle to Grave' concept for production, where raw materials are turned into products, used, and then discarded as waste.

***2. Use current solar income:** The use of energy created by the sun, such as solar, wind, and biomass energy to power production systems, thereby eliminating a firm's dependence on fossil fuels.*

***3. Celebrate diversity: As in nature, products** and production systems should be designed to fit in, and positively contribute to their environment.*

Through these principles, C2C embraces the pursuit of maximum value (economic, ecological, and social) through the practice of intelligent design, seeking to transform the production and consumption of products into a regenerative force, by designing human industry to celebrate its interdependence with other living systems.[3]

activities will have a positive influence on the environment, the company's customers, and not least the company's bottom line. This is an area where C2C distinguishes itself from traditional eco-efficiency thinking, where companies are urged to be 'less bad'. [5] Being less bad in practice often means reducing activity. Even when a reduction of activity corresponds with a reduction in cost, this does little to improve a company's value offering. C2C encourages a company to be 'good' instead. By incorporating intelligent design based on C2C principles, DESSO could improve product quality, differentiate from competitors, attract new customer segments, and as such be 'good' for all internal and external stakeholders of the company, whilst having an ever increasing positive influence on its ecological and social environment.

Choosing C2C would have both short term and long term positive effects for DESSO's shareholders as well. Rudi Daelmans explains: *'Our short term aim with C2C is to separate us from our competitors. We want to be the best we can be in this area and do more than any other company. Every company wants to associate itself with 'being green' nowadays. Our carpets are increasingly popular with companies who don't deliver products, such as banks and insurance agencies. The only way they can carry out a 'green message' is by 'greening' their offices and establishments.'* [4] In this way, the C2C strategy offered a clear short term benefit for DESSO, holding the possibility of reaching additional customers and increasing sales. However, the rational for choosing C2C goes beyond short term benefits. *'One of the basic thoughts in C2C theory is that when you succeed in closing the loop of your production cycle, you become independent from raw materials such as oil. We are actually trying to safeguard our future as well. That's our long term vision. We are in the process of achieving independence from oil, both as a raw material and as an energy supply.'* R. Daelmans [4]

CRADLE 2 CRADLE IMPLEMENTATION

In their implementation of C2C, DESSO works closely together with EPEA and its scientific director Prof. Dr. Braungart. Both parties view DESSO as an international 'flagship' company and a first mover within the field of C2C. Therefore the cooperation between DESSO and EPEA constitutes a mutually beneficial relationship where both parties learn from applying C2C in practice and benefit from each other's promotion of C2C. DESSO's CEO and Prof. Dr. Braungart released the following statements to pledge their long term support for C2C and their mutual cooperation:

> *'By committing themselves to the C2C production cycle, DESSO will be supporting the good health of the planet and helping to improve product quality and environmental performance via eco-effectiveness.'* Prof. Dr. Braungart, founder of EPEA.
>
> *'With C2C, DESSO is in it for the long haul. It's a challenging task which will involve the creation of entirely new products and technologies. It is also a task we're proud to undertake, for the betterment of our products, our brand, the people and our planet'*
>
> Stef Kranendijk, CEO DESSO

The first step EPEA and DESSO undertook was to evaluate how DESSO could move from a strategy of being 'less bad' to the C2C strategy of being good. This entailed setting up the long term posi-

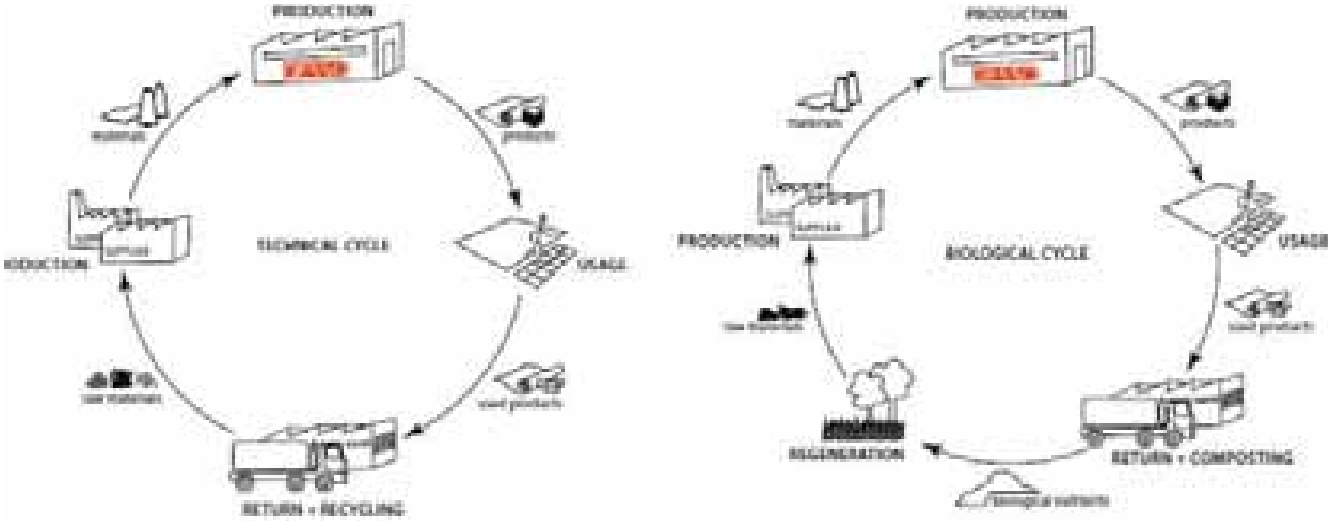

Figure 1. Continuous biological and technical cycles at Desso
source: www.desso.com

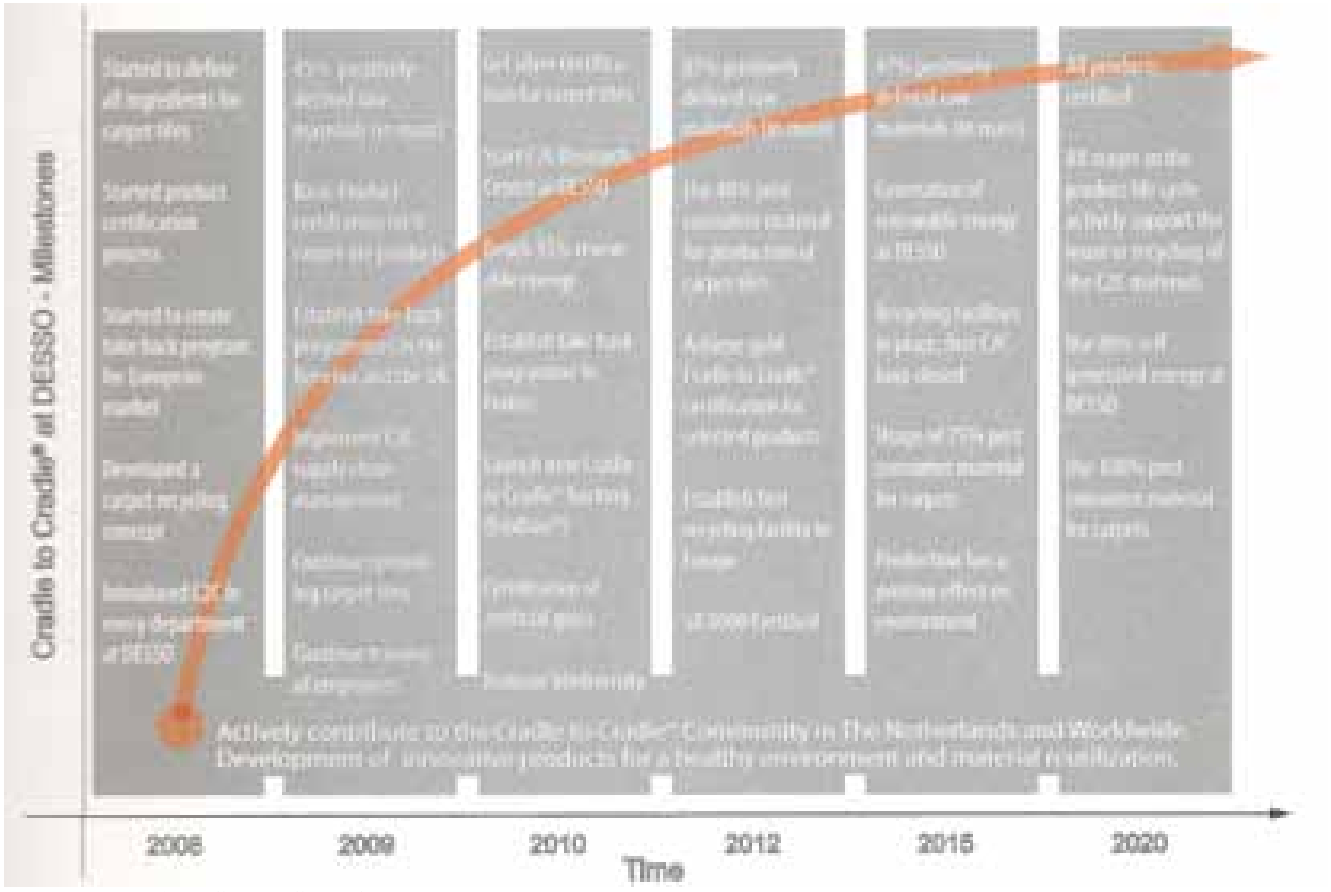

Figure 2. DESSO's cradle 2 cradle roadmap
Source: Desso C2C presentation by R. Daelmans, August 2010

tive agenda for DESSO, the 'roadmap' in C2C terms (figure 2.). The goals for the year 2020 that were established can be summarized as follows:

- All products of Desso are developed according to C2C design criteria.
- All materials and process inputs come from renewable or recycled sources.
- All materials are capable of returning safely to either natural systems or industrial systems.
- Establish unique, tailored take back and recycling systems for closing the loop.[6]

As figure 2 indicates, the first steps on the roadmap are mainly preparatory in nature, focussed on C2C education of stakeholders within and outside of the company, the evaluation and re-design of the first products according to C2C standards, and laying the foundation for the DESSO take back program.

EPEA facilitated the material analysis of DESSO's existing carpet tiles and played an active role in the redesign of the first nine carpet tile products that would apply for basic C2C certification. The challenges faced by DESSO, however, were of a much larger scope than production and product development. The C2C roadmap affected all aspects DESSO's organization, including the underlying business processes. The company's business model had to be re-evaluated and adapted to fit the C2C strategy. Below the different short term goals for 2010 and the corresponding consequences for DESSO's business model are discussed.

FIRST MILESTONES FOR 9 PRODUCTS

In order to meet the first milestones, DESSO had to carry out a very detailed assessment of all raw materials used in the selected products, evaluating them based on human and environmental health criteria. Since DESSO does not produce most of the raw materials used in carpet tile production, they had to rely on (international) suppliers and their willingness to supply detailed information on the contents of the materials supplied. This is a long and delicate process since many suppliers view this information as confidential and a source of competitive advantage. EPEA helped in this process by guaranteeing the confidentiality of information provided by the material suppliers.

The second stage that had to be fulfilled was a full evaluation of the manufacturing process based on recycling potentials, the use of energy and water, and social responsibility. [1] This also entails changing proven production capabilities that have been built up over decades. This can be very difficult process, in part because many of the DESSO employees take grade pride in the production system's they have helped build and the product quality that these systems assure.

TAKE-BACK PROGRAM

A crucial part of DESSO's C2C strategy is that all materials in their carpet tiles belong to either the technological or biological cycle (figure 1.). This, however, also means that DESSO has to make sure that all of their products are integrated in these cycles after being discarded by the user. In order to make sure that DESSO products are not only recyclable but are actually recycled after use, DESSO has started constructing a take-back program. In practice this means that DESSO collects old

carpets from their customers to ensure that that they are properly processed. Since the carpets that DESSO collects, at this point in time, have not yet been produced according to C2C standards, only the nylon yarn of the collected materials are useful as ingredients for C2C carpet tile production. Therefore DESSO has entered into an agreement with waste management companies which ensure the collected carpets are separated at Desso and reused for example as raw material and secondary fuel in the cement industry. An interesting consequence of the DESSO take-back program is the extra customer service that DESSO provides in collecting the old carpets from their customers, regardless of the fact if they were the past supplier of this carpet. This extra service undoubtedly provides DESSO with an advantage over competing suppliers, especially since the customer knows this convenient solution will actually contribute to the environment. Another added benefit is the likelihood of increased customer retention. DESSO customers, regardless of whether they have already used the take-back program, might be more inclined to continue using DESSO products since DESSO provides the additional service of collecting their old products for re-use. Partly because of the costs associated with setting up the take-back program and the fact that the carpets being collected at this time have not yet been produced according to C2C standards, the take-back program still represents a cost to DESSO. However, the take-back program is scheduled to break-even in 2,5 years and the company is confident that it will become profitable soon after.

C2C SUPPLY CHAIN MANAGEMENT

C2C supply chain management is one of the most challenging aspects of incorporating a C2C strategy. Producing products from materials that will return to either the technological or biological cycle requires DESSO to work towards and achieve change outside of the company's boundaries. As mentioned in the section first milestones, the first step is to ensure that all materials supplied to the company are compliant with C2C design criteria. This entails detailed supplier agreements and in order to increase the amount of recycled materials used in the production of carpet tiles new innovative partnerships need to be set up along the entire supply chain of the product, including material sourcing, manufacturing, distribution, disassembly, recovery and reuse. An example of this is the cooperation mentioned above with several European waste management companies. DESSO aims at playing a key role in closing the loop, separating yarn and carpet backing in her own production plants. This is an important step forward since DESSO plans to use 40 percent post consumer material (recycled technical nutrients) in their production of carpet tiles by 2012.

Two potential growth markets for DESSO are South America and Asia. However, shipping generic products from Europe to Asia and South America does not fit within the C2C principle of celebrating diversity. Therefore DESSO will likely set-up localized production and supply chain networks for these areas in the near future.

TRAINING EMPLOYEES

A companywide understanding of C2C throughout all levels of the organization is crucial to the successful implementation of the C2C strategy. Therefore, DESSO is training its employees in C2C. Part of this process is informing the employees about the incentives that have let the company to adopt the C2C strategy. This is important in order to avoid misunderstandings and resistance to change. Whilst the adoption of C2C will have only positive consequences for DESSO employees, resistance to organizational change from within the organization is a natural phenomenon that needs to be addressed. As mentioned before, DESSO employees take pride in the products they produce and sell, therefore any change in product and process needs to be addressed and explained. DESSO has been very successful in involving its employees in the new C2C strategy and at the moment reports little to none remaining internal resistance or difficulties relating to the new strategy. When asked how the company achieved this, Rudi Daelmans reports the following factors could have had a big influence on creating acceptance towards the new strategy within DESSO. First of all the new strategy was implemented through a top down approach. This meant that the new strategy immediately lead to visible investments and policies that were implemented throughout the organization. Secondly, DESSO received a lot of positive publicity and several awards from outside the company. This endowed the employees with a sense of pride in being a real part of the new C2C approach that is making global headlines outside of the company. Apart from this Rudi Daelmans mentions that the positive agenda associated with the C2C strategy creates a lot of positive energy and enthusiasm among the employees because they are working to develop healthy products that will benefit the environment.

PROMOTE C2C WORLDWIDE

A continuous aim of DESSO that is mentioned in the C2C roadmap is the contribution to the C2C community in the Netherlands and Worldwide. This means that DESSO has to use resources for the promotion of C2C. DESSO does this from the firm believe that C2C is the way forward, not just for DESSO but for human industry worldwide. It does, however, mean that DESSO, as a first mover, is doing a lot of the ground work for the companies that will follow in its footsteps. Rudi Daelmans illustrates this point as follows: *'We are now doing all the work for the complete branch. If we, for example, come to agreements with our latex- or yarn-manufacturer now, then the only thing our competitors have to do later is buy their supplies from them and re-designing their own product and processes'.*[4]

Though local and global promotion of C2C and ground breaking work in the field of C2C constitutes a big strain on the resources of DESSO and does not always show a clear short-term return on investment, it is one of key activities for making the C2C strategy a success. Apart from the clear branding benefits, promotion and development of C2C is crucial to shaping the business environment. The success of C2C in the Netherlands is, for example, helping to shape European regulations towards eco-effective measures and away from traditional eco-efficiency based restrictions. The adoption of C2C by other companies along the supply chain will also work in DESSO's benefit. For example, in order to achieve economies of scale in the technological cycle, it is

important that other companies produce and buy resources based on C2C principles.

In the future DESSO hopes to cooperate with other C2C companies in the promotion and development of C2C. Rudi Daelmans explains: *'It is very important for us that people understand what C2C is. It is cheaper and more effective if all companies involved in C2C get together and release this information. We want C2C to be promoted in the same way in the whole of Europe, independently, and purely informative, without company names'*.[4]

PROGRESS MADE AND PLANS FOR THE FUTURE

Mid 2009 DESSO released a statement that they were ahead of the schedule for C2C implementation. Nine of the DESSO carpet tile products (around 22 percent of the carpet tile assortment) had been granted the basic C2C certification. DESSO had also successfully started the take-back program to prevent used carpets from ending up as waste, and through ozone purification of waste water the company manages to safe around 30 million litres of drinking water a year.

More recently DESSO has also started work on the creation of a DESSO C2C research centre, setting up cooperation's with Universities, companies, and institutes around the world.

To fulfil the plans for 2020, there is however still a long way to go and a large part of DESSO's success in achieving its goals is dependent on the global awareness and acceptance of C2C. Rudi Daelmans reflects on the goals in the roadmap as follows: *'The only reason we will not make it before 2020 is because other companies don't believe in it. I'm 100 percent sure that if we can't do it, nobody can. We are that dedicated'*.

In order to achieve its C2C goals, DESSO needs the dedicated support of other companies along the supply chain, such as the new partnership with European waste management plants mentioned earlier. Based on the above it can be argued that spreading the message about C2C and gaining support and cooperation from industrial partners and governmental institutions is the key challenge faced by DESSO in the upcoming decade.

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INITIATING MULTI-STAKEHOLDER INNOVATION WITH TANGIBLE VALUE MODELING

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ABSTRACT

In the initiation phase of multi-stakeholder innovation projects communication between the initiators and potential stakeholders, including end users, is of great importance. At this early stage only an initial set of ideas and concepts are available and the business models as well as the consortium of stakeholders have yet to be determined. Existing design innovation and innovation management research focuses either on the design of the innovative offerings or on the design of the innovation network and business models. The overlap between creating the value proposition and creating the business model has not received much attention. This paper explores the use of tangible value models by visualizing for each stakeholder the exchanged values related to initial ideas and concepts, to encourage the process of participatory innovation.

INITIATING MULTI-STAKEHOLDER INNOVATION PROJECTS

The initiation of multi-stakeholder innovation projects includes activities to identify potential stakeholders. Initiators can begin the innovation process with drafting a number of initial ideas. These ideas are used to motivate potential stakeholders to participate in the (initial) innovation network. This in turn leads to further development of initial business models for the innovation network, for the stakeholders to discuss and reflect upon before jointly designing more concrete solutions. It is therefore very important for the initiators to communicate to each stakeholder the values that accompany these initial ideas and concepts.

The benefits of using visualization in product/service design and innovation projects have been widely recognised (Diana et al. 2009). Stanley King (King et al., 1989) suggests that visualization, as the only common language to which all participants (technical and nontechnical) can relate, is key to encouraging public participation Visualisation helps making complex concepts more tangible, readable and shareable. It supports communication between stakeholders, can help potential stakeholders to understand the intended value models and it can attract them to participate in the discussion. This can encourage them to participate in further developing the innovation.

VISUALIZATION

Visualization literature suggests there are two main variables concerning visualization: the level of iconicity and the relation with time (Diana 2009). In the context of this paper, the level of iconicity refers to the degree of correspondence between the representation of exchanged values created by the initial ideas and their real meaning for the stakeholders. The relation with the time representations can either give an instantaneous –synchronic– picture of the exchanged values or can visualize the – diachronic– sequence of actions and stages that create the values.

In the early initiation phase of multi-stakeholder innovation projects the business models, the value proposition and even the consortium of partners

have not yet been finalized. Therefore, to trigger participation in the innovation, more realistic and diachronic visualizations of the exchanged values are needed to allow potential stakeholders experience the intended innovation before committing to participation. This paper outlines opportunities to support initiators by exploring the use of tangible value modeling to visualize the exchanged values. This will help encourage multiple stakeholders participating in such open innovation projects.

EXPLORING TANGIBLE VALUE MODELS

We explored the use of a tangible value model in visualizing for each stakeholder the exchanged values in a student design project. The initial designs were created by a group of four industrial design students at the Department of Industrial Design, Eindhoven University of Technology. This design project aimed to improve safety in public spaces in the city of Eindhoven. Students were encouraged not to solve the safety problems as they occurred but to create an environment to prevent safety problems from occurring. The design process that the design project followed consisted of iterative cycles of the reflective practice (Schön 1983): Naming (the relevant factors in the situation) > framing (the problem) > moving (towards a solution) > reflecting (on the frame and moves). The students worked for two weeks on this project. The first week was dedicated to exploring the design problem and generating possible solution concepts for the end users. This ended with an initial concept, with demonstrable benefits for the end users. The second week focused on developing the value model describing for each stakeholder the value created by the initial concept. The detailed process steps were:

- Naming phase. Specifying the design problem and identifying the relevant factors, i.e., potential stakeholders that can contribute to possible solutions. To prevent specific safety problems in public spaces in Eindhoven, for example, the municipality of Eindhoven might consider increasing the use of public street lighting and the police department might consider deploying additional police agents or using extra security cameras on the streets.
- Framing phase. Framing the way that the problem is viewed. Safety problems happen when conflicts or friction occurs in the flow of the life of the city.
- First moving phase. Creating ideas for the framed problem and selecting one initial concept; translating the initial concept to values for each stakeholder; visualizing them by building a tangible value model.
- First reflecting phase. Confronting the tangible value model with a simulated stakeholder network consisting of one industrial panel member, specialized in designing business models, two academic panel members who teach value modelling and value propositioning to the students, and one design professional. The panel members were asked to evaluate the tangible value model by interacting with it before listening to the presentation of the student group. The feedback was gathered and reflected upon.
- Second moving phase. Building a tangible model, taking the feedback from the first evaluation into account.
- Second reflecting phase. Confronting the improved tangible value model with the same stakeholder network as before. The feedback was gathered and reflected upon.

Below, we will discuss the results in detail.

NAMING AND FRAMING PHASE

The public space that the group decided to focus on is around unsafe bus stops in the city of Eindhoven. Acts of vandalism occur frequently and as a consequence passengers feel unsafe when waiting alone for the bus in the evening. In this case the public transportation company Hermes and the municipality of Eindhoven were involved as stakeholders. Hermes already installed a GPS system in all the buses and provides real time bus transport information to passengers at the bus stops. Acts of vandalism at the location of bus stops have caught the attention of the municipality of Eindhoven. But despite countermeasures, the situation has not improved. The students took a broader view at the problem of the unsafe bus stops and concluded that the unsafe situation was created due to the irritation while waiting at messy bus stops. Instead of making the waiting experience a safe experience, they decided to completely remove the waiting queue from the unsafe bus stop to another, more safe and familiar environment.

FIRST MOVING PHASE

The initial concept was about a service to provide public transport users with personalized public transportation information so that they always have real-time information on the exact arrival time of the buses. This results in a reduced waiting time at the bus stop and therefore reduces the possibility for unsafe situations. The student group itself acted as a service application development company and identified two potential stakeholders, the public transportation provider Hermes and the municipality of Eindhoven. They proposed that Hermes could provide the actual public transportation information to mobile phone application developers, enhancing their reputation of punctuality and encouraging more passengers to use public transportation services. They also proposed that the municipality of Eindhoven could provide necessary funding to develop such applications while improving their reputation as an environmental friendly and safe city. As the application developers, the students' company could develop a personalized service for the end users. The student group in question used the paper related to tangible business model by (Mitchell and Buur 2010) as the primary reference when creating a tangible value model.

Based on the created value model, the group generated ideas on how to make a tangible version of the value model which would help the stakeholders to understand the idea and the model behind it. A puzzle was considered to be a nice concept direction for the visualization. The idea was to create a puzzle based upon a concept usually found in children's books; one can slide in a piece of paper, that changes the visual appearance of page in the book. The value gained (output) by different stakeholders only appears when the stakeholders slide in their potential input. Using this interaction the stakeholders would be able to see the consequences of their involvement. The

Figure 1: First tangible value model

stakeholders could intuitively understand the value model by interacting with the tangible model. The first tangible value model is shown in Figure 1.

FIRST MOVING AND REFLECTING PHASE

The first prototype of the tangible value model was created out of foam-core and displayed a photoshopped street with elements which would change according to the input of the stakeholders, explaining for each input what they would gain. By interacting with this tangible model, the stakeholders started the first discussion on the concept. The stakeholders were able to imagine which input is needed and what the consequences will be for them and others. They gave very positive feedback to the group. They also mentioned that they would like to have included in the model a visualization that explicates the motivation of the end users, so that they would keep an overview on why such a service is needed. The value for the end users also needs to be specified and supported. In this way, the stakeholders could be further motivated to participate in the innovation proje

SECOND MOVING PHASE

The final prototype was laser-cut in order to have a precise match between the different layers and the photoshopped picture was replaced by a rendering of the location (see Figure 2). Instead of one small piece of a street, this prototype showed a 'cartoon 'version (thus basic but relevant details) of a city. By using this cartoon as the communication platform, as suggested by McCloud (1993), the prototype becomes easier to "read" and relate to. Besides the prototype working more fluently and being clearer, it also incorporated a discrete action from the stakeholders relating to their input. In the case of the municipality of Eindhoven this meant placing a Euro inside the prototype, representing the funding they would provide; in the case of Hermes this was an SD-card, representing their input in the form of data. Specific attention was paid to the value created for the end users.

SECOND REFLECTING PHASE

The stakeholders were positive about this second physical value model. Each of them played with the interactions that were designed for them and understood what the consequences of their and others' input are for the innovation proposed. Physically interacting with this model also raised more questions related to the realization of the value model. Especially they raised the concerns about how such a service could eventually reach the end users. They considered that there is a missing stakeholder in the proposed value model, a functional unit who can promote this new service. They missed the cost structure and revenue flow which is needed when developing a business model (Osterwalder and Pigneur 2010). They also had comments on the target user group as they saw more potential to develop a service platform to serve a different category of end users who may (potentially) use the public transportation system too. Such a discussion suggests that the use of the tangible value model really

Figure 2: Second tangible value model

stimulates the stakeholders to get motivated to participate in discussing and creating the service together. It creates a dialogue between stakeholders as a solid basis for collaboration within the innovation project.

CONCLUSION

This is only a first exploration of the use of tangible value modeling to motivate stakeholders to participate in innovation. Using a "story puzzle", the model was built diachronically to show in sequence how values can be created when different stakeholders join the innovation at a different moment in time. In the end, a picture of the complete value model can be demonstrated. The physical interaction presented in the model also empowers different stakeholders to picture experiencing the innovation before the service is created. Dialogues are sparked that will serve to support the participatory innovation process.

This study is a successful first step towards the development of the tangible value model for innovation initiation.

The difference between this tangible value model and the tangible business model proposed by (Mitchell and Buur 2010) lies in the purpose and timing of use in innovation projects. In our project, the innovation is in the very early stage where stakeholders still need to be motivated and where the joint value proposition and value network still need to be defined. The student group took the role of innovation initiator, and first created the solution and value model. They then motivated potential stakeholders by presenting them with a tangible value model. This creates a basis for further detailed discussion on how the business model will be created, in terms of cost structure and revenue flow, and also in terms of feasibility of participating in the innovation. In contrast, the tangible business model from (Mitchell and Buur 2010) is used to support the redesign and improvement of existing business models. In their case the model is used to support different stakeholders in the realization phase of the innovation project, as the commitment is already in place. It will be very interesting to explore the possibility to connect these two ways of working in creating and realizing participatory innovation.

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BUSINESS MODELING FOR EARLY ENTREPRENEURIAL VENTURES

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ABSTRACT

The main question in the paper is if participatory business modeling could help entrepreneurs in the early stages of their ventures when resources are scarce and all tasks need to be done simultaneously. The discussion in the paper draws on experiences from an entrepreneurial internship program arranged by the Norwegian School of Management and Oslo Innovation Centre during the summer of 2010. 13 master-students-cum-interns worked in start-up companies and were active participants in real-life business modeling processes. The stakeholders in this specific learning process were entrepreneurs, interns and supervisors. The paper raises the question if it could be possible to include formal business modeling methods to improve on the process. Furthermore, could it be feasible to include also other stakeholders earlier in the process?

INTRODUCTION

Early entrepreneurial ventures are cases of real-life, real-time business modeling processes. The value proposition may be diffuse. The different functions of the company have not yet been sorted out and there is a lack of operating resources. The entrepreneurs try to do everything at once. Eventually the company finds its form, but that may take months at best, usually it takes years.

Interns working in such situations have the opportunity to get a good grasp of all aspects of doing business. They also have a hard time making sense of and connecting the different inputs they get. Each task that the intern does is connected to other necessary tasks in very apparent ways, but the configuration of tasks may change from week to week. The interns are in a learning situation, where much is open to consideration and interpretation. Theories and models become meaningful, and even actually useful. The interns may serve as well tuned sounding boards for the entrepreneurs. However, entrepreneurs are busy doing things, and has little time to engage in systematic reflection with students who may not have grasped all that is at stake.

This is why business modeling could serve to give order and direction to the explorations of both the intern and the entrepreneur. This again raises the question if other stakeholders could productively be included in the creative process of business modeling.

LITERATURE AND THEORY

Business modeling refers to a diverse range of concepts and methods for systematizing processes of value creation or innovation in and between companies. A business model is a representation of key features of the value creation process. Much effort in the business modeling literature is devoted to ensuring the best or correct content of the representation, which means attention to the constituent elements of the model. The *business model canvas* merges related approaches to business modeling into a unified methodology (Ostwerwalder & Pigneur 2010). Its main object is a blank template, or canvas, divided into nine columns that each concerns one part of a value creating process. The blanks may then be filled in as a means to assess the present situation and also to identify other opportunities. The main emphasis of this methodology is to ensure a best possible content of the model and a representation that simulates key features of the value creation components of an enterprise. A related approach is *Disruptive innovation* technology. This method to identify and analyze business opportunities makes use of the features of competitor's products and services to determine the unique sell-

ing point of one's own (Christensen 2003). In this approach, products, services and technologies are placed in the foreground.

Designing a model and its actual realization are two very different problems. The business model is only a representation. This representation can function both as a 'model of' and a 'model for' (Geertz 1973:93) the value creation process. As a 'model of' the process, the representation functions as a description of its existing, constituent parts. As a 'model for', it represents different configurations of opportunities. It may therefore serve as both a scenario and a plan. As a plan, it is a representation of action, but it is not the actual action. To design a business model is not the same as to execute one.

The distance between the two types of tasks may be reduced if business modeling is designed as a type of 'situated action' (Suchman 2007:70). Suchman demonstrated that practical effects of instructions and manuals is not determined by wording of documents or features of objects, no matter how well designed they are. It is the action in situ that generates the practical results. Suchman's study is of users who try to make sense of photocopier instructions. It reveals the difference between what planners plan for, and what users actually do (Suchman 2007:109-175). In case of the entrepreneurs it is the formalization of actual relationships that determines the shape of the business. The model is not decided in advance, but emerges as the process unfolds. This is why early entrepreneurial venturing may be thought of as real-life, real-time business modeling. The entrepreneurs are both planners and users at the same time.

The entrepreneur is only the first of several potential stakeholders in the business. These include amongst others investors, partners, suppliers, customers and employees. In order to realize any business model, sooner or later actual users or stakeholders will have to be included in the process. The form of the process then is extremely critical: who, where, when and how of the process needs careful consideration. In addition, that is not something that should be decided beforehand. The questions on how and on what conditions must itself be debated as part of a participatory process (Emery and Purser 1996).

The problem of user inclusion has been dealt with in the participatory innovation literature. Inclusion of users in design processes has been shown to improve the fit between user need and product design (Buur and Matthews 2008). That indicates the benefit of open processes and broad participation. However, studies of user inclusion are mainly concerned with the product or technology design. When it comes to commercialization, other concerns become more pressing. The *open innovation* perspective states on the one hand that uses of external ideas and movements across institutional boundaries should be part of companies' innovation processes. On the other, there are considerable risks connected with innovation that involve separate enterprises, not least the need to protect one's own financial investments (Chesbrough 2005). Hence the premises on which the participants contribute must also be thematized.

In case of the interns, they are present to learn. In some respects that make them less risky collaborators than an investor or banker, or even a supplier or customer who has an actual vested, material interest in a company. The internship literature is mainly focused on the interns' learning experience, both for practical learning and deep learning about ways of being in the world (Sweitzer and King 2009; Wilson 1981). Some attention has also been devoted to the outcomes of the internships for the intern companies and for academic institutions when the internships are part of academic programs. The main lesson from this body of work is the importance of the human interaction. The intern needs guidance and someone to share experiences with in a type of truly interest-free dialogue setting. Hence, the internship literature does have some of the same practical quality as that the business modeling literature, but unlike it, emphasizes the form of individual, experiential learning necessary to generate new knowledge.

During an internship there must be a scope for both action and reflection. Without the action there will be no practical learning or outcomes, but without the reflection the intern will become a copycat repeating any old routine. An action-reflection-based process of inquiry will allow the participants to explore not only the content of their knowledge, but also the process that brings it forth as well as the premises on which it rests – the interests or forces that are in motion (Coghlan and Brannick 2005).

Drawing on these diverse sources, it seems that what needs to be carefully attended to and discussed in a participatory business modeling process in an early entrepreneurial venture is:

- The content of the business model itself.
- The form of the modeling process, including the participants, instructions, time frames, tools and equipment, concepts, location, action and reflection cycles.
- The premises for the modeling, especially the working out of differences of interests.

The case description below will illustrate is neither the content, nor the form or the premises of the process of real-life business modeling were systematically dealt with during the internships. This did affect the progress of the internship work and the interns' opportunities to contribute.

THE CASE

The Norwegian School of Management is a private business school, with 20 000 students enrolled in undergraduate and graduate, executive, and doctoral programs. The main campus is located in Oslo, Norway. The Entrepreneurial Internship Program is an elective 12 credit course offered to Master-students at the Department of innovation and economic organization.

The first pilot course was offered during the summer of 2010 with 13 interns who worked full time in 9 start-up companies in incubators at Oslo Innovation Centre. Preparations started in January, and the actual internship began in June and lasted until mid-August. There were three types of stakeholders in this program, the supervisors, the interns, and the entrepreneurs. I will deal with each type of stakeholder and their expressed interests in the program in turn. This gives a broad and general outline of the program and the scope for participation.

The Norwegian School of Manage-

ment's interest in an internship program sprang from a need to allow students to gain first-hand practical experience with innovation and entrepreneurship. The interns' academic supervisor (the author of this paper) was responsible for the overall design of the course, as well as for following up of the progress of the interns during the program. Hence, the supervisor was not a stakeholder in the business development for its own sake. The academic component of the internship work was a term paper. The students' also participated at a weekly reflection-and-writing workshop. The idea was that this would enable the interns to return to the entrepreneurs with well founded recommendations for how their work could contribute to the growth of the company. In reality it proved to be more useful for sorting out problems and misunderstandings. It also gave the students a chance to reflect on their own work experience and that of the others.

Oslo Innovation Centre is a limited company owned by a number of public and private institutions. About 140 research institutions, companies and organizations are located in the Centre and its three incubators. It also offers seed and venture capital for starts-ups. Most of the interns worked in start-up companies located in one of the incubators. A few worked in companies that had come one step further and had moved out of the incubator. The Centre representative-cum-supervisor helped the interns with practical matters like phones and desks, communal affairs like pubs and lunches. The incubator managers facilitated the initial contact with the companies, and also helped with specific problems for a few of the interns. The agreements between the Centre and the start-ups were based on contractual agreements between independent business parties. Therefore, any agreement about uses of techniques and tools for growth had to be made independently with each company. Each intern therefore had a unique learning situation in terms of tools and methods used in the company.

Of the intern companies, two were in the software business, two in services, and five in high-tech or manufacturing. The companies had from 1-3 full time employees, with an additional 2-3 temporary employees or part-timers. Two of the companies had moved out of the incubators and were defined as past the "valley- of death"-stage of venture financing. Neither had actually gained a stable source of revenue, but managed to secure enough ad hoc business to not operate at a loss. All entrepreneurs were concerned with not losing control of their technology, product and company, so there was considerable secrecy relating to patents and brands, business strategies, and financial information. There were also constant meetings and negotiations with potential partners and the configurations of relationships shifted rapidly. This affected the interns' workdays. In this, they were very much part of a real-life business modeling experience. The entrepreneurs all agreed that their main motivation for accepting interns was the gain of extra, unpaid hands. They also got highly motivated staff. Most of the entrepreneurs had had interns earlier. The extent to which they had prepared a set of well defined tasks and measurable outcomes differed considerably. The learning goals were already defined, but the specific learning objectives of the internship had to be agreed with the company. A blank confidentiality form and work task description form were sent out in advance to both entrepreneurs and interns, but only a few used the forms.

The students' motivations ranged from gaining a network in Norway, to learning how to start a company, in addition to gaining 12 credits. In general, the interns' tasks were of two main kinds, market and customer analyses or web-related work. In addition was the "gruntwork" that interns customarily do, like photocopying invoices or sorting documents. Only two students were initiated through a truly well prepared process. Not surprisingly, their intern companies were the two safely past the "the valley of death".

During the first few weeks the interns were busy simply trying to understand their company, its markets, customers, products, finances, but most of all, the entrepreneur. After that, the interns got more and more absorbed with actually accomplishing the tasks they had been given or had assigned to themselves. They found it hard to be specific, and harder still to define measurable indicators to follow their progress (and the occasional regress). The entrepreneurs were themselves very busy working out their own indicators, which they needed in order to convince investors, customers and suppliers to do business with them. Even those interns who had specific learning objectives found their tasks changing along the way according to the company's most pressing issues. The quality of their relationship with the entrepreneur also played a role. The interns' experiences illustrate the challenges of designing a participatory process in early entrepreneurial ventures, which hardly exist and change rapidly. Below are descriptions of four different situations that illustrate the challenges. Details of each case have been adjusted in order to ensure anonymity.

COMPANY A – MANUFACTURER IN THE VALLEY OF DEATH, YET RELUCTANT TO ENTER MARKET

This company had developed a product to aid in home and institutional care. The technology behind the product was developed by an engineer and one of the founders of the company several years before they were accepted in the incubator. As part of that deal the company also acquired the first round of financing in the form of seed capital. At that time a managing director and co-owner took over the daily operations and the launch of the product. At the time of the internship the company faced two critical issues: whether to operate in the home market only or to go global directly, and how to get the much needed second round of financing. The intern in the company produced market analyses, both for Norway and other countries in other parts of the world, but these were not actually used for anything. The same happened with proposals on how to sell and develop a sales organization, areas where the intern, who had a background in sales and marketing, had special competence. The company people were more interested in talking about how to improve their technology, and collaborating with their suppliers on this. The intern's ability to participate in the discourse on technology was limited, and the directors' limited grasp of marketing did not allow them to benefit from the intern's

competence.

COMPANY B – SOFTWARE DEVELOPER IN THE VALLEY OF DEATH YET UNABLE TO COMMUNICATE THE PRODUCT TO INVESTORS.

The entrepreneur in this company worked according to an innovative business model, in the form of a network of professional software developers from many different countries. The model was based on a type of generative partner-platform known from the social media industry. The company's technology was so complex that neither customers nor investors or interns were able to grasp what value it could possibly have for them. In that company, the intern changed work tasks about every third day, according to the most pressing concerns. The entrepreneur was explicit about the premises for participation, embodying an open source paradigm, and the form of the process was also fairly predetermined. However, as the content of the technology was so hard to communicate, the whole business modeling effort failed to produce the desired results. Investors did not understand what they were supposed to invest in, and customers likewise did not know what to use the technology for. The intern in the end suggested that the entrepreneur develop a professional consultancy business from the ad hoc consultancy work that kept the company afloat economically.

COMPANY C – SERVICE PROVIDER, DEALING WITH THE INTANGIBLE NATURE OF THE PRODUCT OFFERED

The entrepreneur of this company had an idea for a service that would also professionalize a fairly immature industry. The intern was given precise tasks and was followed up with regular feedback sessions. However, because the innovation was a service and a way of doing business rather than a tangible product, the intern did not understand the company's value proposition. It was therefore at first difficult to find concrete ways to make sense of the tasks given. The intern spent the first weeks gathering information about competitors and learning the ways of the company. Only then could a realistic work plan for the internship be made. Through the founder's extensive network in the industry, the company gradually managed to secure enough business to break even. However, the intern saw that the founder had a hard time making the market understand and pay for the added value of the service offered. Customers found it hard to grasp how it differed from the conventional way of doing business in the same manner as the intern had had initially.

Through the intern's efforts to sort out what the company was all about, or perhaps the founder's need to explicate on it, the company's business model become more elaborate and clear. However, the emergence of a well integrated and communicable model happened haphazardly and due to no small amount of patience from both the entrepreneur and the intern.

COMPANY D MANUFACTURE – A STRATEGIC DECISION NOT MADE

In this company, the second round of financing was secured. The product was patented. It was a generic, but key component in other products and the company was setting itself up as a supplier to other producers. The question on how to communicate with the market was high on the agenda. As part of this challenge, the intern was first assigned the task of redesigning the company's web page. The intern had programming background and was well up to the task, but constantly ran aground on the fact that the owners of the company could not agree on who the webpage was for. One owner claimed that since their product was truly new and demands for it had to be generated, they should target individual consumers who were the end users. Another owner claimed that the webpage had to serve as an extended intranet for the company's business partners because they were the actual customers. The third owner wanted a bit both solutions, an open website and a closed partner web. The owners did not manage to agree even when the form of the webpage was reformulated as an important strategic issue and not an operations decision to be made by the intern. In desperation, the intern finally ended up recommending an entirely new value proposition, a generative pull-strategy that led different customers segments along to places that fitted with their needs. That was a truly entrepreneurial feat, which however was not really acknowledged by the company because the people involved did not have the knowledge to appreciate what the intern suggested.

DISCUSSION

The reason for considering the use of business modeling methods is based on a key insight from the internship program - how the entrepreneurs handled a number of issues and relationships concurrently. That included financing, product development, marketing and sales, management and administration. The entrepreneurs had neither the time nor the money to concentrate on one issue at a time. Furthermore, they based their activities mainly on tacit knowledge. Formal business modeling could be a way for them to explicate their knowledge. It could also give the entrepreneurs opportunities for experimenting in a manner that is less costly that doing everything in real-life, without the structure and freedom provided by a learning process.

One would think that participatory business modeling could be a way for entrepreneurs to engage with other key stakeholders early in the process. It could possibly reduce some of the uncertainty by making it possible for each party to connect and reconnect their different types of knowledge, interests and concerns. However, there are some aspects of the early entrepreneurial situation that makes this extra challenging. This is because the content, the form and the premises of the process need to be worked out simultaneously. This is why I suggest experimenting with business modeling next time round in the internship program. The content-focused business modeling methodology needs to be supported with tools to steer the form and identify the premises of the processes.

The participatory base of the program also needs to be broadened. The pilot program was designed in such a manner that the participatory dimension only included the students. During the evaluation, the entrepreneurs, the interns and the supervisor expressed a wish to have earlier and deeper collaboration between interns and entrepreneurs as well as some form of entrepreneur-to-entrepreneur reflections. It would allow both entrepreneur and

intern to play around with the different elements that make up the company in a way that seem useful to both to help meet their different needs. Furthermore, it would allow them to spell out not only the content and details about the form, but also to reflect on the premises for participation. A process that involves interns and entrepreneurs should be relatively interest-free situation in which to begin to test out conditions for participatory business modeling in early entrepreneurial ventures. That which worked could then more easily be implemented directly.

The use of business modeling methods in the next program could then provide valuable insights on how such a process could be designed more broadly. A future possibility would then be to include other groups of stakeholders. This could either be done in the entrepreneur's place, or possibly in a business modeling lab. If designed with due consideration to the three key components of participatory business modeling, content, form and premise, the stakeholders could experiment with different configurations of the model, while at the same time developing the premises for their collaboration. This could possible save time and resources. It could also mean that the apparatus needed to realize the business model was assembled at an earlier stage than many entrepreneurs manage at present. These possibilities would need to be tested and explored and are therefore topics for further study.

ACKNOWLEDGEMENTS

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TRACK 5

PUBLIC PROCUREMENT OF PARTICIPATORY INNOVATION

CHAIRS

Max Rolfstam, Claus Have and Vlad Stefan Wulff

KEYNOTE SPEAKER

Sven-Eric Hargeskog, Affärskollegan

Policy-makers in the European Union have increasingly emphasised the role of public procurement as a policy instrument that can be used to stimulate innovation. This development responds to a growing concern among EU member states about how to maintain competitive advantage in an economic environment increasingly subject to global competition.

As a contribution to these emerging policies, this conference track aims to develop an innovation theory-based approach to public procurement of innovation.

In contrast to current institutional approaches in innovation studies, Participatory Innovation brings in the often neglected endogenous perspective and at the same time the perspective of emergence in contrast to mainstream systems thinking. This means moving beyond a simplistic legal debate ('this is not within the law'), but instead set out to reveal the possibilities within the legal framework already in place.

A central player in this pursuit is users. What kind of thinking and practice does it require to involve users for example within the public sector as sources of innova-

tion? The conference track attempts to outline how innovation theory extended with Participatory Innovation thinking and practice can inform both policies and concrete practices with a purpose to harvest innovation through public procurement.

This track brings together procurement researchers and practitioners from public and private organisations, who are interested in pursuing new angles of innovative and participatory procurement.

TRACKING THE DNA OF PUBLIC PRIVATE WELFARE INNOVATION

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ABSTRACT

Public Private welfare innovation - contributions to the identification of success factors of a new innovation paradigm

Rethinking public welfare will be a major task for all European welfare stats. One approach to these challenges is to form public private innovation projects – making public challenges, private opportunities.

Copenhagen Living Lab have worked with the public private innovation paradigm for the last 4 year, and recently concluded a short research project for the Danish Enterprise and Construction Authority (Ministry for Economic and Business Affairs) on the topic. It's not trivial to do this kind multi stakeholder innovation project across public and private domains. But organizing the innovation process around a shared interest in user needs will help…

In this analysis we have investigated the challenges that PPI projects are facing, and searched for the key that determines success.

INTRODUCTION

This analysis is based on research in how regions, municipalities & enterprises in cooperation has initiated and organized public private innovation (PPI) projects within the welfare domain.

PPI collaborations are characterised by a relationship between the participants, which can not be described as a normal buyer -supplier relation. The participating actors are to be understood as collaborating partners that engage in a joint development process that explore new innovative solutions on commonly defined problems.

(Analysis of public-private collaboration for innovation, EBST March 2009)

The concept 'development partners' raise questions. Who they are? What are the roles and relations in the different, in the different phases of a PPI project?

Beside the focus on relations, the selected cases have been studied investigated based on an understanding of PPI projects that they broadly include 3 stages:

1. Initiation - designation of the project's focus area
2. Project development - shaping and organizing a framework for development
3. Implementation of the development activities

Finally the PPI projects rationale and criterion for success has been seen as a matter of providing solutions with effect on three bottom lines:

1. Higher citizens welfare
2. Lower government costs
3. Growth opportunities for businesses.

BACKGROUND

This paper is based on practical experiences. In Copenhagen Living Lab we are practitioners. Our aim is to develop methodology and process that works for public and private organisations when engaging in innovation. We are trained as ethnologists, designers and innovation managers.

The thought traits we follow are ground in the emerging field of user driven innovation, service design and co-creation.

DATA AND METHODS

Qualitative interviews have been conducted among key stakeholder in six Danish Public Private Innovation ini-

Figure 1: Research design

tiatives.
The basis for the data material lies - in addition to Copenhagen Living Lab's own experience of working with the welfare innovation projects in collaboration between public and private partners as well as desk research in the field – in a thorough collection of data from six OPI cases that are selected according to cover diversity in both structure and content.
The 6 cases represent a geographical spread of Fredericia, Aalborg, Copenhagen and Randers and differ in terms of:

- approaches to public private welfare innovation
- the organizational embedding of project
- professional field or welfare domain

The 6 case study projects are presented briefly in the following gray boxes:

FREDERICIA SHAPES THE FUTURE (FSF)

FSF is a local strategic effort that seeks to develop radical solutions that address the full amount of public services, within the municipality. The project is also an attempt to make the municipality a more attractive workplace with a stronger innovation culture. The project is anchored with the municipal director (with the deputy municipal director as project secretary together with the personnel manager). The project has been implemented in cooperation with MidtLab and external consultants.

GABRIEL

Gabriel is a private hold company with about 90 employees and an annual turnover of 205 million DKK. The company develops and manufactures textiles and upholstery solutions, and has an innovative and value-adding collaborative customer approach. Gabriel has been trying to establish new relationship with the regional hospital as part of business development.

THE GOOD ELDERLY LIFE

A user driven innovation project aimed at developing new solutions that increase quality of life for residents in nursing homes. DGÆ is rooted in the Health and Care Administration (SUF), Copenhagen on Elderly center Sølund and implemented in cooperation with Copenhagen Living Lab. Moreover, a number of private firms have developed specific products and services as part of the project

MORE TIME FOR THE PATIENT

A regional council supported project at the Regional Hospital of Randers. The project counts on the subprojects "Future Smart Bed" in cooperation with MidtLab and "Self-cleaning toilets" in cooperation with a private design firm; ConceptMaking - both as OPI initiatives with the involvement of several private companies.

IDEA CLINIC

A project organization at Aalborg Hospital with the aim of turning hospital-related ideas or inventions in to products, that can be patented and sold, and concepts that can facilitate the daily work. The idea clinic cooperates with local business networks for technology transfer and commercialization.

DIGITIZING EVERYDAY STRUCTURE FOR PEOPLE WITH AUTISM (DESPA)

A demonstration project, supported by the Danish PWT Foundation (Investments in Public Welfare Technology; in Danish: ABT-fonden) with an aim of testing a handheld digital calendar (memo ActiveSync) on homes for adults with autism (or the similar traits), involving 80 residents and 80 staff in the metropolitan area. The project owner is the Social Services Department, City of Copenhagen (SOF), the technical project management is handled by Social Development SUS and Abilia (develop and produce ICT equipment) delivers the technology.

The different approaches to public private welfare innovation can be viewed as follows:
- In Fredericia municipality the total portfolio of public tasks represent the subject of innovation.
- Similarly the Idea clinic is an initiative that relates to ideas from employees, from all parts of the hospital.
- The good elderly life is an example of a domain-specific innovation platform that is used to generate a variety of development projects, all aiming to enhance quality of life for elderly people in nursing homes.
- The innovation initiatives in Randers include two development projects, both of which are embedded in the overall vision of 'More time for patient'.
- DESPA is also domain specific, but it directly targets to test and demonstrate the effect of a concrete solution: Memo-Active.
-The Gabriel case represents a blueprint for a development cooperation initiated by a private company.

The organizational anchoring of the projects is as follow:

- FFF is anchored at top management level.
- The Idea clinic is part of Aalborg Hospital and serves as an independent entity with its own innovation leader.
- The good elderly life and Despa are rooted in domain specific administrative offices on municipality level.
- The projects in Randers, is headed by a project manager, placed as staff function at board level (Finance) in collaboration with an outside counsel.
- Finally, Gabriel is a private limited company that has established an innovation department with responsibility for contributing to business development.

The various domain professionals and welfare domains related:

- FSF is a strategic executive-driven project with principle focus on the entire municipal operation.
- The Idea clinic jumps out of a scientific research-based tech transfer tradition.
- The good elderly life is based in a SOSU dominated health care environment
- The Randers projects operates in a nursing-professional context.
- Despa is rooted within the childcare domain.

The cases represent different relationships between public and private partners:

- FSF has primarily used private development consultants, but expect at a later stage to involve private players in solution development.

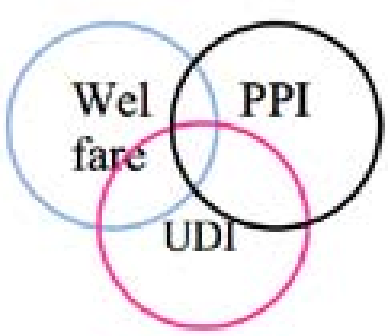

Figure 2: The nature of public private welfare innovation

- Idea Clinic collaborates with a wide range of private businesses, primarily in the role as producers.
- The Good elderly life, is partly driven by private innovation consultants, and incorporates on the solution side collaboration with 7 different companies.
- Randers hospital cooperates with a consortium of several private companies, with a manufacturer as main supplier.
- In the Despa project, an inter-municipal development consortium buys products and services from four different companies.

RESULTS

Based on the study five different generic approaches to PPI have been formulated, based on whom is initiating, the subject of innovation and the actor's motivation:

1. Vision driven
2. Service driven
3. Demand driven
4. Business driven
5. Patent and test driven

Potential and effect of PPI project may depend on approach.

Successful public private welfare innovation projects need to have a grip on:

1. Public Private Innovation (PPI) (framework & process)
2. User driven innovation (UDI) (method)
3. Welfare challenges (purpose)

An overall grip can lead to the formulation of strategies for PPI on welfare issues that relate to:

- Program Level
- Institutional & organizational level
- Project Level

In the following the different dimension will be unfold, and finally an overall strategy for PPI on welfare will be formulated.

PPI

Designing successful PPI projects is question on how to establish a f*ramework* that increases the likelihood of public and private actors shaping PPI *development partnerships*, and how to stimulate the *design, organization and implementation* of PPI projects that increase the chance of developing *value-added solutions for all stakeholders*.

A key issue seems to be who is initiating the projects, how appropriate partners are found and decide on.

The study shows that if PPI projects on welfare are to deliver in line with the challenges ahead, there is a need for a more efficient stimulation of private companies' participation in radical welfare innovations. This will require a better understanding of 'multi stakeholder alignment'.

A firm understanding of the innovations paragraph associated to PPI is necessary:

- The need for addressing the three bottom lines has to be explicit, understood and accepted.

To some extent citizens have a tendency to view quality of welfare as a matter of resources. More resources equal higher quality. This view also applies for many welfare professionals.

On the other hand most private companies see the public sector as the paying customer, when engaging in PPI. This potentially creates projects that increase public cost instead of decreasing them.

- Addressing three bottom lines simultaneous increase the project complexity. PPI projects have a strong need for multi stake holder alignments. The driving interests behind collaboration must be clear and acknowledged.
- The alignment of stakeholder interests is best meet when applying user centered & iterative methods. Taking the users perspectives create opportunities for finding a positional match, between public and private stakeholders.Aligning interests among different types of partners is enabled through the creation of new reframed positions build on user insights.

The financial and legal framework supporting the collaboration has to be clear. Many issues relating to competition and state aid may arise. But also perception of how to frame PPI projects may cause barriers for success.

- It seems critical for projects addressing welfare challenges, to initiate the process with *a problem investigation focus.* Surface appearance of the problem seldom contains the insights necessary for identifying possibilities for new radical solutions.

There is a lack of funding opportunities for this kind of *projects (Darsø 2001) or reframing (Normann 2001*), and there maybe also be a limited understanding of the necessity.

It is notable that a broader problem investigation project can create insights that are useful beyond local challenges. This might add to the understanding of the lack of local motivation for initiating – and represent a potential for coordinated efforts beyond the limit of municipalitries.

Ethnographic methods provide a useful tool for the initial problem investigation, reframing welfare challenges.

- On the legal side the EU promoted framework of *Pre Commercial Procurement* (PCP) represent a potential valuable legal framework for PPI projects, as it can help project overcome issues relating to competition and state aid. Still this framework builds on the premise, that a clear

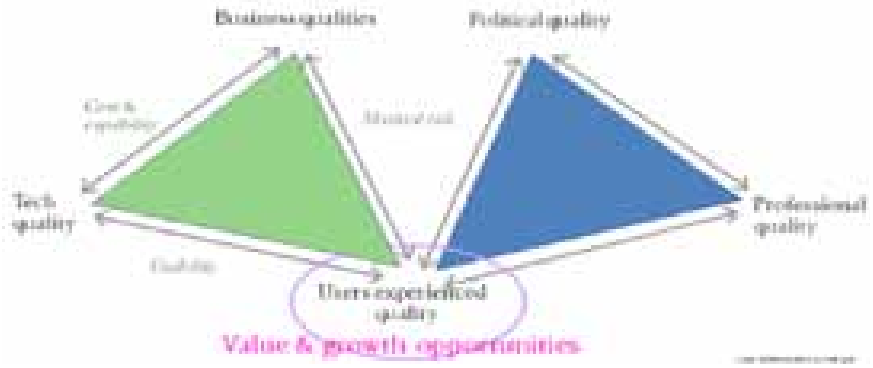

Figure 3: The user perspective as point of alignment

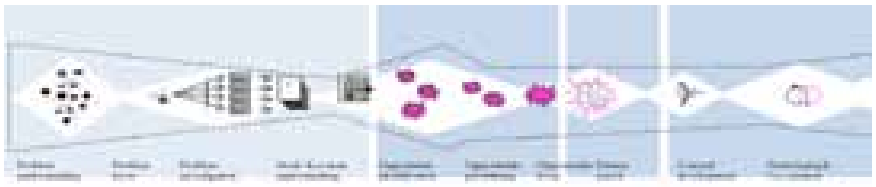

Figure 4: PPI main phases and key activities

problem understanding is available from the set out.

The PCP framework seems to have its root in a natural science research tradition. For that reason there might be a need to adapt the framework to the welfare domains, which are more related to humanities and social sciences. Welfare can to a high extent be characterized as services - more than products.

The PCP framework suggests, in its original format, participation of multiple developers in parallel. This approach may be too expensive for local PPI projects. But combined with an initial *problem investigation projec*t PCP provides a valid framework for larger projects with a clear ambition of scalability.

- *Competitive dialogue* represents a better understood and less complicated framework for collaboration characterized by a high degree of uncertainty, in 1:1 projects. The tender form "competitive dialogue" is a crossover between an ordinary restricted demand and negotiating. Competitive dialogue can be used by public entities when they are dealing with complex contracts.

Competitive dialogue enables the provision of an intended purchase, and can, for example by using phase separation pave the way for development (phase 1) and the purchase of a pre unknown solution (phase 2).

The PPI process.

PPI project can be seen as consisting of four main phases:

1. Problem investigation & project development
2. Opportunity identification
3. Partner search
4. Solution development

An equal focus on all phases is important for success. The management and facilitation of the process represent specific competences – complex (iterative) project management, multi stakeholder alignment, service design and user driven innovation - which are to be acknowledged, by both private and public partners.

UDI

User-driven innovation (UDI) is about increasing the chance of success when innovating, by leading the process on the basis of insight into user needs.

A user driven innovation process shall produce knowledge on user needs and involve users in the development of new solutions.

The methods and tools of user-driven innovation are after years of practice relatively well-known, even do the number of well trained business practitioners is still limited.

The critical issue when applying UDI methodology to public private welfare innovation is the ability to choose and exploit tools according to PPI phases and project scope. Another critical issue related to that, is the ability to scope PPI project according to an innovation strategy.

- Innovation Strategy:

There is a lack of well developed welfare innovation strategies. This lead to an even lesser developed strategy for PPI in the welfare domain. The lack of strategies for welfare innovation may be related to the relatively weak understanding of service innovation.

Applying a service view on welfare innovation reveal four overall approaches to service innovation *(Bettencourt 2010)*:

1. New service innovation
2. Core service innovation
3. Service delivery innovation
4. Supplementary service innovation

- If we consider innovation the process of creating boundaries that define a space, which direct the search for relevant combinations of technology (in the broadest sense), the innovation strategies provide the scale by which projects are framed. Innovation strategies must provide a framework that leads the projects towards relevant combinations. It does so by defining objectives and gaming rules. PPI, as described above, can be seen as a set of rules. The objectives define the 'landscape' to be explored, and depend on the strategic ambitions: Radical changes, new services, enhancements, improved delivery options or reduced costs?

Depending on strategy the scope of a project will be broad or narrow.

A narrow project scope seems to be preferred as it is easier to envision the outcome. This means that PPI project may be limited to help *existing public services* to increase quality or cut costs

- taking a value chain approach.

To enable radical project it is necessary with a broader scope – preferable a value star approach.

- A better understanding on how to formulate welfare innovation strategies and how to use the right UDI methods can reduce the perceived risk in radical innovation projects. This may contribute to the necessary raise of the bar.

Applying Innovative ethnography *(Copenhagen Living Lab, 2009)* make it possible to gain a deep understanding of causes underlying the challenges from the individuals point of view, identifying opportunities trough reframing and guiding the solution development.

WELFARE CHALLENGES

It can, from a rational perspective, seem important to identify and prioritize the key welfare problems, to get the most out of development resources (value for money). But maybe the key challenges are evident?

A Danish magazine *(Mandag Morgen. 2010)* has formulated the overall challenges as follow:

- Bridging the welfare gap: How do we create coherence between public expectations and the wealth that comes?
- The inclusive society: "How do we create a more effective prevention effort in the social sphere?

Figure 5: Value chain vs. value star

- Knowledge and Growth: "How do we develop an elementary school, which matches the future need of society and students'?
- Hands enough: How can we get people, who for one or more reasons are out of work, in employment today?
- Healthy relationships: How do we create coherence in the health sector and between health and other related sectors - in example for elders so they experience seamless process?

At an overall level the challenges are obvious, and prioritization may not create added value.

But beneath the top level challenges a number of key problems are to be identified and prioritized, in order to address the complex welfare problems. There are a number of characteristics and cultures that influence the amount and type of potential PPI projects within the respective welfare domains *(own analysis of ABT project portfolio, 2010)*. The various conditions and characteristics within the different welfare domains means, that PPI projects might benefit from a domain specific designed. There seem to be very different starting points for PPI projects depending on what welfare domains, they are realized within.

The major areas of welfare consist of tasks which are defined in relation to:

- Children & youth care, development and training
- Assistance for mentally, physically or socially disadvantaged
- Treatment of sick
- Assistance to elderly

These are all tasks which deal with various kinds of services. Services understood as someone assisting others with something - typically undertaken by people, for and with people.

The analysis has identified four prominent welfare cultures:

1. The administrative culture where overhead is reduces trough the use of IT & digitalization
2. The repair or treatment culture, where citizens are cured by means of devices and drugs
3. The compensating or caring culture, where citizens get help in doing things they themselves can not and utilize aid devices
4. The educational culture where people are stimulated to grow by means of progression plans, sensory stimuli, and processes

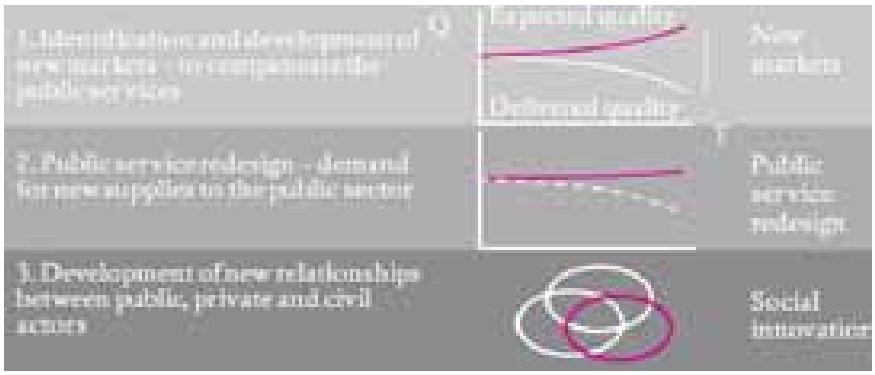

Figure 6: An overall strategy for welfare innovation

The way welfare PPI has been developed so fare has left most of the potentials within the educational culture untouched.

A new service paradigm for PPI is needed, if we are to realize the full potential.

MARKET, GOVERNMENT & FAMILY

In the end welfare innovation has to bee viewed in relation to the most fundamental design criteria – who is providing welfare?

If we are to form radical new solutions, we have to reconsider the distribution of welfare tasks between market, government & family.

Strategies for public private welfare innovation need to be aware of the full scope of means for forming the welfare of tomorrow.

TOWARDS AN OVERALL WELFARE STARTEGY

The analysis suggests a set of PPI principles to be used to outline possible models for organizational structures to facilitate the expansion of PPI with in the welfare domain.

The principles suggest that PPI models shall:

1. Stimulate real collaboration process involving public and private actors.
2. Provide solutions to welfare problems.
3. Frame and organize cooperation that ensures the development of mutually valuable solutions.
4. Adapt to the different welfare areas specific culture.
5. Focus on needs of citizens and increase the perceived welfare, regardless of vendor.
6. Help to define the 'real' scope and align scope and methodology.
7. Apply citizen-centric methods.
8. Address problem investigating and platforms for citizen involvement as infrastructure

The sustainable welfare solutions of the future will most of all depend on citizens' and users' experiences and behaviour – and only secondly on how the professional system is designed within.

This triggers the need for:

- Radical solutions
- Avoiding making existing services the starting point
- A plurality of new solutions.

ENDOGENOUS INSTITUTIONS FOR USER-PRODUCER INTERACTION IN PUBLIC PROCUREMENT OF INNOVATION

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ABSTRACT

Since the turn of the century European policy makers have been changing their focus in innovation policy from supply side measures to demand side measures and specifically on how public procurement can be used to stimulate innovation in the European Union. This is a response to increasing concern for how the European nations can maintain their competitive advantage and maintain their welfare in the globalized economy with ever aging populations. This paper is based on innovation theory and uses institutional focus to investigate public procurement of innovation. Recent work in this field has focused on endogenous institutions rather than exogenous and this paper deals with how endogenous institutions in the context of user-producer interaction influence public procurement of innovation. The preliminary results of the empirical studies cited in this paper suggest that the endogenous institutions in user-producer interaction need to be understood better in order to understand the institutional set up that enables public procurement of innovation.

INTRODUCTION

The focus on public procurement of innovation as a tool to stimulate innovation has been growing in European Union policies and as a field of research. The interest of the European Council was made clear in the Lisbon strategy for growth and jobs in 2000 where innovation is claimed to be an essential link in order for the European Union:

> *"… to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion."*
> (European Parlament, 2000)

The underlying assumption is that innovation *"is a key element in national economic growth."* (Lundvall, 2010)

Early research into why public procurement of innovation was not being utilized more as a tool to stimulate innovation in the member states of the European Union focused on the idea that the EU directives were a prohibiting factor. Several different researchers (i.e. European Commission 2005, Rolfstam 2008) have shown that public procurement of innovation can take place in accordance with the directives and that they are not prohibiting it. In later years several researchers have turned their focus to endogenous institutions that govern public procurement of innovation. As innovation is an interactive process the endogenous institutions were seen as a possible source of the difference between success and failure in cases of public procurement of innovation. Rolfstam (2008) has shown that, at least in some cases, endogenous institutions can hinder public procurement of innovation. He researched a case where several different public organizations failed to conclude a public procurement of innovation as there was a mismatch in their institutional set up.

User-producer interaction in public procurement of innovation is based on communicating both user needs and technological opportunities and the participants in this interaction need a common code of communication to efficiently work together towards a common goal (Lundvall, 2010). User-producer interaction has three forms, exchange of products, exchange of information and cooperation (Lundvall, 1985), all these forms of interaction include interactive learning and are therefore influenced by institutions (Johnson, 2010). Understanding how different endogenous institutions in user-producer interaction influence the outcome of public procurement of

innovation is therefore important and a step in building up an institutional set up that facilitates success. This paper sets out to contribute to this understanding. The research question can be formulated as: How do endogenous institutions help or hinder user-producer interaction in public procurement of innovation? The empirical material consists of two case studies of public procurement.

FRAMEWORK OF REFERENCE

In 2002 the European Council stated that in order to achieve the goals in the Lisbon agenda a stronger action was needed in Europe. The suggested action included setting the target for public and private research and innovation spending at 3% of gross domestic product (GDP) by 2010 (European Commission 2002). An independent expert group headed by Luke Georghiou, working for the European Council identified public procurement as an effective tool to stimulate private sector R&D and innovation by creating a demand for innovative products. Georghiou et al. claimed that lack of private sector R&D was one of the factors where the European countries should do better in order to achieve the levels of innovation needed to secure high quality public service in Europe (European Commission, 2003a). The Union responded in 2003 by including public procurement of innovation in the European Commission Research Investment Action Plan as one of the methods to stimulate innovation (European Commission, 2003b).

Sins 2003 the EU has repeatedly encouraged the member states to implement public procurement of innovation in order to realize the goals from Lisbon and Barcelona of raising private sector R&D. Several of these include models, best practice advice and principles of how to realize public procurement of innovation in accordance with the EU directives (Edler, et al, 2005, CBI innovation brief 2007, Edler and Georghiou, 2007, Hommen and Rolfstam, 2009). One of those reports is from an independent expert group chaired by Mr. Esko Aho that presents a strategy and necessary steps to create an innovative Europe in order to support a sustainable growth. Aho et al. lists 5 reasons for why EU needs to step up in innovation; productivity in the EU continues to fall further behind the levels of USA, application of information and communication technology is to slow and far behind USA, EU is losing out as large firms globalize their R&D, Europe's lock-in in unmodernized traditional sectors and under-investing in service R&D, and aging population that will decrease the working population at the same time as the dependency ratio is rising sharply.

An independent expert group headed by dr. Aho suggests some changes that need to be implemented to raise levels of innovation in EU and which sectors to focus on. The report suggests a pact based on creating a market for R&D and innovation, supplying necessary resources and increased structural mobility (Aho, Cornu, Georghiou and Subirá, 2006). A communication from the Commission to the European Council in 2006 further emphasizes the problems that the European nations are facing in stimulating innovation. It claims that there is a lack of conversion from innovation into products and patents that lead to jobs, that there are many small innovative start-up firms in Europe but few of those grow into globally successful companies and that in some sectors, such as financial services and distributive trades, innovation has failed to bring productivity gains (European Commission 2006).

Public procurement of innovation has become a focus point in the last few years but it is by no means a recent idea. Several empirical studies in the 1970s investigated the connection between public procurement and innovation and they found that over longer time periods demand side stimulation of innovation through public procurement to be more effective than supply side R&D subsidiaries (Edler and Georghiou, 2007). Results of a 2005 innovation survey done in the UK by the Confederation of British Industries (CBI), states similarly that demand pull through public procurement of innovation is much more effective in stimulating innovation than supply push methods, though important (CBI innovation brief, 2006). The recognition of the effectiveness of demand side innovation stimulation has regrettably not resulted in systematic use of public procurement of innovation. Edler and Georghiou (2007) claim that this potentially major driver of innovation has not been recognized in government policies that have focused on supply side stimulation. The emphasis on supply side measures rather than demand side innovation stimuli was also pointed out by Rothwell back in 1981 when he compared the innovation policies of 6 industrial countries (Canada, Japan, The Netherlands, Sweden UK and USA). Rothwell found that all these countries focus on supply side measures (technical or financial), most place some emphasis on SME's, and only 3 countries (Canada, the Netherlands and USA) recognize demand as an important tool to stimulate innovation (Rothwell, 1981).

Current development is both on EU level and in individual member states as many of them have innovation policies that include public procurement of innovation under development or have recently developed such policies. Countries that have already incorporated public procurement of innovation into their innovation policies include UK, the Netherlands and Germany (Rolfstam, 2009). Georghiou and Cave state that several of the EU member states are developing methods of public procurement of innovation that show the benefits of a systematic approach. They find that a key to success in public procurement of innovation as a system are trained professionals that can play the role of intelligent customers and have understanding of technological trends and markets and can specify functional requirements and evaluate offers in terms of whole-life cost (European Commission, 2005).

PUBLIC PROCUREMENT

Public procurement of innovation has been recognized to be an important tool in stimulating and directing innovation and procurement decisions will influence innovation even if governments have no specific innovation policy of doing so (Dalpé, DeBresson and Xiaoping, 1992). Governments wield a lot of purchasing power through their spending on works, goods and services which can be used to stimulate innovation. Average total expenditure on works, goods and services in countries in the European Union is

over 17% (17.23% in 2008 rising from 16.37% in 2004) of total GDP and the total expenditure in the EU27 in 2008 was 2.155,48 billion Euros (European Commission, 2010).

Edquist and Hommen (2000, p.5) define public procurement of innovation as being something that...

> *"…occurs when a public agency acts to purchase, or place an order for, a product – service, good, or system – that does not yet exist, but which could (probably) be developed within a reasonable period of time, based on additional or new innovative work by the organization(s) undertaking to produce, supply, and sell the product being purchased."*

This definition includes both public procurement of innovative goods and pre-commercial procurement of R&D services.

The lack of innovation friendly market and the fragmentation over national borders is a major barrier for company investment in R&D in Europe and public procurement of innovation can be used to remedy this (Aho, Cornu, Georghiou and Subirá, 2006). Dalpé, DeBresson and Xiaoping (1992) argue that the importance of public demand for innovation includes that governments are important customers for high technology, especially in sectors such as healthcare, defence and communication and that in some cases cost considerations are secondary to performance when social or political goals are at stake. This makes governments important as first users of innovations. The role of a first user is not only that to express a need for innovative solutions but also to participate in final product adjustments. Dalpé, DeBresson and Xiaoping (1992) investigated the scope of public procurement of innovation in Canada and found that the public sector was found to be the first user of 25% of innovations with hospitals, electrical energy, deafens, federal administration, railway transport and telephone systems as primary users. The importance of public procurement differs greatly between sectors and is of major importance to relatively few.

Hommen and Rolfstam (2009) claim, that both literature and research on public procurement of innovation have mostly viewed the process as transactions that are evaluated from the standpoint of the public procurer as a buyer. They claim that this looks past the variety and change in the interaction between users and producers and another approach is needed. Hommen and Rolfstam suggest a taxonomy that can be used to better understand different types of public procurement and the user-producer interaction that takes place in public procurement of innovation. The taxonomy is based on the two main dimensions of interaction and evolution of the market and related sub-dimensions.

REGIONAL SYSTEMS OF INNOVATION

According to Cooke (1998) the concept of Regional systems of innovation is a relatively new one, only developing sins 1992 and had its origin in research on national systems of innovation (NSI) and the findings that there was no single identifiable model of NSI and that researching the systems part was difficult on national level.

Cooke (2004) claims that the interest for regional systems of innovation (RSI) in Europe was driven by the idea that it offered solutions to problems such as the fact that even though excellent research and publication were carried out in Europe they were not being exploited commercially, and even worse, they were being used as a foundation for innovation in other countries, mainly USA. A second problem that RSI was seen as a possible remedy for was that the majority of innovations that were exploited were in market failure in advanced business services.

Lundvall (2010, p.13) defines systems of innovation this way;

> *"The narrow definition would include organisations and institutions involved in searching and exploring... The broad definition...includes all parts and aspects of the economic structure and the institutional set up affecting learning as well as searching and exploring..."*

The broad definition includes public procurement of innovation as a part of innovation systems as it will affect learning, searching and exploring of new innovative solutions for needs. Lundvall also stresses the importance of knowledge as "the most fundamental resource in the modern economy" and that it follows that learning is the most important process. He claims that learning is predominantly an interaction between people in a social system and can therefore only be understood through studying the institutional and cultural context in which it takes place. Elements in a system of innovation can both reinforce each other or block processes of learning and innovation.

Systems of innovation, national or regional, are fundamentally constructed of two elements; the structure of production i.e. the industrial set up and dynamics of the production in the area and the institutional set-up that includes the socioeconomic and political institutions that influence the technological and production processes (Borrás, 2004).

As public procurement of innovation is a part of innovation systems it is important to understand the circumstances that support innovation i.e. when the elements of the system of innovation reinforce each other and also when they act as a hindrance to innovation.

INSTITUTIONS

Research focusing on why public procurement of innovation is not utilized more as a tool to stimulate innovation have focused on different aspects of the institutions that govern public procurement, both exogenous and endogenous (Rolfstam 2007 and 2009, Edler et al. 2005). A research done by the Confederation of British Industry form 2006 points out different problems that UK firms find to be barriers in their dealings with public procurers, it states that the firms in the survey find that the government does not do a good job of public procurement of innovation, including that they are too risk averse, lacking in procurement skills, do not foster innovation and that current procedure threatens the intellectual property of the firms (CBI innovation brief, 2006).

The following definition for procurement of innovation is from an expert report for the European Commission (2005, p.5) headed by Georghiou and Cave.

> *"Procurement for innovation' - that is the purchase of goods and services that do not yet exist, or need to be improved and hence require research and innovation to meet the*

specified user needs."

Public procurement takes place as an interaction between the public procurer and supplier(s) that have a solution to the problem, or need, of the procurer. Rolfstam has pointed out that this interaction is bound by institutions and that when investigating why public procurement of innovation is not being implemented more, it can be helpful to use and institutional approach. Rolfstam claims that even though research has indicated that public procurement of innovation can be a useful tool in stimulating innovation the literature on the subject does not deal with what kind of an institutional set up is innovation friendly and that more research is needed in this area (Rolfstam, 2009). Institutions have been defined in different terms; North (1990, p.3) offers this definition;

> *"...institutions are the rules of the game in a society ... that shape human interaction."*

Traditionally much of the research on institutions has viewed them as constraints on organizational behaviour. The new institutionalism, taking shape in recent years, has focus on the field level, organisations work both in competitive and cooperative exchanges the attention is on the structure of relations and formulation of logic (Powell, 2007). Institutions can also function as assets, Rolfstam (2009) states that institutions, both exogenous and endogenous, exist to reduce uncertainty and that they act as cognitive shortcuts as they relieve people from mentally working out a solution to every problem, every time it occurs. He claims that social systems would not be able to accumulate knowledge or have meaningful communication without institutions and could therefore not sustain innovation. Johnson (2010) has a similar viewpoint as he claims that institutions provide the stability that is needed so that change, also technical change, can take place. He claims that institutions are even important for radical innovations as they provide the habits, formal and informal rules of engineering and scientific work that frees up time to do creative thinking. Routines in dealing with innovative work also help in dealing with major technological decisions.

The viewpoint of the new institutionalism is helpful when investigating the influence of institutions on public procurement of innovation as it is important to investigate both the competitive and cooperative exchanges in the process. Lundvall claims that institutions do not only provide economic agents with guideposts for action but that they help economic systems to survive the uncertainty and risk that is included in economic life characterised by innovative activity (Lundvall, 2010). The way institutions influence change is through their influence on learning, it is not possible to communicate, think or act in any field of knowledge without being influenced by the institutional set up (Johnson, 2010).

Drawing on North´s definition of institutions as the "rules of the game" Coriat and Weinstein (2002, p.283) distinguish between a type 1 and type 2 institutions, which will for the purpose of this research be referred to as exogenous and endogenous institutions respectively. Exogenous institutions (type 1) are *"based on criteria of authority and enforcement posed on all the agents"* typically these institutions are formal laws that cannot be waived. Endogenous institutions (type 2) are *"private collective agreements between groups of agents"* these institutions are typically the rules that individuals enter into on their own accord such as contracts they decide to sign and customs they follow.

The exogenous institutions in public procurement of innovation in the EU countries are the EU Public Procurement Directives 2004/17/EC and 2004/18/EC. The directives require that a public procurer advertises new contracts on EU level that all bids have to be evaluated on pre-published criteria and that the procurer provides information on the decision that is made (European Commission, Public Procurement Legislation, 2004). Any investigation into why public procurement of innovation is not being implemented more from an institutional view point includes understanding how applying to the directives influences public procurement of innovation (Rolfstam, 2009).

Research has shown that public procurement of innovation is possible to achieve within the boundaries laid out by the EU directives. In an independent experts report done for the European Commission Georghiou and Cave claim that; *"The gains from procurement for innovation can be realised within the new European directives for public procurement."* (European Commission, 2005, p.5) They go on and point out areas where these gains can be realized, including dialog between customer and supplier that can be used to structure the procurement process and include technical dialogues in preparation for tenders, the possibility of utilizing functional or performance-based specifications in tenders that allows for different solutions from the suppliers and the possibilities of transferring intellectual property to suppliers.

Different bodies of the EU have also published several papers with guidelines for how public procurement of innovation can be carried out in accordance with the directives. These include a paper on pre-commercial procurement that sets forth a stage model of how pre-commercial procurement can be done without counting as state aid, securing risk-benefit sharing between a public procurer and supplier, competitive development and separation of the R&D phase from deployment of commercial volume of the end products (European Commission 2007a). Another example is a 10 step guide on how to secure innovative public procurement within the parameters set by the directives (European Commission, 2007b). This list also includes a report done by Edler et al (2005) for the Fraunhofer institute for the European Commission that identifies 5 stages in the procurement cycle and draws lessons from the 9 cases about implications for public procurement of innovation for each stage.

Endogenous institutions that influence public procurement of innovation have been found to be a possible source of hindrance in some cases. Rolfstam (2009) has researched the effect of endogenous institutions in public procurement through 3 case studies representing both success and failure with regards to public procurement of innovation. He finds that reasons for failure in public procurement for innovations can, at least in some cases, be caused by institutions such as endogenous mismatch among stakeholders, lack

of technology champions, organized scepticism and so on. Rolfstam claims that instead of fighting for changing procurement law efforts should be made to improve the institutional set up.

USER-PRODUCER INTERACTION

Theory of institutional economics traditionally identifies three generic functions for institutions in the economy; to reduce uncertainty as they provide the economic actors with rules, norms and traditions of how to act in given situations, they manage conflict and cooperation between actors and they provide incentives (North, 1990). This makes institutions important in research of user-producer interaction in the process of public procurement of innovation as this interaction includes all these functions. Processes of public procurement of innovation as well as pre-commercial procurement include competition between firms as they compete for being awarded the contract with the public procurer, it includes cooperation between the procurer and supplier and possibly between suppliers and the process includes incentives. Institutions also play a major role in the innovation process (Borrás, 2004).

When viewing innovation from the perspective of user-producer perspective Lundvall (1985, p.5) has defined innovation as; "*… the result of collisions between technical opportunity and user needs.*" He states that this implies that innovation units do need information about user needs as well as of technical opportunities.

Public demand for innovation has both a quantitative and a qualitative side as pointed out by Gregersen (2010). She argues the quantitative aspect is a centre aspect of research into how public procurement can be used to stimulate innovation. It is not only central as an incentive for private firms to invest in R&D but also in infant industries and in maintaining strong home markets. The qualitative aspect of public demand for innovation focuses on user participation. Lundvall (2010) has stated that the interaction between users and producers is at the heart of product innovation and will therefore be affected by the structure of production and the institutional set up. This happens at different levels, user-producer relationships are defined by the structure of production, the institutional form of these relationships is a reflection on the characteristics of the process of innovation, the rate and direction of innovation is affected by the institutional set up and the relationships are shaped by both distance in culture and geographical distance.

The interaction between user and producer takes place at all levels of public procurement of innovation from the discovery and statement of need through the purchasing process, innovation and product development, final product adjustments and finally after sale evaluation (Dalpé, DeBresson and Xiaoping, 1992) Urban and von Hippel (1988) emphasise the importance of the user not only as a source of the need the producer aims to fulfil but also as a source of input regarding possible solutions to that need. They claim that users are in some cases the actual developers of solutions such as in the case of scientific instruments where 82% of the products on the market were found to be developed by the users. Urban and von Hippel define lead users to be buyers of a novel or enhanced product, process or service and that;

> - *"Lead users face needs that will be general in a marketplace – but face them months or years before the bulk of that marketplace encounters them, and*
> - *Lead users are positioned to benefit significantly by obtaining a solution to those needs.*"
>
> (Urban and von Hippel, 1988, p.569)

One of the fundamental ideas of public procurement of innovations is that the public procurer, and or user, can take on the role of lead user and in that way influenced the process of innovation. Dalpé, DeBresson and Xiaoping (1992) found that in Canada the government is the first user of 25% of all innovations in some sectors. Lundvall (1985) states that even though the level of cooperation will vary there will be at least some level of cooperation between the user and producer in most innovation projects. He claims that this will increase the level of risk perceived by the user as he is not only purchasing a product with uncertain properties, with uncertain outcome he is also depending on the producer.(1994) Related to this is the finding made by Dalpé that an important factor in public procurement of innovation is the technical capacity of the user. Users with high technological capacity and that are innovative, force suppliers to innovate they are better at communicating their needs to the suppliers in a meaningful way and have the technical capacity to support the innovation.

A working group report written for the European Commission in 2006 deals with how public procurer in the member states of the European Union can within the framework of the directives take on the role of a first user (the report uses the phrase first user in similar fashion as Urban and von Hippel have defined a lead-user) through both public procurement of innovation and pre-commercial procurement. The authors emphasise the importance of sharing of both risk and benefits between the public procurer and the supplier in this process (European Commission, 2006).

PROCUREMENT CASES

This research includes the study of two cases and interviews with experts in public procurement of innovation which is to be carried out in October – December 2010. The first case (case 1) deals with procurement of self service postal kiosk in Denmark and the second case (case 2) an attempt to sell energy saving light bulbs for streetlights to the municipality of Søderborg in southern Denmark. 6 stakeholders that have participated in the two procurement cases will be interviewed. Interviewees include procurers, project managers, engineers and managers.

Case 1 was selected because it is a case of innovation that was initiated by the buyer and carried out by a supplier in order to fulfil a need from the public buyer and that can be described as a successful public procurement of innovation. Case 2 was selected because it is a case of a firm carrying out an innovation and then attempting to sell it to a public buyer to fulfil a need expressed by the buyer and that can be described as unsuccessful. The two cases give different insights into buyer-supplier interaction during the procurement process and the importance of endogenous institutions in the process.

The cases in the research have been chosen based on the perceived informational richness they offer. With a focus on institutional barriers for innovation, cases that will be chosen may make out either examples of successful public procurement of innovation and/or less successful cases. The research is explanatory, dealing with how endogenous institutions influence the communication between the procurer and the supplier in public procurement of innovation emphasizing the role of communicating need for innovation and in that way influences the outcome of the process.

GATHERING OF DATA

To increase the reliability of the research a case study protocol was developed before the data was gathered (Yin, 2009). The interviews will be semi-structured so that even though an interview guide with topics and questions will be used it should only be seen as a guideline for the topics that should be covered during the interview. The purpose of these interviews is to gain an understanding of the reality of the interviewee and it is important to have a balance between the control of the interviewer, which has the purpose of securing that the necessary topics are covered in the interview, and a flexibility that allows the interviewee to set forth his/her opinions and information (Darmer, 1996). Transcripts of interview recordings and preliminary case reports will be delivered to interviewees to increase the internal validity (Yin, 2009). Data will also be collected through documentation such as tender material, correspondence and reports. Relying on different sources of data will increase the internal validity of the research (Yin, 2009).

PRELIMENARY RESULTS

CASE 1

Case 1 deals with how Post Denmark A/S purchased a self service postal kiosk. Post Denmark was at the time a limited company where 75% of the stock was owned by the State of Denmark (Post Danmark, 2010) and the company therefore, had to apply to the current legislative set-up for public procurement, i.e. the EU Public Procurement Directives 2004/17/EC and 2004/18/EC. The project started in 2005 when Post Denmark approached aCon A/S with ideas on developing a self service postal unit and is still running as final delivery has not taken place. The requirement specifications in the tender called for a self service postal unit where customers could handle all transactions that take place in a smaller post office. The unit should be able to measure and weigh letters and parcels for domestic and foreign destinations and calculate the postage. The customer should be able to pay the postage with a credit card and receive all the necessary stamps, labels and stickers as well as a receipt. The unit should also allow the customer to keep track of the letter or parcel (track & trace). At this time there were no available solutions on the market that could deliver all the aspects that Post Danmark required from the unit. The innovation is in combining all the factors in one unit and in the user friendly software that was created by aCon.

The procurement process was in three steps, two steps of pre-commercial procurement and a procurement phase with an EU tender call issued in 2008. The two pre-commercial steps included development and writing of requirements specifications in 2005 and a pilot program in 2006 that included delivery of 6 self service postal units. These two steps did not go to tender as the amount of the contract signed with aCon was under the threshold limit of the EU directives. When the tender went out in 2008 five companies committed a proposal. Two of the proposals were excluded early on as they did not fulfil the requirements specifications and negotiations with the remaining companies lead to a contract between Post Danmark and aCon being signed in February 2009. aCon delivered 30 self service units to Post Danmark in 2009 the contract also included that aCon should deliver up to 500 units in 2010 but Post Danmark has not ordered any units this year.

Preliminary results from this case indicate that the origin of the need for an innovative solution influences the buyer-supplier interaction in public procurement of innovation. The initial need for a self service post kiosk came from a department within Post Danmark which initiated the cooperation with aCon on developing the requirement specifications. During this stage in the process there was cooperation between the buyer and supplier and interactive learning took place. In the second stage, the pilot project, the supplier needed interaction with other departments within Post Danmark that had not been a part of defining the initial need which influenced the communication between them partially because the departments have different goals and the institutional mach between the supplier and buyer was not the same when interacting with different departments of Post Danmark. The results also indicate areas of mismatch of endogenous institutions between the buyer and supplier organizations centring around; difference in the goals the process is to achieve, the difference in size and complexity of the organizations and difference in understanding of the time frame of the project.

CASE 2

The second case deals with an attempt by the small entrepreneur firm Design Peak to sell intelligent LED base light bulbs for street lights to the municipality of Sønderborg in Southern Denmark. The project started in 2009 when Design Peak approached the mayor of Sønderborg with an idea of creating a light bulb that would lead to considerable savings in electricity used for lighting footpaths and bike lanes in the municipality. At that time Sønderborg was participating in different projects that had the purpose of saving energy for both environmental reasons as well as cost savings. In 2010 Design Peak and Sønderborg started a trial where intelligent LED light bulbs were tested in street lights in the city. The test has proven to be a success, never the less the municipality has no plans for going on to a pilot project or a purchase.

The innovation is based on saving energy both through using LED technology and by using motion sensors to control the amount of light given by the street lamps and in that way save considerably on the electricity used. The idea is that when no one is about the bulb only has a dim light of 10% of its capacity and only lights up with full strength when there is a movement in the proximity. An added benefit of using LED technology for the light bulbs is that it increases security as the bulb

will keep on emitting light even if some of the LED´s fail.

This is a case of unsuccessful attempt of a supplier offering a solution to a public buyer for a problem that had been realized by the buyer. The importance for this research is not that Sønderborg has chosen not to go further than offering the supplier the opportunity of using their streetlights for testing the product. The importance lies in the fact that this case is an example of an interaction between a buyer and supplier when the purchasing process is initiated by the supplier. This case is an example of how a public organisation responds when a supplier initiates contact offering an innovative solution to a recognized problem namely the need to save electricity. Preliminary results indicate that it can be important in user-producer interaction of public procurement who initiates the process as institutional barriers may, in some cases, hinder procurement of innovative products when the supplier initiates the procurement process. This aspect will need further analysis of the data from both the cases.

DISCUSSION

The two cases differ in the context of the procurement process and in the level of user-producer interaction that took place (Dalpé, DeBresson and Xiaoping, 1992). In case 1 the interaction was initiated by the procurer, Post Danmark. The interaction included different stages from analysing the need through to the procurement of the product that had been developed through participatory innovation. In case 2 the interaction was initiated by the supplier and the interaction was limited to the procurement stage as the supplier had developed the product prior to the first contact with the public procurer.

In case 1, even if it was a successful in the sense that both the pre-commercial stages and the final procurement took place, different potential institutional barriers to user-producer interaction were identified. These potential barriers appear at the level of endogenous institutions and are related to difference in the goals that the buyer and the supplier are aiming for, the complexity of the organizational structure of the public organization and the difference in the urgency of the project.

Case 2 was an unsuccessful attempt where the public buyer declined the offer of being a lead user for an innovative product the offered potentially a significant benefits by solving his need for an energy saving lighting solution (Urban and von Hippel, 1988). Data from both the cases indicates that there are potential institutional barriers for a public procurement of innovation in the cases where the supplier initiates the procurement process. Most of these barriers are on the level of endogenous institutions.

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EXOGENOUS INSTITUTIONAL REDESIGN FOR SUCCESFUL PROCUREMENT OF INNOVATION: THE CASE OF THE PUBLIC HEALTH SECTOR IN SOUTHERN DENMARK

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ABSTRACT

Within the European Union, public procurement is subject to Community rules. Under these rules public sector must follow transparent open procedures ensuring fair conditions of competition for suppliers. This study discusses how those rules, specifically, exogenous institutions, can enable or prevent public procurement of innovation in order to come up with the necessary implications for successful and/or more efficient procurement process. It should be noted that the present is a preliminary product from a Master thesis research which, at the same time, is part of the ProcSouth project. The study is based on empirical research material consisting of two case studies from a Danish scenario. The analysis concentrates on institutional barriers for public procurement of innovation. The central theme emerged from the uncertainty regarding methods and procedures to make public procurement of innovation work in practice. The

concepts of innovation, public procurement and institutions are used as theoretical tools to interpret the data. Prelude results from the present imply that there are aspects to be improved for public procurement of innovation to be effective.

INTRODUCTION

The policy interest for public procurement of innovation has followed in the wake of the targets formulated at the 2000 Lisbon European Council (Lisbon European Council, 2000) and refined in Barcelona 2002, for the EU to become 'the most advanced knowledge economy in the world'. Although, reports and studies have followed to develop these ideas further (e.g. Guy, Tsipouri et. al., 2003;

European Commission, 2003; Edler et. al., 2005; European Commission, 2005; Aho et. al., 2006; Gavras et. al., 2006; European Commission, 2007), uncertainty still prevails regarding methods and procedures to make public procurement of innovation work in practice. A similar situation is on the national level. Although there is an emerging interest of the issue on the national level in Denmark (Erhvervs- og Byggestyrelsen, 2009).

The purpose of documenting the current activities and potential areas for future developments of public procurement of innovation practices is to study further how public procurement can be used to stimulate innovation in Southern Denmark. This purpose should be seen in the light of the policy development within the European Union (EU) that has taken place last years, stressing the role of public procurement as a means to stimulate innovation to increase competitive advantage in a global economy. Based on the findings in case studies, the aim is to develop policy implications in order to inform innovation policy development for public procurement. The last can be achieved by finding out the mode in which exogenous or formal institutions, EC Directives, can affect the outcome of public procurement processes.

THEORETICAL FRAMEWORK

Different aspects of innovative public procurement lead to some generalities such as innovation theory, the impor-

tance of institutions and the current legal framework ruling public procurement and its implementation in Denmark. So, basically, the following will try to bring up the problematic between a supra-national entity and a national one. For that, the European Union is considered as a supranational "institution which can affect innovation outcomes in public procurement of innovation" (Rolfstam et. al., 2009) in a member state.

First of all, "Procurement" refers to the function of purchasing goods or services from an outside body (Arrowsmith, 2005). The activity of procurement is of concern to a wide range of groups and interests. In particular, it affects those who fund the activity (taxpayers in the case of government); the citizens or consumers who benefit from the products or services acquired; businesses that supply the products or services; and also the economy as a whole, since effective purchasing can play an important role in promoting economic activity.

Public procurement as a discipline expands from a simple internal market topic, to a multi-faceted tool of European regulation and governance covering policy choices and revealing an interesting interface between centralized and national governance systems.

Additionally, it is important to know the linkages between the public and private sector concerning an acquisition process. Undoubtedly, both have their own characteristics but when it comes to procurement, they are correlated in order to work in the most efficient way. Public and private permeate and are not clearly differentiated. Statist systems distinguish public and private, by institutionalizing the former in the state and the latter in society.

Nevertheless, the acquisition exercise involves both the public and private sector; actors that start with a 'problem that needs to be solved: a buying need that has to be fulfilled' (Robinson et. al., 1967). The public sector is defined here as public administrations (federal, provincial and local), hospitals, universities, as well as public enterprises at all three levels of government, but excludes privately owned enterprises in regulated industries (Dalpé, 1992). Public enterprises in the manufacturing industry are therefore considered as part of the public sector. The principal public users of innovation are hospitals, electrical energy, defence, the federal administration, railway transport, and telephone systems. On the contrary, private sector refers to all economic activity other than that of government; good and services are produced by individuals and/or companies.[1]

Through purchasing, governments have, in fact, the power to determine their suppliers' market shares. Thus, innovation becomes a major stake in the competition for contracts, since the winning firm inherits a competitive advantage and privileged access to future orders.

In that line, Schumpeter (1911) defines innovation as "the introduction of a new good … or a new quality of a good" and process innovation as "the introduction of a new method of production … or a new way of handling a commodity commercially".

Hence, public procurement of innovation has been defined by Edquist and Hommen (2000) as something that:

> *…occurs when a public agency acts to purchase, or place an order for, a product – service, good, or system – that does not yet exist, but which could (probably) be developed within a reasonable period of time, based on additional or new innovative work by the organization(s) undertaking to produce, supply, and sell the product being purchased.*

Robert Dalpé (1994) mentions that whether or not governments develop an explicit procurement policy that is oriented towards innovation, their decision concerning prices, quantities, and standards affect innovation, positively or negatively, in a group of industries involved in government procurement.

Likewise, the role of public procurement in innovation is most influential at the earliest stages of the life cycle of a product and of an industry (Dalpé, 1994). Hence, according to R. Hebert et. al. (1982), an important factor that explains the role of procurement policies in innovation is the maturity of the product and of the industry. In the early stages of development, when products are not yet standardized, public sector demand can affect important technical changes. In the later stages, the industry is less receptive to clients' demands (Dalpé, 1994). Thus, a key to successful procurement for innovation is the "intelligent customer" who is able to be aware of potential new solutions, and can specify and manage contracts of this kind throughout their lifecycle (Aho, et. al., 2006).

But, it is important now to consider that as the main actor here is the government, there is the existence of certain statutes which it has to follow in order to fulfil everybody's goals. Those can represent a barrier or not to any kind of activity to perform and that is why institutions are studied.

Douglas C. North[2] (1990) argues that economic growth is a function of institutions. He demonstrates that institutions matter because they "provide the rules of the game, constraining human interaction and providing incentives for individuals and organizations to engage in productive and/or destructive political, economic, social and other activities" (North, 1990). Equally important, the American economist adds dynamics into the theory of institutions, claiming that if institutions are the rules of the game,organizations and their entrepreneurs are the players. The same author contends that institutions exist to make cooperation sustainable. The presence of some kind of third-party enforcement such as courts, governments and firms can be illustrative.

Based on North's approach, Coriat and Weinstein (2002) define two dimensions; one is based on the origin and formality of the institutions and the other on durability. They distinguish between a type 1 and type 2 institutions, which will for the purpose of this research be referred to as exogenous and endogenous institutions respectively. Exogenous institutions (type 1) are *"based on criteria of authority and enforcement posed on all the agents"* (Coriat and Weinstein, 2002), typically these institutions are formal laws that cannot be waived. Endogenous institutions (type 2) are *"private collective agreements between groups of agents"* (Coriat and Weinstein, 2002), these institutions are typically the rules that individuals enter into on their own accord such as contracts they decide to sign and customs they follow.

At this point, it is important to consid-

er the institutional framework which guides the public and private sector in terms of procurement. Then, the aim should be to set up institutions that will provide a more stable basis for co-operation between various organizations, between staff and management, between businesses and research institutions, and between businesses and their investors.

But it is also important that the existing institutional structures should contribute towards the creation of a climate conducive of innovation. Though, in essence, institutions are not just constraint structures; all institutions simultaneously empower and control (Powell and DiMaggio (1991).

Moreover, J. D. Roessner (1979), in his study of local government procurement in the United States, concluded that the choice of the least expensive product over the highest performing and most innovative product, as well as the risks inherent in new production acquisition, are the major obstacles to the introduction of new technologies. In this case, institutional barriers inhibit the public buyer from supporting new products through procurement.

Because of the above, on one hand, it can be noted that institutions affect public procurement of innovation no matter where; for instance, the EC Directives on Public Procurement act as a central, formal institution (exogenous) within the European Union (EU). On the other hand, without institutions a social system would not be able to accumulate knowledge, or enable communication and would therefore be unable to sustain innovation.

It is important to mention that an objective of the European Community since their inception has been to create a common market, eliminating barriers to the movement of business, labour and capital. Barriers to trade were numerous and varied, including customs duties, discriminatory taxation, quota systems and subsidies. Procurement practices that do not allow for fair competition between firms may also operate as barriers to trade and produce trade distortions.

In like manner, the constantly changing enlargement of the European Union has placed the concept of the common market as the heart of the European integration process. New member states and member states have to adapt the public procurement acquis communnautaire[3] and existing ones must improve on the quality of its implementation (Bovis, 2005).

For companies, the principal barrier to investment in Europe is the lack of an innovation friendly market. In particular, the fragmentation of markets across the national boundaries of member states provides a major disincentive for innovation. Esko Aho et. al. (2006) emphasizes that despite progress towards the single market and some notable successes, the reality for most innovators remains that they face an obstacle course of multiple levels of regulations and requirements, each of which raises costs and lowers incentives.

It has been argued that the introduction of more stringent competition regulations across the European Union has proven a major factor in the declining use of public procurement (Edquist, et. al., 2000). The extent of relative decline is indicated by statistics showing EU procurement four times less that the US in civilian sectors and two times less when defense is taken into account (Directors Forum, 2006). However, from 2003 - 2004, the issue has received renewed attention, especially at the EU level but increasingly so at nationallevel in a number of member states (Edler and Georghiou, 2007).

Besides, as part of the Single Market programme, public purchasing above certain thresholds has been regulated by Community Law since 1 January 1989 (Thois, 1997). Purchases above these thresholds must be announced in the Official Journal of the European Community. In principle, this should give all relevant suppliers irrespective of nationality a fair chance to win any national EC tender.[4] In effect, policy-makers in the EU have increasingly emphasized the role of public procurement as a policy instrument that can be used to stimulate innovation (Rolfstam, 2009). Consequently, procurement for innovation was incorporated as an element of the European Commission's Research Investment Action Plan to raise R&D expenditure to the 3% Barcelona target[5] (European Commission, 2003).Afterwards, in November 2004 the "Kok Report"[6], which was reviewing progress on the "Lisbon Strategy"[7], recognized that procurement could be used to provide pioneer markets for new research and innovation intensive products (Kok, et. al., 2004). Indeed, there is the need for Europe to provide an innovation-friendly market for its businesses, the lack of which is the main barrier to investment in research and innovation (Aho, et. al., 2006). This needs actions on regulation, standards, public procurement, intellectual property and fostering a culture which celebrates innovation (Aho, et. al., 2006). The Commission has taken actions to raise awareness and to spread good practice in this domain[8] but these are only necessary first steps – the real challenge is to apply these concepts in key areas of public purchasing and at a European level to explore ways of aggregating and coordinating demand through common standards and joint procurement. Aho et. al. (2006) emphasizes it is particularly important that public sector productivity grows strongly in Europe because of its relatively large public sector and citizen's expectations of a high standard of service. In the area of public procurement, new EU directives have created opportunities for public authorities to purchase innovative solutions, with key changes including (Aho, et. al., 2006):

- Possibilities for technical and competitive dialogues between purchaser and supplier, a necessary condition if each side is to understand the other;
- The facility to specify requirements in terms of functional performance or standards, which allows suppliers to produce any configuration of technology they feel can meet the need;
- Options to permit variants, thus opening up bids to alternative ideas; and
- Conditions that allow transfer of intellectual property to the suppliers, and hence allow them to exploit their innovations in wider markets.

For that, effective multi-level governance arrangement will need to be in place, combining regional, national and supra-national elements. The above can be a challenge due to the fact that countries within the EU are formed by regions or provinces which, at the same time, still keep their own regulations toward public procure-

ment activities. So, the study of them is mandatory to get to know how it works. There is an essential need for a legal basis in which all public procurement can be governed. The EC and EU Treaties (v. 2006) and the respective EU Directives help to ensure that public procurement is conducted in a fair and open manner within the member states. Directives are, by definition, not directly applicable and, in order to produce their effects within the member states, need to be implemented or 'transposed' into national law (Trepte, 2007). On April 30, 2004 two new directives were published in the Official Journal (Arrowsmith, 2005):

- Directive 2004/17/EC (for utilities, to replace the current Directive 93/38)—hereafter "the new utilities directive"[9];
- Directive 2004/18/EC (for contracts covered by the current Works, Supply and Services Directives)—hereafter the new public sector directive[10].

In the European Union, the Procurement Directive was to be implemented into national law before 31 January 2006 in the individual member states, and, therefore, the rules of the Procurement Directive must be considered in combination with the rules of the individual member state (Evers et. al., 2006).

Whilst the provisions of the Directives must be transposed into national law and whilst tenderers bidding for contracts in other member states will need to be aware of the national implementing rules and practices in that member state, those rules will be based on the obligations imposed by the Directives…..(Trepte, 2007).

Moreover, Maskell (2004) notices that it is the extent of the egalitarian structure of the Danish society that continues to distinguish Denmark from most other small developed nations. The business community in a small nation such as Denmark leads to see that domestic producers know each other directly or indirectly. Most managers in larger enterprises will meet regularly. All firms in the same sector will usually be organized in at least one association or guild with nationwide coverage. Most managers will have participated in some sort of joint activity on the local, regional or national level. Local rivalry stimulated the entrepreneurial spirit and reinforces the productivity in the region.

Furthermore, in accordance with Thois (1997), public procurement in Denmark still exhibits a very low degree of economic integration as measured by direct cross-border interaction. He states two explanations which may be offered: a) Almost all relevant foreign suppliers already have a national presence of some kind in Denmark, be it a Danish sub-contractor, subsidiary or a national agent. There is therefore a limited material basis for an increase in direct cross-border activity; b) Foreign suppliers to the public sector often have to deal with prohibitive 'logistical' barriers. For example, they have to be able to deliver to fifty different places each day within a local community; they have to deliver after-sales service promptly and have a stock of goods on hand for immediate delivery.

In other words, a local presence of some kind is almost always mandatory. The EC Directives on public procurement are transposed into the Danish legal system, i.e. the texts of the directives have been directly incorporated to the national level. The Danish Competition Authority is the governmental agency responsible for the implementation of the EC directives on public procurement[11].

DATA AND METHOD

A case study protocol has been developed for case studies which will bring reliability to the research (Yin, 2009).

The case studies are designed to give the researchers the opportunity to investigate public procurement of innovation from different sides by interviewing managers from supplying firms, public procurers that have participated and policymakers that influence innovation policies in Southern Denmark. The purpose is to investigate the institutions that govern public procurement of innovation and to discuss cases of successful procurement as well as ones that did not succeed in order to gain understanding of the process. The protocol also offers a serial of questions which serves as a guide to gather the necessary information.

Data collection, primarily, is based on semi-structured interviews with relevant several respondents or key actors that play a role in the public procurement of innovation exercise. Respondents might express not only facts, but also opinions and insights about how they perceive the procurement process. Furthermore, the different views expressed should be confronted and weighted with other more formal sources of information, i.e. policy documents, annual reports, etc. This might result in a more adequate picture of the procurement process reducing subjective elements.

The following topics are addressed during the interviews:

i. Public Procurement of Innovation
ii. Procurement Decision
iii. Context of the Procurement
iv. Outcome of the Procurement
v. Future Development of Public Procurement of Innovation

The data collected in the interviews and any data from documents that are relevant to the cases will be analyzed and used to develop implications for public procurement of innovation. And, following Yin (2009), records of the interviews and preliminary reports will be available for interviewees to increase validity of the research.

PROCUREMENT CASES

Two case studies of public procurement have been conducted in November 2010. The first case (Case 1) is about the procurement of ambulance driving service and patient transport; the second (Case 2) is a supply of a new laboratory information system to hospitals. Ideally, both, the supplier and procurer would need to be interviewed. At this point, the study has only the supplier's perspective from both cases. Moreover, stakeholders within the topic will be interviewed in the next short-term.

The cases in the research have been chosen based on the perceived informational richness they offer. With a focus on institutional barriers for innovation, the chosen cases make out examples of successful public procurement of innovation. Cases have been carried out under the current legislative set-up for public procurement, i.e. the EU Public Procurement Directives 2004/17/EC and 2004/18/EC.

The research is explanatory in nature expecting the conclusions to be analytical. It deals with the way exogenous or formal institutions can prevent efficient and/or successful public pro-

curement of innovation, and, in some cases, affecting positive or negatively the outcome of it.

Case 1 was selected because it involved a project that was successful providing stability and security to both, the procurer and the community. Case 2 was selected because it ensures an innovative and proven software solution for the buyer and the user. The two cases give alike insights concerning the weight that exogenous institutions towards the public procurement process.

PRELIMINARY RESULTS

CASE 1

The first case deals with how Region South Denmark has purchased a package consisting of a control centre system, developed ambulance driving and recumbent patient transport. The provider is the Danish company Falck A/S which its main tasks have been to offer assistance at accidents, emergencies and illness. Part of the purchased service by Region South Denmark has been also provided before to the public sector for many years.

Specifications of the tender include quality, delivery and price while the last one is always matter of attention when coming into an agreement. Price was the most important criteria when choosing the awarded supplier. The new features in the service are, mainly, faster response time and better quality, for example, cars' specifications. The contract was signed on September 1st, 2009 and runs for four years plus two of renewal.

Jesper Stig Andersen, Station Leader of Falck in Sønderborg, appointed that since the public purchasing law of 1989 referring to the announcement of tenders, the company has lost a percentage of their market due to the competition. Also, for Falck A/S, the public sector is a loyal customer regarding the rules they need to follow in order to come with a purchase. In general terms, the company is contended with the EU regulation because it enhances free competition; however, rules can always be more flexible.

CASE 2

The case deals with the IT firm Logica who has become the supplier of a new laboratory system (LIMS) to hospitals in both Region South Denmark and Sjælland. It is a case of joint procurement. The new laboratory information system will make the exchange of information between the individual hospitals more simply, when the current three different IT systems in Southern Denmark and the two different systems in Sjælland will be replaced by a single common system. According to IT Director of Region Sjælland, Michael S. Hanson, "the system will provide greater stability and reliability for the laboratory production". The new system is innovative in the sense that it is capable to do something different that the old version that the Regions have. Ten percent of the software needed to be re-designed in order to meet the specifications of the tender. In degrees of innovation, it is sort of incremental innovation. The new IT system also opens new opportunities for laboratory work processes, for example, in connection with obtaining and reading the questions on samplings.

The reason behind the tender came up back in Autumn 2009 when both regions cancelled their separate contracts for solution for laboratories because the provider, which was the same for the two regions, could not deliver what they needed. So, a restricted EU tender was implemented. Logica won 3 out of 4 categories of the requirement specification which included project, planning, price and delivery.

The contract was signed on October 4th, 2010. And, once the new system is introduced, it is expected that both regions will have substantial operating savings each year. All in all, the project covers approximately six years.

Moreover, according to Martin Pedersen, Divisional Director – Public Sector and Healthcare at Logica, there is a huge risk of misunderstanding when the tender is out. According to him, the requirement specification do not cover everything that the procurer really wants. Every single person involved in the procurement process has a different understanding of the tender material.

Misinterpretation is always on the line and the dialogue that the supplier and the procurer can have is very structured, very formal.

So, the case is an example of the barriers that parties within a procurement process can encounter due to the 'bureaucracy' of exogenous institutions. The process is not smoothly as the, in this case, the provider, would like it to be.

DISCUSSION

The cases referred to here are both, coincidentally, within the public health sector. However, the reason behind the purchase was different. It can be said that in Case 1, there is a need from the community (hospitals and society in general) to assist emergencies or the transport of patients, so, Falck A/S was chosen because of experience. In Case 2, the need was raised due to a failure of a previous supplier in the delivering of the software solution, so, Logica was chosen because of its efficiency.

From both cases, it can be seen that exogenous institutions have a significant role when it comes to public procurement. Exogenous institutions, conversely from endogenous institutions, are "based on criteria of authority and enforcement posed on all the agents" (Coriat and Weinstein, 2002); typically, this type of institutions is formal laws that cannot be ignored. The public sector needs to follow and be pegged to the EU regulation (EU Pubic Procurement Directives). Information from cases makes evident that even though cooperation between the specific company and the procurer is excellent, the process is more rigid and much stricter than the one faced with a private business, for instance. And, also because there are rules to tracked, the decision process is much longer because it need to be approved at certain levels.

Case 1 points institutions as the way to compete in a fair scenario but the company has had losses because of them. Case 2 shows that, sometimes, it can be that the rules are so severe that a firm cannot deliver what the procurer really wants. So, more dialogue between the buyer and the supplier and less rigid rules is recommended. So, in legislation or institutional terms, there is a lot that can be improved.

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NOTES

[1] "Private sector" (2010) Business Dictionary Available at: http://cordis.europa.eu/innovation-policy/studies/full_study.pdf Retrieved on June 6, 2010

[2] Douglas C. North (1920 -) is an American economist, Nobel Prize in economics in 1993. He is also Hoover Institution's Bartlett Burnap Senior Fellow whose research activities include research on property rights, transaction costs, economic organization in history, a theory of the state, the free rider problem, ideology, growth of government, economic and social change, and a theory of institutional change.

[3] It can be described as the total body of European Union law applicable to the EU member states which is constantly evolving. The concept includes the primacy of EU law and other principles developed by the Court of Justice. Member states are bound to accept future majority decisions and verdicts from the EU Court.

[4] As the analyses focuses on the period prior to the formation of the European Union, the Community is referred to in the following as the EC.

[5] The European Council met in Barcelona on 15 and 16 March 2002 for its second annual Spring meeting on the economic, social and environmental situation in the Union.

[6] Report executed by a High Level Group headed by Mr. Wim Kok, former Prime Minister of the Netherlands which was asked to carry out an independent review to contribute to the mid-term review of the EU's Lisbon Strategy.

[7] During the meeting of the European Council in Lisbon (March 2000), the Heads of State or Government launched a "Lisbon Strategy" aimed at making the European Union the most competitive economy in the world and achieving full employment by 2010.

[8] Actions include an expert group report; Wilkinson R. et. al. "Public procurement for research and innovation", DG Research, September 2005, EUR 21793 and a study leading to a Handbook on raising the technological and innovative intensity of publicly procured goods and services.

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BUILDING UP COMMITMENT AT THE FINNISH RENOVATION INDUSTRY

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ABSTRACT

This paper illustrates a special case in public procurement of innovation: a collaborative user-oriented R&D project representing the 'fuzzy front end' of innovation taking place before pre-commercial procurement. The project called 'IKE' generated an innovation of resident-oriented apartment building modernization, which was revolutionary in the strictly technology-oriented and conservative industry.

The proactive project strengthened the dialogical connection between public and private sector and built up significant stakeholders' commitment to resident-orientation at the renovation sector. According to the case study, stakeholders committing to the user centred process innovation required three preconditions: technical and social pressures, interweaving stakeholders to a development network, and the unique engagement of residents and professionals in co-design workshops.

INTRODUCTION

Most of the apartments in Finland are in housing condominiums. The expense of their prolific renovation has constantly grown. Today a typical plumbing renovation cost of an average family apartment is more than 45 000 €. The residents typically own their apartments and cover the renovation expenses but they have only little influence on the planning, designing and implementing the renovation. Instead, three to five members at a board of residents together with a professional house manager and renovation practitioners answer for the decision-making and implementation plan of the renovations. The other residents' voices usually sink down under prevailing hustle and bustle. The apartment owners are not alone with their problems, because the Finnish nation has a vast amount of residential buildings reaching their technical expiration within the next few decades. The estimated increase of renovation need is 1600 % from 1990s to 2020s (Virtanen et al 2005:11).

Public procurement of innovation aims at addressing these kinds of public problems that are typically complex and connect multiplicity of actors (European Commission 2007; Rolfstam 2009). By overtly simplifying, public sector's role lies in ordering and purchasing innovations while private sector is responsible for the implementation.

This paper is based on an ongoing longitudinal case study about the impacts of a collaborative user-oriented R&D project *Life Cycles of People and Property* (In Finnish Ihmisten ja kiinteistöjen elämänsyklit, IKE) that took place in 2004-2005 (Virtanen et al 2005). The project IKE investigated how the complex system of Finnish renovation industry could be enhanced, and was co-funded by the Ministry of the Environment and one of the partner companies. The project generated a process innovation: resident-oriented apartment building modernization. The innovation paid attention to the residents' experiences on renovation processes and its results. It also addressed the notion of modernizing apartment buildings meaning that they are not only renovated by the original standards but updated to meet the contemporary demands. Considering the residents as equal partners instead of a nuisance was revolutionary in the strictly technology-oriented and conservative industry. The innovation led to an array of consequences, e.g. new policies, follow-up R&D&I projects and new professional tasks, which have shifted the focus of the renovation sector towards resident-oriented services.

How did the industry started to change? What kind of factors contributed to the innovation and its diffusion? Drawing from Pfeffer's (1981) ideas on conditions for commitment, we claim that favourable innovation consequences (Rogers 2003 [1962]) arise of building up commitment to a shared goal. The

process innovation – resident-oriented apartment building modernization – was a goal for the renovation sector to be developed and implemented after the project IKE.

In the paper we investigate how the commitment to the user centred process innovation was built up among renovation professionals. The commitment did not occur in particular events or because of a single driver, but via an interconnected network of various actors. Building up the commitment required according to the case study three preconditions: 1) technical and social pressures that challenged the sector to transform itself, 2) interweaving oneself to a development network, and 3) unique engagement of the professionals with the residents in workshops. All the three preconditions were needed to build up the commitment, meaning also that participatory innovation does not happen in a vacuum but amidst complex systems. Following the analysis of commitment, we discuss the implications of our results on the public procurement of innovation. We suggest that public sector needs to allocate procurement also for emerging topics that the pioneering practitioners raise up based on their experiences at field.

BUILDING UP COMMITMENT WITH SUPPORT OF PUBLIC PROCUREMENT

PUBLIC PROCUREMENT AS AN ENABLER OF INNOVATION

Public procurement of innovation refers to the public sector's role in ordering and purchasing innovations. It has been discovered that via procurement, the public sector may stimulate innovation more efficiently than other supply-side policies (Rolfstam 2009). Public procurement can also be used for stimulating technical development, coordinating demand and accelerating product diffusion to markets. As an incentive for public procurement of innovation EU, and Finland among other member states, have launched innovation policies to enhance the competiveness of nations, to reinforce the innovation capabilities and to improve public services (European Commission 2005; European Commission 2007; Kansallinen innovaatiostrategia 2008).

Public procurement of innovation embodies a phase called pre-commercial procurement (European Commission 2007; Rolfstam 2009), which delivers innovations for later use in various ranges of the society. A constitutive definition and policies for pre-commercial procurement are still under discussion (European Commission 2007; Rolfstam 2009; Rolfstam 2010). Current interpretation of pre-commercial procurement refers to an approach to procure R&D services that are based on "Risk-benefit sharing [among public and private stakeholders] according to market conditions; Competitive development in [iterative and evaluating] phases; and Separation of the R&D phase from deployment of commercial volumes of end-products" (European Commission 2007:6-7).

At the Commission's communication (2007) to the European Parliament, pre-commercial procurement is situated between 'a product idea' and 'first test-products'. Pre-commercial procurement thus funds R&D activities once the initial idea has been identified. At least it requires a preceding definition of a problem for "inviting a number of companies to develop in competition the best possible solutions to address the problem" (European Commission 2007:9). Thus, pre-commercial procurement includes elements of a top-down system, as "knowledge about the problem needs to be communicated to suppliers and also, awareness of available solutions needs to be communicated to the procurer" (Rolfstam 2010:5). The role of the non-public or non-governmental parties is essentially 'a supplier' or 'a deliverer' without having an opportunity to make incentives on identifying the relevant problems.

The phase before pre-commercial procurement is called 'Curiosity Driven Research' and 'Phase 0', which probably refer to finding out the problem at the front end of innovation. European Commission (2007:3,8) has not yet defined its objectives.

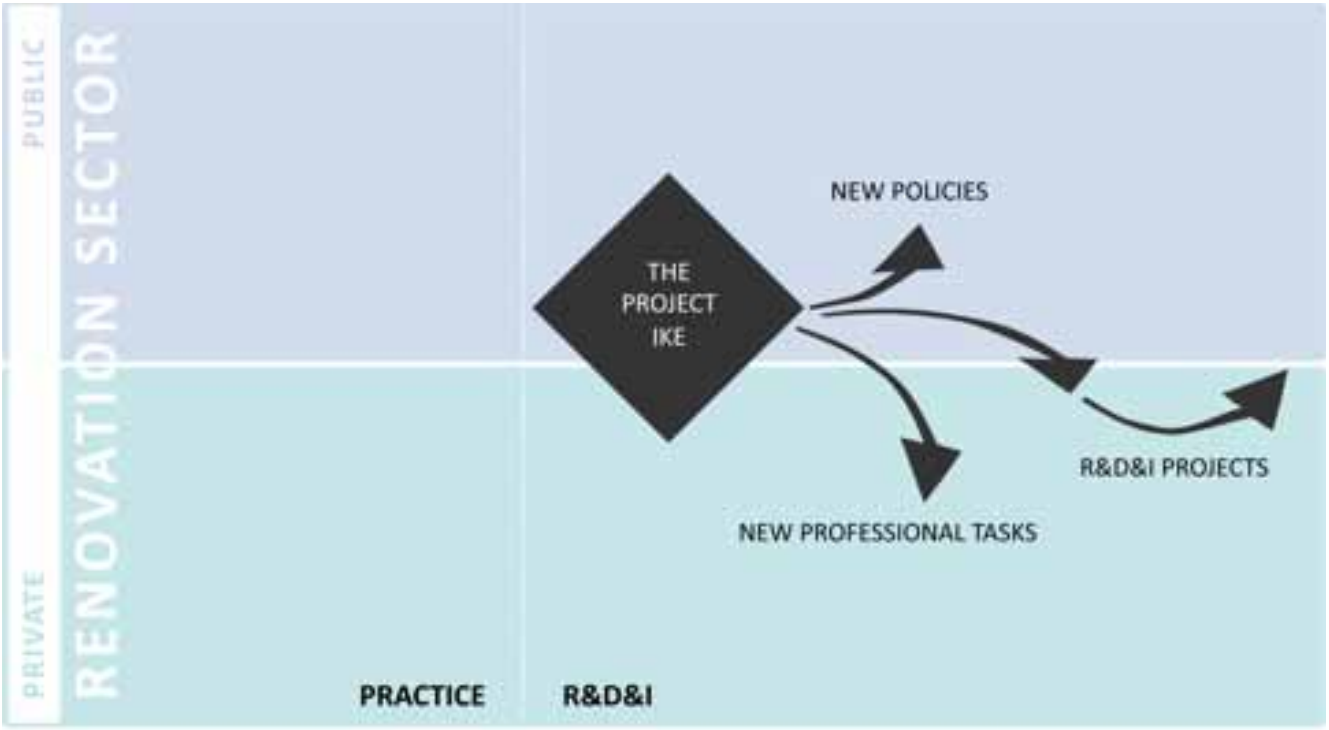
COMMITMENT FOR CHANGE

Commitment has an important role in developing better futures because it has an impact to preceding actions: "commitment involves the binding of an individual to a decision, so that consistent beliefs develop and similar decisions are taken in the future" (Pfeffer 1981:290). A committed person thus sustains the object of commitment, and a group of committed people likely pursue a similar goal.

However, getting committed is not a rational decision. It is a process, in which power, emotions and participation affects (Kanter 1972). Pfeffer (1981) discusses causes and effects of commitment. He presents three conditions for commitment. The first condition is: "Freedom to choose from among a set of options, an individual will become more committed to the choice" (Pfeffer 1981:291), meaning that volatile choosing engages people. Secondly, being exposed to public actions or even publicity influence commitment, because it "is also produced to the extent that the chosen behavior is made public" (Pfeffer 1981:292). On the other way around it suggests that private actions can more easily be taken back or forgotten. Thirdly, Pfeffer (1981:292) claims that commitment occurs if actions cannot be changed without regretting, "commitment occurs when the publicly chosen behavior is also irrevocable".

Commitment is somewhat enduring. Another way to say this is that when people invest to a matter, people are more likely to continue with similar actions than changing the course (Kanter 1972). Therefore, "the difficulty [of commitment] is that once decided, courses of action become difficult to reverse" (Pfeffer 1981:290). This may complicate building up a shared commitment among development network stakeholders because people may have prior commitments, and to build up a new commitment, the earlier one needs to be replaced or re-directed. When we interpolate this with the complexity of organizations that are "pluralistic and divided into various interests, subunits, and subcultures" (Pfeffer 1981:28) and also multiplicity of stakeholders, any attempt of advancement seems complicated.

All the designers and developers identify the difficult task of promoting a profound change. Making a favourable change is not a simple step-by-step task but a negotiating process embracing multiplicity of factors. European Commission seeks for better value for money by early commitment: "Earlier engagement in the innovation process enables public authorities to detect at an earlier stage potential policy and regulatory issues that need to be addressed



Picture 1: The project IKE was co-funded by public and private sector. It led to an array of consequences within two years after it was ended. Examples of consequences are: new policies, follow-up R&D&I projects and new professional tasks.

in order to ensure timely introduction of the new solutions into public services and other markets." (European Commission 2007:8). Rolfstam (2009:353) states that innovation diffusion requires certain circumstances, "a social system may not adapt an innovation if it does not match the prevailing institutional set-up". When dealing with public problems, the set-up need to be identified, i.e. what kinds of stakeholders there actually exist, or should exist.

New stakeholders outside the customary set-up, such as co-designers, can boost change because "change in organizations is largely externally induced" (Pfeffer 1981:331). However, the 'outsiders' need to accommodate to the set-up. According to Thackara (2005:226), designing complex systems needs a holistic approach. "It involves a new relationship between subject and object [of design] and a commitment to think about the consequences of design actions before we take them". Designers are not the only ones to contributing to change of a complex system. Commitment to a clear goal among the stakeholders merges development efforts that otherwise would divert.

PROJECT IKE

The data of this paper stems from an ongoing longitudinal case study. The case examines the impacts of a half-a-year project *Life Cycles of People and Property*, IKE, in 2004 to 2005 (Virtanen et al 2005). It was launched to examine holistically the critical points and the best practices of renovations of residential buildings in Finland. The focus was especially at the previously paltered perspective of residents in relation to technical expiration of apartment buildings.

The project IKE was the first collaborative attempt in the sector to get grips with the imminent workload the sector would phase within the next decades. The project generated a co-created innovation of resident-oriented apartment building modernization. The innovation was divided into development proposals to execute the innovation. All the proposals would require joint efforts whether they would relate to strategies, services, technologies, funding or resources. One of the proposals suggested "to create a concept of mutual cooperation and service between residents, the housing condominium and construction, enabling the parties to work together to renovate and improve buildings" (Virtanen et al 2005:80).

The user-oriented process innovation generated an array of consequences. The picture 1 shows how the consequences have led to changes both on the private and the public sector. For example, the Ministry of the Environment applied the project results at their renovation strategy planning, and launched a definition of policy for the built environment maintenance and renovation in 2007 (Korjausrakentamisen strategia 2007). Also a new competence cluster 'Living Business' had its kick-off in 2007 to improve the "networking between the participants tighter and thus speed up the development of solutions to serve residents" (www.oske.fi). The user-oriented ideology of the project IKE was applied in the formation of the cluster. One of the leading themes of the cluster is called also *Life Cycles of People and Property,* and is a follow-up project to develop new service processes and practices for renovation. In addition to these political and multi-actor-projects, more practical consequences have emerged. An engineering company has extended its human centred competence, e.g. by hiring a public relations professional. Her task is to develop communication approaches for the company's customers including all the residents in the apartment building under renovation, in parallel with the members of the board of residents.

The project was most of all a learning process through constant collaboration, negotiation and re-negotiation within

the multi-disciplinary team (Soini and Pirinen 2005). These kinds of projects that merge research, concept design and planning strategies have been conducted at universities (see e.g. Bødker and Buur 2002; Johansson et al 2002; Mattelmäki 2005; Soini 2006; Halse et al 2010). In these cases, called also co- design, universities did not only produce reports, but also enabled sharing of knowledge and inspiration with stakeholders by intensive collaboration.

Two years after the project IKE ended, 67 participants were interviewed to gather interpretations on the history, working methods and impacts of the project. The interviewees consists of people from four project organizations – a leading engineering company (management and co-funding of the project), an established housing communications consultancy, a design university, and the Ministry of the Environment as the financier – as well as residents, constructors and other stakeholders within the complex system of renovation. The first author participated in the project and holds an insider's knowledge in addition to the research data.

This paper is based on the analysis of four key players' interviews. These players hold a unique access to the occurrences at the renovation sector and act as opinion leaders. We assume, that together they have a good overview of the development trends by representing policy-making, renovation practitioners, publicity and research. At the interviews they emphasized change trends in the renovation sector and also criticized it of being in the slow lane of progress. Their personal impact is shown typically through attempts to improve the renovation practices. The interviewees discuss organizational aspects by showing examples of practical improvements and strategic goal-settings.

The analysis builds a story of the project by clustering and highlighting similarities and eye-catching exceptions in a case study manner to achieve rich description. Early findings illustrate the role of commitment (Pfeffer 1981) in participatory innovation. Thus, this paper does not discuss the working methods of participatory innovation but the relations of user-oriented collaborative design and the larger industry level development processes.

BUILDING UP COMMITMENT: TECHNICAL AND SOCIAL PRESSURES AT THE RENOVATION SECTOR

Early 2000s renovation industry faced numerous challenges. The main one was the technical expiration of apartment buildings. In Finland, the majority of apartment buildings were built since 1950s and 63% of the property was built since 1970s (STAT 2008). Technical expiration is cyclic, and e.g. renewal of the plumbing system is faced every 40-50 years (Virtanen et al 2005). Consequently, the property constructed during the peak decades are becoming to the age of plumbing renovations.

The renovation sector was not prepared to face the workload for instance because plumbing renovations have become common only since 1990s as the apartment building built in the 1950s faced the renovation need (Virtanen et al 2005:9-12). Experience had not yet accumulated and in 2004 the field embodied as many practices as practitioners. The practitioners disagreed about the benefits of various traditional and alternative methods. Prices for renovations had a wide range. Nobody was able to evaluate the durability of various trial solutions. The amount of renovation practitioners was too small to cover the demand for renovations in 2004. The practitioners were concerned how they would be able to respond to the demand when the need for renovation would increase.

More reasons for the chaotic situation were found during the project IKE. In the early days renovation practitioners applied methods of the new construction production. However, building new apartment buildings has a logic that is not easy to convert for renovation. When building a new apartments, the potential resident can choose if she wishes to invest or keep on searching. Renovation providers, in contrary, invade residents' homes and everyday lives.

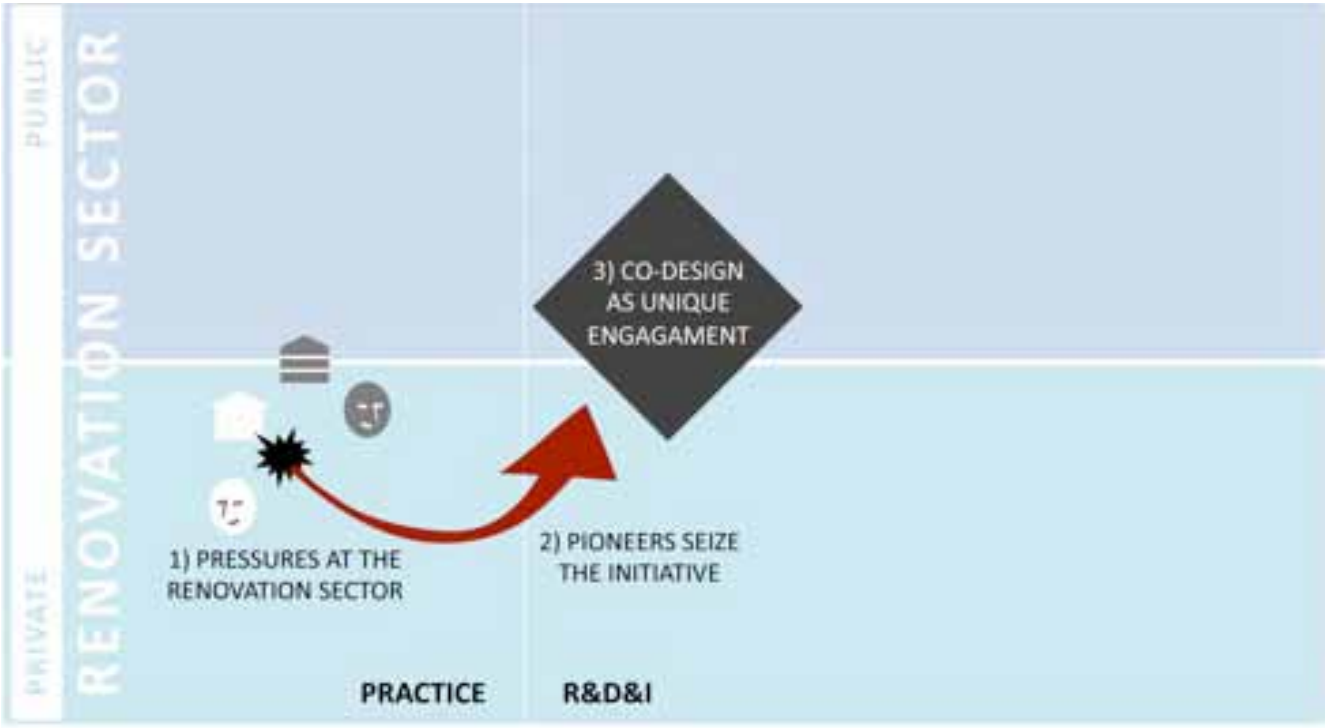
An example of this conflict was found during the project IKE as a resident told her story of a lost bathtub. She described her Friday night ritual. After work she was used to fill the bathtub with hot water. She sprinkled some scent into the water and arranged candles around her. Then she took her glass of wine and slid in the bathtub to relax and to declare the weekend was there. During the planning phase of the plumbing renovation at her apartment building, the engineers and architects decided that all the bathtubs would be removed from the building. They did not listen to residents' protests. Not even the resident of our example had influence, even though she was a member of the board of residents and therefore was supposed to have power within the process. The industry has neglected the service-oriented mindset and focused on technical issues.

At the picture 2 all the three preconditions for building up commitment are presented as an interconnected network. The first precondition for building up commitment is one dimension at the network. It represents the technical and social pressures that challenged the sector to transform itself. The renovation sector, pioneers among the first, decided to make a change like Pfeffer's (1981) first condition of commitment is choice. They had prior commitments to for example technical processes. They also realized that if they wish to maintain their role as opinion leaders at the sector, they were ready to look familiar issues anew. The risk to loose control and on the other hand the attraction of taking control over the chaotic and threatening situation built up commitment to the new resident-oriented goal. The stakes at hand were high enough to attract their efforts.

BUILDING UP COMMITMENT: INTERWEAVING A NETWORK

Until 2004, development of the renovation sector composed of dispersed projects on methods of planning, constructing and evaluating. Individual organizations had developed their practices and tools only to tackle burning technological challenges. Any coherent multi-stakeholder projects involving residents in parallel with technologal issues had not been conducted.

In 2003 three business associates organized a meeting to figure out what they could do with the subject at hand. They had remarkable experience in the renovation and housing industries, and were able to identify the challenges earlier than other practitioners who only tried to cope with the growing demand. The CEO represented an engineering company that was a valued pioneer at



Picture 2: Innovation consequences are generated with the support of commitment to a shared goal. Building up the commitment required three preconditions in the project IKE: 1) technical and social pressures that challenged the sector to transform itself, 2) interweaving stakeholders to a network, and 3) unique engagement of residents and professionals in co-design workshop.

the renovation sector. Two communication professionals had vast experience in multiple mediums of housing communications, and also in developing suburbs and social funding for renovation in 1980s. They held a realistic conception of the renovation industry and knew that the technical expiry would not be solved with the prevalent system of renovation. They were also concerned on societal impacts of the elderly residents' independent coping, and saw a potential in combining the interests of people and property. They predicted a huge business opportunity but felt helpless in the face of the challenge. Occasional R&D projects would not solve the problem, but a large national development project was needed.

Once an acquainted director at the Ministry of the Environment agreed with the urgency and importance of the objective, the initiators started to gather research and steering groups through their extensive networks. The groups combined of people from the ministry, companies, associations and a research unit. The members were established experts in the renovation sector but also a "joker in the pack" was needed. A design university was invited as the research partner instead of the regular suppliers because of its reputation in user centred design approach. The director of the research unit was a business associate, which reasserted the validity of the unit. The final project group comprised of an engineering company, a housing information centre and a design university.

The project objectives were co-defined by merging the interests of the project and the steering group members. The aims were elaborated through out the project after they had been defined at the project plan. The project was the first part defining the development needs of a larger national development process. The design researchers argued with the ISO 13407 (1999), standard for Human-centred design processes for interactive systems, the importance of understanding the problem before developing it. This would spare from wasting resources and also eventually speed-up the enhancement of the renovation sector. The project IKE would follow with iterative development and piloting phases.

The original idea of people and property aging together broadened out to include people in various life situations. The examination of renovation projects focused to plumbing renovations, which are the most extensive and challenging because the renovators invade residents' homes and everyday lives. Acquired understanding would later be applied to other simpler renovations such as facades or elevators. The data was collected in three real projects representing differing phases: planning, constructing and using. The initial idea was to develop technical renovation tools and processes in parallel with the research. This changed to multi-stakeholder interaction rehearsals in workshops because of the time constraints and also emerging user-oriented understanding

The second precondition for commitment is interweaving oneself to a development network (see picture 2). The project participants used their networks to form the project. Therefore, they invested their reputation for the cause, and made it apparent to all. According to Pfeffer (1981) they made their intentions public, which influenced their commitment to the subject. By acting towards enhancing the renovation sector from the residents' perspective, they built up commitment towards similar actions in the future.

BUILDING UP COMMITMENT: UNIQUE ENGAGEMENT OF PROFESSIONALS AND RESIDENTS

"Share the goal; share the work; share the results" (Thackara 2005:220-223).

This was also the central idea in the project IKE. Innovation is said to be an emergent phenomenon that may occur when individuals or organisations interact with each other (Thackara 2005:218). Design researchers who conducted the user study and the participant workshops realized that the complex subject has to be handled in a multi-disciplinary and collaborative manner: the project was constant collaboration, negotiation and re-negotiation of the multi-disciplinary team. By joining forces the project was able to work effectively and thoroughly. In half a year the project IKE defined a set of development targets for the industry. Beyond efficiency, collaboration is also empowering and prepares participants for future tasks. Participation on research and co-design activities created a foundation for sustainable collaboration. The participants shared a goal, with which they may take coherent actions in the future within their business or life.

The project put emphasis on joining the participants' different missions. The aim was to engage as much stakeholders as possible during the project. The project and steering groups consisted of 17 people. In addition to them 50 residents, practitioners and other stakeholders participated the project. Project IKE participants represented a variety of stakeholders from individuals to organisations to renovation industry and all the way to government level. Their different views were appreciated as an advantage (Johansson et al 2002), but synchronizing their missions became crucial (Thackara 2005). A key factor for joining the missions was to involve participants in design events in a way they themselves saw purposeful. It required an interface between the stakeholders.

The very first sketch of the interface was created in the pursuance of defining the user study objectives and e.g. probes tasks (Mattelmäki 2005) in collaboration with the project partners. Since some of the project group members did not approve the researchers' approach of empathic user design (Koskinen et al 2003) in the beginning of the project, the researchers put an extra care for finding a mutual understanding. In several meetings, the researchers suggested objectives and tasks, and other project members commented and adjusted them. Researchers emphasised emotional aspects: for example one of the probes tasks was "my home" and the residents were asked to imagine their home as a person and describe its qualities. The renovators pointed out more practical issues to be studied such as how the renovation communication was mediated or how the residents have solved living during the construction period. By co-designing the probes, the researchers learned the renovation practices and elaborated the user study exercises, while the other project members started to see the value of emotional aspects and learned to trust the "joker in the pack".

In projects that involve various actors, specific occasions to share perspectives and adjust the aims are important (Buur and Soendergaard 2000). The main work in the project IKE was conducted in various face-to-face workshops. The shared interface between project participants was the residents' everyday experiences as an angle to plumbing renovation projects. All the stakeholders were able to apply the interface: it was easy to understand and concrete enough to relate with all the varying aspects such as engineer's interest in planning visualizations or constructor's communication tools during the implementation phase of renovation.

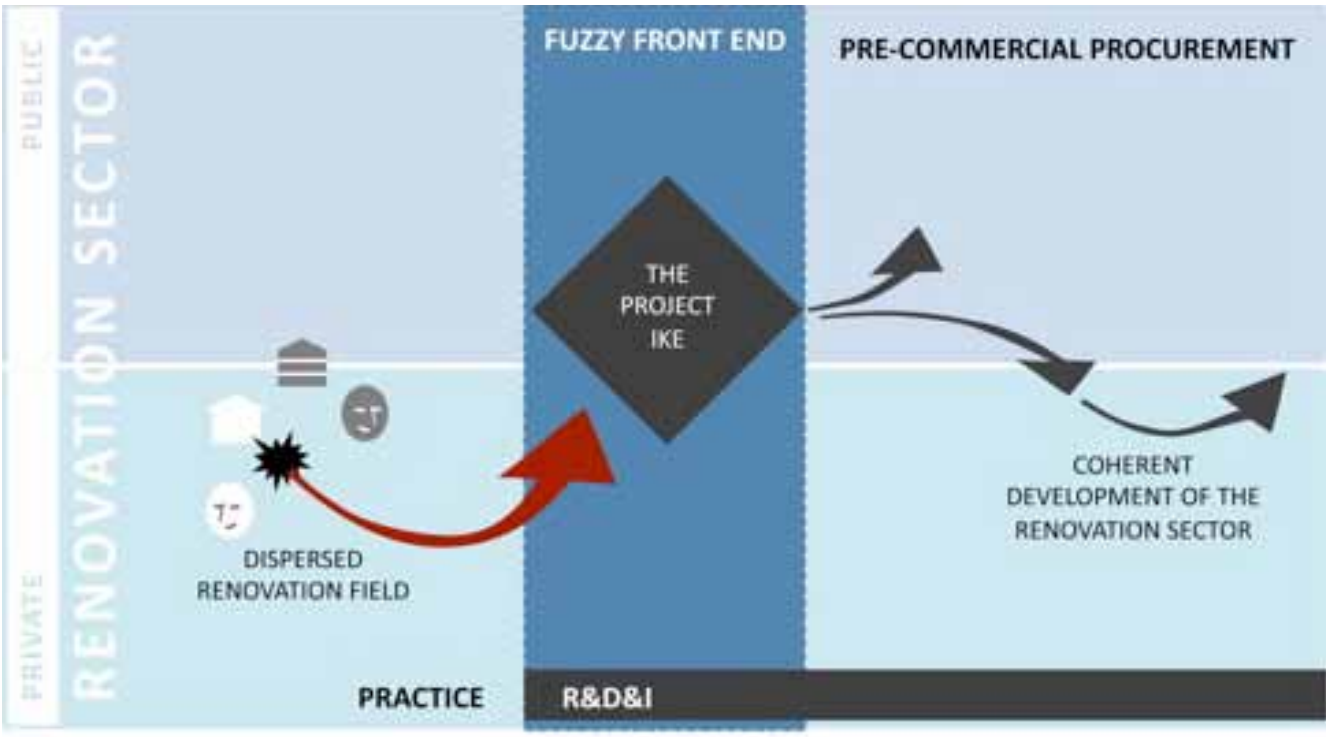
The professionals faced the residents' everyday experiences in workshops where the results of user studies were interpreted (Soini and Pirinen 2005). The three first workshops were called 'resident workshops' and they converted the residents' experiences to best practices and development needs of renovation processes. The workshops started with residents' 'Home Album' stories, which described their homes and lives from childhood to the present date (Soini 2006). The stories sensitized the professional participants to renovation experiences and opened a new perspective to renovations: projects are visits to residents' lives that have a potential to enhance their living conditions. After focusing to everyday living, a group of a resident and stakeholders such as an engineer and a constructor working at a particular renovation project, together clustered samples of renovation experiences.

A new partnership was also prototyped: the residents were equal partners with the professionals for the first time. The professionals realized that the residents might provide useful experiential knowledge and requirements for the renovations. Residents do not complain or demand for the sake of resistance but because of valid reasons. The residents felt that they had something important to say and finally they had some power within renovations. The professionals hung on residents' every word, which became to have an impact to the renovation sector. Thus, the participants 'rehearsed the future' (Halse et al 2010) of the new partnership. Following the resident workshops, the user study and workshop data was synthesized to an initial set of development themes. The fourth workshop was organized for 40 renovation stakeholders representing practice, policy-making, jurisprudence, finance, research and residents to elaborate the themes.

The third precondition for commitment is unique engagement of stakeholders in workshops (See picture 2). Workshops engaged stakeholders to reassess plumbing renovations. What made it unique was the chosen approach: residents' everyday life. The focus was not in technologies, or even service processes but on the residents' lives and personal experiences within renovations. The approach raised new insights, inspired and stimulated learning. Professionals were challenged to rethink their practices and the prevailing paradigm of the building renovation industry, and also try out new resident-oriented approach. Quite similar to Pfeffer's (1981) third condition for commitment of irrevocability, the experience of genuine engagement with residents had a powerful and irreversible influence on the project partners. It affected the whole project and provided a common ground for future efforts. It built up strong commitment and enthusiasm.

IMPLICATIONS FOR PUBLIC PROCUREMENT OF INNOVATION

According to Rolfstam (2009), public procurement from innovation perspective is a special case of user-producer interaction. Rather than price-guided market processes, public procurement of innovation is a social and collaborative process. We have illustrated in this paper that commitment builds up in



Picture 3: The project IKE was a 'fuzzy front end' phase of innovation, before pre-commercial procurement. During the project dispersed renovation sector built commitment to a shared resident-oriented goal. It also strengthened the dialogical connection between public and private sector. Public funding by the Ministry of the Environment provided a public status for the problem and promoted a user centred approach to handle it.

a network of preconditions that need to be synchronized. Commitment to a clear goal among the renovation stakeholders merge development efforts that otherwise would lead to disconnected and mismatching lines.

The picture 3 illustrates how the project IKE represents an endeavour at the 'fuzzy front end' phase of innovation, before pre-commercial procurement. The public funding enabled the practitioners to keep their industry at arm's length and to reassess it. It was a proactive project that strengthened the dialogical connection between public and private sector. The collaborative project actively mobilized significant stakeholders at the renovation sector to further enhance policies and practices with a coherent goal. Based on the results, we suggest that public procurement should be allocated also for emerging topics. These topics are raised up by the practicing pioneers and experts based on their experiences at field.

In the project IKE, a group of informed experts in the field gathered a project team to seize the imminent challenge that would affect the whole nation within next decades. Co-designing apartment building renovation and rehearsing the future of new partnerships became materialized because of public funding. There was no open tendering for R&D project suppliers but procurement followed the restricted procedure and was negotiated among project partners (Ympäristöministeriö 2004:7-8) because the project was proposed by a research coalition, and also funded by one of the project partners with a 23% share. The restricted procedure made it possible to take advantage of the extensive networks that the project initiators and partners had. The procedure valued their know-how and expertise. It also provided them freedom to channel their efforts to negotiating the best possible project in collaboration with the ministry representatives.

The project IKE was a collaborative conquest, by combining the interests of the private and public sector. It represented a public-private-partnership. Active citizens, pioneers of their fields, identified a public problem to be examined further, and once the ministry agreed with the objectives a joint venture was launched. The Ministry of the Environment constantly procured, among other projects, R&D projects that were not actively initiated by the ministry itself at the time of the project IKE (Ympäristöministeriö 2004:21). Today, the ministry's R&D budget has decreased to a 1/3 within five years. The ministry still allocates R&D budget to vital surveys that are needed in order to make specific policy-decisions. Practitioners or research units knowing the situation make practically no proposals for the ministry anymore. This opens the issue of an adequate budget for the public procurement of 'fuzzy front end' phase of innovation. Public financial support for citizens' efforts to improve public problems could create an interactive system that feeds both private and public sector. By strengthening the dialogical connection of the sectors, enhancing public problems could be a pro-active pursuit and a valuable partnership.

As the Ministry of the Environment funded the practitioner-driven endeavour of enhancing the apartment building renovation practices, the ministry supported their efforts. Thus, public funding declared the ministry's support for the public problem of apartment building renovation. It also established a particular approach to handle the public problem. The resident-oriented apartment building modernization gained a public status latest at the point when the ministry published the project report (Virtanen et al 2005). We emphasise the importance of publicity: it is also a tool for enhancing a public problem. By gaining awareness for the

subject, also other stakeholders and citizens beyond the participatory innovation project may join the endeavour.

DISCUSSION

We have presented a special case in public procurement of innovation: the project IKE represents the 'fuzzy front end' phase of innovation before pre-commercial procurement. The project combined public and private sector concerns on the inadequacy of apartment building renovation practices. It represents a special case of public procurement of emerging topics.

As the Ministry of the Environment procured participatory innovation of the public problem of apartment building renovations, it also promoted the issue. The project IKE led to empowered networks, a process innovation and a shared goal, and later on to favourable consequences. These occurred in the project IKE through building up stakeholders' commitment.

Commitment required three interconnected preconditions: technical and social pressures, interweaving stakeholders to a development network, and unique engagement of residents and professionals in workshops. These have similarities to Pfeffer's (1981) three conditions of commitment that are choice, publicity and irrevocability. Pfeffer's conditions contextualise in organisations but the project IKE deals with the inter-organisational and also public renovation sector. Pfeffer draws a picture of an individual that is persuaded to commitment. In the project IKE, the stakeholders were more self-motivated. The opinion leaders, who initiated the project IKE, were motivated to enhance the renovation sector. Already before the project, they had ideas on how to develop the sector. The project IKE acted as a tool to advance their objectives. During the project they gained consolidation and refinement to their preconceptions. As co-design workshops highlighted promising goals for the sector, their motivation strengthened. With clearer goals, they continued their endeavour. As they are also opinion leaders, they have disseminated the innovation to the renovation sector. Public procurement converted the opinion leaders to change agents.

Other project participants' commitment is in a certain degree based on other premises. One reason for the renovation sector to approve the resident-orientation could be that time was ripe for emphasizing residents. The growing interest in user-orientation at many fields and media, as well as maturing collaboration practices may have emphasized the idea of residents as equal partners. Equally, the contemporary fragmented work culture highlights the need for genuine face-to-face meetings that the workshops represented. These phenomena should be further studied to better address the feasibility of co-design for public problems.

The case IKE also raised a need for awareness of design research. Design researchers ability to provide tools for societal progress should be acknowledged before the projects are initiated. Then design research would be seen as one of the options to deal with public problems.

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CONCEPTUAL FRAMEWORK FOR PUBLIC PRIVATE INNOVATION NETWORK (PPIN): A TECHNOLOGICAL PERSPECTIVE

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ABSTRACT

In this study, we investigate the conceptual framework for public private innovation network (PPIN) to figure out the basic components that lead to the implementation of an efficient process of innovation. Four main internal components are included to build the conceptual framework: 1) inclusions of heterogeneous public and private actors in PPIN collaborate or interact between each other, where each has his own preferences, knowledge and technological competences. 2) Dynamic and evolutionary interaction processes. 3) The interaction-processes (ties decoupling and fragmentation) are combined with the emergence of social network, which would lead to generate knowledge disclosure between the heterogeneous agents. 4) The innovation network follow life cycle growth model, where in each stage of life cycle a set of new interactions and innovation activities take place. In addition, organizational and institutional competences are presented as complementary factors to facilitate efficient implementation of the conceptual framework.

INTRODUCTION

Globalization, convergence of consumer preferences, new technological paradigms stemming from advances in information and communication technologies (ICTs) and spreading similar technologies worldwide have led to organizational and structural deficiencies in the firms. They also hampered the firms' abilities to reformulate their competitive skills, provide solely the resources and competences required to offset high costs and keep pace with new technologies. However, such deficiencies have stimulated a change in the organizing principles of economical activities (Castells, 1996) and enlarged the organizations' boundaries in accessing a wide range of corporate expertise and technological fields (Cantwell and Santangelo, 2006). As a consequence cooperation and collaboration between different organizations through outsourcing, partnership, alliances, joint ventures and societal network (network relationship) have become an optimal choice for firms to persist, where technological and non-technological competencies can flow freely between partners.

The levels of the local connections in firms reduce the sustainability of the innovation processes which become a major difficulty for innovation to occur without exchanging knowledge and information with the surrounded environment. Thus, firms shifted from a traditional perspective to a more system-centered approach of innovation that mainly depends on collaboration between several institutions. Moreover, the linear model has been replaced by non-linear model of innovation that presents the innovation process as "systemic, complex, multi-level, multi-temporal and employ a plurality of heterogeneous economic agents" (Lundvall 1988; 1992, Freeman 1988; Nelson 1988; 1993; Rossi et al. 2009).

Innovation network manifests as a prominent mode of non-linear (complex) innovation process, which consists of several actors with relationships of social and economic context. Moreover, the innovation process is an evolutionary and interactive process that entails "intensive communication and collaboration between different actors, private firms, and other organizations such as universities, innovation centers, educational and financing institutions, standard setting bodies, industry associations, and government agencies"(Todtling and Trippl, 2005). The communications and interactions between network actors assure the diffusion and production of resources (e.g. financial resources, knowledge, information skills and competences) required to enhance innovation.

Recently, innovation network has evolved from uncomplicated network which consists of identical partners with specific economic activities to more complex network with heterogeneous actors. It becomes responsible for implementing most of the sophisticated innovation practices. Public actors are likely to be actively manifesting in this new innovation environment as main providers of complementary knowledge and technological assets, as they have high abilities to provide new institutional arrangements and new technological capabilities through their public institutions (like, government institutions, universities, public research centers and public R&D institutions).

Constructing an efficient interaction processes between heterogeneous actors to produce a successful innovation process is one of the most intriguing question in the new complex model of innovation. This paper will shed light on the answer by formalizing a conceptual framework that contains the structural elements of the public private innovation network (PPIN), needed for an efficient interaction process and successful innovation output.

In the second part, we will focus on the concept of network and its development to include innovation network, as well as the motivation for this innovation network. This will help us to define the network structure and the factors that may lead to successful innovation network. Thirdly, the paper will include the developing of the conceptual framework that will consider the existence of public and private actors, existence of social dimensions of interaction processes and the dynamic process of interactions, which follow specific life cycle growth model. Finally, we will reveal the successful organizational and institutional changes that required to have efficient innovative process.

Definition and Motivation of innovation network the determination of the structure of PPIN and their successful factors require well understanding of the innovation network's concept, and how we move from the cost perspective of collaboration relationships (like networks) to knowledge-based perspective of evolutionary economics as in the innovation network. Then, we will discuss the motivations for innovation network and how the need for an open model of innovation can significantly contribute to the development of the model.

DEVELOPING OF INNOVATION NETWORK CONCEPT

Network has multidimensional applications, as it is found in social sciences, sociology, anthropology, human geography, organizational theories and economics. Therefore, scholars have no consensus about one single definition for network. Nevertheless, the network is defined as a group of actors (like individuals, organizations) connected by a certain type of relations (Joy, 1964; Iacobucci, 1996). Gipouloux (2000) determined four main elements for the structure and operation of a network: 1) actors; 2) resources that represent the main exchange items between network' actors; 3) a binding mechanism which aims at providing coherence to the network (like, license agreement, shares in equity and subcontracting agreement); 4) activities includes the outcome of the network.

Some scholars defined network as a social structure between a group of actors, where social substance of network comes from the process of decoupling and fragmenting of ties. For example, Doreian (2001) defined network as "G = (V, R)", where V is a set of social actors and R is a social relation defined over the elements of V. Meanwhile, Agapitova (2003) illustrated the social specificity of the network through two dimensions: content (information, advice, friendship, trust, etc) and strength (amount of time spent together, emotional intensity, etc).

Since the beginning of 1990's, the concept of network has been employed in the discussion of innovation as a prominent application for open model of innovation, in which the complementary financial resources are not the only concern of cooperation, while the level of partners' technologies, know-how, and skills are also crucial.

Innovation network is new organizational forms that replacing the firms as dominant actors in the knowledge-based economy (Belussi and Arcangeli, 1998). Freeman (1991) was one of the first scholars who introduced an apparent network definition of the innovation process. He defined innovation network as "new institutional arrangements" or "organizational changes" to cope with systemic innovation. The institutional arrangements may include public research institutions, technology mediating organizations (technology licensing offices, innovation centers, etc.), and educational institutions (universities, polytechnics, vocational training institutions, etc.). Freeman's definition was quoted many times and most of the following definitions of innovation network were derived from it. In general, the structure of innovation network doesn't differ significantly from that of the other networks. It consists of several connected actors and the needed processes for final output determination. The innovative nature of output determines the specificity of actors and the kinds of exchange resources between them.

In technological innovation network, complex knowledge and technological resources are likely to be the main endeavor for different network actors. Therefore, to capture the main characteristics of the innovation network (inter-firm learning, the exploitation of complementarities, and the creation of synergies), it is important not only to focus on cost-perspective, but also to rely on the knowledge-based perspective of evolutionary economics (Pyka, 1999), and the inclusion of innovation network through intersection between organizational learning and knowledge-based view (Thijssen et al. 2004).

Innovation system and innovation cluster are two other concepts which are similar to innovation network, that entail interactive or collaborative processes of innovation in systemic and spatial frameworks (Freeman, 1987; Lundvall ed., 1992; Nelson, 1993; Freeman, 1995; Edquist ed., 1997; Hamdouch, 2009). In the former, scholars established "innovation system framework" that depends on the interactive learning theory, where the system includes agents (industries, universities, public institutions, etc) along with their main competences and features and the interactions produced among them. In the latter, we have a multi-agent collaborative relationship, where a variety of actors (like, organizations, public institutions, suppliers) interact together and exchange knowledge, technologies, skills and competencies

in respective geographical localizations that occur at a variable spatial space and specific institutional environments, so as to produce different modes of innovation (Hamdouch, 2009).

MOTIVATION OF INNOVATION NETWORK

The accumulation of knowledge (both explicit and tacit), skills and technological capabilities is fundamental to enhance firms' competences and innovation activities. Meanwhile, the emergence of complex knowledge and technologies require a new set of constant organizational changes and several types of learning competencies (like, know-how, skills and capabilities) to commercialize these new complex technologies (Rycroft, 2002). Therefore, collaborative relationships come into sight as crucial organizational changes in this new technological-based economy to off-set the deficiencies in firms' internal organizational and learning capabilities.

An innovation network manifests itself as prominent and sustainable way in accessing external technological capabilities and in delivering innovation in today's environment. Tushman (2004) determined four main reasons for firms' tendency to innovate through network rather than depending only on their internal activities. 1) Increase development time, 2) increase costs, 3) decrease product life cycle, 4) rapid globalization and competition for limited scientific expertise.

In fact, building an open model of innovation is a crucial motivation for developing innovation network. Until recently, innovation has been an internal process to the firm's boundary, directed by a fully controlled system and managed through hierarchical mechanism. Information and knowledge are considered private to the firm, where the diffusion of knowledge for actors out of firm's boundary is not possible under normal conditions. This debate, however, is less rational in a world described by high pace of innovation, high rate of change, globalization, mobile work force and uncertainty, therefore, the socialization of knowledge is demanded for increasing flexibility and reducing the risk of autonomous knowledge production (Sawhney and Prandelli, 2000).

In the innovation network, the firms' technological capabilities encompass both internally developed technologies and technologies developed out of firms' boundaries. In this case, the innovation paradigm will shift from closed to open innovation where firms constitute external connections (channels), social network and knowledge communities that enable these firms to capture both internal and external creativity and commercialize their own ideas to market by developing pathways out of current business (Chesbrough, 2003; Kline, 2003).

In services where the outcome is basically manifested in uncodified and tacit shape, the innovation network has different tasks. It is important in providing non-technological innovation. For example, new methods, approaches, organizational competences and designs lie in the core of those non-technological innovation activities.

CONSTRUCTION OF PPIN CONCEPTUAL FRAMEWORK

Increasing knowledge complexity has significant effect on the degree of complexity of PPIN, such as successful and efficient PPIN includes a wide variety of heterogeneous actors (like, industry incumbents, government policy makers and private actors). The natures of those actors depend on the endeavor of PPIN. For example, traditional PPIN which produce complex technologies need for actors with complex technological competences like universities, research centers. While "non-technological production" PPIN needs actors with non-complex competences like service firms and public service institutions.

As we concern only with traditional PPIN, it is important to know how interaction processes work in these complex structure. In other words, there is a need to define the features of such complex innovation structure by developing a theoretical perspective on how the heterogeneous actors communicate and interact socially and dynamically in a proper way that leads to producing new technological innovations.

To investigate this issue, we will construct a conceptual framework that combines the heterogeneous actors and standardize the dynamic process of interactions that include the key successful factors. In other words, we will develop a mediation framework between public and private actors in a complex networks which finally leads to an efficient and successful implementation of innovation output. Empirically, this conceptual framework can be applied to describe the innovation processes in actual PPIN (like, in transport, health sector, etc) to produce new technological outputs.

The conceptual framework will be constructed to synthesize four basic elements. Firstly, it will take into account the inclusion of public actors as main factors to the innovation networks. The public universities and research centers are the main representatives for those public actors, due to their abilities to provide complex knowledge and technologies. Secondly, the process of interactions between different actors is a dynamic and evolutionary process. Such process is responsible for the network structure overtime. Thirdly, the processes of ties decoupling and fragmentation are combined with the emergent and development of social network. The question is how these social interactions could generate knowledge disclosure between network actors to stimulate different forms of innovation. Finally, the innovation network has evolutionary path (life cycle), where in each stage of life cycle new interactions are re-arranged to construct the network structure overtime.

Descriptive approach supported by a group of theoretical perspectives will be employed in the constructing of the conceptual framework. The theoretical perspectives include diverse of theories from economic, management and social science. For example, interactive learning theory is important to capture the interactive processes between heterogeneous actors in one network, evolutionary economic theory is important to describe the interaction processes between different actors and dynamic processes of knowledge accumulation and diffusion, while social network theory and structuration theory are vital to show that networks are constructed into the social processes presented in the network and that these social processes are crucial to relationship founding and first stage performance, whereas new institution-

al theory and organizational theory are required to capture the institutional and organizational changes accompanied by innovation process and their role in developing innovation.

PUBLIC ACTORS' ROLE IN PPIN

The second part of the last century witnessed changes in the form of public output provisions. The output generally provided by public institutions, is now provided in collaboration with non-public actors. For example, private actors might cooperate with public actors to provide new public outputs. Public- private partnerships lie in the heart of these collaboration agreements. The main goals of collaboration are mitigating risks, minimizing costs and finding complementary financial resources. All these goals are considered non-innovational, while in PPIN, the production and diffusion of complex knowledge and technologies are becoming the main engines for collaboration. In this case the public actors are vitals due to their internal complex knowledge and technological capabilities that provided mainly by universities and public research centers.

The complementarity between public and private competences and the actors' absorptive capacity are important for efficient interaction processes. In other words, it is important to synthesize the interaction processes between public and private actors-they generally have different preferences and competences- in a way that avoids the inconsistency between their preferences and the technological capabilities.

Public actors (like, governmental agencies) have also minor role in the technological PPIN. They can regulate the interaction processes and provide the institutional envelope that will be aligned with the PPIN life cycle. These institutions might include new rules, routines, approaches, legal and government policies, new types of intervention tools, design of political initiatives which are adequate to foster the learning and knowledge exchanging processes and supporting functions that ensure the cross-flows of knowledge and information between other network actors.

Finally, the public role and participation do differ from PPIN to another, depending on the complexity degree of the network, power-sharing arrangements or relative-influence on the innovation between the public and private actors.

SOCIAL DIMENSION FOR PPIN (NETWORK AS A SOCIAL SYSTEM)

The extent of innovation outputs in PPIN depends on the efficiency of the interaction processes. The decoupling and fragmentation of ties lie in the core of interaction processes and are combined simultaneously with the development of social network (Agapitova, 2003). Therefore, PPIN is constructed into the social processes present in the networks (Samli and Bahn, 1992). The social capital enhances the collective learning between heterogeneous actors and impact the exchange behavior (Granovetter, 1985; Uzzi, 1997; Valley, Neale, & Mannix, 1995). Consequently, in PPIN, a socio-economic framework (regime) should be employed to incorporate both technological and social dimension of interaction processes.

Social processes are gaining more interest in PPIN because interactions between network actors strongly determine the innovative output. Therefore, social capital have vital role in relationship founding, first stage performance, and in maintaining the cooperation between network actors in the long-run. They are also crucial to balance the deficiency when using economic dimensions to describe social entities, mainly using physical artifacts and the corresponding R&D and economic activities to describe the different stages of life cycle of PPIN product (Pyka et al.2010).

Social network analysis (SNA) (Freeman 1984) is one of the most prominent techniques used to incorporate social dimensions, analyze social relations between individual firms or actors (Salavisa, 2009) shape the evolution of innovation in innovation networks and to determine the position receptivity or popularity of network actors (Wasserman & Faust, 1994).

SNA has metrics (measures) that can identify network characteristics from both actor-related and network-related level. Actor-related measures (like, degree centrality and closeness) are used to describe the role, power and influence of different actors in the process of exchange, creation and diffusion of new knowledge and technologies. While, network-related measures (like density, clustering coefficient) are important to attribute for the overall measurement of network characteristics regardless of the actor-level assessment. They are important in determination of the evolution of innovation network, and establish other important factors related to the innovation process like, the stability of network (more density network lead to more stable network), the speed and number of channels for information flow (high connectivity provide different ways for knowledge diffusion).

SNA was employed by many scholars in innovation network discussion. For example, Messica (2007) in static analysis of innovation network in high-technology sector used three SNA metrics like, clustering coefficient, the extent of the network and the mean connectivity. He classified innovation networks into five categories: ring, mesh, star, fully connected and line. Cowan et al. (2004) in dynamic analysis of innovation networks, used different SNA metrics like, local order or cliquishness, path lengths and density. They found that knowledge creation through emerging network was the corner stone of the innovation process. Watts (2003) used distance between nodes to estimate the effect of network structure and actors' behavior. Pyka et al. (2010) in their analysis of innovation network, classified SNA measures into two groups. The first group includes actor related measures: degree centrality, closeness centrality and betweenness centrality. The second group includes network-related measures to describe the structure of the whole network: density, connectivity, distance, degree distribution and clustering.

DYNAMIC OF PPIN

The interaction or communication processes between network actors are not static; they are dynamic or evolutionary processes (Arechavala-Vargas et al. 2009) and accompanied with ties decoupling and fragmentation processes (i.e. the entry of new actors and exit of others or forming of new ties and dissolving of others), which lead to different structures with different roles for network actors over time. The efficient dynamic process should match between two network specificities: the enormous complexity of the interac-

tion patterns and different incentives and information that determine the behavior and preferences of actors (Schweitzer et al.2009).

The dynamic processes are important as they induce knowledge accumulation and learning (Garcia-Pont and Nohria, 2002; Gulati, 1999; Powell et. al 1996) and allow accessing for new technologies that promote innovation output. According to Lane and Maxfield's (1997; 2005), the dynamic interaction processes in the innovation network that contains heterogeneous actors can lead to structure that is significant for the innovation processes.

Dynamic innovation network mean that the state of the network in one period determines their state in subsequent periods. Therefore, the initial form of network has fundamental role in the evolution of the network at later stages and determining of its final structure. Nevertheless, this does not imply that the innovation network will maintain a stable form over time. A network may start spontaneous with informal interactions between actors where the entrepreneurs play vital role in making the network function and develop the innovation in its initial form. Then, at later stages develop into permanent network and become more professional in terms of internal management and developing of learning toward network sustainability (generating series of innovation) (Weber, 2009).

Topologically, it is expected that the conceptual framework for PPIN considers both the dynamic process of interactions and the structure of the network, because different evolution rules lead to different network topologies.

EVOLUTIONARY MODEL FOR PPIN

The dynamic process of PPIN is systematic. It follows evolutionary path (life cycle model) structured in a way that leads to new innovative products. Meanwhile, each new innovation output requires different modes of interactions between network actors (i.e. the exchanged knowledge to produce output "X" will certainly be different from that of producing output "Y"). So, it is important to have a theoretical concept that explains the way the structure of innovation networks change or evolve overtime (theoretical life cycle model) arriving to an efficient network structure.

The life cycle model is important to explain the network function and success factors, redefine actors' roles over time and distinguish between different networks (i.e. if there are similar temporal patterns of evolution across different networks) regardless the mode of innovation output which might extending from technology-intensive to primarily organizational changes.

In literatures, we can find many approaches to describe the network life cycle model. Jackson and Wolinsky (1996) for example, introduced a game theoretical setting (co-author model). Li (2005) proposed a socio-cognitive model for newly development product illustrating the dynamic of interaction between technological platform/hard architecture of knowledge and communities/soft architecture of knowledge that lead to open innovative and new products. Podolny et al (1996) used niches in evolutionary theories of technological network (technological network niches). Weber (2009) proposed other theoretical model that explains the network life cycle like, chaos theory or cybernetics for public-private network.

Product life-cycle growth model were found to be the most prominent theoretical concept that used to incorporate the network dynamic process (Weber, 2009; Pyka et al., 2010). Product life cycle model has four[1] main stages: initial, growth, maturity and decline stage. The innovation networks evolve through life cycle model and each stage has different form of innovation activities.

The product life cycle model was successfully applied to describe the life cycle of innovation networks in manufacturing sector to produce new technological output (technological innovation) (Jovanovic, 1994; Klepper, 1996; 1997). Therefore, the application of product life cycle model on traditional PPIN is likely to be efficient.

Two important points should be considered when applying product cycle growth model on PPIN. Firstly, it should consider the social dimensions that are important in the formation of PPIN. Secondly, it is difficult to follow the four life- cycle stages (initiation, growth, maturity, and decline) in some forms of PPINs, due to the dissolve of network before decline state, the start of a new cycle within the same network (Tushman and Anderson, 1986) or in some cases, network follows more than one evolutionary paths (Weber, 2009).

The introducing of "socio-economic approach" that consists of both economic measures (relative performance) and relevant social indicators (measures) allow to adjust the product life cycle model to incorporate the social dimensions of interaction process (Cowan, 2004; Koenig et al. 2007 and Pyka et al., 2010)

CONCEPTUAL FRAMEWORK FOR PPINS

PPIN framework is a process of comprehensive conceptualization for an innovation process that formed through the synthesizing between the four constructing elements in an open, complex, social and interactive process of innovation (see fig.1). The synthesizing process involved the consistency between public and private actors who interact dynamically in the product life cycle model, reinforced by social capital and supported by appropriate institutional and organizational changes to facilitate the process of interactions and lead to efficient and successful innovation process. The innovation output under the conceptual framework will be provided as follows: the public and private actors communicate and interact between each other where complex knowledge and technologies are exchanged between them in a collaborative environment and supported by the social capital, to produce new technological innovation. The complementarities between actors' knowledge and technological resources are crucial for successful and efficient interaction processes. The interaction processes and the production of new innovation output are dynamic processes along the network life cycle. In each stage of network life cycle, the nature of interaction processes and innovation activities (the mode of innovation in the first stage of network formation is different from that at the growth or maturity stage) are different determined by the type of actors, the SNA dimensions and the mode of knowledge and technologies exchanged. The diversity of innovation activities along the evolutionary path is critical underpinnings for a successful PPIN life cycle.

The existing of social capital in the innovation network safeguards continu-

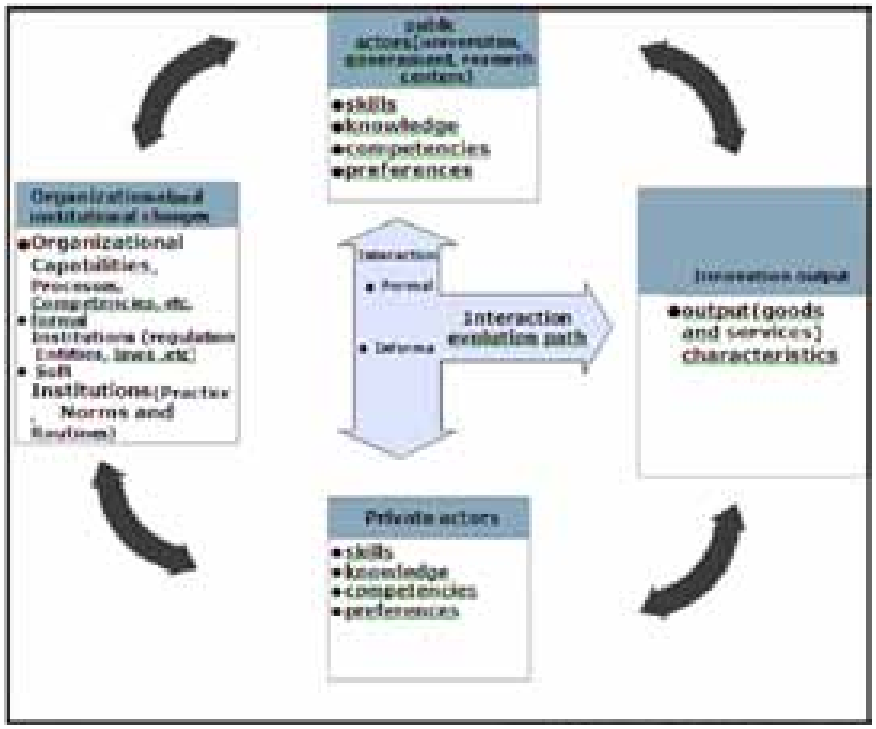

Figure 1: PPIN Framework

ous and efficient process of flowing knowledge and technologies between public and private actors. In addition, the definition of public and private actors' roles in the innovation process in all life cycle stages reveals a crucial point upon applying SNA in PPIN. For example, actor with high degree centrality (enabling or control power) means that they have a prominent role in the success or the hamper of innovation process, as they can control the creation and flow of knowledge and technologies through the network and determine the quantity and quality of interactions with other network actors.

The dynamic process of PPIN allows for the transition from the initial to the decline stage of the network life cycle and shows how the competences and preferences of one actor co-evolve overtime with the competences and preferences of the other network actors supported by a "feedback mechanism", where actors either reinforce each other to produce and diffuse of new technological resources or they conversely block the effect of each other.

INSTITUTIONAL AND ORGANIZATIONAL DIMENSIONS OF CONCEPTUAL FRAMEWORK.

Organizational thinness and weak building of institutional framework are two main network failures. Transformation from a close notion of innovation process (innovation is a decision of one actor) to an open process of innovation (innovation output is a result of collaborative effort of several actors) entails decisive path-shifting in terms of organizational and institutional patterns to form a supportive instrument for the innovation process and avoid any possible contradictory forces between the heterogeneous preferences and competences of network actors, which if not handled appropriately might lead to the emergence of lock-in forms of innovations. Consequently, PPIN must undertake organizational and institutional changes to evolve in a different level along the network life cycle, where inappropriate organizational changes and divergent orientation of existing institutions in one stage may lead to serious innovation problems in other stages.

In fact, organizational changes represent a parallel path for the network evolutionary path. Organizational competences are developed to cope with the creation and diffusion of new knowledge and technologies along the network life cycle, where the shift from one stage to other requires the shift in the organizational patterns to organize the behavior of actors and the interactions between them.

The process of innovation and institutional adaptation are two interactive entities in PPIN structures. The institutional competences in PPIN serve as a medium where knowledge and technologies are combined with routines, norms, rules, regulations and mutual understandings to facilitate the process of interactions and to have efficient exchange of information between network actors. They allow for PPIN to survive and act in high changeable and uncertain informational and technological system, by safeguarding the mutual relationships and securing the flow of knowledge and technologies between different actors and determining the factors that may impact on fostering or constraining the innovation processes.

Institutional adaptation includes wide varieties of practices which are provided by public institutions, private institutions or from individuals. They might comprise funding organizations (banks, venture capital companies, 'business angels', public funding agencies, etc.), law companies (especially those specialized in property rights issues) and regulation entities (standardization committees, ethical commissions, etc.) (Hamdouch, 2009).

SUMMARY

We have developed a conceptual framework that used as a "comprehensive mechanism" for producing and diffusing technological innovation in traditional PPIN. This mechanism is built through the cooperation between public and private actors in a complex, dynamic, social and interactive network structure. Innovation output is produced through dynamic interaction processes between the public and private actors along the network life cycle. In each stage various interactions occur and different modes and quantities of knowledge and technological resources are exchanged reinforced by the flowing social capital. The association between product life cycle model and SNA shows how is the structure of PPIN in each stage of life cycle and reveals crucial information about how public and private actors' roles are embedded through network life cycle, which leads to a successful innovation output.

Organizational and institutional

changes are important for efficient constructing of PPIN. They will facilitate the initiation of collaboration between PPIN actors, the exchange of knowledge and competences in all stages of network life cycle and to avoid any prospect conflict between heterogeneous preferences and competences of network actors.

NOTES

[1] *Weber (2009) proposed network life cycle from three stages: 1) prototype-industry, 2) commercialization and entrepreneurial, 3) consolidation and firm growth.*

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INTELLIGENT PUBLIC DEMAND

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ABSTRACT

Recent work has pointed towards a new age of innovation that is emerging and affecting both the public and private sector. To survive, companies must respond to finding solutions to global challenges, such as climate change and poverty, as well as participating in solving the welfare challenges that are prominent in particular in the western world. At the same time, the public sector must become more innovative in order to deal with the economic pressure on welfare services, and lack of warm hands. Intelligent public demand is identified as one of the solutions to these identified challenges.

This article is based on the recently published report by FORA, I*ntelligent Public Demand and Innovative Public Tenders*. By interviewing 40 people in public organizations in UK, Finland, US and the Netherlands the study conducted an analysis of leading organizations and their experiences of using intelligent public demand to solve major societal challenges.

Two distinct findings emerged from the study: (1) major societal challenges and the desire to create a more innovative society means that intelligent public demand and innovative public procurement will play an important role in future innovation policies; and (2) further it is believed that countries especially in Europe can learn from the experiences described in this study and find inspiration to prioritize the use of intelligent public demand and innovative public procurement.

INTRODUCTION

Finding solutions to major global and societal challenges will be one of the most important drivers for innovation in the future. This applies to issues such as the climate challenge, the need for clean drinking water, disease and poverty in developing countries and welfare challenges in developed countries. Few, but leading private companies have committed themselves fully to addressing some of these future challenges. They have created innovative organizations focused on finding new ways to solve some of humanity's problems and at the same time they are profitable private companies.

There are also exciting new examples of NGOs and charities that are organized as innovative private companies where earnings do not accrue to shareholders but are reinvested in social solutions.

Also the public sector needs to become more innovative. Future welfare challenges can only be overcome in the coming decades, if new ways to produce and deliver welfare services are created.

Innovation in the private sector often takes place in innovation alliances between companies and experts from research institutions and often involving users in the innovation process. The results are often individual solutions, where customers and companies create value together.

It will be important for the future welfare system, that public organizations and institutions become part of the open innovation alliances of tomorrow. One way to do this can be by introducing intelligent public demand.

The purpose of this paper is to discuss experiences with intelligent public demand from countries that are considered advanced in this field and who have already obtained some initial experiences.

WHAT IS INTELLIGENT PUBLIC DEMAND?

Public private innovation (PPI) is the newest form of public private interac-

tion and it is about public and private partners who jointly explore and develop new innovative solutions.
Public private innovation and intelligent public demand is the same phenomenon. However, intelligent demand is more than just public private innovation. If innovation partnerships are to be described as intelligent public demand they must be part of an overall systematic innovation process, ranging from identification of a social problem to implementing the new solution.
Intelligent public demand can be divided into 4 key elements.
Firstly, a societal challenge needs to be identified in a field, which will generate the necessary understanding and support to launch a demanding process of innovation by private actors. Innovation involves risk and the solution may not be known in advance, hence it is not an entirely easy matter to pick out the areas where it makes sense to experiment with intelligent public demand, and where the public sector is willing to take a chance.
Secondly, once a societal challenge is selected the next step is to achieve a deeper understanding of the causes of the problem and explore how the problem can be divided into elements that make it possible to launch concrete innovation processes.
If this is achieved, the third step will be to set up innovation teams with the right skills for solving the problem. Often multi-disciplinary innovation teams are needed, and it is rarely clear who the right partners can and should be. Therefore access to special search processes or to knowledge networks will be needed in order to combine innovation teams with the appropriate skills.
Finally, it is crucial that concrete innovation processes are arranged so that the solutions that are a result of the processes are useful for the government and actually ends up being implemented.
While these 4 elements seem to make up an innovation process that is recognized by countries working with intelligent public demand, there are also several barriers that need to be overcome at each step. These barriers will be discussed later in this paper.

DATA AND METHODS

In the report, *New Nature of Innovation*[1], intelligent demand and smart regulation are highlighted as policies that can meet future innovation policy challenges.
The report identifies Finland, Netherlands, UK and U.S. as countries that are advanced in respect to new innovation policy considerations on intelligent demand and smart regulation.
The experiences with intelligent demand in the 4 countries are described in the study, *Intelligent Public Demand and Innovative Public Tenders*[2], and are the basis for data collection in this study.
In all 4 countries key figures within the ministries responsible for innovation policy has been contacted for pointing out designated public organizations and/or private institutions working with intelligent public demand. Desk research of organizations and activities in the designated institutions has also been carried out.
Semi-structured interviews have been conducted with a total of 40 people. The people who were interviewed have been asked to explain the structure and work of their organizations. They were also asked about their experiences in overcoming the challenges or barriers to intelligent public demand outlined above. Finally, they were asked about the existence of other barriers to intelligent public demand.

EVALUATION OF DATA

There are relatively few examples of intelligent public demand around the world, but especially the UK seems to have interesting experiences both with the development of welfare technology and user involvement.
This is the case for the Technology Strategy Board in particular, which has been asked by the UK government to carry out a number of projects which will promote private sector involvement in the development of new technology for new welfare solutions.
It also applies to the Design Council, funded by the British Government. The Design Council has launched several projects for the renewal of welfare services by using new design methods. Service design can provide knowledge about how the meeting between technology and users can be optimized in order to better achieve the full benefits of technological opportunities.
Finland has tried to break new ground with systemic innovation of the entire welfare area. The work is grounded in the Finnish Innovation Fund, SITRA. Finland has also interesting experiences with the use of public procurement to stimulate new innovative welfare solutions.
In the U.S., NASA and DARPA have extensive experience with technology exchange between the private and public sectors, especially technology exchanges between small and medium sized businesses and entrepreneurial firms.
It is estimated that NASA is the organization which has the most experience with unconventional but effective ways to use private companies for technology development for public use - a technology development which also forms the basis for development in the private sector.
Although NASA basically works with the exchange of space technology, the assessment of methods and experiences can also be used for development and dissemination of welfare technology.
The study *New Nature of Innovation* had a particular intent to screen for policy initiatives that signaled new policy praxis within a very broad area of innovation and not just new welfare solutions. The screening was not perfect and the detected cases were not investigated and described in depth, and hence some countries might have been overlooked.
The report *Intelligent Public Demand and Innovative Public Tenders* made a more thorough screening of experiences with new welfare solutions based on new technology and especially interesting experience in getting private companies to develop technology for use in public. The screening was carried out in the UK, Finland, Netherlands and the U.S. On the basis of the screening a number of the most promising projects will briefly be described, and one project from UK, which is considered to be the most comprehensive case of the study, will be described more in depth in the following.

RESULTS

The U.S. has a long tradition of public private cooperation in defense equipment and aerospace. It began in the

1950s and has mainly focused on developing advanced technologies for the U.S. defense and space program. But there are also numerous examples of technology developed for defense and aerospace, which have been applied in the rest of society. The most spectacular example is the Internet, originally developed for the U.S. defense so different computer systems could communicate with each other.

The U.S. also has a long experience with a program of collaborative research between the public and small businesses - Small Business Innovation Research - SBIR program. All federal institutions with research budgets are required to spend 2.5 per cent of their research budget to purchase technology from small and medium sized enterprises.

UK and the Netherlands have been inspired by the American experiences and have taken similar approaches and launched programs to develop new solutions to both global challenges and welfare challenges.

Finland is also experimenting with new forms of public private innovation. Here the inspiration is not so much the American experience, but rather the work of the OECD and the experiments initiated by the EU Commission[3].

None of the countries so far are so advanced that they have carried out major projects that make it possible to describe and evaluate the combined effect of new ways of conducting public private innovation. But there are contours of new ways of doing it.

One can distinguish between intelligent public demand, starting with the major societal challenges - Grand Challenges - and intelligent demand, which is based on more definite concrete problems.

In the Netherlands the government has initiated programs that are based on major societal challenges.

The Dutch government has set up Innovation Platforms with the Prime Minister as chairman. The government has asked businesses and universities to contribute with suggestions for social challenges, which require new solutions, and in areas where the Netherlands have the competences and strengths to develop new solutions.

The Innovation Platforms divided the many proposals into 6 prioritized areas - Key Areas. The Government invited the business sector and knowledge institutions to form networks that could establish the necessary cooperation to solve the challenges. The government has also established a number of innovative programs that will be the driving force behind the innovation networks[4].

The Dutch Ministry of Finance coordinates the work between the ministries involved in the projects, which is about finding new solutions to societal challenges. The 4 priority areas: Security, Energy, Health and Water.

The Dutch government has also introduced a Small Business Innovation Research (SBIR) program based on the American model. The program will promote public institutions' use of intelligent public demand. Originally it was intended that the program would require all state institutions to spend a specific amount of their budget on problems that could form the basis of public private innovation - so-called innovative public procurement.

The UK government has ordered all ministries to develop strategies for innovative public procurement. However, the tenders have not yet had the widespread success that the government had hoped for, but there are interesting examples such as the UK's National Health Services and the Home Office.

One of the challenges of innovative public procurement is to get the right companies and knowledge institutions to come together in innovation alliances. Experiences from the UK shows that the Knowledge Transfer Networks established by the Department for Business, Innovation and Skills play a key role as intermediary between public authorities, companies and knowledge environments. A similar role is also carried out by the Design Council.

The UK government has also provided the Technology Strategy Board (TSB) resources to launch more extensive experimentation with intelligent public demand. TSB is an independent organization at arm's length from the government and TSB has a 3-year budget of 1 billion pounds.

The board at TSB consists of representatives from business and knowledge institutions. The Board has established Innovation Platforms where major societal challenges are discussed and examined whether the challenge can be divided into sub problems that can form the basis of public private innovation.

When a problem is identified TSB cooperates with the specialized knowledge networks, KTNs to form the right skilled innovation alliances which can apply for grants to solve the problem. The selected innovation team is put in touch with a steering committee with representatives from ministries, companies and scientific institutions.

Initially the focus was on developing new technologies for climate, environment, safety and flexible transport systems. But innovative platforms to come up with solutions for elderly and disabled people to become more self-reliant have also been created- Assistant Living and an innovation platform for the reduction of risk of infection - Detection and Identification of Infectious Agents.

In Finland, the independent innovation fund SITRA just created a design laboratory, Helsinki Design Lab (HDL), which will investigate how to use service design and design thinking to come up with proposals for solutions to societal challenges. Helsinki Design Lab has in the summer of 2010 conducted 3 pilot projects: Marginalization of boys in primary school, How elderly people can stay longer in their own homes, and The reduction of CO2 emissions in society.

The Finnish Funding Agency for Technology and Innovation TEKES, has a program where municipalities and public institutions are eligible to hire private consultants for advise on the launch of innovative public procurement.

The Finnish Ministry of Economic Affairs and Employment has recently published a new Finnish innovation strategy - Demand and User-Driven Innovation - Framework and Action Plan.

The strategy announced that Finland should increase the use of innovative public procurement and find ways to increase the use of intelligent public demand. TEKES has thus been instructed to make suggestions about how the Finnish technology programs to a greater extent may be based on the solution of social problems and

demand-driven innovation.

Technology Strategy Board

The Technology Strategy Board (TSB) in the UK has developed a model for intelligent public demand, which is perhaps the most comprehensive case in the study. The model consists of 4 stages (see figure 1 below):

- Study phase
- Innovation Platform
- Development phase
- Implementation

At the first stage social challenges are identified and prioritized, and it is decided which challenges should become subject to continue the innovation proces. At TSB, the Governing Board determines whether a challenge can qualify for the next stage.

At the second stage, an innovation platform is launched. The overall responsibility for the work on the innovation platform is handled by a member of the TSB's management team, who forms a team of TSB employees, responsible for activities on the platform. The aim is to come from the complex socio-economic challenge to concrete problems that can be tendered.

Along this process brainstorming sessions with experts are organized and working groups with individuals who have specialized knowledge in the field are set up. The intention is to gain a deeper understanding of the problem and a possible division of the problem into distinct sub problems. Societal challenges are often complex problems that cannot be solved by one single project. Therefore the challenge needs to be divided into several concrete sub problems that can be tendered to right skilled project groups. It is a great challenge to ensure that the most skilled knowledge and the most relevant experts participate in the activities at the Innovation Platform. TSB has over the years built up an extensive knowledge of British businesses and knowledge environments. TSB also works closely with ministries and other organizations, such as the Design Council.

To find the right experts and partners for the innovation platforms TSB draws on a number of UK Knowledge Transfer Networks (KTN), which are built on the initiative of the Ministry of Business, Innovation and Skills (BIS).

When work on the Innovation Platform has led to a concrete problem that can be tendered, it is up to TSB's Managing Directors Board to decide on the budget and the steering committee for the project. The steering committee may consist of representatives from the TSB, ministries, companies and knowledge institutions.

It is obviously very important that a tender from one of TSB's innovation platforms is reaches all relevant parties to form the necessary innovation alliances. It is a task in which the KTNs play a crucial role.

There are several examples that KTNs have been very active in disseminating information on procurement from TSB to members and played a leading role in shaping innovation alliances that have applied for the projects.

The last stage in TSB's overall innovation process is the implementation. It is of great importance that the public institutions responsible for the addressed issues on the Innovation Platform are following the process all the way through.

Representatives of public institutions can participate in working groups on the platform and in specific steering committees for specific innovation projects. The intention is obviously that the representatives for the "users" are welcome to influence the implementation process with their knowledge, attitudes and needs.

DISCUSSION

It has been a starting point for the study that there are a number of barriers to overcome before intelligent public demand can be introduced. The study has focused on how different institutions are trying to overcome the barriers.

It has been a part of the study to test whether the expected barriers were a hindrance to intelligent public demand and whether there were additional barriers. The anticipation was that there could be challenges in all stages of the process for intelligent public demand

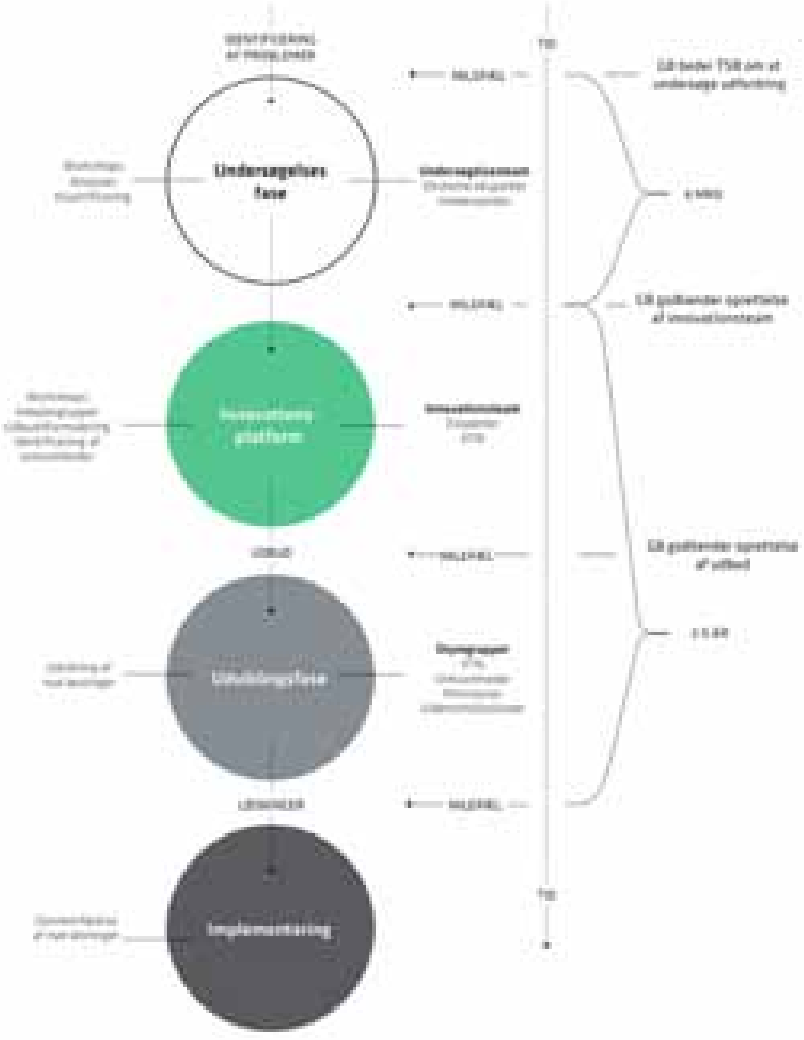


Figure 1. Technology Strategy Board – Innovation Program
Source: Intelligent Public Demand and Innovative Public Tenders, FORA (2010).

and that tradition and culture in public and private organizations also could be a barrier.

Five barriers have been identified:

- Tradition and culture in public and private organizations
- Identification and prioritization of societal challenges
- Managing the process from challenge to concrete, specific issues/problems
- Identification of innovation teams
- Implementation of new solutions

All public bodies have a specific mission and one or more specific tasks to solve. Public organizations strive to have the best knowledge and skills for the job, and therefore it is not easy to acknowledge that external persons may have the capacity to develop new and better ways to solve the problems.

Many public authorities have a control function towards the private sector, which leads to a natural distance between the public authority and the private sector. This can be a barrier if the public authorities want to invite the private sector as partners to explore and develop new innovative solutions.

There may also be cultural barrier in the private sector. It can be difficult for private companies to understand and work within the boundaries of the public sector where the services offered must fulfill standards that are normally not required of private companies.

Innovation is by definition uncertain. You can plan to solve a specific problem, but you may not know if there is a solution to the problem or what the solution will be. This kind of uncertainty can easily be handled in the private sector where much development can take place behind closed doors. This is not the case in the public sector, which can lead to public authorities being more reluctant to engage in radical innovation projects. It may also be difficult for private companies to understand the conditions that apply to public innovation.

The study showed that one way to change the culture of public organizations is by a top down approach where the government outlines a strategy or policy for introducing intelligent public demand, and thereby forces ministries and other public organizations to go in the desired direction.

If a public organization decides to introduce intelligent public demand the first barrier is to identify issues where it seems likely that intelligent public demand may lead to new solutions. It requires knowledge of both technological opportunities and new services, which the public organization does not necessarily hav,e and it is not easy to obtain.

Furthermore there is often a priority issue. How many resources are to be spent on finding new solutions? And if there are several important issues that could be relevant to solve, which ones are to be given priority?

The starting point for intelligent public demand is a complex societal challenge to which a solution is not obvious. The public organization must gather teams with the right skills to manage processes that make it possible to get from a complex overall societal challenge down to specific problems for which it is possible to find practical solutions.

The next barrier is to put together the right innovation teams. In private companies it is common to form innovation alliances, because often it is simply not possible for a single company to have all the skills needed in an innovation process in house.

But also for private companies it may be hard to find the right innovation partners. It is therefore an important element in innovation policy of today to create an environment that promotes networking and better opportunities to create innovative alliances.

The final barrier to new solutions based on intelligent public demand is how they actually end up being implemented. Innovation processes are lengthy and expensive. Private companies would not spend resources on public innovation, if there were no prospects of a sufficient demand for a new solution.

Furthermore, the market may be too small for a solution to be commercialized, but there may also be uncertainty about the size of the market because there is rarely given any assurance in advance that a new solution will be implemented.

On the other hand the public organizations cannot decide whether a new solution can be implemented when it does not know the solution. This might be one of the most important barriers to intelligent public demand.

The study has showed a number of cases of how public organizations in EU and US have overcome these barriers. The most significant case is the Technology Strategy Board (TSB) in UK who has designed a coherent model for intelligent public demand to solve major societal challenges. The TSB model sees to overcome all the identified barriers as presented under results in the previous sections.

In summary, it is considered that the need to find solutions to major societal challenges and the desire to create a more innovative society means that intelligent public demand and innovative public procurement will play a big role in future innovation policies.

It is further believed that countries especially in Europe can learn from the experiences described in this study and find inspiration to prioritize the use of intelligent public demand and innovative public procurement.

ACKNOWLEDGEMENTS

This paper is based on the report, *Intelligent Public Demand and Innovative Public Tenders*, FORA (2010). The report is written by Jørgen Rosted and Anne Dorthe Josiassen.

For the report a total of 20 organizations were visited in UK, Finland, Netherlands and US, and more than 40 people were interviewed. The study has received information on specific projects, but also about the difficulties and considerations that have occurred during the processes of introducing intelligent public demand. Finally the study has received interesting evaluations of the various initiatives and programs.

We appreciate the openness and assistance we have received which has been crucial to the preparation of the report and the present paper.

NOTES

[1]*FORA (2009), New Nature of Innovation*

[2]*FORA (2010), Intelligent Public Demand and Innovative Public Tenders*

[3]*http://www.oecd.org http://www.copenhagenlivinglab.com/sites/default/files/PreCo_Brochure.pdf*

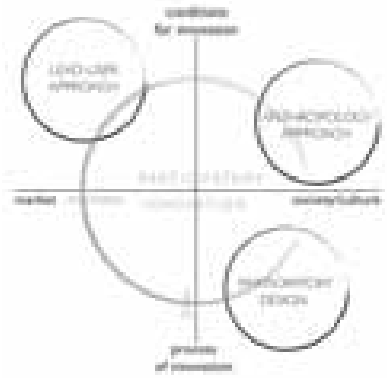
[4]*Ministry of Economic Affairs, November 2009, Innovation Programs - The driving force behind the innovation network*

ABOUT SPIRE

Sønderborg Participatory Innovation Research Centre is a national strategic research centre located at the University of Southern Denmark. The SPIRE centre was founded in 2008 with funding from the Danish Strategic Research Council to boost the field of user-driven innovation. SPIRE has its roots in the Scandinavian tradition of participatory design, and the research environment at the Mads Clausen Institute can be traced back to the Danfoss Group who was industrial pioneers in the field of user-driven innovation in Denmark from the early 90s.
SPIRE research is fundamentally cross-disciplinary with a full time staff of 20 researches collaborating across disciplines like design anthropology, linguistics, participatory design, interaction design, innovation management, organizational development, business administration, public procurement. As part of the centre the Dacapo Theatre contributes with a unique knowledge of complex organizational processes and an experimental method of developing innovation practices. SPIRE conducts its research projects in close partnerships and collaboration with companies. The company partners in the SPIRE centre include a spectrum of multinational corporations, large Danish manufacturing companies and small and medium sized enterprises.

FROM USERS TO VALUE NETWORKS

The basic premise of SPIRE research is a re-conceptualisation of the value chain. While the transfer of knowledge between different domains and organizations is understood to be central to innovation, the typical focus of such research on technical knowledge has overshadowed the potential for innovation available at other junctures in the value network. This is a potential that can be explored by seeing innovation not in a simple developer-user value chain, but in a complex and dynamic network of value-producing relations between producers, suppliers and consumers. Similarly, the conception of 'use' must be broadened to include service, marketing, packaging, distribution, sub-supply and sales, as well as the various end-users, who each bring their own, vested concerns to the product. Users are a valuable source of creativity and knowledge and thus contribute to the development of new products, especially in the so-called "fuzzy frontend". Understanding the role that users can play in innovation has been the focus of different strands of research in economics, management, design, engineering and systems development. Three of these strands, differing in focus and orientation, are especially salient to the current state of the art in user-driven innovation research. Exploring the constructive tensions between these strands opens a new approach to the study of user driven innovation.



COMBINING APPROACHES

The *Lead User approach* developed by Eric von Hippel details the business potential of lead user innovation and the conditions that lead to it. This approach has developed theory and methods whereby companies can find and exploit ideas developed by users — in a sense, outsourcing design and development and obviating traditional market research — thereby increasing their market advantage. Another vital strand is the Scandinavian legacy of *Participatory Design*, originating out of Kristen Nygaard's pioneering work in the 1970. Participatory Design has developed a myriad of methods to engage stakeholders in co-design activities throughout innovation processes. A more recent development, particularly in the USA, has been the application of anthropology to development practices as a means of providing comprehensive understandings of users. *Design Anthropology* selectively applies anthropological theory to challenge existing conceptualisations of products, services, technology, users and use. Interaction analysis has played a central role in the emergence of Design Anthropology, augmenting anthropology's holistic focus that takes into consideration societal and political issues, with a detailed analytic orientation to the organization of their practices.

Each of the three approaches offers unique contributions to user-driven innovation. Design Anthropology provides the most comprehensive understandings of users and contexts of use, and brings a theoretical orientation that enables businesses to expose tacit assumptions embedded in organisational processes and to re-perceive their role in the market. The unique strength of Participatory Design is its ability to introduce novel user-driven practices to organisations that have traditional ways of working. The Lead User approach directly ties to market opportunities for innovation and has produced impressive results at organizations such as 3M. By adding new disciplinary perspectives SPIRE has the ambition to establish the new research discipline of *Participatory Innovation*.