

Future probing: Practices for exploring and anticipating far and near future uses of digital technologies

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This is work under development. We appreciate comments on approaches for further analysis and theoretical viewpoints.

Abstract

Digital technologies permeate and transform organisational practices. As a society, we need means to explore the uncharted terrain that lies ahead and the desirability and consequences of possible courses of action to move forward. We investigate a design approach, called ‘future probing’, to envision and critically analyse possible futures around digital technologies. We first reconstruct our journey and describe related insights on the process, content and context level. Reflecting on the journey, we then extract a key insight revolving around the challenge for participants to link back from exploring the future to their present practice. In a first attempt at theorizing these difficulties, we see future probing as a practice that opens up adaptive space (Uhl-Bien & Arena, 2017) in which people from different backgrounds engage in dialogue about possible futures of digital technologies. We found that adaptive processes, like semi structuring, temporary decentralisation, and collaboration (Uhl-Bien & Arena, 2018) were supported by the future probing practices and seemed to create space for employees to engage in exploration. There was still a lack of compelling acts of brokering and network cohesion (Uhl-Bien & Arena, 2018). This may indicate why linking back to daily practice is challenging. We assume that organising for adaptability requires a deliberate act of connecting far future explorations with present action, and propose that besides explorative skills, ‘adaptive anticipating’ action is needed to make the connection and that linking back through near future experiments might be a way to achieve this.

Keywords: Future probing, exploration, anticipation, digital technology, adaptability

Introduction

Digital technologies permeate and transform organisational practices (Yoo, Boland, Lyytinen, & Majchrzak, 2012), enabling new forms of organising and blurring the boundaries of the business, the private and the civic sphere. New forms of organising relate to all cross-sections of society, like the educational system or work participation. Not only the work itself will change with increasing AI’s, robotics and other smart technology, but also the workforce and the workplace will change. The division of labour between people and machines is expected to continue to shift towards machines, especially for repetitive and routine tasks (Leopold, Ratcheva, & Zahidi, 2018). This affects our understanding of human work, which will shift towards problem-solving and managing human-relationships. The future workforce will probably work longer, career switches will increase and purpose is key to engage employees. By 2025 millennials will constitute 75% of the world’s workforce. Engaging millennials requires organisations to provide purposeful work, in flexible environments with ample opportunities for development. Substandard (digital) technology at work

may withhold millennials from choosing a job. At the same time, the number of 65+ employees increases unprecedentedly. Addressing this broad spectrum in size, age and diversity may lead to new ways of organising work, ranging from contracts for traditional functions to crowdsourcing platforms for specific tasks. Digital technologies affect the workplace with respect to physical proximity. Virtual collaboration spaces enable people to work together from a distance mainly through screens. In the future virtually embodied avatars may even change our current perception of virtual work, introducing a (virtual) physical aspect in virtual-virtual interaction. As such, digital technologies can bring forth both desirable and undesirable futures. To prepare for such futures we need ways to better understand and determine the consequences of digital technology on people and society, and how we can anticipate these consequences.

While most organisational scholarship has studied the impact and enactment of technologies, this paper investigates a design approach called ‘future probing’ to envision and critically analyse possible futures around digital technologies. As a society we need means to discuss which possible futures are desirable “beyond the one prescribed by solutionist ideology and the various crises it attempts to displace” (Means, Alexander, 2018). Future probing involves co-creating visionary products or services by a diverse group of stakeholders interested in learning from the future in a specific domain. These future probes enable people to experience and have a dialogue about envisioned futures (Gardien, 2006; Sarmiento, Pasmán, & Stappers, 2016). This helps stakeholders to disentangle from current paradigms and thinking patterns, and to open up to new possibilities (Dunne & Raby, 2013). To visualise and scrutinize possible futures enables us to anticipate its consequences. Researching how people would deal with such a future provides insight into people’s drives, motives and values. We believe that this way of learning from the future contributes to more meaningful innovation.

As early process research has shown, innovation processes are typically not linear and may take unpredicted routes through uncharted terrain (e.g. Van de Ven, Polley, Garud, & Venkataraman, 1999). Particularly the early phase of idea generation is fuzzy (e.g. Schroeder, Van de Ven, Scudder, & Polley, 2000). Digital technology has further complicated this path. Due to the malleability of digital products and services (Zittrain, 2006), innovation has become an ongoing process (Yoo, Lyytinen, Thummadi, & Weiss, 2010; Nylén & Holmström, 2015). Instead of new product development, there are updates and extensions, and the convergent and generative nature of digital technology platforms distributes innovation across multiple organisations and heterogeneous knowledge sources (Yoo et al., 2012), including intended and unintended audiences of a product or service.

In such a volatile world adaptability has become a competitive advantage for organisations (Reeves & Deimler, 2011) and inevitable to thrive in times of uncertainty and change (Taysom & Crilly, 2017). Birkinshaw and Gibson (2004) define organisational adaptability as “the ability to move quickly toward new opportunities, to adjust to volatile markets and to avoid complacency” (p. 47). They further argue, that adaptability alone is not enough. Alignment is needed to turn innovations into value, and organisations need to be able to coordinate and streamline activities for exploitation (ib idem.). Where adaptability is associated with an organisation’s long-term exploration, radical innovation and developing visions of the future, alignment is associated with short term operations, incremental innovation and value creation in the present. In the literature on organisational ambidexterity, exploration and operation have been treated mostly as separate aspects that require a balancing act (e.g. March, 1991; Tushman & O’Reilly, 1996; McCarthy & Gordon, 2011). However, in fuzzy environments, characterised by high uncertainty and high complexity, finding balance is not so much the issue as is creating ways to connect the two domains.

In this context, innovation may benefit from more opportunity-driven approaches (Conklin, 2005; Guindon, 1990), involving bricolage (Garud & Karnøe, 2003), supportive contexts for individuals

to choose how and where to focus their energies (Birkinshaw & Gibson, 2004) and collective envisioning in innovation networks (Deken, Berends, Lauche, Gemser, 2018). Most literature focuses on theoretical frameworks and strategies, without providing practical methods and tools to support adaptability. As a result, companies have introduced new spaces of work and innovation, like open innovation labs and co-creation studios, but research on their implications for adaptability is lacking.

In the presented case, we partnered up with a provider of ICT infrastructure to Dutch research and education institutes to explore possible future digital practices, further referred to as ICTnet (pseudonym) or the organisation. They contributed with knowledge from digital technology and we contributed from a co-design perspective on innovation. We developed design interventions to work towards a desired outcome and to further our understanding of possible courses of action. From various first explorations¹ with speculative futures (Dunne & Raby, 2013) (similar to figure 1) we had learned that, with a little help, people readily engaged in exploring far futures, but linking back to daily practice was challenging. In the presented case, we tried to overcome this problem by taking more time to do richer explorations and to bring the innovation space close to the work floor of the organisation.

This paper contributes to the literature on organisational adaptability (e.g. Lavie, Stettner & Tushman, 2010; Andriopoulos & Lewis, 2009; Raisch, Birkinshaw, Probst & Tushman, 2009; Gupta, Smith & Shalley, 2006; Gibson & Birkinshaw, 2004) by addressing the challenge of working with a diverse groups of stakeholders and of bridging the cognitive gap between ease of brainstorming and the stickiness of implementation. The paper offers preliminary findings on how the principles of the future probing practice work and how they influence adaptability and alignment, as a first step towards a framework integrating theory and concepts from future studies, design and organisational research.

Future probing practice

Exploring the future is not new to organisations. Future probing practice involves activities from future studies and design. Whereas designers create artefacts and prototypes to make ambiguous and abstract notions concrete, the core of futuring evolves around scenario planning, which traditionally centers around the discursive or at most two-dimensional media (Selin, Kimbell, Ramirez & Bhatti, 2015). Future probing brings together the ‘shaping the future’ capacities of both practices, e.g. scenario building (Chermack, 2011; Van der Duin, 2007; Kleiner, 1994; Wack, 1985), creating (speculative) artefacts (Jensen, Elverum & Steinert, 2017; Stomppff, Smulders & Henze, 2016; Wensveen & Matthews, 2015; Dunne & Raby, 2013), experiencing and discussing futures (Hajer & Pelzer, 2018; Candy & Dunegan, 2017) and abductive reasoning (Dorst, 2015; Kolko, 2010). Some of these have been researched empirically, but mainly within their originating domain and with shortcomings in the context of connecting future explorations to daily practice. In future studies, scenario planning is used to connect future explorations to long term strategic planning (van der Duin, 2006; Dammers, 2000), but scenario planning does not account for ‘reading changes and adapting continuously’ in more fuzzy situations, like today’s digital transition challenges. Furthermore, future probing distinguishes from future foresight and backcasting by taking a designerly approach to shape the future instead of merely preparing for any approaching future. Design thinking focuses on novel solutions for current (latent) human needs, designed in the studio and assumed to be accepted because they are extensively iterated and tested (Plattner, Meinel & Leifer, 2011; Owen, 2007; Dörner, 1999). Where design becomes speculative, it focuses on critical debate (Dunne & Raby, 2013) and exploration of potential without the pressure for

¹ Philips Design and Jeroen Bosch Hospital (Future of health: 2014), the Ministry of the Interior and Kingdom Relations (Future of urbanism: 2015) and multiple municipalities (Future of inclusive cities: 2016)

economic productivity (Bleecker, 2009), with no intention to result in direct implementable application.

Making tangible products or embodied experiences of possible futures, so called future probes, is central in future probing. According to Sanders and Stappers (2014) the role of ‘making’ in design allows designers and non-designers to work together, using making as a way to make sense of the future. Even before a design opportunity is identified ‘artefacts’ provide views on future experiences and future ways of living (ib idem.). As such, the artefacts serve as conversation pieces to bridge imagination and materialisation (Bleecker, 2009) and to suspend disbelief of change (Sterling, 2013). Future probing is a way to create, experience and discuss envisioned futures in the fuzzy front end of innovation (Sanders & Stappers, 2014). The creative power of future probing lies in making unknown futures imaginable in the present. It is like travelling with a time machine and having an embodied experience of what might come, enabling us to discuss ‘in real time’ how we would deal with that and provoking us to ask questions about the unknowns. The future being both unknown and unknowable (Peschl & Fundschneider, 2016) requires probing in different directions to explore a wide range of possible futures in order to gain a broad understanding of possible future developments and to sense people’s responses to those.

We developed an intervention method, that guides a diverse group of stakeholders through two iterative, sequential steps and that enables them to explore the far future and to learn from scrutinizing possible futures of a system (e.g. education, healthcare or a city) to prepare for the future. Figure 1 visualises our initial representation of the future probing practice:

- A. Mapping the current system: sensing and understanding (horizon 1²).
- B. Future explorations: distancing, reframing and learning (horizon 3).

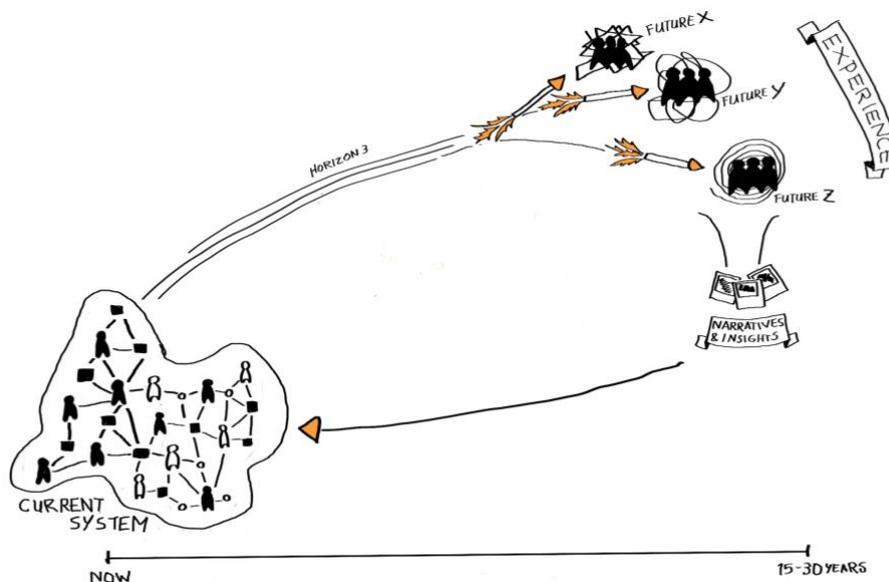


Figure 1: Future probing practice as envisioning the future

The intervention method was designed to support collaborative innovation and to enable multiple stakeholders to develop a sense of future-readiness. Probing the future is not primarily aimed at developing value propositions or creating direct market value. It rather focuses on sense making and learning in the fuzzy front end of innovation. As there is no concrete end goal and emerging

² Often 15-30 years ahead, compliant with McKinsey’s three horizons of growth (2009). [<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/enduring-ideas-the-three-horizons-of-growth>].

learnings may change the direction of a journey, the intervention method is not constituted by a rigid set of instruments to be used in a fixed order. It functions as an inventory, containing available methods and tools to draw from in order to match the specific needs of the group of stakeholders involved.

First, looking at past events may give some understanding of how developments evolved into the current situation, and exploring trends, (disruptive) drivers and weak signals to gain insight into consequences and possible paradigm shifts helps to understand what is going on in the current system. This step stimulates a sensemaking process, that not only connects the past to the present (Gioia & Chittipeddi, 1991), but also challenges participants to connect with their intuition and emotions to spot opportunities to do things differently. Second, co-creating visionary products or services (far-future probes) helps the group to explore and imagine what could be in the future. Far-future probes are provocative future experiences in image, sound, scent and/or touch that invoke discussion about the impact of this future on people's lives. Creating, experiencing and discussing the probes raises awareness about people's current frames, their motives and values when dealing with such futures. Furthermore, it opens up possibilities to explore alternative frames and to explore the unknown (e.g. what roles are missing to enable such futures, what capabilities need to be developed and what are the system barriers in terms of rules and regulations?). Although imagination and creativity are key in this sensegiving step, our ability to travel to the future remains grounded in the present (Gioia & Chittipeddi, 1991) or to speak with George Lucas: "*You can't do it unless you can imagine it*".

Probing possible futures allows a multi-stakeholder group to gain insight and build understanding on future (societal) challenges. Future probing invites people to step out of the operational flow and link up with other disciplines for exploration. It is our assumption that in result of this, people will be able to take the learnings from these explorations to their daily practice and translate them into opportunities for innovation in the present or at least to be more aware of emerging opportunities. However, preliminary findings indicate that linking back to the present is challenging. To further our understanding on this, we research how future probing works as a practice within a group of multiple stakeholders.

Methods and empirical context

To research the future probing practice, we turned to methodology using organisational ethnography (Ybema, Yanow, Wels & Kamsteeg, 2009) and design interventions (Sanders & Stappers, 2008; Kuijer, 2017; Zimmerman & Forlizzi, 2008). We planned a two-year trajectory to activate employees to explore possible futures of digital practices in research and education, with the intend to prepare for future changes. A systemic designerly approach, based on future probing, and cooperation with (design) students were agreed starting points. Following a participatory action research approach (Argyris & Schön, 1989), we collaborated with a core team from the organisation to customize the future probing practice and reflect on the process.

The trajectory consisted of 2 one-week pressure cooker bootcamps, surrounded with 4 co-design sessions, 2 four-weeks probelabs and 15 core team meetings. The bootcamps took place in company and ICTnet employees worked together with multi-disciplinary students educated in design thinking. Its main objective was to conceptualise and build future probes, and to gain insight into people's reactions to the probes. The co-design sessions with ICTnet employees were meant to either explore and define challenges in preparation of the bootcamps (before a bootcamp) or to establish a better understand of the outcomes (after a bootcamp). The probelabs allowed student teams to further explore specific outcomes and themes from the bootcamps. The core team was responsible for designing, organising and guiding the journey. Following this team in their pursuit of comprehending future developments and their impact on the organisation, and using this trajectory as a means to revive the entrepreneurial mindset on the workfloor, formed the bases for a retrospective holistic case study (Yin, 2018).

Case setting

We explored possible future digital practices together with ICTnet. The organisation was founded in the late eighties to establish a national computer network to support Dutch research and education. ICTnet has been promoting itself as an organisation in the frontline of innovation, which it probably is compared to many other organisations. However, it had recently started to buzz around within the organisation, that the old days' entrepreneurial mindset on the work floor had vanished. While growing in the nineties, the organisation had established more structured processes and procedures for stability of the organisation and it had been flourishing for decades. At the time of research, innovation was still part of their DNA, but the trajectory was formalised and followed a stage-gate-model with succeeding steps and many decision moments supported by considerable paperwork. Although functioning as a well-oiled machinery, a sentiment of longing for the turmoil of the early days was growing within the organisation. Employees were searching for ways to breach the boundaries of bureaucracy in search for more flexible ways to innovate (Greiner, 1998). This resonated with one of the managers' desire to advance the organisations adaptability towards future changes. Acknowledging these dynamics, he sought collaboration with the research group Co-design (further referred to as "Co-design") to investigate how a designerly approach might invite employees to bring back the entrepreneurial mindset to the workflow and to prepare the organisation for future changes. It was decided to develop a topical designerly intervention (figure 2), that would attract employees to participate and to cooperate with students to bring in their fresh perspective on things. Together we would research how ICTnet could prepare for an unknown and uncertain future in light of the data-revolution, where presumably providing bandwidth for institutions would no longer be the core business of the organisation.

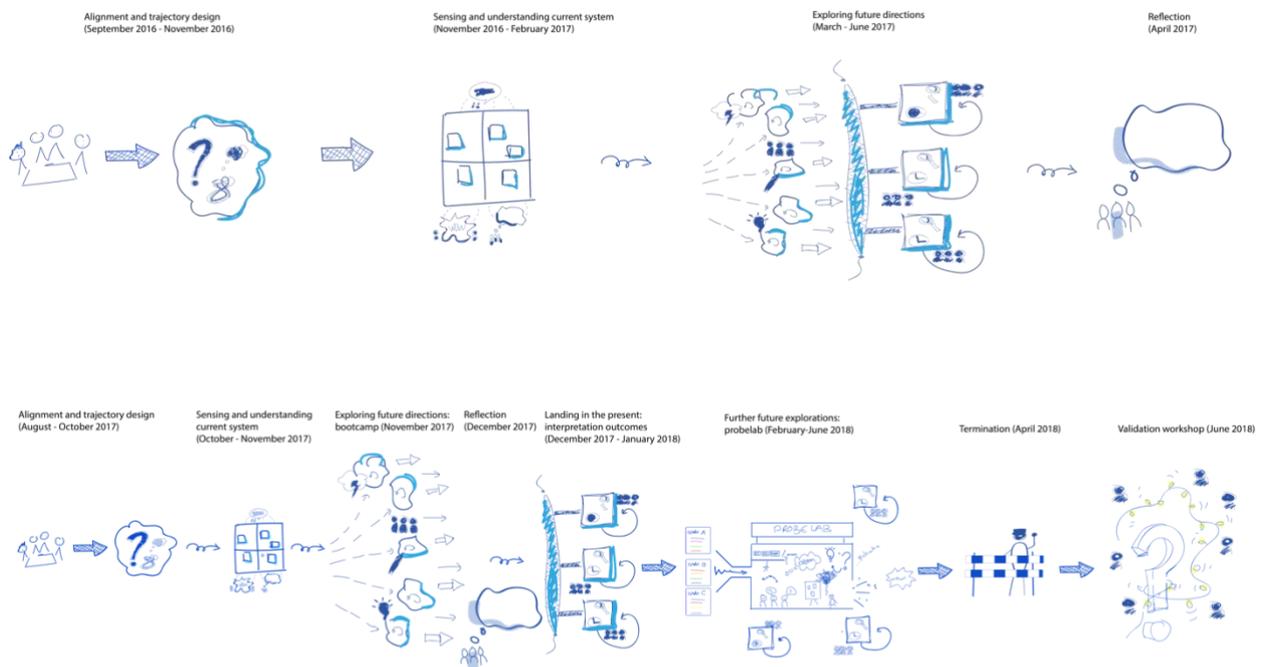


Figure 2: Project journey

Data collection

Our first aim was to understand how the future probing practice worked and how it affected the organisation's adaptability. We zoomed in on the actual practice of future probing (Nicolini, 2012) and the intervention approach was documented using organisational ethnography (Ybema, Yanow,

Wels & Kamsteeg, 2009). We gathered longitudinal process information to study how processes unfold over time (Langley, Smallman, Tsoukas, Van de Ven, 2013) using mixed methods of observations, documents developed during the process and interviews. Field notes, videos, photos, artefacts were gathered during meetings of the core team, co-design sessions and the bootcamps. *Bootcamps*: We had informal conversations with both student and employee participants during the two bootcamps, which we documented together with our observations in field notes. As part of the intervention method, we had participants create artefacts during the bootcamps, which were captured in photos. The participants documented their insights from the probing process, which we collected for further analysis.

Co-design sessions: One co-design session was partially captured on video, the others through photographs. We wrote field notes to capture our observations and discussions.

Core team meetings: We captured observations from 12 core team meetings in field notes and photos, and there is video footage of two of the meetings.

During the bootcamps, co-design sessions and core team meetings we prompted participants to express, discuss and elaborate on their thoughts and feelings by use of generative design tools and artefacts as part of the intervention method. The results have been captured either physically or on photographs when obtainable.

Participants were interviewed midway (after the second bootcamp) and at the end of the journey. Midway we conducted 5 semi-structured interviews by phone with employees (not core team). The interviews took between 20 to 40 minutes. Findings were written down as complete as possible during the interviews. At the end of the journey we conducted 4 face to face interviews with core team members using generative tools (Sanders & Stappers, 2012); e.g. a project activities timeline to prompt interviewees' reminiscence of events. The interviews lasted about 1 hour and were audio-recorded and transcribed verbatim.

Data analysis

A first step in data analysis was to establish a chronological overview of the events that had taken place during the two-year trajectory. We used the visual map of the journey (figure 2), that had been produced for project management purposes during core team meetings, as a basis to match the materials we collected to the events. A narrative of the journey was then constructed to reflect on what had happened during each event and who was involved. We used visual mapping and temporal bracketing to analyse the process (Langley, 1999). We identified two comparable iterations in which the future probing practice passes through the stages representing two horizons (present - future). The iterations were indicated by a name change of the project by participants and internally (core team members and researchers) referred to as project 1.0 and 2.0. Next we went through all the material to identify critical events through a lens of enabling and disrupting aspects of the process. Using a visual card mapping technique, we captured first insights, that led to findings on three levels: process (how), content (what) and context (why) (Pettigrew, 1987). The process level refers to how the future probing practice unfolds in relation to making sense of the future and to act on it, the content level relates to possible future digital practices in research and education, their impact for the organisation and possible action in the present, and the context relates to how the future probing practice is shaped by factors internal and external to the organisation.

Contentwise, the collected documentation, interviews and artefacts were used to learn about possible future digital practices in research and education and their impact for the organisation. More precisely, we elicited the information that concerned visuals and descriptions of the developed probes and insights. These findings were then clustered thematically using sensitizing concepts (Bowen, 2006). Core themes regarding the content level were: 'autonomy', 'educational big data' and 'data ownership'.

Regarding process and context, we had encountered a growing tension in the core team between the desire to explore the future through an engaging intervention method and the experienced need to comply to the demands of an organisation that tried to pull them back to daily routines, which had

considerable impact on the process. We interrogated the data for emergent content and interactional patterns (Nicolini, 2012) and concurrently searched in organisational adaptability literature for sensitizing concepts. Our particular interest was drawn to the concept of adaptive space between an organisation's explorational and operational system (Uhl-Bien, 2017), because it complied with our empirical findings of tension between enthusiastically exploring participants on the one hand and the pull to order from the 'agenda driven' organisation those same participants reported back on the other hand. Preliminary findings were fed back to participants in a communicative validation workshop. We are still in the process of analysing and interpreting our data.

Results: Recounting the journey

The results section describes the innovation journey and related insights on the process, content and context level. The journey consists of two iterations in which the team moved from the present to the future and back to the present again. This movement is represented by the subsequent stages of 'alignment and trajectory design', 'sensing and understanding the current system', 'exploring future directions' and 'reflection'. The first two stages involve acting in and with the present, the third concerns the future and the last stage brings us back to the present in a reflective mode. Based on learnings from the first iteration, the second iteration is extended with the additional stages of 'landing in the present', in which the outcomes from the bootcamp were explicitly interpreted, and 'further future exploration' as a continuation of exploring future directions. The details of the trajectory would be designed in an emergent way, constantly reflecting and fine tuning the intervention method. It was intended to take place from September 2016 until January 2019, but in April 2018 it was early terminated.

The research group Co-design worked together with ICTnet to investigate how ICTnet could prepare for an unknown and uncertain future in light of the unfolding data revolution. A small core team would be followed and facilitated in their process of learning from exploring the future, and how they would try to involve a larger group of employees in order to instigate a change in the innovation practice towards more collaboration, more future orientedness and more adaptability. The trajectory was designed with co-design sessions and bootcamps to make the group aware of both their own current thinking patterns and societal paradigms in the domain of research and education (their clientele) with respect to a data-rich future, as well as to discover and discuss the implications for possible courses of action.

Iteration 1.0

Alignment and trajectory design (September 2016 - November 2016)

After deciding to start the trajectory, a small core team was formed, consisting of the initiating manager and a trainee from the Blue Sky team. Occasionally extended with other frontrunners, the team and the researchers discussed purpose, leading question to explore and planning of events and activities with this team.

Process: The main intention at this point in time was to see what would happen if students would explore various future directions and interact with people on the workfloor. Activities were aimed at preparing the innovation bootcamp *for* the students and trying to get employees involved in one co-design session in preparation of the bootcamp. The cooperation with students was supposed to create energy on the work floor, because of their eagerness and fresh perspectives.

Content: It was decided to focus on the exploration of the research landscape instead of education, which was regarded as being more explored already. The leading question was formulated very broad: How could the Dutch research landscape of 2050 look like? What might be a possible role for ICTnet in such futures?

Context: Being new to this whole approach the core team members asked numerous questions about the design of the process, trying to get some grip on what was about to happen and what their role in organising and participating would be. Expectations as well as excitement were high.

Sensing and understanding current system (November 2016 - February 2017)

In this period several (extended) core team meetings and one co-design session with 9 employees and 2 students lead to the formulation of 5 ‘what if’ questions supported by short future scenarios. ‘What ifs’ and scenarios were intentionally provocative, based on an exploration of trends, drivers and weak signals, yet well referenced. The ‘what if’ questions project trends to the future to stimulate imagination about what could be.

Process: The ‘what if’ questions, related trends and speculative questions were translated into short scenario briefings by one core team member and one of the researchers. Each future scenario was appointed to a case owner as a first contact towards the organisation for the students.

Content: Exploration of the current situation and identifying trends and weak signals of change lead to the development of scenarios, that seeked to explore the future in different directions:

- What if research converges into few, closed consortia?; based on trends like ‘big companies funding (fundamental) research’.
- What if everybody is a researcher?; based on trends like ‘wisdom of the crowds’ and ‘citizens sciences’.
- What if knowledge sharing is replaced by virtual expert cloning?; based on for instance the developments in VR.
- What if research budgets are allocated by public referenda?; based on growing involvement of the public in policy making.

Context: Organising the co-design session took a while, due to busy schedules and postponed meetings. Most of the organising and communication about it was done via email, resulting in some miscommunication about time and desired number of participants.

Exploring future directions (March - June 2017)

The main events in this period were an intensive one-week innovation bootcamp with students, followed by a probelab where one student team of 5 elaborated on insights from the bootcamp. The cooperation with students was an explicit wish of ICTnet for two reasons: 1. It was believed their fresh, young perspectives might shake up the employees and create energy on the work floor, and 2. they represent part of their clientele and easier to involve than working clientele. Students came from a multidisciplinary programme ‘Creative Industries’ and had been educated in design thinking, but not future probing. They were guided through the programme by the codesigners (authors included) and supported by the case owners (core team members included) on (access to) expertise within the organisation.

Process: Students were guided through a mildly structured process, supported by generative tools to prompt their thinking and actions. Students could walk freely on the workflow and interaction with employees was stimulated, yet not arranged. Students reported back, that the case owners acted more like process coaches than as participating (digital) experts. Consequently, the student started asking scholastic questions about how to proceed when encountering difficult moments.

Content: During the innovation bootcamp students developed different future probes to provoke discussion with employees on envisioned futures. For example, they designed a visual of global research hubs dedicated to a specific domain; e.g. health hub, food hub, ecology hub. They developed a guiding story, that only highly specialised top researchers would work there for the few mega companies that finance the hubs. Data scrapers would constantly gather people’s personal data, turning civilians into data suppliers, for example with personal health or nutrition data. For civilians data would become the new currency to pay for their daily needs. A central mega-data centre would assemble, combine and (re)distribute all data. Discussing this envisioned future for a

research landscape with students and university researchers, the students harvested two main insights concerning integrity of both the data suppliers and the data scrapers: 1. the data that civilians will provide may not always be reliable; traded or fake data will also become part of the data economy, and 2. civilians may need protection from the companies behind the research hub; personal data easily leads to manipulation. These insights triggered the students to advise ICTnet to pursue the role of central gatekeeper to keep research at high quality standard on the one hand and to guarantee anonymity when providing personal data. It seemed that the organisation would likely be mandated such a role, since they are already an authority on digital science, and they operate without commercial objectives, as they are related to the government.

Context: It was noticed that people were busy and drawing their attention was not easy for the students. Some even avoided eye contact when passing by. The case owners were busy as well, but they had daily moments of interaction with ‘their team’, as they called it. The case owners themselves also experienced the interaction more as ‘mentoring students’, than as participating and learning themselves.

Reflection (April 2017)

The core team and researchers evaluated the impact of the bootcamp, mainly on a process and context level. The need for a profound evaluation was driven by a feeling of dissatisfaction, because we had not met expectations both in outcomes of the bootcamp on a content level and involvement of employees on the process level.

Process: The student teams worked rather independently from the beginning of the bootcamp and did not connect with employees to find out about current innovation activity within the organisation. “*So much innovation is already going on in the organisation (that they don’t know about)*”, expressed by a core team member, might indicate that it felt as a denial of current practices or at least a missed chance to involve employees. It was questioned several times, whether the set time horizon wasn’t too far into the future. It was suggested to design interventions to intensify involvement of employees, prior to a next bootcamp with students. Also, the week should be an even greater happening. More campaigning beforehand so no employee could ignore it. And more planning ahead, so employees could more easily fit events in their agenda’s.

Content: The probes went in such ‘wild directions, that the plausibility was at stake and grounding to current business and innovation of the organisation seemed lost. As quoted by a core team member: “*Students didn’t even ask what our current business and daily routines are like, let alone how we [the organisation] innovate*”. The researchers sensed a shared feeling of dissatisfaction about the outcomes of the bootcamp expressed by the two core team members as “*What do we really have now?*”

Context: The case owners showed low commitment to the trajectory, probably due to being involved late in the trajectory. It played out as confusion about their role. Instead of participating with the students in the future explorations, they acted as student coaches, aiming for the students to learn and not fully realising that it was their learning journey as well. Aligning the students’ work process with the daily routines and agendas of employees lead to tensions. Expected moments of interaction between students and employees were delayed, which provoked irritation. “*We are not comfortable with improvising all the time*” explained a core team member referring to ‘the organisation’. The employees experienced conflict between the desire and fun to engage with students and the demands of an “*agenda-driven organisation*”, as the same manager called it. This schism in ways of working between ICTnet and the codesigners, who brought in the students, surfaced an emotional layer regarding responsibilities. The codesigners assumed the partnership involved shared responsibility for designing, organising and leading the whole journey. In the perception of the Codesigners, ICTnet treated the relation as client-contractor affiliation. Expectations and agreements, as to who does what, had remained ambiguous.

Iteration 2.0

Alignment and trajectory design (August - October 2017)

After the profound reflection, there was a new elan in the core team. It was decided to embed the trajectory directly in the Blue Sky programme. The senior manager was part of the organisation's top management team, and as such he would spend an effort to create more flexible space and commitment. This started by writing a provocative blog on the organisation's Intranet to acquire more dedicated members to the core team.

Process: Initiating a good kick start was considered essential to avoid all pretence of improvisation. The researchers designed a visually well-structured session that still offered much room for informal dialogues and personal interactions. In this alignment session it was agreed upon that core team members and researchers would be equal partners in this explorative journey, meaning that we would share responsibility to progress and to take the lead when necessary in an open atmosphere, without holding back on information and feelings. By opening a dialogue during this session about how we would work together, the researchers hoped to achieve a huge sense of ownership during this journey, that would result in commitment and investment of time. A shared intention was formulated and extensively discussed and iterated. The intention emphasised a focus on making the journey work to activate employees in dealing with future changes in the environment. However, while trying to establish a shared understanding of the different levels of innovation readiness of employees and how to involve them, it appeared that the intention started to shift towards a central role for material outcome. It was important then to reopen the earlier discussion and negotiate alternatives to reach a sharper formulation, that covered new insights. We added that increasing the entrepreneurial mindset on the work floor should contribute to the organisation's adaptability. The creation of material outcome would be secondary and serve as a means to an end.

Content: The new volunteers were intended to act as ambassadors on an emerging topic of interest related to the newly formulated leading question: "*How will we handle information in research and education in light of future technological developments like deep or machine learning, learning analytics, sensor applications and the influence of big tech companies? And what can be a role for ICTnet in such futures?*"

Context: The trajectory seemed to get more stature because it was now embedded in the Blue Sky programme. This resulted in an extension of the core team with one senior manager and 4 volunteers. Being volunteers implied intrinsically motivated people, but not necessarily dedicated time to spend in agreement with their line manager. This was not discussed at that time.

Sensing and understanding current system (October - November 2017)

At this stage the aim was to define explorable themes and establish cohesive thematic groups around them led by the ambassadors.

Process: The ambassadors were asked to gather a small group of interested employees around their preferred theme and to write a blog to persuade employees to join. The core team and researchers then organised a co-design session with all interested employees to dive deeper into the themes, identifying trends and drivers and discovering weak signals. From here 'what if' questions and briefs were written by the thematic group as input for future exploration during the bootcamp.

Content: Various discussions in the core team based on personal background and interests led to the identification of three themes: autonomy, data ownership and educational big data. They would be explored in the context of future information flows in research and education related to new technologies. Leading what if questions were:

- What if all data protection laws are abolished and all data and content are openly available? (data ownership)
- What if technology makes decisions for and about us that we don't necessarily understand, but simply accept? (autonomy)

- What if data driven learning is completely focused on self-actualisation? (educational big data)

Context: At this point the first cracks showed in the core team's positive intentions. Daily practice in the organisation started to pull the ambassadors back to attend meetings and reach targets. Urgency to deliver input for the bootcamp was felt, but other deadlines often prevailed. It appeared difficult in this context to connect employees to the thematic group, which resulted in a heavier workload for the ambassadors. Ambassadors reported: "*I was constantly balancing between this and deadlines for my regular work. I wish I could have spared more time*", and "*my other work was placed under pressure*". It is safe to say that they did feel ownership and took the lead in trying to gather a cohesive team around a topic of interest. It took some persistence, but they managed to mobilise their network just before the bootcamp would start.

From October the coordinator from the educational programme that would participate in the bootcamp was involved in the preparation of the bootcamp. This introduced a new interest at the table, namely the students' learning journey. It made the process more complex with respect to aligning all interests and activities, but it also had advantages with respect to guiding the process and ensuring quality work of the students.

Exploring future directions: bootcamp (November 2017)

In the second iteration a group of international students participated from the minor Co-design Studio participated in the bootcamp. This intensive programme already had prepared the students in design thinking and co-design, but future probing was new to them. Being prepared for co-design made this group more open to collaborate with employees than the group in iteration 1.0, and to take a leading role with respect to the creative process during collaboration.

Process: For the second bootcamp with students more employees (thematic group) interacted at regular intervals with the student teams. Also, round table meetings were scheduled with experts on the three topics. The educational programme provided creative coaches, including designers and design researchers, that would guide the students' creative process. Another difference was that the students would work in a separate innovation space nearby, instead of on the workflow which had not proven any added value in the first bootcamp. In addition, a visible and active innovation space was created right near the main coffee corner at the entrance. Every student team had always one member present that functioned as a bridge to the rest of the organisation. As boundary spanners, they showed intermediate outcomes and interacted with employees to instigate a discussion within the organisation. It was supposed to be easier to involve employees than trying to disturb them while at work, but it appeared a difficult to grasp concept for students as well as their educational coaches.

Content: Future probes were again developed; e.g. students designed a virtual classroom where an AI would guide students highly personalised in their developments. Surprisingly, the teams found out that students were less afraid of making mistakes in front of an AI instead of a teacher. They said not to feel judged by it or that it would affect their status.

Context: Designing the bootcamp, we had been creative to withdraw employees from their busy work schedules. For example, timed the interaction moments at the beginning (breakfast) and end (tea time or drinks) of the day and during lunch time in the canteen. The thematic group members were involved late in the process and their attendance followed their last-minute availability. Employees reported back, they would have easily reserved time, had they been involved earlier in the process.

Reflection (December 2017)

After the second bootcamp the researchers had a reflection session with the core team to capture their feelings and thoughts about the process and the outcomes so far, and about its impact on the organisation.

Process: Reflection on the probing process revealed both satisfaction about the enthusiasm and energy it had invoked, as well as an ambivalent feeling about the outcomes of the probes. The presence of the students with their eagerness and actionable attitude had invited many employees to participate in the process. Employees had reported feelings of reminiscence of their own student time in which anything was possible and exploration was stimulated. However, it was also easily pushed to the background when daily practice asked their attention, especially because they did not perceive direct relation to their current activities. Thematic group members who were asked to participate as (digital) experts on and off in the student teams had ambiguous feelings about their role. They often slid into a coaching role to help students who were obviously struggling with the difficult tasks of exploring the unknown, and then encountered the problem that they themselves had no answers either. It made them feel uncomfortable, yet one employee would reflect: *“no one knows what is right or wrong; maybe asking counter questions is the best way to move forward”*. Many employees worried about the small amount time they had been able to invest and reported that if time would be ‘given’ by management, they would gladly participate the whole week in such an exploration. Interestingly, management (within the core team) replied that the organisation stimulates exploration time: *“This week has shown that people do not feel allowed to make time for this. Sometimes we call that workload.”*

The discussion raised questions about whether the far future had been too far off the innovation projects that employees are involved in, and also if the organisation was or was not ready for such a future oriented approach.

Content: The bootcamp left the core team with mixed feelings about the outcomes with respect to knowledge about the investigated themes. Impression was that nothing new had come out. *“Didn’t we already know this?”* (core team member). Doubts were raised about how deeply involved the employees had been in the knowledge creation process. Evidently the students had learned a lot, but it was difficult to grasp whether the employees, including the core team members, had learned about the content. They did return to have learned about the designerly approach as a new way to explore such matters. Thematic group members had reported that they were triggered by the questions the students asked, as the right questions to think about, but they would not use any of that in their current work practice.

Context: Although perceived energy and enthusiasm during the week and in the co-design sessions before was very high, the perception was, that none of our interventions had any impact or connection to daily practice of those involved. Trying to create an undercurrent in the organisation through a bottom up approach, that would not only attract employees in the moment (bootcamp, co-design sessions) but also engage them in between, appeared difficult. Engagement varied over time, and was influenced by aspects like role conception and personal innovation readiness. Fluctuating engagement over time (active when facilitated, detached in between) counteracted the accumulation of knowledge over time. Being in the journey to learn versus to coach students were two different role conceptions, that had a completely different effect on the process and evidently the outcome. Differences in innovation readiness among employees were identified at the beginning. The core team build ‘persona profiles’ around them to align our events and activities to their alleged readiness for participation. Innovators were very capable of quickly aligning themselves to the purpose of an event and to contribute valuably. The majority, however, was reluctant to engage. The bridge function of the students as boundary spanners in the physical innovation space on the workforce appeared a complex concept for both students and employees, and did not have the impact we had hoped for towards these employees.

At this point it was determined that a number of employees would be interviewed to discover how they had experienced the bootcamp and its outcomes. In the course of the journey it appeared that the results would only be used to prepare for the validation workshop. They were not reported separately, but were part of the reflective narrative.

Landing in the present: interpretation outcomes (December 2017 - January 2018)

Process: In this period two core team meetings and a co-design session with employees were aimed at interpreting the outcomes of the bootcamp, led by the question: “*What probes had delivered what insights and how could we proceed from there?*”. The intention to interpret outcomes and insights was good, but the effectuation was difficult due to issues of underutilisation in the core team and among the researchers. The core team meetings were poorly attended and progression was lagging. The date for the co-design session was set, but preparations were minimal.

Content: The extraction and discussion of outcomes lead to a clustering of insights on the three themes: autonomy, data ownership and educational big data. Relations were explored and new connecting themes emerged. The privacy issue had been intentionally ignored before, but now the core team acknowledged that it was a topic that they were expected to tackle sooner or later. Common attitude had been that privacy issues would be solved with new technology developments, and therefore the topic had often been set aside as ‘not an issue’. It was decided to elaborate further on this topic in a four-week probelab with students.

Context: After the bootcamp the atmosphere in the core team had changed. Someone had withdrawn from the team due to lack of time, one person was assigned new tasks, the others felt similar time pressures, the issue of the bootcamp’s outcome still remained up in the air, and on the researchers’ side there were underutilisation issues as well. At this moment the core team and the researchers were not fully aligned anymore. As researchers, we tried to tackle this by giving insight into possible courses of action to proceed. While this involved hooking up with students again, and agreements about this were made long before, we tried to get the core team on board. Fresh teams of creative students were lined up to start their probing journey with the organisation.

Further future explorations: probelab (February-June 2018)

The core team reluctantly agreed to continue the journey. An assignment was written and a meeting set up to brief the students.

Process: The students followed a regular course in their curriculum where they work for a client. They get to choose from a list of assignments; ours would attract students responding to its speculative, open character. They had been educated in scenario development, but not in future probing, in which the researchers would support them. The core team members agreed to act as (digital) experts and client.

Content: The student teams would explore the privacy theme within educational big data futures. They designed a data driven personal assistant that appeared as a hologram from your watch or bracelet. The assistant’s job is to guide a student in safe data use, based on a governmental regulation. People could relate to such positive and well-regulated use of their data, but it’s design also reminded them of ‘Clippy’, the annoying assistant in MS Word, that would pop up uninvited. Concerns about privacy were outed as well, because a hologram on your wrist does not seem that private. They developed the wristband further into a ‘fitbit’-like bracelet that would subtly guide you to behave as a ‘good student’. It would help you find your way, and gently remind you to be on time using vibration as a cue to start your trip, persistently increasing and turning into subtle electric shocks if you would ignore its stimulation.

Context: The concern about the discrepancy between the pacing of the organisational process and the educational process had not yet diminished. During a constructive core team meeting, the team and researchers strived to re-align our purposes and line to proceed. We concurred on the intention to connect our next interventions to regular activities in the organisation. The core team would set up a list of upcoming events that might be deployed for our purposes. From there together we would start designing new plans to continue exploring the future and connecting activities to the adaptability of the organisation. First ideas were shared on the spot.

Termination (April 2018)

It was decided to terminate the exploration journey after internal consultations within the core team without the researchers' presence. Meanwhile the manager in the core team opened a vacancy for a new business developer. The probelab student teams would still be supported. To extract learnings from the trajectory, the researchers would conduct interviews with core team members about their experiences through the journey. To close off, a validation workshop would be organised to present and discuss research findings and to reflect on the learnings of this journey.

Validation workshop (June 2018)

After the interviews with most of the core team members, we started reconstructing the pursuit innovation journey and extracting insights from data gathered. Our reflections and first insights from literature led us to the notion that we had been quite capable of opening up adaptive space within the organisation of ICTnet. We decided to use the basics of the complexity leadership model as a basis for reflecting on the insights from our research with the core team.

Process: We started the validation workshop by reminiscing our mutual innovation journey. For this purpose, we used the familiar visual of the project journey annotated with photos and a written reconstruction of the events. We then proceeded by drawing the complexity leadership model on the table while explaining the basic concepts, gradually settling on resonating terminology: exploration, exploitation and adaptive space. The core team members were then prompted to reflect on these from the perspective of their organisation. Next, we initiated a contemplative dialogue using a reflective narrative, composed by one of the researchers, that highlighted learnings about obstacles and enablers in the process. Participants first selected text fragments that 'spoke' to them and then wrote their own text as a response. Next those writings were shared, while the listeners would write in response to again resonating fragments. Finally tried to map the writings on the complexity model and had a dialogue about it to deepen our understanding and find closure for the journey.

Content: The introduction of the complexity leadership model invoked immediate responses. Participants recognised the language and could easily recall related language that was used within the organisation for both exploration and exploitation. One of them remarked: "*At our organisation we have very well-structured procedures for our exploration or innovation projects*". Another participant openly questioned whether their innovation was innovative enough, referring to incremental versus radical innovation.

For adaptive space associating language was less obvious. Surprisingly, the writings they had composed in response to the reflective narrative about the innovation journey were almost all placed in the adaptive space section of the complexity leadership model. Zooming in on the writings most of them referred to some sort of conflict or dilemma. For instance, 'one wants to involve people with an explorative mindset, but still many participants were looking in advance for certainty about outcomes, and how might this be related to fear of failure?' Or, 'why should participation be voluntary, isn't exploration and innovation part of our job?' Another writing links that people experience such explorative trajectories as an 'extra' to having too little or not the right leadership to shape exploration and adaptation within the organisation. Yet another refers to how to connect the many moments of explorative interactions to what we [the employees] are actually doing in our jobs? Takeaways for the organisation were to keep facilitating an open learning culture, that leadership needs to be redefined to bridge the gap between exploration and exploitation and that our explorative journey has instigated a first step of change by starting to act, but that it needs nurturing.

Context: The validation workshop took place a while after official termination of the trajectory. The atmosphere was open and honest. All minds were directed towards learning. No blaming remarks or accusations were made about what had led to the termination of the project.

Discussion: connecting future explorations with present action

Our aim was to understand how the future probing practice works and we want to emphasize that it was a precondition for this trajectory to focus particularly on its ability to bring back the entrepreneurial mindset to the workforce instead of putting too much focus on the future probes in terms of outcome. To this respect, our findings indicate that contextual forces have been shaping the process and probably the content in terms of outcome. Our intention was to create a lot of energy on the work floor by introducing appealing future related topics as design challenges to work on together with students. In this we have succeeded. Many employees were drawn to the action and interacted with the students in one or more occasion. ICTnet employees have the capability to switch quickly from performing their job to engaging in future explorations and interacting with students. Brainstorming together with the students about far futures turned out to be relatively easy, although some pulling back to nearer futures occurred. The enthusiasm and excitement of participants in the co-design sessions showed the eagerness to be involved in discussing the future of society and related to the organisation. A few striking observations emerged while reflecting on the data. First, we observed that the energy on the work floor initially evoked a desire of belonging and willingness to invest time among employees, but as time evolved we noticed an increasing number of complaints about making time in their busy schedules and experiencing pressure from their daily practice. Second, repeated remarks were made about whether the futures we had been exploring weren't too far off the daily work of employees. Third, we had hoped the appealing challenges would cause employees to continue elaborating and collaborating on the topic in between events as emerging part of their job, which they did not.

When relating these observations to initial insights from literature, a key insight revolved around the challenge for participants to link back from exploring the future to their present practice. In a first attempt at theorizing these difficulties, we see future probing as a practice that opens up adaptive spaces (Uhl-Bien & Arena, 2017) in which people from different backgrounds engage in dialogues about possible futures of digital technologies. Uhl-Bien and Arena describe adaptive space as: “[...] contexts and conditions that enable networked interactions to foster the generation and linking up of novel ideas, innovation and learning in a system” (p.12). Adaptive space generates adaptability between the explorational (entrepreneurial, as they call it; p.16) and operational demands of an organisation when both tension and integration mechanisms are engaged. This requires specific enabling leadership functions, that can be picked up by anyone in the organisation, bottom-up and top-down (p.14).

We found that the adaptive structures and processes of semi structuring, temporary decentralisation, and collaboration (Uhl-Bien & Arena, 2018) were supported by the future probing practice and seemed to create space for employees to engage in exploration. Semistuctures (Brown & Eisenhardt, 1997) in the future probing practice leave space for interaction, intuition and improvisation, while providing the stability of the design process. The designerly intervention method poses an open challenge which invites employees to disentangle from their structured comfort zone. Simultaneously it offers generative tools as scaffolds to engage in the process of exploration without culminating in chaos. In relation to the concept of temporary decentralisation (Siggelkow & Levinthal, 2003) the future probing practice triggers to engage in temporary exploration of possible futures to scrutinise for instance new capabilities for the organisation that comply with the consequences of envisioned futures. A collaborative process is evidently at the centre of the future probing practice for it is based on principles from co-design (Sanders & Stappers, 2012). In the literature on adaptability collaboration refers for instance to linking activities to foster ambidexterity, a vehicle for learning in the dynamic capabilities approach or information flow in networked innovation processes. In these views collaborative activities improve information flows across networks which might lead to emergent knowledge and learning (Uhl-Bien, 2018). These basics appeared enough for many employees to become enthusiastic and participate at some point in the future probing practice.

On the other hand, there was still a lack of compelling acts of brokering and network cohesion (Uhl-Bien & Arena, 2018). Their networked innovation process (p.97) places networks central to open up information flow and interactions needed for adaptability. It shows how through brokering new ideas and forming cohesive groups to elaborate them, ideas may amplify, again through brokering, and finally become adopted and then implemented through network closure. Brokering thus refers to both the generation of ideas through weak ties in the network and the amplification of the idea to the system after elaboration of the idea, through a few strong ties. Our findings showed that brokering did occur to some extent when ambassadors tried to promote the thematic challenges to work on in order to gather a group of employees around the specific theme. It appeared difficult to turn the acquired employees into a cohesive group that could translate learnings from future probing into actionable steps in the present. It should be noticed, that the future probes themselves are speculative. They are imagined as far futures and therefore not the ideas to drive forward through the organisational networks towards adoption. However, the insights and subsequent possible ideas for the near future would benefit from being shared within the organisation. For insights from the probes this had not happened and ideas for the near future had not yet been generated. This may indicate why linking back to daily practice is challenging. Eventually, this leads to feelings of discomfort: What did these decentralised collaborative acts contribute to the company's business when no concrete outcome? Is it worthwhile to keep spending dedicated time to exploration if there is no integration with normal routines?

Interpreting the data by using sensitizing concepts from the complexity leadership framework (Uhl-Bien & Arena, 2017; 2018) implies that with the future probing intervention method we have been capable of opening up adaptive space. We can even argue that we have been holding the adaptive space for some time, by nurturing it through repetitive cycles of co-design sessions to sense and understand the current system and its drivers of change, and bootcamps to explore far futures in interaction with students. However, we found that opening and holding adaptive space for a limited time is not enough to connect adaptability of an organisation with alignment. A recurring pattern in our findings was the missing link between our explorative journey and the daily practice at the organisation. We see it on the content level as employees report to have personal interest in the topics, but not professionally, because they are working on completely different things. Similarly, on the process level employees claim to have learned from the new designerly approach, but most of them don't see using it on the short term. One exception is a core team member who started thinking of using similar interventions in his PhD-research, which is indirectly related to his work. Contextually, we recognise the pull to order by the organisation's operational practice, that imposes pressure on the participants in the journey to comply with bureaucratic organising structures of the organisation (Uhl-Bien & Arena, 2018).

Our study in progress aims to contribute to the growing literature about organisational adaptability that advocates the value of networks and enabling leadership (Uhl-Bien & Arena, 2017; Havermans, Den Hartog, Keegan & Uhl-Bien, 2015; Dinh et al., 2014) in the context of organisations as (social) complex (adaptive) systems (Meyer, Gaba & Colwell, 2005; Anderson, 1999; Stacey, 1995; Weick, 1995). We embrace the view that leadership can be distributed and is not restricted to managerial authority (Bäcklander, 2019; Uhl-Bien & Arena, 2018). We believe creative professionals can play an important role by contributing their imaginative power to connect people for proactively anticipating tomorrow's world, and organising for adaptive responses. In line with the literature on organisational adaptability claiming that both adaptability and alignment is needed to thrive in a volatile world (Gibson & Birkinshaw, 2004) our research focuses on understanding how the future probing practice may enable people and organisations to bridge the gap between ease of brainstorming and the stickiness of implementation. Adaptability refers to an organisation's ability to respond to changes in the environment (Birkinshaw and Gibson, 2004), and its core mechanism relates to feedback. However, in volatile situations mere reacting on changes in

the environment is insufficient, especially with respect to the expected radical changes that the digital transition (and others) foresees. We assume that anticipation in such a volatile environment requires a proactive attitude, some understanding of the situation and a sense of ownership to actively seek weak signals of change. Having experienced similar situations before helps to understand future situations and to make better decisions in the present (Miller, 2018). Such a proactive mindset to actively seek opportunities for change helps to shape the future, instead of waiting for change to happen and then adaptively respond. Although the future is unknown and unknowable (Peschl & Fundschneider, 2016) we are able to influence the course of the future to some extent by exploring possible futures. Insight and knowledge gained will drive our present action, and thus partially determine what will happen next. Consequently, anticipating alone is not enough. Anticipation requires the ability to ‘read’ signals about the future that indicate what is about to happen, like a toddler’s mother, who braces herself because she picks up the signal that her child is going to jump into her arms (as toddlers do), and because she knows the toddler expects to be caught (as mothers are supposed to do, according to child logic). The mother knows, because she has seen and probably experienced this situation many times before.

Anticipating for organisational adaptability goes further. It not only seeks to know what will happen tomorrow to direct incremental change, but also values to explore the consequences and implications of radical change on the long term. It challenges people to engage the tension in adaptive space by allowing them to switch between the different skill sets for exploring and ‘adaptive anticipating’ action in the present. Exploring the far future requires skills that take you out of your comfort zone, makes you aware of current personal thinking patterns or societal paradigms and dynamics, and that help to reframe challenges. This might be accompanied by feelings of discomfort and fraught. By adaptive anticipating we mean that people and organisations engage in future oriented action because they are ready to quickly pick up and act on changes in the environment, through anticipating what might be coming, based on proactively experiencing and exploring possible futures in collaboration with others. Adaptive anticipating action requires skills that support integrating new thinking and acting (from explorations) with adequate operational activities (Uhl-Bien & Arena, 2018). These skills suppose awareness to other people’s thought worlds and anticipation of other people’s responses to enable heedful contributions (Dougherty & Takacs, 2004). This involves bending the current practice to create space for emerging practices, or reframing new practices to fit in with current practices, while considering the future. To enable operational structures to accommodate the learning and creativity necessary to innovation we suggest to make an explicit connection between far future explorations and near future action. Activities to make sense of possible far futures lead to learnings that need translation to near future experiments. Near future experiments are meant to be enriched with knowledge about a range of possible futures and we believe, they can be bolder experimentations than incremental steps that may result from extrapolations of current thinking to the future. As such, near future experiments are a way to act in the present while still learning how a system responds and act further from there (Snowden & Boone, 2007; Ryan, 2013). For this to happen it is necessary to be able to change between a focus on learning and a focus on outcome. We propose to remain focus on learning until a window of opportunity opens and energy can be concentrated on achieving a desired outcome.

We see the future probing practice not as a one-time exercise to feed long-term strategic planning, but as an ongoing innovation practice that supports adaptive processes with visualisation and imagination. Ultimately, we envision the continuous development of far and near future probes for learning about possible futures and shaping a multi-faceted, desirable future.

From our interpretations of the findings we derived the notion of ‘adaptive anticipating’ that might help to explain why connecting future explorations to daily practice is so difficult. Briefly introduced above, the concept needs elaborate research to understand how exactly it could help explain the difficulty of making the connection. Following this line of thinking, we expand our

visual representation of the future probing practice with a third stage ‘near future experiments’ in support of making the connection (figure 3). We propose adaptive anticipating as the actionable skill that makes the connection between far future explorations and near future experiments. Figure 3 shows our expanded representation of the future probing practice:

- A. Mapping the current system: sensing and understanding (horizon 1).
- B. Far future explorations: distancing, reframing and learning (horizon 3).
- C. Near future experiments: connecting and transforming (horizon 2).

In addition to mapping the current system and far future explorations the process continues by collecting narratives and gathering insights, that need translation into near future experiments. These try to poke the current system with the aim to energise people to connect and amplify the experiment, which may lead to transformation of the system.

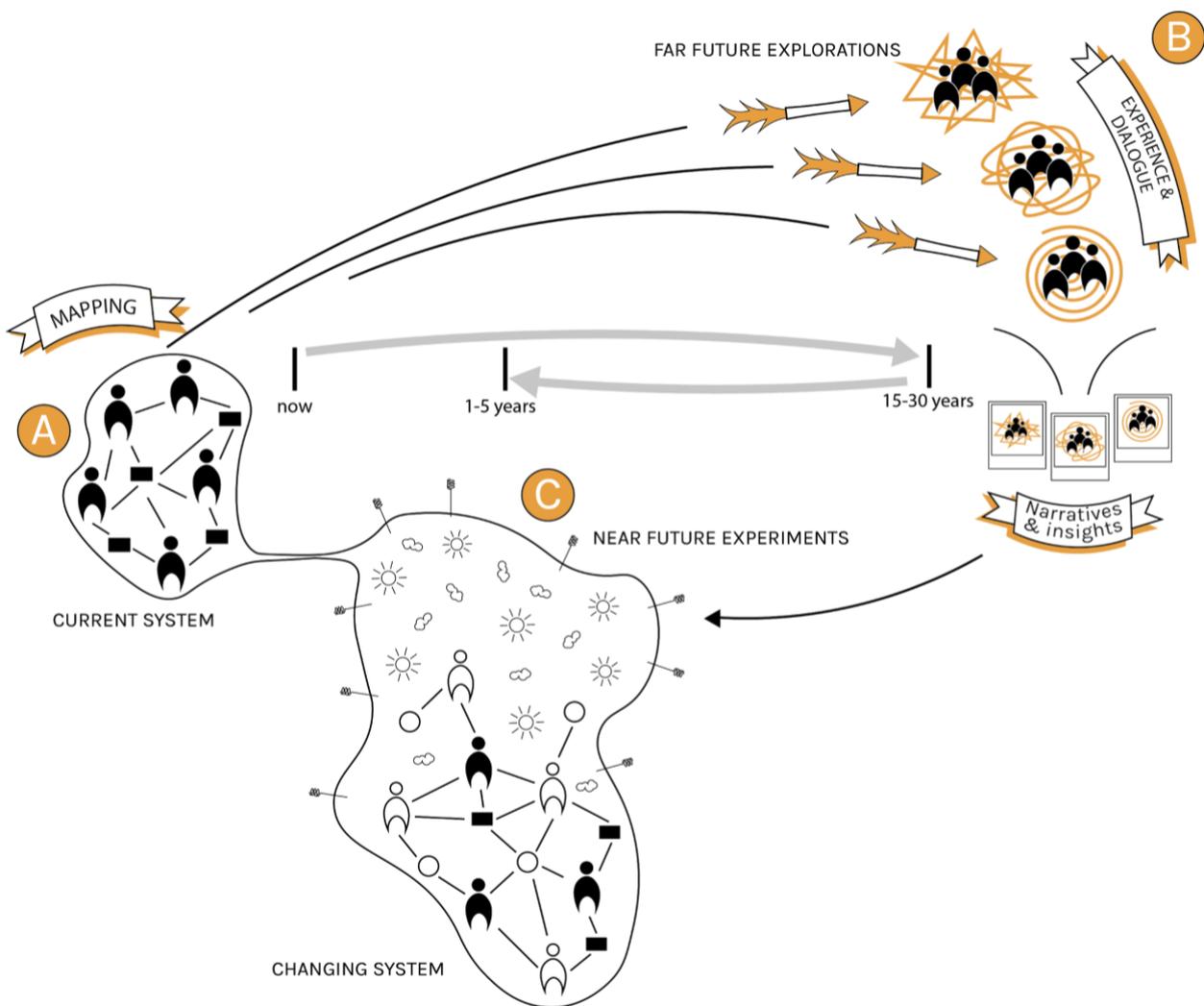


Figure 3: Future probing practice: iterations across three horizons (present - far future - near future)

Practical implications

To bring our findings into today's innovation practice, it is necessary to answer the question: "Having learned from far-future-explorations, what can we do now?". The expanded future probing practice addresses this issue by explicit focus on the connection between far future explorations and present action by way of near future experiments. Insight about the far future will inform and direct experiments to probe with new frames in the current system. Near future probes may then become resonating attractors, that evoke energy to mobilise people and organisations and instigate transformation of the current system. No intervention method can support the actual moment of connecting far future learning to near future acting to be managed or orchestrated precisely, but careful design of the intervention method can create circumstances that empower people and organisations to act and enable connections to happen. To achieve that, we see a specific role for creative professionals, because of their ability to connect people's creative power.

With our continued research we respond to the call for research that focuses on identifying ways in which leaders promote the adaptive process through enabling adaptive space (Uhl-Bien, 2018). The future probing practice provides practical support to enable adaptive space by showing not telling. The visual power of future probing appeals to the imagination of people and takes them to envisioned futures to experience and discuss the unknowns. Such an approach can be very convincing to engage people in adaptive space to make sense of possible future realities and their consequences.

The future probing practice supports multi-stakeholder groups in the fuzzy front end of collaborative innovation. Its process provides sufficient structure to trigger heedful contributions, while posing open, challenging questions, that leave room for interaction, intuition and improvisation, and stimulate skills for dealing with complexity, like creative problem solving, critical thinking and cross-professional collaboration.

Moreover, future probing challenges people to switch between explorative skills and adaptive anticipating action in the present

Conclusion

Organisational adaptability in today's volatile world is high on the agenda of many organisations. Whereas radical changes through digital developments impose new ways of organising, organisational life appears to have become one long innovation journey. Innovation for society demands intensive collaboration and creativity as well as foresight for we developed the future probing practice. We investigated how the future probing practice works and did a first attempt to theorise findings with sensitizing concepts from the organisational adaptability literature. Our case study findings so far show that connecting far future explorations to daily practice is challenging and that organising for adaptability may require a deliberate act of connecting far future explorations with present action. We propose that besides explorative skills, adaptive anticipating action is needed to make the connection and that linking back through near future experiments might be a way to achieve this.

We are still in the process of analysing and interpreting the data. We will scrutinise the data for other patterns that help us understand why making the connection between far future explorations and present action is so difficult. We suspect alternative explanations might add to our understanding. For example, the role of artefacts in the collaborative work might explain why recurring questions about the outcome intervened with our attempts to bring back an entrepreneurial mindset to the workforce. We recognise that artefacts serve different, shifting purposes in collaborative work ranging from developing shared understanding to driving the collaboration forward (Nicolini, Mengis & Swan, 2012). Another interesting perspective might come from the

perception of time in understanding organisational processes. Reversing our natural perception of time (flowing from past to present and extended into the future), allows us to conceptualise the future as flowing into the present. The future then offers many potentialities as not yet occurred alternative states and possible outcomes, which may be actualised “*by the enactment of individual, social and environmental events that are often serendipitous*” (Lord, Dinh & Hoffman, 2015; p.264). This conceptualisation fits well with the underlying idea of future probing in which a range of possible futures are explored. The reversal of time allows us to interpret the various possible futures to flow into the present and we (and many other factors) might be able to influence its actualisation. This touches upon our presumption that through a designerly approach we may contribute to shaping the future as it unfolds. To ground the notion of adaptive anticipating we will search literature for additional social concepts.

We welcome all theorising suggestions and those in support of elaborating our research in the development of a framework for understanding how the future probing practice might contribute to organisational adaptability.

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