Making as Social Fabrication: Towards a new Fab Commons?

Peter Troxler
Dr. sc. techn. in Management, Technology and Economics
Research Professor at Rotterdam University of Applied Sciences

After cautiously appearing with the new millennium and making its official start some ten years ago, *Making* has become a term attached to a phenomenon that will persist for a while. Its various incarnations—maker movement, Fab Labs, maker spaces—have become the subject of political agendas, socio-economic and academic inquiry. *Making* is a pastime, an educational innovation, a new renaissance, reuniting the liberal arts with science and engineering and constituting a new industrial revolution which claims to empower people through technology. *Making* has a geeky flavour to it, consciously or unconsciously as an ingredient of the branding of some maker initiatives. Yet *Making* has certainly become more than just the occupation of a few consenting nerds.

Making is starting to have an economic impact as boutique manufacturers integrate principles of *Making*—such as prototyping, digital tools, open source and communities—in their business models. There is potential for self-employed and micro-enterprises to build a network and grow laterally instead of only gaining more mass individually or being swallowed by some large multinational. In that context, it is interesting that businesses are also starting to prototype their business models as they grow. Even incumbent industry is starting to develop an interest in these principles and is looking into new ways of innovating and manufacturing. Whether the reason for this is open innovation, more effective use of internal talent or simply employee retention that motivates companies, *Making* is becoming a 'tool' in

the hands of business. Yet incumbent industry could also benefit from the networked, lateral approach that is often at the core of collaboration between *Making* initiatives.

Leaving traditional GDP-oriented markets and economics, *Making* also develops a strong social meaning. Aizu and Kumon (2013) coined the term Social Fabrication and understand it as part of a first information revolution that is happening in parallel to the third industrial revolution (in the sense of Rifkin (2011)). They foresee a further development in which robotics and new social institutions will form. *Making,* in that context, is not just an activity of producing goods, rather it is a social activity—deep play (Rifkin 2004), conviviality (Illitch & Lang, 1973), and building a commons.

Making has a significant link to education. There is a strong call for more STEM education, which is not undisputed but resonates with the skills demanded by a high-tech world. There is an equally strong drive to equip students with 21st century skills which, some argue, could be achieved by including *Making* in the curriculum—as a very concrete, hands-on implementation of constructionist learning. However, adding, for instance, a Fab Lab to a school or university also requires a profound revision of educational practice, including planning activities and assessing performance and outcomes. Simply offering something different for a change is not good enough, and revising education also needs to address the question in whose name education is offered, why to provide maker education and not only how and what.

Making and urban (re)development are also connected. On the one hand, there is a new and changing manufacturing industry, from boutique to established, that is looking to accommodate its activities, ideally in places that reflect the spirit of *Making.* On the other hand, there are many places in which post-industrial urban (re)development is desired or already happening, for which *Making* is an attractive ingredient—much akin to the argument of the creative class.

However, the spirit of *Making* is not just redoing urban development with a new ingredient. Rather, the social and empowerment character of *Making* is supportive of new ways of urban development—urban development as a collective process of change (Peek, 2015), Fab City as a data-in-data-out system replacing

the traditional product-in-trash-out paradigm (Diez, 2016), and fair gentrification (Godsil, 2013).

Finally, there is also a deeper link between *Making* and contemporary urban (re)development which relates to the issue of prototyping. Prototyping is one salient ingredient of *Making*—both with respect to the products of services and with respect to the way a *Making* business is established. Prototyping—or rather an incremental development path—is becoming a key characteristic of urban (re)development. The latter is evolving into a much more co-created practice that leaves room for experiments and creates multi-dimensional value—social, economic and physical.

The Future is Lateral

There is a common thread which connects the three areas discussed, namely *Making,* education, and urban (re)development—a different way or organising, grouping, aligning and governing activities in these fields. This way of organising is resounding a theme that has been discussed in economics, social science and to a certain extent in organisation theory for a while: the theme of the network (Barnes, 1954), of self-organisation (Trist & Bamforth, 1951), of peer-production (Benkler, 2006), of the Commons (Ostrom, 1990) and of lateral governance (Rifkin, 2011).

If considered to be more than just an assembly of individual maker heroes, **Making** is fundamentally cooperative when it eschews the lure of venture-capital fuelled individualism with its grim exit perspectives. The future of *Making* lies in cooperation: the key to Fab Labs and the maker movement is not personal fabrication, but social fabrication. The grassroots proponents of the maker movement basically carry the power of lateral governance.

There is maybe a threat of corporate takeover in *Making* if multinationals start to sponsor *Making* activities and begin to incorporate pockets of *Making* into their own structures and operations. There is a threat to groups within *Making* to become overly self-contained through aggressive branding, wanting to become world-leaders in *Making,* establishing standards that exclude rather than include the out-group. The answer to these threats is to return to lateral governance and to nourish the network, even if there is no easy ready solution and even if one has to abandon the craving to achieve the position of 'the first', 'the biggest' or 'the leading' enterprise and adopt a lateral attitude.

Such an attitude must come from **people** who have learnt to think, learn and act in laterally governed settings. The most prominent setting to learn such an attitude is certainly education. Being able to interact laterally is learnt similarly to 21st century capacities. Both essentially require personality development gained through being exposed to situations that require these capacities, rather than memorising facts and behavioural action scripts.

Creating situations of lateral governance in education means fundamentally discarding instructors and educators as hierarchically superior. In a constructionist educational setting, teachers must act rather as facilitators, curators, navigators of a field or discipline, approaching teaching from a lateral attitude themselves.

The **places** where *Making* will happen also need to be developed, maintained and governed in a lateral way. Many development initiatives —however naïve, idiosyncratic and non-cooperative they sometimes might be— already aim to co-create urban spaces and places. City councils and regional and national governments are increasingly waking up to the call and are eager to include grassroots initiatives and to create an environment for lateral development—albeit coming from a traditionally hierarchical position. There is still a lot of room to create and animate cooperation, to provide education about the commons, and to develop lateral business and governance models in urban development. The right criteria to evaluate initiatives need to be found, inclusiveness has to be addressed and a possible bias towards corporate solutions has to be investigated. Grassroots initiatives often also have to stop themselves being competitive and develop a relationship of 'coopetition'.

Beyond Consenting Nerds

For Making to move beyond the circles of consenting nerds it needs to contribute to the bigger challenges of society—becoming economically, socially and ecologically sustainability, developing the network, achieving equality, defying technocracy, and elaborating on the notion of lateral governance.

Sustainability

Notwithstanding its limitations, *Making* can have a substantial impact on sustainability—economically, socially and ecologically. For *Making* to contribute to economic sustainability there needs to be a

development away from depending on public subsidies and towards developing value propositions that allow makers to become economically self-sufficient. Experience shows that this requires new approaches to creating value that are based on network approaches and involve multiple, interdependent parties. Such business models are not taught at business schools and do not emerge from the practices of general business consultants. Rather they require conscious co-creation by the parties involved and, as examples have shown, 'uniting profitability with a 2.0 and open rationale, thus solving the "puzzle" of the open business model' (Delbosc, 2014, p. 59).

For *Making* to contribute to social sustainability it needs to pursue its path of individual empowerment. However, it is important not to leave social innovation and empowerment to chance: social innovation must be pursued actively and in conjunction with attaining economic sustainability. Many enterprises in the 'sharing economy' have promoted individual empowerment as social innovation, but eventually only recreated an old-style 'renting economy' in which those entities which profit economically from a 'sharing' business do so by exploiting resources they do not even own and augmenting inequality. By creating networks of value creation, *Making* will be able to contribute to positive social transitions that broadly contribute to diversity, equality and inclusion.

Ecological sustainability is an equally challenging call for *Making*. Energy and material consumption and waste generation are serious issues at present. Taking 3D printing as an example, the materials used are either ABS (acrylonitrile butadiene styrene, a common plastic polymer) made from oil or PLA (polylactic acid, a bio-based polymer) which is often made from genetically modified corn. While oil is not a sustainable source of raw materials, the issue with corn is the competition between food, material and biofuel manufacturing for farm land. Both materials, ABS and PLA, do not degrade naturally in landfills. There are currently no easy recycling routes for these materials that would guarantee the material safety that is required in their application. Research on sustainability in Fab Labs has only just started (see, for example, Kohtala, 2013; Kohtala, 2016). So far, the conclusion is that it remains to be seen if Fab Labs are able to transform themselves into a platform for participatory ecological innovation.

Network

Despite its prominent place the term network has, for instance, in the Fab Charter—it stars with the sentence 'Fab Labs are a global network of local labs' (CBA, 2012)—and the important functions the network is supposed to provide—'operational, educational, technical, financial, and logistical assistance'—the Fab Lab network has still to develop. Other initiatives in *Making* are even more disconnected and thrive, for example, mainly on the marketing efforts of Makermedia.

There are a few services the network offers to the Fab Labs, mainly a couple of yellow pages listing the Fab Labs globally. There are also a number of websites offering guidance for setting up Fab Labs and a plethora of other sites aiming to promote exchange, to create business opportunities and to attract funding. It has been acknowledged early on in the Fab Lab network that it requires multiple forms of alignment—lateral, bottom-up and layered instead of top-down—and that the network needs distributed leadership that is based on influence, not authority (Cutcher-Gershenfeld, 2007). Yet many of the initiatives to strengthen the network are in actual fact authoritative approaches as they are try to become the single central resource for a certain purpose or to define what a Fab Lab is once and for all.

Equality

The annual ritual in which the Fab Lab network gathers for an international fab forum and symposium (or 'conference and festival' as it was called in Barcelona in 2014) is one established structure for promoting connections within the Fab Lab network. Local and regional Maker Faires have a similar function. The growing attendance to these events, however, conceals that they risk losing out on broad, inclusive participation from the whole network. The cost of attending is high if it involves international travel to far away countries—and for a large section of the *Making* population any destination is by definition far away. Spending several days away is a substantial demand on the time budget of many a maker. Remote participation is virtually impossible, and while selected content might be available as a video stream, bandwidth at the receiving end might not be sufficient. It is a huge challenge for the whole maker movement to become and remain inclusive and not to create a divide between the ordinary members of

the maker movement and a Making elite. However, developing the sharing capabilities of the network is a burden borne mainly by the wealthy participants in the network. There is a potential issue of colonisation, of the Western white male ideology (or role model) dominating the discourse. A telling example is the promotional video 'A Fab-ulous Future: What Is a Fab Lab?' by the Manufacturing Institute (2012) where a plane is seen circling the earth and parachuting replicas of the Manchester Fab Lab onto remote parts of the planet.

Technocracy

Another challenge which *Making* faces is its position in relation to social and political questions, as was mentioned above. The louder voices in the maker movement appear to side with the ideals of liberal individualism, projecting makers as a new breed of Randian heroes. Is this image of the creative individualist, who perseveres against all odds in the pursuit of his goals—even when his ability and independence lead to conflicts with others—really the ideal *Making* aspires to? As *Making* empowers people through technology, they have to acknowledge that technology is a site of power. Consequently, the question needs to be asked 'In whose name is this done?' If the maker movement is indeed the final phase of winning the digital revolution (Gershenfeld, 2006), the earlier developments in this digital revolution should be a warning: the first decade of the Internet revolution (approx. 1995 to 2005) brought horizontality, cooperation and decentralisation, and a vaguely anarchistic outlook. The second decade of Web 2.0 with its focus on data placed central control in the hands of unregulated corporations, 'politically speaking ... a counter revolution' (Stalder, 2013). What is required is developing a critical discourse around a few implicit assumptions—technology is not neutral but 'society made durable' (Latour, 1990), technology and people are 'entities that do things' (Latour, 1994), and technology comes with built-in societal, cultural and political assumptions. Participation will not just work, out-of-the-box as it were, but is influenced by local cultural and social variables, such as heterogeneity and the role of elites. Downward accountability and upward commitment are key to making participation work (Mansuri & Rao, 2004). As *Making* is at the forefront of technical innovation in and for society, in moral controversies

it is expected to provide leadership and not to adopt a 'neutral' hands-off attitude. Overall, in Morozov's analysis, 'there's more politicking—and politics—to be done here than enthusiasts … are willing to acknowledge' (Morozov, 2014). A particularly difficult case in point is the issue of funding of Fab Labs and their activities by large business corporations.

Lateral

While still growing at an exponential pace, the maker movement, Fab Labs, maker spaces and makers in general have to develop their practices of interaction and exchange. They have to keep abandoning top-down, centre-out as the one single possible imaginable approach for organising and experimenting with polycentric, bottom-up and lateral schemes. This in fact means that actors need to engage in constructing their practice and becoming institutions in 'a dialectic synthesis of what is going on in a society and what people are doing' (Sztompka, 1991, p. 96). They will need to avoid the potential enticement of the corporate privatisation of *Making* and the cajolement of fab-washing. While being earnest—as an infrastructure for learning skills, developing inventions, creating businesses and producing personalised products, and as a movement that is building its identity in a complex socio-technical and politico-economic environment—Fab Labs should not forget that play is a crucial ingredient, as is their non-utilitarian social role as third places, distinct from the first and second places of home and work (Oldenburg, 1989), providing for civil society, democracy and civic engagement.

In the long term, *Making* has to prepare for a time when the concept has lost its novelty, when fabbing is not fabulous anymore. Depending on the decisions players like Fab Labs make about their purposes now and the routes they take in the near future, this could mean retiring to the position of consumer-oriented, commodity-producing facilities for consenting nerds, or being part of a much broader development of the cultural, scientific and political (re)configuration of society.

A Fab Commons

Eventually, for *Making* to contribute to a more equitable society within the means of the planet (Raworth, 2015) lies the necessity to abandon the market/state duopoly of the first and second industrial revolution, the market economy that is

based on the assumption of unlimited growth and the fair functioning of the free market. The principle of the commons has been proposed as a generative paradigm to step outside of the dominant discourse of the market economy. A commons is a social system for the long-term stewardship of resources that preserve shared values and community identity (Bollier, 2014, p. 175). *Making* as social fabrication requires developing such stewardship for people and planet.

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