

ANNA SERAVALLI

MAKING COMMONS

(attempts at composing prospects in the opening of production)



MALMÖ HÖGSKOLA



THE OPENING
OF PRODUCTION



MAKING COMMONS

Doctoral dissertation in Interaction Design

Dissertation series: New Media, Public Spheres and Forms of Expression

Faculty: Culture and Society

Department: School of Arts and Communication

Malmö University

Information about time and place of public defense,

and electronic version of dissertation:

<http://dspace.mah.se/handle/2043/17232>

© Copyright Anna Seravalli, 2014

Designed by Anna Seravalli.

Photos, diagrams and illustrations by Anna Seravalli unless stated otherwise.

Printed by Service Point Holmbergs, Malmö 2014

Supported by grants from The National Dissertation Council

and The Doctoral Foundation.

Isbn

978-91-7104-583-6 (print)

978-91-7104-584-3 (pdf)

ANNA SERAVALLI
MAKING COMMONS

(attempts at composing prospects in the opening of production)

Malmö University 2014

CONTENTS

ACKNOWLEDGMENTS	13
FROM ALTERNATIVE FUTURES TO (IM)POSSIBLE PRESENTS	16
FOREWORD	18
1. In the swamp: context and concerns	20
1.1 In the opening of production: a matter of alternative futures?	20
1.2 Medea and Malmö Living Labs: how to support and appraise co-production?	22
1.3 Designers in the swamp: what kinds of practice? How to relate to other fields?	24
1.4 Research questions	26
1.5 Dealing with the mud: a compositional programmatic approach	26
Design as making and composing	26
A programmatic approach	27
1.6 Three spots in the swamp	28
Fabriken and STPLN: a space for opening material production	28
Herrgård's Women Association (HWA): issues and dilemmas with creative communities	31
Connectivity Lab, accountability, and the making of possible presents	34
1.7 Takeaways	37
1.8 Relation to interaction design	38
1.9 Thesis structure: a programmatic work	39
1. ENTERING THE SWAMP	45
2. Design research as a programmatic approach	46
2.1 Understanding design practice: a conversation with the materials of a situation	46

2.2 Programs and experiments: design practice-based research.....	50
2.3 Programmatic approach as an academic research method, a matter of where	53
2.4 The actual program: Making Commons (attempts at composing prospects in the opening of production).....	55
3 Commons as the first compass	56
3.1 In the swampy lowlands of the opening of production: a long way for the definition of the 'where' and the 'what'	56
How commons entered this work	58
3.2 Commons as a manifold notion	60
3.3 Commons, commoning, and infrastructuring in the opening of production.....	66
4 From prototyping to making (and composing)	68
4.1 The second compass: compositionism, how "Things" can be made...70	
4.2 Future and prospects: from potentiality to actuality.....	72
5. Summing up: 'where', 'what', and 'how'	75
6. Some methodological considerations	76
6.1 Compositionism and other methodologies.....	76
Composing in a programmatic approach from experiments to engagements	76
Compositionism and PAR: action as knowledge and attempts at change.....	78
Compositionism and case study research: commons as narratives, located power, and values.....	80
6.2 Validity, relevance, and rigor.....	82
6.3 Knowledge contributions.....	84
2. THE OPENING OF PRODUCTION	87
7. Mapping the opening of production	88
7.1 Hackers, makers, and freedom for commons-based production.....88	
Commons-based peer-to-peer goes tangible (and maybe also big?)	91
7.2 Open and democratic innovation, publics and ethical economy ..93	
7.3 Sharing economy buen vivir and degrowth	97
7.4 The opening of (re)production: a matter of care	99
7.5 The opening of production: the same old story?.....	102
8. What happens to the roles of users, producers, and designers?	104
9. Issues and dilemmas in the future of opened production.....	109
9.1 Maintenance and provisioning of the commons.....	109
9.2 A very fine line between empowerment and exploitation.....	111

9.3	The myth of the amateur?	112
9.4	Going local and small: the risks of neo-medievalism.....	114
9.5	Infrastructures for commoning: struggling towards economies of scope.....	114
10.	The engagements: two infrastructures in the swamp	116
10.1	Malmö: a city in the opening of production.....	116
10.2	Fabriken and Connectivity Lab: infrastructures for tangible production	118
10.3	The Neighbourhood and HWA as enabling platforms	119
3.	COMMONS AND PROSPECTS	125
11	Fabriken and HWA as commons in the opening of production.....	126
11.1	What kind of production?	126
11.2	HWA as a commons: consensus, collective identity, the premises	129
	Collective groups versus peer-to-peer networks?.....	130
11.3	Fabriken commons, form 1: transient participation, lack of consensus, and the NGO as a partner	132
	Issues with transient participation	135
11.4	Fabriken commons, form 2: from commoning with individuals to commoning between organizations.....	138
	Issues with expectations and ownership.....	140
11.5	Commons sustainability: rivalry and durability and economies of scope.....	142
	Nuancing rivalry and durability	142
	Economies of Scope	143
11.6	Connectivity Lab a non-commons.....	145
12.	Prospects in the opening of production	146
12.1	Creative communities struggles	146
	When bees and trees do not match.....	146
	Spaces and resources for experimentation and continuity.....	148
	Supporting the trees?	152
12.2	While waiting for the third industrial revolution	152
	Commons-based, peer-to-peer production goes tangible: articulating openness	152
	Dealing with material scarcity	153
	Amateurs, but not necessary entrepreneurs.....	155
	New producers and old producers: alliances in the margins?	157

13. Which prospects get to travel? (Constraints making)	158
13.1 The making of CL and the delegitimization of Fabriken.....	159
13.2 Others constraints making: regaining legitimacy	162
13.3 Shaping 'matters of fact', actants, and relationships	165
4. MAKING COMMONS AS COMPOSING	169
14 Commons which gather actors with diverse interests	170
14.1 Boundaries, boundary objects, boundary organizations and trading zones.....	170
14.2 Engagements: infrastructuring for boundary organizations and trading zones.....	173
15 Initiating commons	174
15.1 Exploring boundaries: finding common interests and articulating differences	174
15.2 Giving trust, lending/borrowing trust	177
15.3 Non-humans mobilizing humans: laser cutters and stories	178
15.4 Openness as matter of constructing the stakeholder	180
16 Unfolding commons.....	183
16.1 From co-design to non-consensus-based commoning	184
16.2 Collaborative making without commons?.....	186
16.3 Co-ownership for long-term commitment	187
16.4 Diverse and non-overlapping interests	189
16.5 Collaboration: trading or bending?	191
17 Continuing commons	193
17.1 Control over production	193
17.2 Sharing as a necessity and (safe) trading zones	194
18 Leaving commons.....	196
19 Design(er) and making commons.....	199
19.1 Collective prototyping and making rather than facilitating.....	199
19.2 Making power, practicalities and friendly hacking	201
19.3 Beyond workshops: other collective forms.....	203
19.4 From strategies and methods to located prudent tactics.....	205
5. CONCLUSIONS	208
20 Summing up contributions	210
20.1 Answering the questions	210
What kind of co-production practices are emerging in the opening of production?.....	210
To what kind of (alternative) futures do they relate?	
Which of them may move forward as possible presents?	212

How can design be at play in co-production practices as a matter of making possible presents?	214
20.2 Design practice-based approach, as a matter of making futures	215
20.3 Reflecting on the programmatic approach	216
Actionable program, knowledge-able experiments, a matter of where	216
From experiments to engagements.....	218
21 Aftermath reflections	219
21.1 Prospects in the opening of production.....	219
Community-supported production.....	219
Makerspaces, meeting-by-making, and learning-by-making	220
21.2 Making commons and design	221
22. The latest update on people and projects.....	224
6. SAMMANFATTNIG	228
7. REFERENCES	230
APPENDIX 1	243
M1	245
A1	247
A2	263
M2.....	283
A3	285
A4	303
A5	327
A6	337

ACKNOWLEDGMENTS

Many people, places, materials and technologies have been involved in this journey. I am grateful for the opportunity to make and reflect together with them. *Tack!*

Thanks to my supervisors, Pelle Ehn and Jonas Löwgren. Pelle, thanks for always finding the time and energy to engage in reading, discussing, deciding and reflecting on what emerged along the way. Your commitment to 'making futures' has been fundamental for this work and a great inspiration for me as a design researcher. Jonas, thank you for providing me with an 'outsider' perspective, for your sharp and direct comments, and for your support in finding clarity and structure when most needed.

Thanks to Anders Emilson and Per-Anders Hillgren. We have been through a lot together, and I am grateful for the opportunity to experience it with you. I have learned a lot from both of you, and I hope there will be opportunities to continue exploring things together.

Thanks to Fabriken/STPLN people and Herrgårds Kvinnoförening. Caroline Lundholm, Oyuki Matsumoto, and Ola Persson: thanks for making STPLN possible and for sharing part of this journey; it has been great to contribute to such a space. Carin Hernqvist, working together has been an unique opportunity for experimenting and learning about design and making, and I am grateful for having been part of ÅterSkapa. Luisa Carbonelli—engaging together in Tantverket and our subsequent attempts at other projects has been funny, frustrating, and giving. Thanks also for the long conversations about makers culture, do-it-yourself crafts practices and their (im)possibilities. Bertil Björk, thanks for sharing your experiences and reflections about Cykelköket. Thanks to Jila Moradi, Aisha, Halima, Banor, Rosa and all the other women engaged in the Herrgårds Womens Association. Working with you has been a very giving journey both in the good and bad times. You have all been role models for me when it comes to endurance, long-term commitment,

and innovation. Thanks to Helene Granqvist, Åsa Skogström Feldt, and Göran Nätverket members for your engagement and will to explore. Thanks to all the people and initiatives that have been or currently are making, sharing and collaborating in Fabriken/STPLN: Tantverket and Textil Departmentet participants, particularly Cia Borgström, Monica Ståle, and Jytte Hammenskog. Forskningsavdelningen people, particularly Olle Jonsson, Davey Taylor, Quinn Ertel, Niklas, Markus, and Toby. Cykelköket people, particularly Katarina Älg, Katarina Lind, and Ola Sturesson. Thanks also to Lina Linde, Sophia Ersson, Bertil Löwgren, Grupptricket, Elisabet Frick, Demobanken, Arduino Verkstad, Joanna Bolgar, Tony Olsson and all the participants in the everyday running of STPLN, both with the events and workshops. Thanks also to Malmö Stad and the civil servants I have been meeting along the way. Thanks to Attendo, its employees and the refugee children they hosted in Malmö during the spring of 2010.

Thanks to Medea and K3 (The School of Arts and Communication)—you have been giving, but also, at times, very turbulent environments to work in, however, I will always treasure what I have learned here. Bo Reimer, thanks for your ongoing support along the way, and also for the good company, concerts, and afterworks. Erling Björgvinsson and Per Linde, discussions with you have always been very giving, and your way of working has been a great inspiration for me. Elisabet M. Nilsson, I enjoyed working together in Fabriken, as well as engaging together in all sorts of discussions and activities. Maria Hellström Reimer thanks for your availability and support along the way. Richard Topgaard, thanks for taking care of my broken English and messy writing, for random discussions, dinners and for the good music. Karolina Rosenqvist, thanks for your helpfulness and support as well as for Medea afterworks. Mette Agger Eriksen, Luca Simeone, Staffan Schmidt, Kristina Lindström and Åsa Stahl, Susan Kozel, Bo Peterson, Pernilla Severson, Mads Høbye, Mahmoud Keshavarz, Erik Snodgrass, and Zeenath Hasan, thanks for good discussions, support and inspiration. Ylva Gislén, even though it was just for a few months, I am glad we got to work together. Thanks to my students who helped me reflect on and make sense of my work. Thanks to K3 and Malmö University for providing me with organizational, administrative and financial support. Thanks to the European Structural Funds that have financed the Malmö Living Labs.

Thanks to Liam Bannon for a giving 90% seminar and for providing me with useful comments on how to improve this work. Peter Parker, thanks for your comments on the final draft.

Thanks to Design Fakulteten (The Swedish Faculty for Design Research and Research Education) for providing an unique arena to learn, discuss and meet other PhD design students. I am particularly grateful for the good discussions (and good times) with Johan Blomqvist, Magnus Eneberg, Stefan Holmlid, Marcus Jahnke, Li Jönsson, Stoffel Kuenen, Tara Mullaney, Fredrik Sandberg, Fabian Segelström, Henrik Svarrer Larsen, Mats Rosengren, Helena Tobiasson, Peter Ullmark, Otto von Busch, Bo Westerlund, and Katarina Wetter-Edman. Thanks also for providing me with the financial support to attend courses and conferences.

Along this journey there are other people who have inspired and helped me in reflecting on this work. Thanks to Anna Meroni, from Politecnico of Milan; Joachim Halse, Marie Aakjaer, Maria Foverskov, from the co-design cluster in Copenhagen; Jacob Buur and Henry Larsen from the SPIRE Center in Denmark; Johan Redström and the PhD students at the Umeå Insititute of Design; Oksana Mont from Lund University; Sanna Marttila, from Aalto University Media Lab; Participants and Reviewers of PDC 2012; and Katherine Gibson from the Community Economies group and Institute of Culture and Society University of Western Sydney.

Thanks to my proof-reader Janet Feenstra.

Thanks to Malmö for being a good place for living and an incredible place for making (im)possible presents. Thanks to Silvia Venditti, Calle Engene, Lajka and Betina, your friendship has been a great support along this journey. Thanks to Anders, Staffan, Jonas and Klubben Cyklisten for good rides and 'fika'. Thanks also to Rebecka Eriksson, Liv Kroona, Julia Rönnbäck, Mari Brännvall. Thanks to my SFI teachers and classmates; particularly, Motoko Brimmicombe-Wood, Monica Díaz Baeza, Pilar Rodriguez, Miguel Gabard.

Bruno and Luciana, Enrica, Ettore and Elia, Francesco and Claudia thanks for your constant support and for looking after me along this journey.

Martino, you made this work possible in so many different ways. Thanks for always being on my side, for your patience and understanding, and for helping me get perspective over things.

Thanks to my bikes, the Skåne countryside, and the Giulie Alps for giving me the possibility to break away from time to time.

FROM ALTERNATIVE FUTURES TO (IM)POSSIBLE PRESENTS

I started working as a designer quite early in my life. During my studies, I had the opportunity to collaborate for a few years with a company called Fantoni which produces office furniture and fiber boards. I was part of the design and product development unit and I was often given the chance to go down to the shop floor, to learn about machines and production processes. I was also involved in meetings with suppliers and in discussions and negotiations with the production, sales and marketing departments. I had the possibility to be part of the long journey that takes for a sketch to become an actual product, which entails prototyping, mobilizing resources, negotiating, and, sometimes, also failing. I learned how such a process is necessarily a collective process requiring the involvement of people with diverse competences, as well as technologies and materials. When a proposal was received from external designers, the head of the design and product development unit used to discuss it with me, highlighting possible production problems and mistakes done by the designers. Every time, he ended the conversation with the same reminder: “You see, you can make the most realistic rendering of a piece of furniture, but if you lack the knowledge about how to make it, it may likely simply remain on paper.”

By working there, I realized that knowledge about making plays a crucial role in design proposals moving forward.

I like to think that the roots of this work can be found in those years at Fantoni, particularly, when it comes to my interest in understanding how things are made, what it takes to move from sketching and prototyping possible futures to their actual implementation.

Since then, my interests as a designer have moved towards sustainability and social innovation, with a particular focus on economy. In my Master's thesis, I developed a proposal for a public service which aimed to support local economy initiatives in the Alpine area where I grew up. From citizens to local institutions, more than forty people got involved in the process. The result turned out to be a very complex proposal which, despite of a number of attempts at trying to move it forward, remained on paper. I started to ask myself: what kind of making is required for social innovation? What kind of prototyping, resource mobilization, negotiating and failing is required for changes in economic practices and in the relationships between public institutions, the private sector, and the third sector?

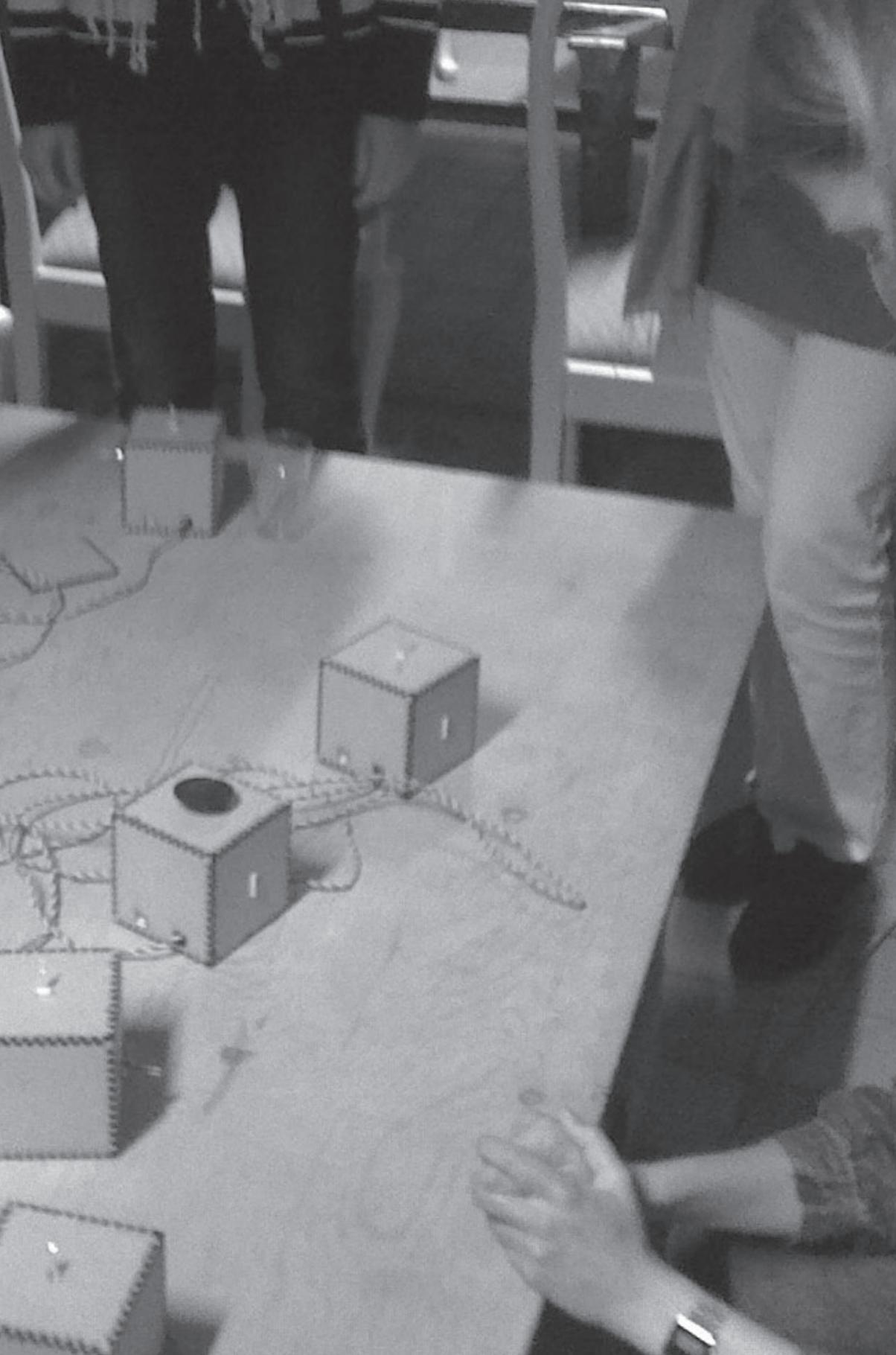
This PhD has been an incredible opportunity to delve into that question. The position I applied for was related to Medea, at the time, a new research center at Malmö University focusing on collaborative media and co-production processes between academia and external actors. Specifically, the position was part of Malmö Living Labs, “an open innovation milieu where new constellations, issues and ideas evolve from bottom-up long-term collaborations among diverse stakeholders” (Björgvinsson et al. 2012).

I have been part of Malmö Living Labs for four years, getting involved in long-term collaborations with diverse people in Malmö. Together with them, I explored possibilities of alternative production practices, inspired both by emerging practices of open, collaborative, and sharing-based production, as well by heterodox economics ideas about local production, commons-based peer-to-peer production, degrowth, and feminist notions of well-being, value production and work.

Through the practical engagements, my colleagues' work, and the happenings at Medea, I had the opportunity to explore what kind of making may be implied in social innovation, particularly when dealing with practices of making things and delivering services. I learned about how futures may, or may not, become possible presents and what role designers can play in such a process. This thesis aims at sharing the insights, questions, and issues that have emerged along this path.



FOREWORD



1. In the swamp: context and concerns

In the design field, the notion of swamp developed to differentiate two situations in which practitioners may engage (Schön 1995). The first one is the high ground, where problems can be solved through theories and techniques. The second situation is the swamp, where instead, “problems are messy, confusing and incapable of technical solution” (Schön 1995 p.1). Schön writes “The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or society at large, however great their technical interest may be, while in the swamp lie the problems of greatest human concern.”(Schön 1995, p.1).

The metaphor of the swamp is used to depict the context of this work and the concerns it brings up. In particular, this work is carried out in the swampy lands of *the opening of production*, where the increased accessibility to means of production, and the rising of open, collaborative and sharing-based production practices are fostering the emergence of a number of visions and scenarios about the future of production. In such a swamp, I position my two engagements which may be looked upon as two possible examples of the growing role that openness, collaboration and sharing play in making things and delivering services. The broader context and the two engagements raise a series of questions which are relevant for the design field, but also for academic and practical work concerning alternative, or heterodox, economics.

1.1 In the opening of production: a matter of alternative futures?

The notion of *the opening of production* accounts for emerging practices and understandings of co-production, where openness, sharing, and collaboration play a growing role in making goods and delivering services. *Openness*—as the increased possibilities of participation for ‘end-users’ in processes of value creation, thanks to the growing accessibility of means and resources for production. *Sharing*—as the establishment of forms of collective ownership, management, and use over resources for production, as well as over

processes' outputs. *Collaboration*— as forms of collective action that, contingently, emerge with openness and sharing.

When it comes to performing value production, the opening of production entails a shift from individuals, private property, controlled production, and closed innovation processes, toward collectives, shared ownership, and distributed and open production processes.

The opening of production is not a homogenous phenomena; it spans from the software field to public services and from food production to the media industry. It also presents a number contradictions and issues in the way in which openness, sharing, and collaboration work. Nevertheless, it seems characterized by four distinctive traits:

- *Shuffling of roles*—these practices often entail an overlapping of roles between end-users, producers and designers and, consequently, a profound transformation of the relationships between them.
- *Beyond use value*—the centrality of sharing and collaboration implies that these practices are not only generating products and services which respond concretely to a human need, but also social connections between the participants, as well as facilitating a knowledge exchange between them.
- *Alternative production forms*—the increasing availability of technologies and knowledge about making is boosting the emergence (or reinforcement) of marginal practices on the border of capitalist, industrial mass-production.
- *Diverse forms of commons*—where commons have to be understood as ways of organizing and performing sharing and collaboration and, consequently, entailing diverse modes of openness.

The opening of production is mobilizing and feeding a number of possible futures that span from the creation of a post-capitalist mode of production based on shared resources, to the idea of collaboration and sharing as the new mantra for possible business models and startups. An in-depth mapping of the opening of production, the possibilities and challenges it entails is provided further on. What is important to highlight here is both how it challenges the traditional role of the designer and how it seems to open up the possibility of

transforming or reforming the actual production system toward a more social and environmentally sustainable one.

1.2 Medea and Malmö Living Labs: how to support and appraise co-production?

As already pointed out, this work has been carried out at Malmö University, within Medea, a research center focusing on collaborative media and, more specifically, within the Malmö Living Labs group (MLL). Medea involves researchers belonging to the media studies, interaction design, and participatory design fields with the aim of investigating co-production processes involving actors outside academia.

Malmö Living Labs represented one possible way in which co-production processes can be carried out, with a focus on establishing long-term relationships with grassroots initiatives operating in Malmö, working with cultural production, material fabrication, public services and city planning. In particular, this work builds on a two-year engagement with Living Lab Fabriken, and, within the Living Lab The Neighborhood, on the long-term collaboration with the NGO Herrgårds Women Association (HWA).

A third minor engagement at play in this work is Connectivity Lab. Connectivity Lab was also a Medea lab, and it represented another possible way to understand and perform co-production with an explicit focus on big players and more short-term engagements.

Malmö Living Labs were initiated and financed by the Malmö Nya Medier (MNM) project, a three-year program funded by European Structural Funds. MNM was driven by the regional council and aside from Medea, it involved a local media cluster, an incubator, a computer game conference, and a forum financing independent film producers. The MNM project aimed to generate innovation and economic growth in the Skåne region in Sweden.

In May 2011, a change in the management of Medea brought up a number shortcomings and limits of Malmö Living Labs in relation to their inability to involve big players and deliver jobs, companies



1(a)



1(b)



1(c)

1(d)



Figure 1 Medea

and technological innovation, which were some of the MNM goals. In light of this, a decision was made to set up a new lab aimed at fostering collaborations between companies and researchers with a specific focus on technology-driven innovation.

The setting up of Connectivity Lab was not a smooth process, as it implied a strong critique of the way Malmö Living Labs had been operating, since they were, essentially, being considered a failure. However, later on, another way of assessing Malmö Living Labs' work has emerged. In Spring 2012, an independent national study on European Structural Funds projects highlighted the experience of Malmö Living Labs as a matter of investigating new forms and understandings of what economic growth and innovation may entail. These events have strongly influenced my work; while trying to support co-production, they forced me to reflect on how it could be possible to assess what was emerging in the engagements, as well as understanding how alternative practices and notions around production, innovation, and economics may, or may not, move forward to become possible presents.

1.3 Designers in the swamp: what kinds of practice? How to relate to other fields?

In the design field, there is a long tradition of engaging with complex issues, or as Schön defines them, problems of greatest human concern. In his book on design activism, Fuad Luke provides a historical overview of this tradition; from Bauhaus to Critical Design, he describes how designers have been engaging in projects and practices aiming at “generating (...) positive social, institutional, environmental and/or economic change” (Fuad-Luke 2008, p.28). However, he also notices how “the target audience for many of the design movements, groups and individuals were predominantly aimed at designers, with a view to change the way they think, approach their work and deliver their form-giving, rather than at specific targets external to the world of design” (Fuad-Luke 2008, p.48). It could be said that, even though designers have been willing to deal with great human concerns, they have rarely dared or had the possibility to engage in the swamp. An exception to this is represented by the work of the participatory design (PD) community, who, since the Seventies, has engaged users in the design of technologies to improve their working conditions

(Simonsen and Robertson 2012). Their concern was how to bring democracy to the workplace, and thus, they began to involve workers, unions' representatives, and managers in co-designing IT systems, interfaces, and products. The participatory design tradition has developed a wide repertoire and understanding of how to design with others, as well as what it means to be a designer in the swamp, navigating conflicts and power issues that might emerge when diverse interests are brought together (Simonsen and Robertson 2012).

In a similar way, the growing field of design for social innovation (Burns et al. 2006, Meroni 2007, Jegou and Manzini 2008) is calling on designers not only to engage with complex issues, but to do so by co-designing and co-creating new solutions and practices together with citizens, civil servants, entrepreneurs, and activists. The interesting fact is that, in a similar way to participatory design, such engagement is increasingly supported and recognized by other actors as well. Design and co-design approaches have been recognized as playing a role in the development of new products, services, and practices that simultaneously meet social needs and create new social relationships or collaborations (Mulgan 2009, 2010, Murray et al. 2010). Moreover, there are an increasing number of organizations initiated by the public sector and private foundations which are using design approaches to support processes of co-creation to tackle complex issues (such as the former SILK Lab in England, Mind Lab in Denmark, the 27th Region in France, and the former Sitra Design Lab in Helsinki).

Designers' engagement in the swamp is also raising a number of practical and ethical concerns. These challenges are in relation to designers' lack of skills when it comes to organization and economics, and their inability to drive implementation processes (Mulgan 2009, 2010). As the designer Sara Schulman¹ points out: "if we want to solve big social problems we need more than design thinking. Big social problems have many causes; involve real tradeoffs; and require solutions that can work with multiple user groups across multiple levels. We need the critical questioning of social policy alongside

¹ Sara Schulman, together with Chris Vanstone, drove InWithFor (2009-2012) a "design studio" focusing on how to tackle social problems and improve social problem-solving. For more info: <http://www.inwithfor.org/>

the creative freshness of design. Indeed if we want to achieve long-term social transformation, we must be equipped to develop, test and spread robust theories of change” (Schulman 2010).

These critical voices call for new approaches and skills for designers (Schulman 2010, Mulgan 2009, 2010, Blyth and Kimbell 2011) in order to better relate to other fields of knowledge and practices (Mulgan 2009, 2010), as well as being able to navigate the practical and ethical complexities of certain issues (Mulgan 2009, 2010, Tonkinwise 2010, Blyth and Kimbell 2011).

This work attempts to address such concerns by articulating what kind of design may be at work in the making of social innovation.

1.4 Research questions

Summing up the concerns emerging from the swamp, this work aims at addressing four questions:

What kind of co-production practices are emerging in the opening of production?

To what kind of (alternative) futures do they relate? Which of them may move forward as possible presents?

How can design be at play in co-production practices as a matter of making possible presents?

1.5 Dealing with the mud: a compositional programmatic approach

This section introduces both the methodology and the understanding of design that is at play in this work (further developed in chapter 1).

Design as making and composing

The interest in articulating the actuality rather than the potentiality of co-production practices, implies to frame design as a matter of *making*, rather than exploring, proposing, or imaging. Here, making is understood as a collective action where diverse actors, technologies, and artifacts are involved and which is located (i.e. dependent on the context) and emergent.

Such a framing is very close to the understanding of the design practice developed by the participatory design community. By building on notions coming from science and technology studies and, particularly, Actor-Network Theory, PD has started to consider how both human and non-humans have a stake in participating in collective design processes (Agger-Eriksen 2012) and how these processes, rather than generating things, seem to generate *Things* (Björgvinsson et al. 2012)—socio-material gatherings that bring together several actants² and where diverse concerns and interests are at play. In articulating making in relation to Things, one possibility is to build on an existing notion from ANT, that of Compositionism. Compositionism has been proposed by Latour as an alternative way of performing critiques where the focus is not in debunking reality, but rather in collectively engaging in the construction of alternatives (Latour 2010). Such engagement becomes a way of tentatively moving from the potentiality to the actuality of alternative futures.

Compositionism has allowed for the articulation of what kind of making was at play in the engagements in this thesis and how to assess them.

A programmatic approach

In this work, design practice is understood also as a collective (Agger-Eriksen 2012), ongoing, and interactive conversation with the materials of the situation (Schön 1983). Such a conversation represents a learning process in which, by reflecting in and on the action, knowledge is generated (Schön 1983). This way of understanding design practice is one of the grounding elements of a design practice-based way of doing research and, particularly, of the programmatic approach (Binder and Redström 2006, Brandt and Binder 2007, Redström 2011, Koskinen et al 2011, Brandt et al. 2011). Such an approach provides a model for understanding how practice and theory can interact for generating knowledge. The programmatic approach entails the formulation of the program—what is to be explored and how—which is then put to work with a series of practical experiments or, in this case, what is defined as *engagements*. If the program guides

² The notion of actant is used by Latour to describe both human and non-humans agents (Latour 2005).

and frames the engagements, the engagements provide insights to further specify and challenge the program itself. It is in the dialectic relationship between the program and the engagements that the answers to research questions emerge. The latter represents a sort of meta-level above the program that allows one to connect it to the academic and practice-related discourses, or genealogies, the work wishes to address.

When it comes to this work, the program is *'making commons, attempts at composing prospects in the opening of production'*. Where commons and prospects represent the 'what', making and composing represent the 'how' and the opening of production represents a 'where', that is the theoretical and practical context in which the program is settled. In terms of genealogies at play, this work started by wanting to address the fields of design for social innovation, participatory design, and heterodox economics. However, as it is explained further on, relating to the latter has been particularly challenging, and it has required the introduction of another discourse, the one around commons which allows for relating to academic genealogies, as well as the practice-based discourses and concerns about the opening of production.

1.6 Three spots in the swamp

The engagements on which this work is based have already been introduced; here, some additional information about them is provided.

Fabriken and STPLN: a space for opening material production

Fabriken has been one of the three Malmö Living Labs; it is a public workshop where people can access tools and machines for experimenting with technology and diverse forms of production.

Fabriken is hosted inside STPLN, an old industrial building, which has been recently renovated and is situated in Malmö's former harbour area, which has been reconverted into a residential and commercial neighbourhood. The building is owned by the city of Malmö and run by a NGO (STPLN) as a facility for diverse activities ranging from music concerts to robot building and from office work to rollerskate training. STPLN can be considered as an infrastructure for opening

production since it gives individuals and small organizations the possibility to engage in production processes and prototype ways of generating goods and providing services.

The space has two floors; the basement is Fabriken, the actual workshop, with some personal fabrication machines, hand tools, and equipment to work with electronics. Fabriken also hosts other initiatives: a bicycle repair workshop (Cykelköket, in this work 'Bicycle Kitchen'), a textile corner (initially called Tantverket, then Textildepartementet, in this work 'The Grannies Workshop' and the 'Textile Department'), a screen printing workshop, and a material library of cast-off materials (ÅterSkapa, in this work 'ReCreate') which organizes activities for children and adults to foster creativity and environmental awareness. On the ground floor, there is a venue for concerts, a quite large kitchen, and another large room that during workdays hosts a co-working facility.

Fabriken was initially set up as a collaboration between the NGO STPLN running the premises, Medea, and 1scale1 (an interaction design company with a history of collaborating with the NGO). The plan was that while the NGO was dealing with the everyday routine of the space, the company would provide a laser cutter to the space and occasionally run some workshops, while the research center would be involved in the setting up of the space carrying out diverse activities and supporting various in-house projects. This initial situation has since changed; 1scale1, for example, was never very active in the space. They provided the laser cutter, but they rarely participated in the space activities. When it came to Medea's role, that also changed; an initial massive investment in people and time was progressively reduced, particularly after the decision to set up Connectivity Lab. However, a number of new actors have also entered the collaboration. Aside from the actual participants, an important role has been played by more long-term initiatives such as The Bicycle Kitchen and, later on, ReCreate. At the end of 2012, one of the former members of 1scale1 came back to the space with a new company, Arduino Verkstad, establishing a new collaboration for the running of Fabriken.

I had a long-term involvement in the implementation and running of the space, assuming various roles and engaging with diverse activities,



2(a)



2(b)



2(c)



2(d)



2(e)

Figure 2 Welcome to STPLN and Fabriken
2(d) photo courtesy of Elisabet M. Nilsson

from organizing the first co-design workshops to being actively involved in the setting up of the space (The Grannies Workshop/ Textile Department) and from working together initiatives hosted in the space (ReCreate) to being part of driving and organizing events and other activities.

This thesis follows Fabriken and STPLN's evolution from May 2010 to March 2014. In regard to my active engagement in the space, it spans from May 2010 to December 2012. Events which took place in the space between December 2012 and March 2014 have been recounted through a series of interviews.

My long-term involvement with Fabriken/STPLN is the cornerstone of this work. Such experience provided insights in relation to implementing social innovation initiatives and carrying out co-production processes. It also played a major role in the mapping of the opening of production.

Herrgård's Women Association (HWA): issues and dilemmas with creative communities

In the frame of Living Lab the Neighbourhood, this thesis focuses on the engagement with the Herrgård's Women Association (HWA), a NGO founded by a group of women to respond to the issues of feeling (and being) excluded from Swedish society.

HWA is a NGO of immigrant women operating in one of the roughest neighborhoods of Malmö. It was founded in 2001 by a group of eight women. The members include women who originate from Iran, Iraq, Afghanistan, and the Balkan region. HWA carries out diverse activities: from educational initiatives (i.e. Swedish language courses, sessions on how to ride a bike, meetings to discuss violence in families, and even sexual health) to production initiatives (i.e. catering services and various kinds of crafts activities, such as carpet weaving and pearl embroidery). Moreover, they are often involved in the neighborhood community by organizing public activities, but also intervening in social controversies.

The collaboration between HWA and Living Lab the Neighbourhood has been ongoing since 2009 with the aim of supporting the NGO's

primary goal of becoming more integrated in Swedish society. This loose framework has allowed for the implementation of a number of activities and the opportunity to try out diverse collaborations with actors belonging to the third, public, and business sectors. The main concern was to give more visibility to HWA activities and support their development. In doing so, my colleagues and I have worked on very different levels, from prototyping services with the women to engaging civil servants in discussing possible collaborations between the public and the third sector in Malmö. In exploring how HWA's work could be more acknowledged, a wide range of stakeholders have been involved: established NGOs, civil servants, third sector agencies, entrepreneurs and representatives from the business sector.

The collaboration with HWA was initiated by my colleague Per-Anders Hillgren, the Neighbourhood Lab manager. When I started my PhD in 2010, I joined him together with Anders Emilson, another PhD candidate.

The engagement with HWA and my colleagues has led to several activities (see Emilson et al. *forth.*); however, this thesis focuses mainly on those which can be considered part of the opening of the production swamp. Such activities include some prototypes that have been carried out right at the beginning of my PhD, and the attempt at establishing a collaboration between HWA and a network of successful Swedish business women, the Mike Network (MN—a Swedish network of peer-to-peer support between women).

In regard to the prototypes, some of them focused on supporting the women to further develop the catering activities they were already carrying out. Others were initiated out of HWA's interest in working with refugee children (kids between 13 and 17 years old who have escaped war zones and came to Sweden on their own). The aim was to set up a potential service for cultural mediation for these kids in which the women, who often shared the same background and mother language of these kids, could provide them with some knowledge about Swedish society and culture, while at the same time help them feel more at home. These prototypes, aside from revealing specific qualities and the potential of HWA, brought up a number of challenges.



Figure 3 Herrgård's Women Association
3(c) photo courtesy of Per-Anders Hillgren

In trying to understand how such barriers could be overcome, the possibility of a collaboration between HWA and the Mike Network emerged. It seemed that this could be the perfect match, with HWA bringing their unique skills and relational qualities and MN members offering experience and competences in structuring successful businesses. The process included a third actor, MakeItReal, a startup platform fostering grassroots, peer-to-peer support between individuals. The starting point was to organize a meeting between some members of the two organizations and encourage the creation of mixed groups brought together by a common interest. After a promising start, a number of issues and challenges emerged and the encounter between the two groups turned out to be quite problematic. Moreover, during the process, HWA premises were set on fire³. It was the third time, and the women were very distressed and scared since the only thing that the attackers stole was a notebook containing the names, addresses, and contact information of the NGO members. This event put all the activities on hold and HWA went through a very rough and painful time. They felt lonely and discouraged because, after so many years, it seemed as their situation had not improved at all; they were still fighting for basic needs, such as having their own space and finding legitimacy and support for their activities.

The collaboration with HWA has brought up several insights in relation to difficulties of experimenting with alternative business forms, as well as in relation to possible risks and complications that might emerge when making in social innovation fails.

Connectivity Lab, accountability, and the making of possible presents

As stated, Connectivity Lab (CL) represents a minor engagement and it cannot be considered on the same level as the work with Fabriken and HWA. However, as already pointed out, it did have a major role in shaping some of the main concerns driving this work.

When it comes to roles, it might make more sense to talk about the role that CL had in my work than the other way around. I have not been directly involved in the planning, nor the setting up of the lab,

³ It is still unclear who was responsible for the fire. However, it appeared as a clear threat against the women and their work. Further on in the thesis, this event will be mentioned again, in particular, in the context of the roles and responsibilities of designers involved in co-production processes.

although its development had a number of consequences on my work. Particularly, it brought up issues in relation to assessing co-production, as it made it very difficult to navigate the diverse accountabilities I had within Fabriken and with my research interests, and towards the organization I belonged to as well.

On a operative level, the project manager from Fabriken was redirected to work with CL, meaning that I ended up working alone in Fabriken. This situation was complicated by Medea's decision to set up CL generating some discontent and preoccupation with the NGO running STPLN. Particularly, at the outset, the concern was that the new lab would jeopardize Fabriken. These concerns were eventually put to rest when the new lab was inaugurated and it became clear that it was not a Fabriken competitor.

The more interesting outcome of CL's establishment , when it comes to this inquiry, is in relation to what it takes for alternative futures to be understood as possible presents and what is at play in such a making.

Beside CL, a number of other minor, unsolicited experiments have emerged in the engagements. However, none of them had the same impact that CL had on my work, as its development brought up a number of issues and questions that turned out to play a central role in my program.

2014

2013

2012

2011

2010

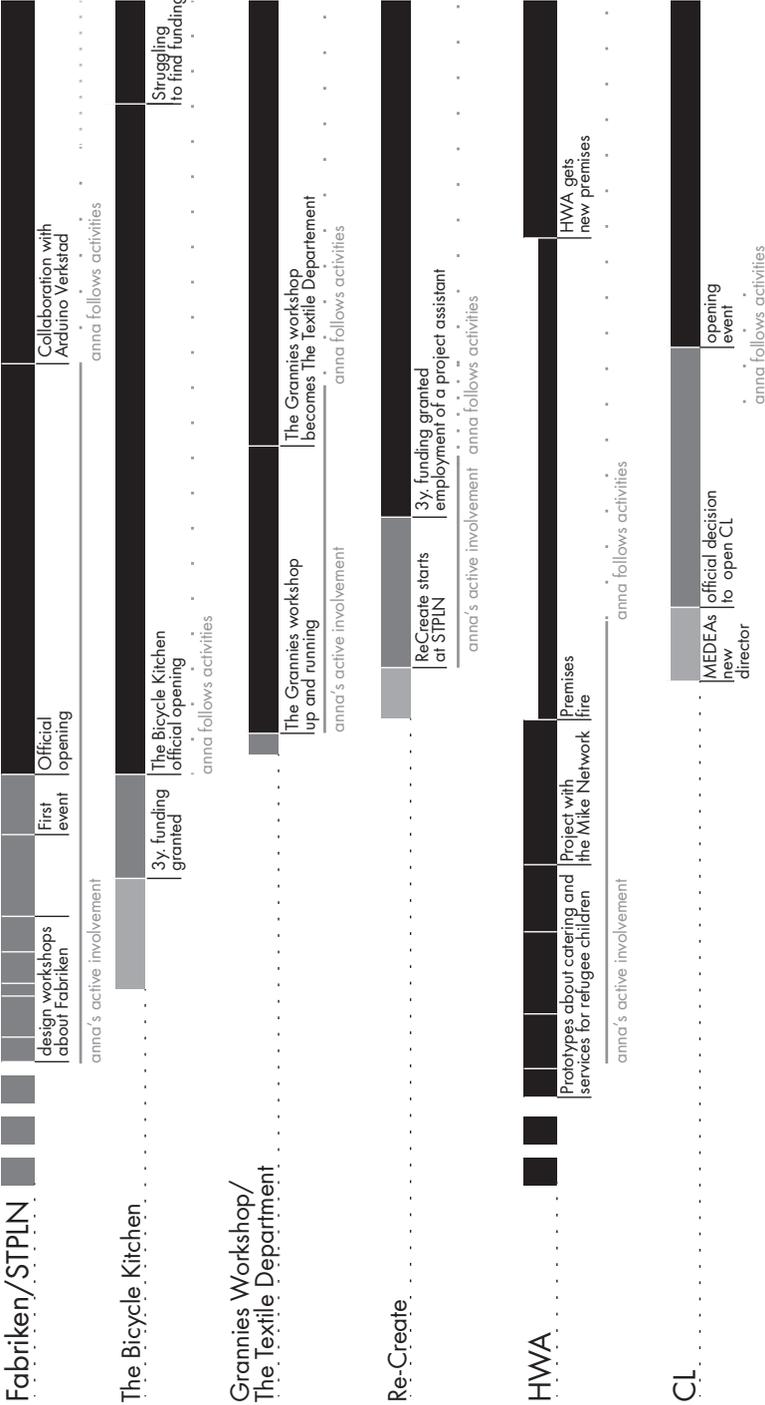


Diagram 1 Timeline of the engagements and of my involvement

1.7 Takeaways

In a nutshell, this work wishes to provide three takeaways:

A context:

The opening of production, a map of the landscape of open, collaborative, and sharing-based production practices which weaves together practical examples and theoretical discourses around commons and heterodox economies. It articulates expectations and visions in the opening of production, what they may entail for the roles of producers, designers, and users, as well as a number of challenges and risks in relation to them.

A designerly approach:

Compositionism entails a specific way to frame and understand design when engaging with the making of possible presents rather than proposing alternative futures. Compositionism allows both articulating a particular way of working in the swamp as well as developing a discussion about how and why some futures may become presents and other may not.

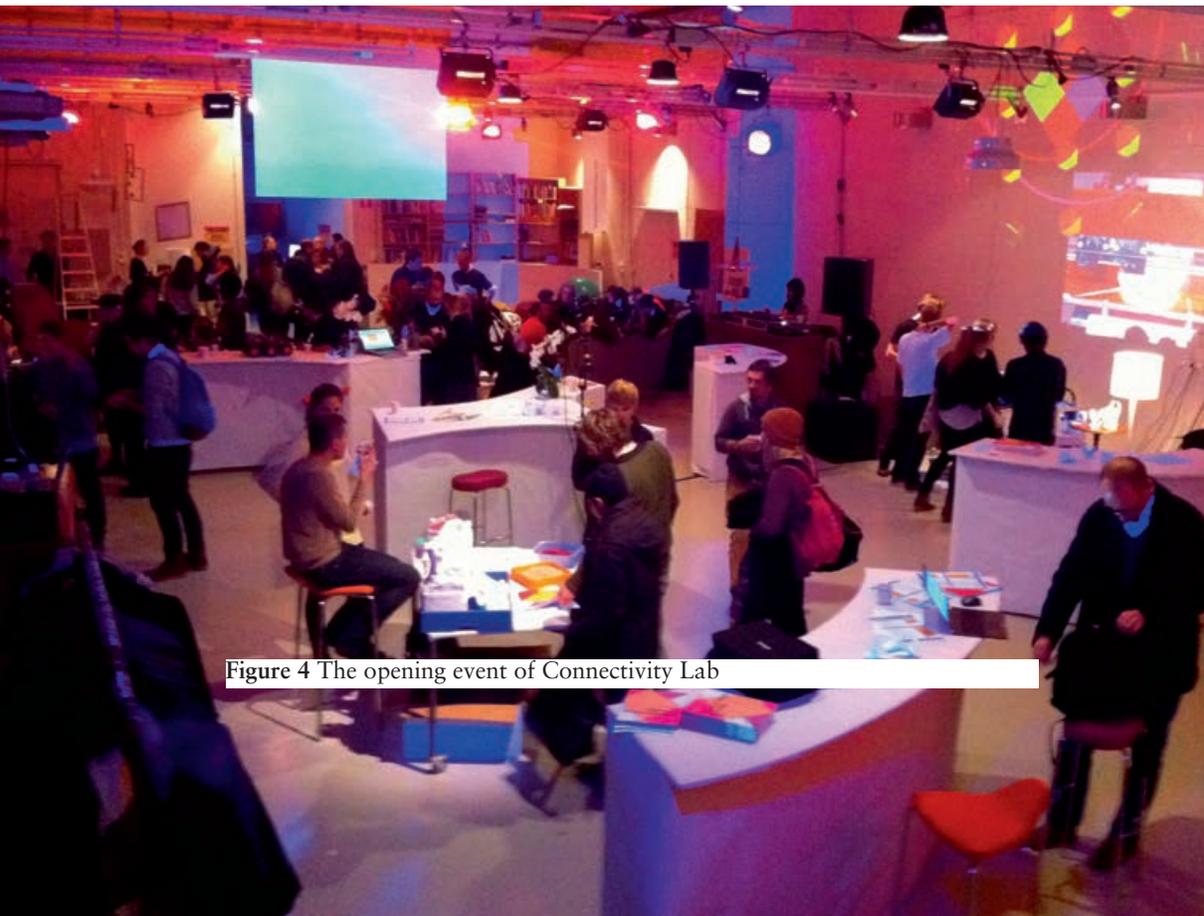


Figure 4 The opening event of Connectivity Lab

A way to frame the outcome and the process of co-production processes:

Making commons develops as a two-fold notion, which allows for consideration of the design practice as matter of outcome as well as process when it comes to co-production.

In the understanding of *commons which are making*, it considers what open, collaborative, and sharing-based practices are generating and how they do it by considering their organizational forms, their sustainability, and how value is created through them.

In the understanding of *commons which are being made*, it focuses on what kind of design practice may be at play in co-production by articulating how commons can be initiated, constructed, continued, and left, and how this entails a specific way of performing openness, collaboration, and sharing.

1.8 Relation to interaction design

In recent years, the growing role of co-production practices has brought up a number of issues within the field of interaction design. Particularly, the focus seems to be on how to understand the role of the designer in supporting and enabling users' design and production activities (Burnett and Scaffidi 2013, Fischer and Giaccardi 2006). Recently, a broader articulation of the role of design in media co-production has been developed (Löwgren and Reimer 2013). This growing interest strongly reinforces the historical connections between interaction design and participatory design, but it also creates possible bridges with design for social innovation and sustainability. Such bridges are reinforced by the increasing role that themes such as sustainability and social innovation play, even in more technology-focused traditions of IxD, such as Human and Computer Interaction, as shown by the recent special issue of TOCHI (ACM Transactions on Computer-Human Interaction) on practice-oriented approaches to sustainable HCI (September 2013). Interesting signs are also coming from the practice field, with IXDA (a profession-oriented organization within the field) assigning the Future Voice Award 2013 to project H, an American design studio involved in long-term projects of design for social innovation in US rural areas.

1.9 Thesis structure: a programmatic work

The structure of the text is highly influenced by the methodology used in this work—the programmatic approach. The compilation format has been chosen to highlight how the program of this inquiry developed over time in relation to events emerging in the engagements as well as theoretical elements coming in and out of the work. Such a format provides visibility to the attempts that have been made to develop a work aimed at contributing to diverse genealogies, both related to academic fields as well as practice.

In this perspective, the attached articles and maps⁴ represent accounts, at different stages of the inquiry, of parts of the program. They have been ways to roughly formulate a particular concern and to account for the insights that the engagements were providing in relation to it.

They both depict different aspects of the program as well as attempts at trying out possible framings.

A coherent definition of the program, however, is to be found only in the Introduction, which does not sum up the articles content, but rather presents the ultimate formulation of the program and the insights as they emerge from the interaction between the actual program and the engagements.

Another important point is how theory and practice merge in this work. Theory, in particular, is not presented in a separate chapter; instead, the different concepts are spread throughout the Introduction when required to define a specific part of the program or further articulate certain insights. Theoretical ideas should be considered as compasses for the swamp, as they help articulate knowledge and outcomes from the practice, as well as relate them to genealogies.

Having stated that for clarity, this Introduction is divided into five chapters followed by two appendixes.

Chapter 1—Entering the swamp. This chapter depicts the program of the research and how it came to be. It introduces the programmatic

⁴ The maps are representations of the program at different stages of my research.

approach in general terms and then it specifies it as a matter of defining what is to be investigated, how to do it, and where the inquiry is taking place (i.e. which genealogies it wishes to relate to). Then, it discusses the long detour in defining the 'where' and the 'what' of this research and how the theoretical compass of commons played a central role in their definition. In presenting the 'how', the second compass is introduced—compositionism—which represents both a particular mode of investigation as well as further defining the object of the inquiry. The final part addresses the methodological consequences of compositionism by relating it to the genealogies and articulating validity, relevance, and rigor in relation to this work.

Chapter 2—The opening of production. This chapter maps the swamp in which the inquiry developed and weaves together the diverse genealogies. The notion of commons is used to describe the different ways in which open, collaborative, sharing-based production practices may be at play; it highlights possibilities, but also limits and risks related to diverse discourses and expectations about the opening of production. Further, it discusses what this phenomenon implies for the design field and for the roles of the producer and user. It ends by positioning the engagements in the swamp.

Chapter 3—Commons and prospects. This chapter depicts some of the insights emerging from the engagements, using the notion of commons. It looks at what value was generated by open, collaborative and sharing-based practices in Fabriken/STPLN and HWA and how such value was produced (i.e. what kind of organizational forms were in place). When it comes to Fabriken/STPLN, it also accounts for how the commons evolved over time. After reflecting on the nature of the engagements as commons, this part looks at what kind of possible presents, or prospects, they might represent in relation to the opening of production. By reflecting on the process of how Connectivity Lab came to be, it also provides some insights on what it might take for a prospect to move forward and shift from potentiality to actuality.

Chapter 4—Making commons as composing. This chapter accounts for the insights, which emerged from the engagements in relation to initiating, establishing, continuing, and leaving commons. It does so by introducing and using an additional set of compasses (boundary objects, boundary organization, and trading zones) which allow to

articulate the design practice as well as to discuss the nature of openness, collaboration and sharing as emerging from the engagements.

Chapter 5—Conclusions. This chapter sums up the main findings of the work by answering to the research questions. It also provides some methodological considerations in relation to how design practice-based research can be at play in exploring futures and, in relation, to how the programmatic approach has been adapted in this work. It then brings forward issues that may require further exploration when it comes to prospects in the opening of production and design for non-consensus-based commons.

Appendix 1—This contains some of the publications I wrote during my PhD. They have been chosen as they provide an overview of the theoretical and empirical material which has been at play in the last formulation of the program and in writing this Introduction. Beside the articles, the appendix includes also two maps which represent the program at the beginning and half a way in my PhD.

M1. The first map of the program, June 2010

A1. Hillgren, P-A., Seravalli, A., Emilson, A.(2011) Prototyping and infrastructuring in design for social innovation. *CoDesign : International Journal of CoCreation in Design and the Arts*;3-4, 169-183

A2. Seravalli, A. (2012). Building Fabriken, Design for Socially Shaped Innovation. Design Research Society International Conference Bangkok, 1-4, July 2012.

M2. 50% seminar map of the program, October 2012

A3. Seravalli, A. (2013) Prototyping for opening production: from designing for to designing in the making together, *Crafting the Future 10th European Academy of Design Conference*, Göteborg, Sweden, 16-19 April 2013.

A4. Seravalli, A. (forth.) While waiting for the Third Industrial Revolution. In Ehn P., Nilsson E., Topgaard R. (eds) *Making futures, marginal notes on innovation design and democracy*. Cambridge,

MA: MIT Press.

A5. Seravalli A., (2013) Can design go beyond critique? (Trying to compose together in opening production), NORDES, Nordic Design Research Conference, Copenhagen, Malmö, 2013.

A6. Emilson A, Hillgren, P-A., Seravalli, A. (forth) Designing in the Neighborhood: Beyond (and in the Shadow of) Creative Communities. In Ehn P., Nilsson E., Topgaard R. (eds) Making futures, marginal notes on innovation design and democracy. Cambridge, MA: MIT Press.

Appendix 2—This can be accessed through this link (https://www.dropbox.com/sh/4af95p178x5xyb0/AAA7KnPw_bRAP5Tb10G7U-uCa) and contains some of documents that are mentioned in chapter 3, when discussing how prospects in this work were able to move forward or else never took off.

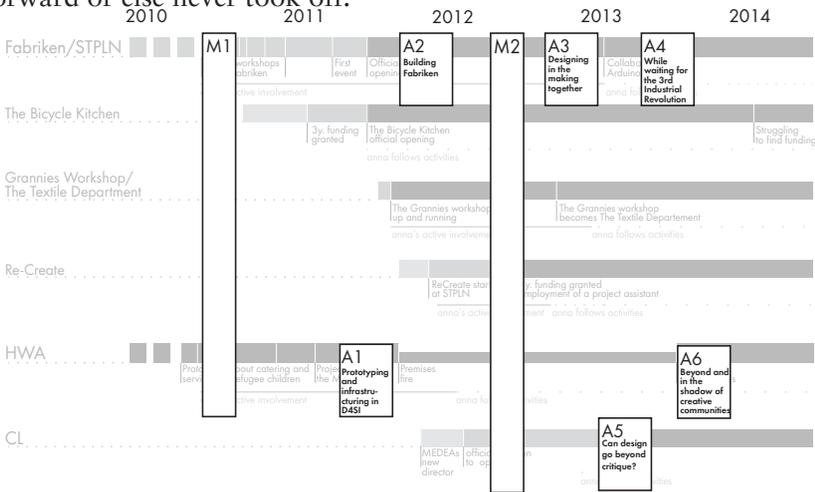


Diagram 2 Timeline with the articles and the maps.

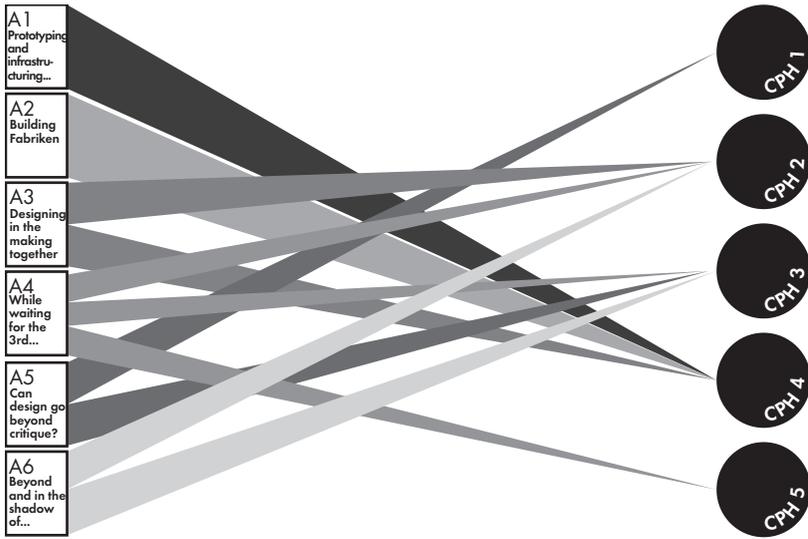
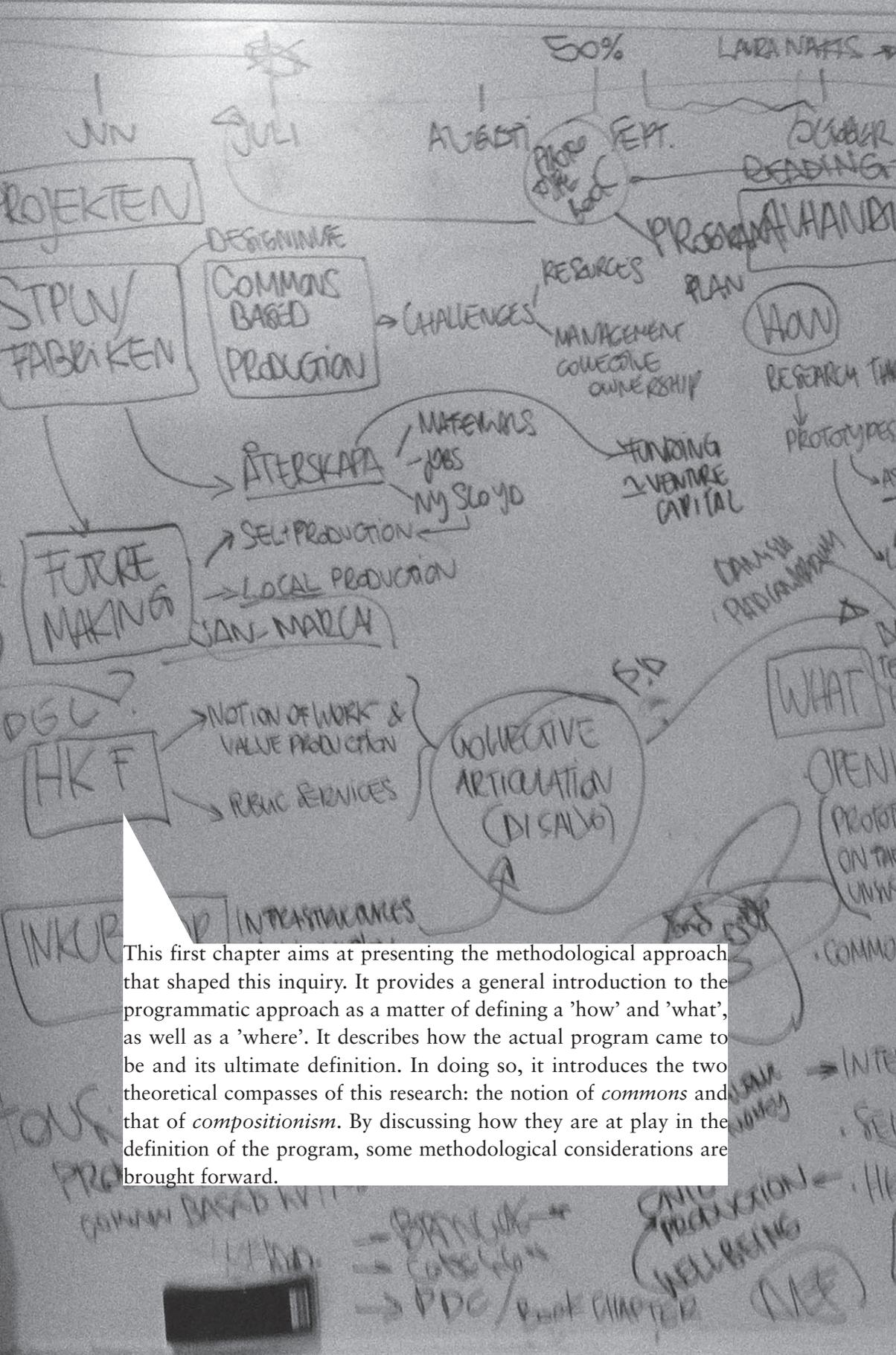


Diagram 3 How the articles contribute to the chapters



This first chapter aims at presenting the methodological approach that shaped this inquiry. It provides a general introduction to the programmatic approach as a matter of defining a 'how' and 'what', as well as a 'where'. It describes how the actual program came to be and its ultimate definition. In doing so, it introduces the two theoretical compasses of this research: the notion of *commons* and that of *compositionism*. By discussing how they are at play in the definition of the program, some methodological considerations are brought forward.

2. Design research as a programmatic approach

In recent years, there has been a major effort, especially in the Nordic countries, for the definition and legitimation of practice-based design research through the formulation of the programmatic approach (Binder and Redström 2006, Brandt and Binder 2007, Redström 2011, Koskinen et al 2011, Brandt et al. 2011). The programmatic approach expresses how practice and theory can interact to generate academic knowledge when conducting research through design practice.

2.1 Understanding design practice: a conversation with the materials of a situation

The programmatic approach is strongly related to Schön's work (1983, 1987) which articulates professional practices and how practitioners operate, with a specific focus on design and designers. In *The Reflective Practitioner* (1983), Schön defines the design practice as a reflective conversation with the materials of the situation, where the designer does not operate according to general theoretical principles or guided by technical rationality but, rather, out from an ongoing reflection that brings together abstract theory, learning from previous experiences, and the specificity of the situation (and materials) in which the designer operates (Schön 1983):

Thus, the designer evaluates his moves in a threefold way: in terms of desirability of their consequences judged in categories drawn from the normative design domains, in terms of their conformity to or violation of implications set up by earlier moves, and in terms of his appreciation of the new problems of potential they have created (Schön 1983, p.101).

In this understanding, the core of (design) practice is *problem-setting* rather than *problem-solving*:

In real-world practice, problems do not present themselves to the practitioner as givens. They must be constructed from materials of problematic situations, which are puzzling troubling and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of an uncertain situation that initially makes no sense. When professionals consider what road to build, for example, they deal with a complex and ill-defined situation in which geographic, topological, financial, economic and political issues are all mixed up together. Once they have somehow decided what road to build and go on to consider how best to build it, they may have a problem they can solve by the application of available techniques; but when the road they have built leads unexpectedly to the destruction of a neighborhood, they may find themselves again in a situation of uncertainty (Schön 1983, p.40).

Problem-setting represents an ongoing process through which a practitioner defines the issue and decides how to proceed to respond to it. It represents an interactive process through which “we name the things to which we will attend and frame the context in which we will attend to them” (Schön 1983, p.40).

Problem-setting in (design) practice allows the practitioner to test out and understand the consequences of diverse ways of operating, since it implies the freedom of introducing a particular way to construct the problem, what it *can* or *might* be, and then explore the implications of such construction, as in what *should* or *must* happen. It is out from these latter implications that the diverse ways of framing the problem are to be judged (Schön 1983). In this perspective, (design) practice represents not only an ongoing process, but also an oscillation between the particular and the whole (Schön 1983), where the former represents one of the possible musts emerging out from a specific framing, what the whole might be. “Once a whole idea has been created a bad placement of the administration can ruin it. Hence, the designer must oscillate between the unit and the total, and[...]he must oscillate between involvement and detachment” (Schön 1983, p.101-102).

It is important to remember that the process of framing and reframing the problem happens in a *conversation* with the materials of a situation, which implies that “The phenomena that [t]he [designer] seeks to understand are partly of his own making; he is in the situation that he seeks to understand” (Schön 1983, p.151). This means that the actions that emerge from a specific framing are two-fold: on one side, they represent a move to try to develop a desired change in the situation; on the other, a probe through which it becomes possible to explore it. Schön frames the two-fold nature of the practitioners’ actions as a form of experimentation, where the action is carried out in order to see what it leads to—answering to the fundamental question of ‘what if?’ (Schön 1983). More specifically, Schön highlights how there are two kinds of experiments at play in practitioner’s work. The first ones are *exploratory experiments*, “the probing, playful activity by which we get a feel for things. It succeeds when it leads to the discovery of something there” (Schön 1983, p.145). In exploratory experiments, action is undertaken to see what follows from it (Schön 1983). The other kinds of experiments at play are *move-testing experiments*, which represent action taken to produce an intended change (Schön 1983). Move-testing experiments imply not only a relation to the question ‘Did you get what you intended?’ but also, because they can generate unintended consequences, to the question ‘Do you like what you got?’

Practitioner’s action, in this perspective, is not only a matter of acting to change the situation, but also a form of inquiry through which the practitioner is able to understand and frame the specific problem she is dealing with. Schön’s understanding of practice as a form of inquiry builds on the work of the pragmatist philosopher Dewey, who framed all creative activities as forms of “controlled inquiry: framing situations, searching, experimenting, and experiencing, where both, the development of hypothesis and judgment of experienced aesthetic qualities, are important aspects within this process” (Binder et al. 2011, p.10). In this perspective, “the main difference between doing scientific research and making art is that the former aims at the production of theories, whereas the latter concerns inquiries into materials used in the production of artworks” (Binder et al. 2011, p.10).

Schön (1983) also highlights a risk in relation to the practitioner's action, which is the emergence of a *self-reinforcing system of knowing-in-practice*, where the different situations that the practitioner encounters are forced in existing frames rather than constructing ad-hoc frames. This is because the process of framing a situation is often quite complex and it requires putting under discussion the practitioner's role and way of working. The risk is that, more or less consciously, the practitioner misreads or manipulates the situation to 'fit' pre-existing frames in order to protect himself from "uncertainty (and perhaps also from the paralysis) he would experience if he were to allow his system to come apart" (Schön 1983, p.283).

A way for the practitioner to avoid getting stuck in pre-existing frames is to develop a second order or reflection on her practice that is *reflection-on-action* (Schön 1983). This represents a form of meta-reflection that allows the practitioner to articulate her framing process and, thus, allow her to become aware of the way in which frames operate in her understanding of the situation. "A practitioner might break into a circle of self-limiting reflection by attending to his role frame, his interpersonal theory-in-use, or the organizational learning system in which he functions. Whatever his starting point, however, he is unlikely to get very far unless he wants to extend and deepen his reflection-in-action, and unless others help him see what he has worked to avoid seeing" (Schön 1983 p.283). Reflection-on-action plays a fundamental role in developing better conversations with the situation, as it entails a conscious articulation of the framing process.

This section illustrates how design practice may be understood as an ongoing reflective conversation with the materials of the situation, where the designer is involved in a process of reflection in action through which she develops an understanding of the situation out of which she then operates. Acting in the situation is a two-fold process: an attempt at change-making as well as a form of inquiry, where the situation and its materials talk back to the designer informing and adjusting her understanding of it. Besides processes of reflection-in-action, the designer needs to also develop processes of reflection-on-action that expresses the way in which the designer frames a situation, making it possible to articulate how she frames her role,

which theories-in-use are at play and to which extent she allows herself to learn from the situation.

Keeping in mind Schön's way of framing design practice, it might be possible to move forward and discuss how such a practice could be at play in academic research.

2.2 Programs and experiments: design practice-based research

As already pointed out, the programmatic approach aims at legitimating in an academic setting design practice-based research by formulating a method that expresses how knowledge emerges from practice and in which ways it can be considered academically grounded.

Particularly, the programmatic approach focuses on the interaction between reflection and action that characterizes all forms of practices. To describe this interaction, the notions of programs and experiments are introduced.

A program represents a provisional knowledge regime (Redström 2011) that “acts as a frame or foundation for carrying out a series of design experiments and interventions” (Brandt et al. 2011, p.19). The program defines what is going to be explored and how to do it, it defines an area of intervention and a direction for intervening in this area (Redström 2011) resembling what, in the previous section, was defined as the framing of a situation. The way in which a program is defined (Brandt et al.2011, Redström 2011) resembles a reflective conversation with the materials of the situation (Schön 1983) as it is a matter of previous experiences, theoretical elements, as well as emerging findings from the situation (Brandt et al.2011, Redström 2011). Moreover, it is important to remember how the program is transient; it changes in time to accommodate learnings and findings emerging from the experiments, which are the interventions that the design researcher carries out.

The relationship between the program and experiments represents the core of the programmatic approach. Such a relationship is defined as a dialectic (Brandt et al. 2011, Redström 2011), since

they are mutually dependent: the program represents a hypothetical worldview that needs to be materialized, and the experiments are in need of having a frame that provides them coherence and specification. “A program is not just a program, but a program for something, and it is this some-thing that the experiment materialises” (Redström 2011, p.4).

The experiments allow us to explore the program. If we understand the program as a way of defining a specific design space⁵, then the experiments become a way to explore this space “positioning us somewhere to be able to say, ‘this is what the design space looks like over here’” (Redström 2011, p.4). Experiments represent specifications of the program.

This exploration also becomes a way to challenge or better define the boundaries of the design space as, when formulated, the program represents an abstract frame (void of relations and context) that by performing experiments becomes progressively more concrete, an understanding rich in relations and experiences (Brandt et al. 2011).

It could be said that experiments in the programmatic approach resemble both *exploratory* and *move-testing* experiments as they are both a matter of understanding and challenging the program.

It is important to underline how experiments in the programmatic approach are not a matter of affirming or refuting a hypothesis, like in traditional experimental research, they do not answer the program, but rather substantiate or challenge it (Brandt et al. 2011) as they allow one to explore what the program means (Redström 2011). Another difference with traditional experimental research is how the program differs from hypothesis, as the former is rather more open, suggestive and ill-defined than the latter. “Whereas the hypothesis ideally is addressed through one experiment, the design program needs to open up a space where innovation and future development is possible, thus typically requiring us to perform series of experiments to illustrate the diversity it affords” (Redström 2011, p.4).

⁵ A design space that is not a Cartesian space, but rather a “lived landscape’ in which the design researcher journeys and dwells” (Binder et al. 2011).

In this perspective, the program and the experiments develop simultaneously, even though the program comes it before in epistemological terms (but not necessarily time-wise), since it provides a scaffold for the interventions (Redström 2011). The ongoing relation between the program and experiments is fundamental to avoid uncontrolled drifting of the experiments, as the “program maintains influence on the experiments, thus not only acting as a starting point, but as something continuously present in the work.” (Redström 2011, p. 5). However, experiments are not only determined by the program, but also by the materials of the design situation (being both human and non-human), as well as by their agendas, which have a central role in influencing the experiment (Redström 2011). This poses a central challenge to the definition of the program, as the latter must be open to the unexpected, but at the same time robust enough to avoid uncontrolled drift (Brandt et al. 2011).

The ongoing process between programs and experiments comes to a close when the program loses its ability to suggest a way forward; when experiments do not provide any new insight on the program itself (Brandt et al. 2011). This creates the need to reformulate the program in order to define a new ‘what’ and ‘how’ to explore. Closure is a researcher decision and, as Brandt et al. (2011) underline, it resembles the decision of ‘being done with a prototype’.

Schön’s way of framing design practice can be at play not only in understanding the nature of program and experiments, but also in articulating the dialectic relationship that hold them together. The notions of reflection-in-action and reflection-on-action allows the unfolding of different levels of interpretation which are at play in the programmatic approach: “the interpretation of the program we make as we design experiments, the interpretations of the experiment we make as we analyse the results, the interpretation we make as we look at a collection of experiments belonging to one program, etc.” (Redström 2011, p.5). Reflection-in-action can be used to describe how the design researcher makes decisions in the experiments, while reflection-on-action can be at play when discussing how the program informs the experiment and the other way around. Thus, the programmatic approach could be visualized by two co-existing

and connected loops: one regarding reflection-in-action and the other reflection-on-action. Such loops are connected and they provide a possible representation of how the dialectic relationship between the program and the experiments can be actualized. Furthermore they account for the program's provisional and evolutionary nature.

It is important to underline how the parallels between the programmatic approach and Schön's understanding of design practice reveal nothing more than design practice being a form of inquiry (Schön 1983) that can generate diverse forms of knowledge, and the programmatic approach being a form of design (research) practice. Thus, a question that needs to be addressed is how the programmatic approach leads to the generation of academic knowledge.

2.3 Programmatic approach as an academic research method, a matter of where

In framing how the programmatic approach represents an academic research method, it becomes important to consider the role of the research question as well as how knowledge is generated.

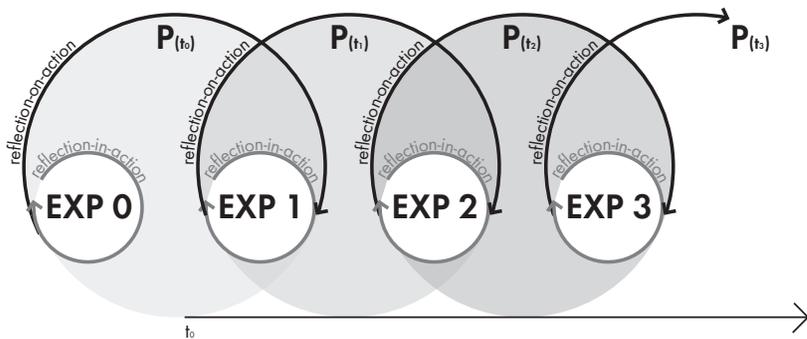


Diagram 4 Applying the notions of reflection-in-action and reflection-on-action to the programmatic approach.

EXP stays for 'experiment' and P stays for 'program', the arrow on the bottom indicates time. EXP x represent the diverse experiments carried out over time and guided by the program. P(t_x) represent the different formulations of the program that further emerged in reflecting on the outcome of the experiments. The diagram illustrates how reflection-in-action and reflection-on-action may be used in articulating the dialectic relationship between the program and the experiments, accounting for the program evolutionary nature.

Brandt et al. position the research question as an overarching frame outside the program, and underline how in the programmatic approach “the research question is not necessarily to be found in the actual program (as it may even take on a manifesto character, being rather normative in nature), nor in the individual design experiment (as it may even be quite similar to a design project not in itself explicitly answering a particular research question), but rather in the relations that surround them and bind them together” (Brandt et al. 2011, p.22).

Consequently, “(it) is the combination of program and experiment that respond to the research question...” (Brandt et al. 2011, p.23) and, therefore “We must take care of not overcharging the experiment with respect to what it can answer and how” (Brandt et al. 2011, p.23).

What Brandt et al. bring up, could be considered as an additional dialectic reflection that connects the program (and the experiments) with the overarching research question, and consequently, with the different genealogies that the research wishes to address (Brandt and Binder 2007).

Genealogies may include academic discourses, as well as everyday discourses on the topical area (Brandt and Binder 2007), and it is in relation to them that the knowledge contribution of the programmatic research should be evaluated (Brandt and Binder 2007). “With the notion of genealogy, we want to extend the questions of on what and for whom knowledge production is directed to also encompass which context of debate and dialogue the research is participating in” (Brandt and Binder 2007, p.11). It could be said that the genealogies define a ‘where’ for the program; they provide the broader context in which the work is placed which is made up by theoretical, as well as practice-related, discourses and concerns.

When it comes to validity, a key criterion relates to accountability, which implies making explicit which genealogies the program involves and, consequently, to whom the knowledge contribution is accountable. Defining accountability may also imply the introduction of other specific criteria related, for example, to relevance and rigor, which are not given, but actually emerge from the dialectic relationship between the program and the genealogies.

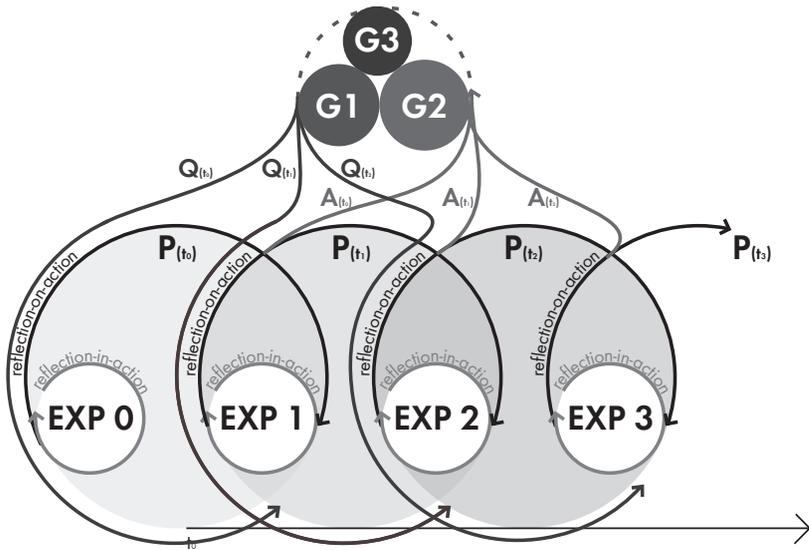


Diagram 5 Program, experiments, research questions and genealogies. G stays for genealogy, Q stays for research question and A stays for answer to the research question.

This diagram depicts how the research questions and the corresponding answers may be understood as a broader framing around the program, but also as the connections that relate the program and the genealogies to each other. As the research unfolds in time, it is not only the program that gets to be reformulated, but also the questions that connect it to the genealogies.

After introducing the general features of the programmatic approach, it might be possible to discuss it in detail by introducing the actual program of this work and how it came to be.

2.4 The actual program: Making Commons (attempts at composing prospects in the opening of production)

At the core of this program is the notion of *making commons*, which allows one to articulate the nature of open, collaborative, and sharing production practices.

Making commons can be read two-fold: on one side, commons is the subject of the making—*commons which make*. This implies a consideration of what commons (i.e. collective and collaborative organizational forms) generate and how they do it (How are open and collaborative processes are at play? Who and what is participating? How is sharing organized? What are they generating? To which extent

are these commons viable and sustainable?).

In the second possible reading, commons becomes the direct object of making—*commons which are being made*. Here, the focus is on what kind of design practice can be at play in establishing and running commons (Which approaches may be used in the initiation, unfolding and leaving of commons?)

The notion of *composing prospect* proposes a particular way of exploring alternative futures by engaging in collective and located attempts at constructing them. Thus, it suggests both a particular way of making, in making commons, as well as opening up for relating the engagements to expectations and broader scenarios emerging in the opening of production. It also provides the possibility to discuss how hypothetical futures may be acknowledged as possible presents.

In this program, the theoretical frames of commons and compositionism work as compasses that allow one to navigate in the swamp, as they articulate the 'where', 'what' and 'how' of the program.

3 Commons as the first compass

3.1 In the swampy lowlands of the opening of production: a long way for the definition of the 'where' and the 'what'

The 'where' of the program is the swamp of the opening of production, where practice-related and academic concerns are to be found. The definition of the context has been crucial for the development of this work. Defining where the program was situated has been a fundamental step in articulating the relationship between the program and genealogies, and, consequently, also in shaping the definition of the program itself.

As already said in the introduction, when it comes to the genealogies,

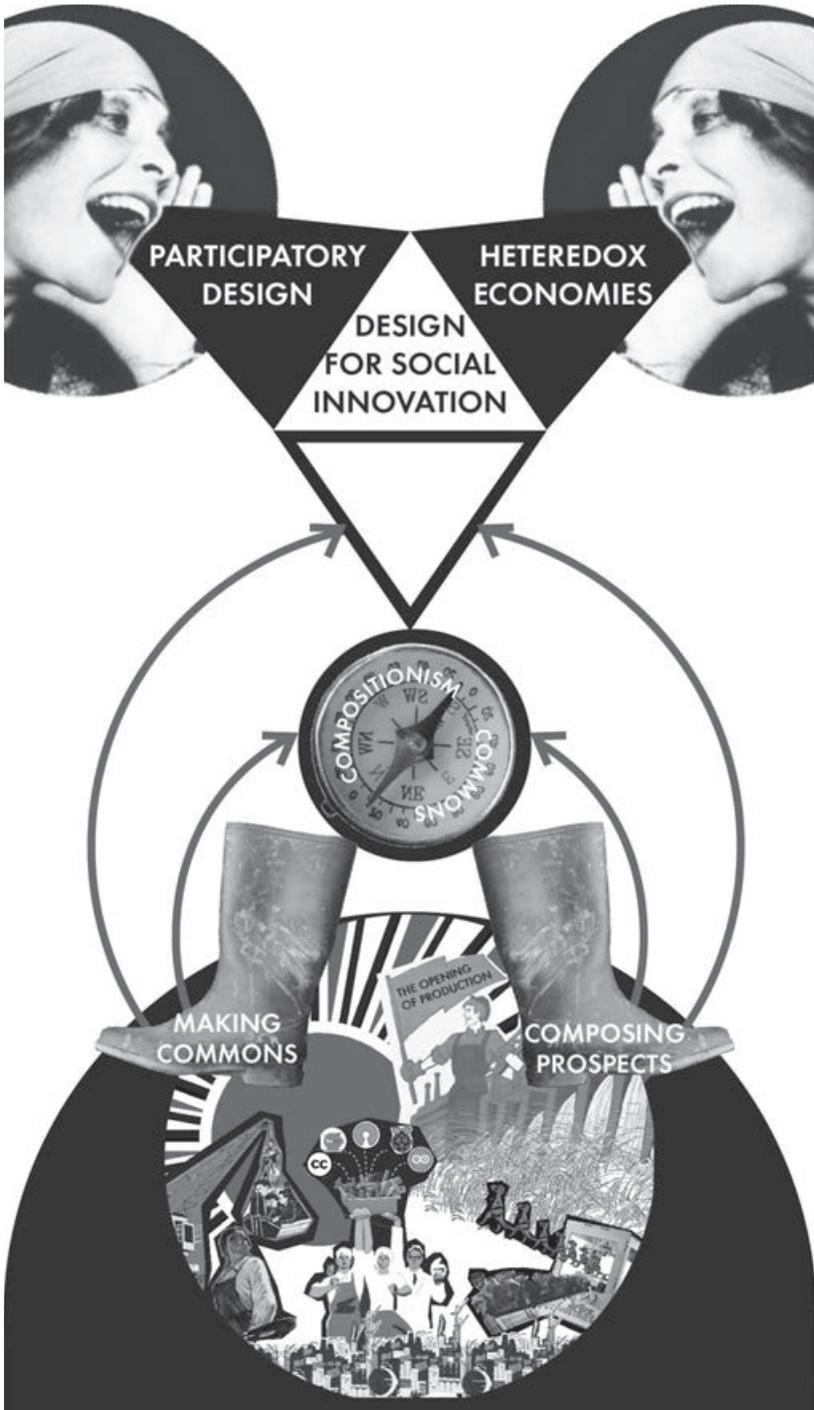


Diagram6 The program of the research.

this work started out with a strong interest in working within three discourses: design for social innovation, participatory design, and heterodox economics. In trying to relate them to each other, while being involved in the engagements, a swamp emerged, which has been labeled as 'the opening of production'. It took me three years to come to a coherent definition of the 'what' of the program; one which could not only bring together the genealogies in a coherent picture, but also foster a dialectic relationship between the swamp and the program where the latter was not only shaped and inspired by the former, but also able to provide meaningful insights for the genealogies, particularly for the concerns about heterodox economics.

How commons entered this work

From the beginning, the focus was on understanding the nature of open, collaborative, and shared-based production practices and to which extent they could or could not be considered alternative ways of making things and delivering services. The issue was on how to assess the nature and the viability of those practices. Thus, the decision was to relate to the field of heterodox economics and, particularly, to the localist tradition (local and distributed production) and feminist economics (production for well-being), since the experiences with Fabriken and HWA seemed to resonate well with these themes. Moreover, these two particular discourses are recurrent in design for social innovation (Manzini 2010) when it comes to discussing more social and sustainable ways of organizing economics and production. However, it turned out that the engagements were contributing back poorly to the notions of local and distributed production and production for well-being. In relation to participatory design and design for social innovation, the program was not just triggering and framing the engagements, but it was also challenged and further specified by the unfolding of the engagements, providing insights that seemed interesting also for the genealogies. The ideas of local production and production for well-being were framing and triggering the engagements, but it was difficult to see how the program-engagements' relationships were providing new insights in relation to them. This appeared to be caused by two factors.

The first one was that I was interested in the *making* rather than in

the *designing* of such ideas, and therefore, I was aiming at involving a number of diverse stakeholders. In both engagements, there have been great opportunities to work with users in the opening of production, but it has been way more difficult, if not at all impossible, to engage with other actors and processes, such as producers, in general, and more specifically, with mass-manufacturing processes and artisans.

Moreover, it emerged how open, collaborative and sharing-based practices' ability to contribute to a more social and environmentally sustainable future is not a given; they can be at play even in traditional, market-logic processes and therefore not being a self-evident alternative way of making things and delivering services.

The second reason why the engagements contributed back to the program poorly was that my knowledge about local production and production for well-being was too limited to understand how to formulate an experiment that could give back to this genealogy. This became evident when confronting critical literature about local production. I suddenly realized that I was not able to argue about limits and alternative possibilities to local production as much as I was able to do for participatory design and for design for social innovation.

The decision was, at this point, to try to involve someone that would have a more extensive knowledge of this field by engaging for my 50% PhD seminar an opponent doing research with sustainable production and consumption. This 'experiment' did not generate the hoped-for results; quite the contrary, it revealed even more how complicated it is to engage another field since their way of doing and understanding research is completely different.

At that point, I faced the issue of both understanding which futures open, collaborative and sharing-based production forms may entail, as well as understanding the specific nature of the engagements I was involved in and what kind of futures they were working towards. I started, therefore, to look for a frame that could help in articulating these issues, and this is how commons entered the program.

The notion of commons can be used to articulate the nature of open,

collaborative and sharing-based practices, since, at the same time, they are a matter of “what” (a collaborative arrangement between human and non-humans generating value) and a matter of “how” (the way in which such an arrangement is organized and works). Moreover, commons can be at play both in alternative, as well as mainstream economics and thus, they provide the possibility to discuss and relate to a number of diverse future scenarios.

Commons have become a key element of this work both in defining the 'where' and the 'what' of the program.

3.2 Commons as a manifold notion

Commons are generically defined as “pool of resources or facilities, as well as institutions that involve some aspects of joint ownership or access” (Ostrom et al. 2002, 18). 'Commons' can refer both to an intrinsic characteristic of the resource, in which case it is defined as a *common-pool resource*, or to a specific kind of management arrangement created by humans, *commons as an institution* (Ostrom 1990). *Institution* is here understood as the rules and norms that humans use to organize forms of interaction (Anderies and Janssen 2013).

Common-pool resource represents a specific class of goods which are rivalrous (their consumption subtracts the availability of the resource itself) and non-excludable (it is difficult to control access to them). Natural resources such as lakes, fisheries, and mountains represent common-pool resources⁶.

The work around commons initially developed through the study of collective institutional forms in managing natural resources (Ostrom 1990). Specifically, the group around the Workshop in Political Theory and Policy Analysis at the Indiana University⁷, founded by Elinor and Vincent Ostrom, has carried out extensive work in mapping and understanding collective forms of managing and using natural

⁶ Ostrom classifies goods according to four categories:

- Private goods: rivalrous and excludable, they get worn through use, and it is easy to control access to them (personal computer, doughnuts)
- Common-pool resources or common goods: rivalrous and non-excludable (libraries, irrigation systems)
- Tool or club goods: non rivalrous and excludable (journal subscription, day care center)
- Public goods: non-rivalrous and non-excludable (useful knowledge, sunset) (Ostrom and Ostrom 1977; Hess and Ostrom 2007)

⁷ For an overview of the Workshop work and publications <http://www.indiana.edu/~workshop/publications/index.php>

resources. Such research was driven by an interest in understanding the opportunities and issues around collective institutions as an alternative to private property and the market or public property and the state, in managing use and access over common-pool resources (Ostrom 1990, Hess and Ostrom 2007).

The main outcomes of this research have been collected in *Governing the Commons* (Ostrom 1990), a seminal book that, based on the findings from case studies from all around the world, discusses how collective and located institutions for managing common-pool resources were not just sustainable and viable, but preferable to private or public property in managing limited and rivalrous natural resources (Ostrom 1990).

The work of Ostrom has been fundamental in giving visibility and legitimacy to collective institutions that, in some cases, have been working for hundreds of years and successfully managed natural resources (Ostrom 1990). It is important to underline how, when Ostrom's work was published, collective ownership and management of natural resources was considered, and often still is, as unavoidably leading to the depletion of the shared resource itself (Ostrom 1990). The so-called *tragedy of the commons* (Hardin 1968) states that collective institutions are always doomed to fail, as self-interests always overcome collective ones, even when, in the long-run, this may lead to counterproductive results, such as the destruction of the shared resource. For this reason, the best way of managing common-pool resources is either privatizing them or putting them under the control of the state (Hardin 1968). The seminal work of Ostrom (1990) has consistently refuted Hardin's thesis, showing how collective ownership and management not only can be successful, but when it comes to common-pool resources, can be even more effective than private and public property. Particularly, she found out how these collective institutions were usually more successful when they could establish their own rules (e.g. without the interference of the state or other over-structures). In further work, Ostrom points out how the 'tragedy of the commons' should be rather labeled as the 'tragedy of open access' since overuse seems unavoidable only when there is no regulation about how to access the shared resource (Hess and Ostrom 2003, 2008). Ostrom's contribution has worked towards changing the understanding of commons as a property regime (CPR), legitimating

the viability of an institutional model where resources are owned, used, and managed collectively. She has also pointed out the importance for such institutions to be shaped on the basis of local conditions by the participants themselves. (Ostrom 1990, Ostrom 1999, Ostrom et al. 2002, Hess and Ostrom 2008). CPRs require collective action, joint voluntary effort by many diverse actors, and self-governance. The latter consists of a combination of collective action, knowledge, will and consistent institutional arrangements; this is paired with social capital, or the aggregate value of social relationships (connections between individuals) and their norms of reciprocity and the trustworthiness that arises from them (Hess and Ostrom 2008).

It is noteworthy how commons as an institution is not just a matter of collective ownership, as collective property is, but does not necessarily, characterize commons; instead, what appears to be central in this institutional form are aspects of collective access over the use and management of a resource (Ostrom 1990). In this understanding, commons can also be used to manage goods and resources that are public, private, or club goods (see footnote 6).

Beside Ostrom's school, there is another academic approach to commons developed by legal scholars who focused on property regimes that are open-access and "where no one has the legal right to exclude anyone from using a resource" (Hess and Ostrom 2003). Such an approach becomes relevant in discussing large-scale commons, but also in relation to the emergence of 'new commons' (Hess 2008, Benkler 2013).

Since the mid-'90s and, particularly, with the diffusion of Internet, the notion and language of commons have been used in domains which are not natural resources (Hess and Ostrom 2007, Hess 2008). In mapping the new commons, Hess notes how they present "disparate meanings and uses of 'the commons' as a descriptor of a resource, movement, or phenomenon. Yet, they all had a sense of 'sharing' and joint ownership." (Hess 2008, p.6). Commons institutions have strongly emerged in on-line practices since Internet facilitates collective action, mass collaboration, and peer-to-peer relationships (Benkler 2006), but also as a response to the progressive commodification or enclosure of shared resources (e.g. patenting seeds) (Hess and Ostrom

2007, Hess 2008).

As stated, many of the new commons represent forms of open commons (Benkler 2013) which have been extensively studied by legal scholars. This second line of work around commons started out from studying the role that public access to infrastructures for transportation has played in supporting the rise of modern markets (Rose 1986). Lately, it developed extensively by studying the Internet and the role of public domain in the production of knowledge, information, culture and innovation (Benkler 2013). Here, commons are understood as an institutional device characterized by the absence of asymmetric power to determine the disposition of the resource itself (Benkler 2013). This means that the concerned resource can be used by a number of diverse actors, but none of them has the possibility to exclude the others from accessing the commons, thus being treated as an open-access commons (Benkler 2013). It is important to underline that open-access does not imply the absence of use rules (Benkler 2013), but rather the avoidance of a permissions culture (Lessig 2002), “commons at every layer of the networked environment meant that no one needed permission to innovate in and with the network, and that as a result creativity, speech, and innovation all depended on a robust commons throughout these resources” (Lessig 2002, p.161). Thus: “What commons offer[s] is a space for experimentation, learning, and adaptation whose limitations are uncorrelated with the limitations of the property system. They offer another degree of freedom in the exploration of solution spaces to the problems that human existence posits.” (Benkler 2013, p.1504).

There is a crucial difference between the first and the second school of commons in relating to open-access. Ostrom’s line focused on rivalrous goods which require continuous maintenance and provisioning and where, therefore, access requires a means to be controlled for the long-term sustainability of the resource. The legal school, on the other hand, has focused on goods that present low or no rivalry, and thus open-access, even when poorly regulated, does not endanger the resource itself.

Consequently, it can be said that Ostrom’s commons are characterized by collective use and collective property, while the legal school commons are characterized by collective use and the absence of a

property regime.

Open commons have become particularly important in the networked society, Benkler (2013), in discussing the success of open-source software, states that “the absence of either property rights or well-defined, limited CPRs (commons as a property regime) was necessary to support the kind of rapid, cumulative, decentralized innovation that the software industry was experiencing in the late 1980s and early 1990s” (Benkler 2013). The legal school also stresses the importance of open commons in relation to human rights and the full realization of citizenship in democratic regimes (Rodotá 2013). In this view, open commons can become a way to ensure everybody’s access to certain goods that are intrinsically connected with the exertion of basic human rights. A very concrete example is represented by India’s Supreme Court’s decision of denying Novartis’s request for patenting a cancer drug, which implied that Indian drug companies could continue to produce cheap copies of the medicine (Rodotá 2013). This case illustrates how open commons can be at play in exerting a very basic human right such as access to health and medicinal cures. It also opens a number of questions related to how these open commons should then be provisioned and maintained: by whom, and in which ways? Such questions play a central role and they are discussed further on in this chapter.

Beside these two schools, there is a third approach to commons where collective institutions are seen as way of organizing society and economy beyond capitalism (Hardt and Negri 2009, Bollier and Helfrich 2012). Here, commons are considered as the core element for overcoming the limits and inequalities of the actual society. The creation of shared and collective proprietary regimes at diverse scales is seen as a way to govern access to resources that would reinforce the possibility of exerting basic rights (Rodotá 2013) and support the establishment of more equal societies (Botero 2013). Commons, though, would be at play on a global level to guarantee free-access to knowledge and information (Botero 2013), but also the preservation of natural resources (Svampa 2013). Further, commons could be at play on a smaller scale to re-organize economics and production beyond the market (Hardt and Negri 2009, Bauwens 2006, 2009), with resources and outputs of production being held and managed in commons.

Commons should not necessarily be understood as in opposition to the market. The emergence of sharing economy, collaborative consumption (Botsman and Rogers 2010), open (Chesbrough 2003) and democratic innovation (Von Hippel 2005), as well as part of the new commons mapped by Hess (2008) are showing how commons can also represent another model for participating in the market besides individualism or corporatism (Caffentzis 2010). Actually, according to Benkler (2013) and Frischmann (2012), commons are playing, and have always played, a major role in the development of market economy.

As it emerges, commons is a manifold notion; it might indicate a particular kind of natural resource, a common-pool resource, or it may entail an institution to organize property and access over a resource, CPR or open commons, which can work either in the frame of the market and capitalism or in opposition to it.

As Hess and Ostrom point out: “commons is not value laden- its outcome can be good or bad, sustainable or not- which is why we need understanding and clarity, skilled decision making abilities, and cooperative management strategies in order to ensure durable, robust systems” (Hess and Ostrom 2007, p.14).

Hess and Ostrom seem to call for a careful understanding of commons: how they are established and how they evolve. This way of thinking may be related to the idea of commoning (Linebaugh 2009), which looks at commons as a practice through which collective ownership, use, access and maintenance are performed (Linebaugh 2009).

Commoning, therefore, can be understood as a located and ongoing practice whose unfolding is strictly related to who and what is involved and where it is situated, as well as which rules and mechanisms are at play (Ostrom 1990, 1999, Hess and Ostrom 2007).

Summing up, commons can be understood from three diverse perspectives. The first is commons as a space-limited, rivalrous natural resource (common-pool resource), the second is commons as an institution (CPRs and open-access commons) and, consequently, the third perspective is commons as a located ongoing practice through which rules and behaviors for collective access, use, management, and ownership over a resource are shaped and reshaped.

3.3 Commons, commoning, and infrastructuring in the opening of production

Of the three perspectives, it is the second and third perspective of commons which are most relevant for this work, as they both articulate the nature of co-production processes (what they generate and how they do it) as well as consider such processes as a matter of commoning (i.e. ongoing located practices).

Commons and commoning can be used to understand and frame open, collaborative and sharing-based production practices, where availability of information and means of production is opening up questions related to ownership, responsibility and control over how things are made and service delivered.

The legal school opens up for understanding commons from an additional perspective that is commons as infrastructures. As discussed in 3.2, in this tradition shared and open-access resources are considered from the perspective of what they enable and which economic activities, and exertion of rights they make possible. In this perspective, commons are not just arrangements and institutions, but become an organizational form that can be used to support specific production practices rather than others.

In considering the opening of production, it emerges how infrastructures are a common interest for design for social innovation, participatory design and heterodox economics.

Within the three genealogies, it is possible to find recurring reflections and discussions on how to develop structures allowing for openness, collaboration, and sharing in production during use-time. In design for social innovation, a great deal of discussion centers around how to develop meta-technological infrastructures able to support the emergence of grassroots social innovation initiatives (Jegou and Manzini 2008), but also to facilitate the encounter between top-down structures and grassroots initiatives (Murray et al. 2010, Manzini and Staszowski 2013). In participatory design, a growing discussion is around design-after-design (Binder et al. 2011); that is, how to design for design activities which are carried out during use-time by former-users and designers. Here, the focus is both on technological

solutions as well as on socio-technical processes of *infrastructuring* (Karasti and Syrjänen 2004, Pipek and Wulf 2009, Björgvisson et al. 2010). In this latter discourse, there is a focus on formats and understandings of the design practice that can empower former-users' design and production practices. Further discussions center on how the designer can be part of these practices and what kind of resources and procedures need to be put in place for realizing them (Ehn 2008, Bannon and Ehn 2012).

In heterodox economics, a number of discourses around the infrastructure and formats that could allow the emergence of alternative economic practices can be examined. Most of the time, the concern is around how alternative notions of labor and production can be used to change the understanding and functioning of the economic system (e.g. the degrowth and feminist economics work presented in chapter 2). In some other cases, the starting point begins with existing potential alternative practices, how they could be supported and to what extent they represent a valid alternative (e.g. discourse around commons-based, peer-to-peer production, see chapter 2).

When it comes to the understanding of infrastructure, this work builds on ideas coming from the participatory design tradition that, in turn, build on the STS way of understanding infrastructures. Here Star and Bowker underline how “infrastructure is not absolute, but relative to working conditions” (Star and Bowker 2010, p.230), which means that infrastructure is a matter of 'when' rather than 'what' as

“it becomes an infrastructure in relation to the organized practices. Within a given cultural context, the cook considers the water system a piece of working infrastructure integral to making dinner; for the city planner, it becomes a variable in a complex equation. Thus we ask, *when*— not *what*— is an infrastructure.” (Star and Ruhleder 1996, p.4).

This is why it might make more sense to refer to *infrastructuring*, rather than *infrastructure*, as an on-going process of aligning human and non-human actors to enable and support a specific practice in a given context (Björgvisson et al. 2010), where a practice is composed by implicit and explicit material and social elements, such as

“language, tools, documents, images, symbols, well-defined roles, specified criteria codified procedures, regulations and contracts that various practices make explicit for a variety of purposes. But it also includes all the implicit relations, tacit conventions, subtle cues, untold rules of thumb, recognizable intuitions, specific perceptions, well-tuned sensitivities, embodied understandings, underlying assumptions, and shared world views”(Wegner 1998, p. 47).

This particular understanding of infrastructures as processes should not drive away the attention from their material aspects; even if they are understood as a matter of ongoing alignments rather than given objects, there is still the need to consider where the energy for keeping the process ongoing comes from, who and how organizes the diverse elements, and what kind of resources are necessary to maintain them over time.

In this work, when considering commons as a matter of infrastructuring, it entails considering what kind of open, collaborative and sharing-based practices they support and what kind of futures they work towards, as well as discussing their structure and sustainability as organizational forms.

4 From prototyping to making (and composing)

The interest toward articulating actuality rather than the potentiality of commons brought in the notion of making which has then been further articulated with the notion of composing prospect that allows both to discuss what kind of making was at play in the engagements and how to appraise them.

When it comes to articulating the nature of such making, it stretched from building furniture out of pallets, to organizing and carrying out workshops with civil servants from the city of Malmö, from organizing and setting up prototypes with HWA, to drive workshops

around 3D modeling at Fabriken, from taking part to the strategic meetings of the NGO running STPLN, to work with the ReCreate founder in building objects with cast-off materials. These activities involved diverse kinds of materials and people, presented diverse levels of engagement, and worked on diverse scales (from knitting to setting up a makerspace).

Making has been a central element in my program for a long time, initially under the label 'prototyping'. In the papers, it is possible to find diverse meanings and understandings of prototyping. From being, in traditional design terms, a way to try out activities and collaborations, to becoming a way of exploring issues and controversies, for example in the work with HWA, as well as located understandings of specific phenomena, such as what a makerspace can be, in the work with Fabriken.

In time, however, it became clear that the term 'prototyping' was somehow reducing what was emerging from the engagements. It was an issue in relation to time, as my engagements started to become quite long and complex interventions, but also in relation to the fact that they were not a matter of trying out something, but rather implementing it, particularly within Fabriken. The notions of design-in-use and design-after-design are recurrent in the articles as a way to frame and make sense of how, in both engagements, I moved from articulating and exploring possibilities, to actually prototyping, implementing and running them. In Fabriken, it became a matter of engaging in small-scale initiatives, long-term projects, as well as being part of the everyday running of the premises. In HWA, as a matter of prototyping and then trying to understand how such prototypes could move forward.

Moreover, the notion of prototyping did not allow for the articulation of the issues and risks emerging from engagements, where it has often been difficult to manage expectations as well as failures. This happened because, while in design prototyping is understood as a low-cost, relatively quick and safe way to try out or explore a possible feature (Brown and Katz 2009), in these engagements, it turned out to be quite often an activity requiring major investments of time, resources and commitment. Moreover, it seldom happened in a secure and

protected environment such as a design studio, but rather ‘in the wild’, exposed to an external public (e.g. prototyping with ReCreate) and raising issues in relation to expectations and ethical questions (e.g. the involvement of the refugee children in HWA activities).

With the unfolding of the engagements, I started to use the notion of making rather than prototyping, to underline the long-term perspective and to discuss the issues that were emerging in relation to implementation and maintenance.

With the notion of making, I could describe collective processes involving both people and artifacts where agency was distributed meaning that what was happening and how it was happening depended on the interaction between diverse agendas and interests at stake. This meant a shift in the understanding of the idea of authorship from single to collective, but also in understanding making as a located and emergent practice, made up by a series of attempts, whose results could not be predicted.

But making did not only imply a particular way of operating, it also brought forward the understanding of commons as possible presents. With the development of Connectivity Lab and the different ways of appraising the Malmö Living Labs’ work (see chapter 3), it also emerged how possible presents are a matter of being able to mobilize and interest other actors. In order to further develop these considerations, the notion of compositionism has been introduced.

4.1 The second compass: compositionism, how “Things” can be made

The Compositionism Manifesto (Latour 2010) was written in the aftermath of 2009 UN Climate Change Conference in Copenhagen that, once again, ended with no substantial decision being taken about how to address the environmental crisis on a global scale. A particularly complex issue which is interwoven with others, such as social justice and economic development, and it requires, according to Latour, an alternative approach to be tackled (Latour 2010). According to Latour, change requires more than trying to ‘reveal the truth behind things’. Thus, when it comes to the environmental

crisis, it is not enough to consistently reveal data and restating the consequences of climate change, and thus engaging with what he defines as debunking critique. Change might require, instead, engaging in composing, compromising, and even composting alternative ways of living and working (Latour 2010).

According to Latour, such a shift is necessary if we embrace how facts and concerns are bonded. “Matters of fact are only very partial and, I would argue, very polemical, very political renderings of matters of concern and only a subset of what could also be called *states of affairs*” (Latour 2004, p. 232). Particularly, Latour recognizes how historically, “critique did a wonderful job of debunking prejudices, enlightening nations, and prodding minds, (...) generating an immense source of productive energy that in a few centuries reshaped the face of the Earth” (Latour 2010, p.474). However, when recognizing that reality is made by Things (see 1.5), which flick between being matters of fact and matters of concern, debunking critique seems not only to move on very thin ice, but also unable to foster change, risking, instead, to end up with “poking holes in delusion” (Latour 2010).

Moreover, he underlines how, in trying to explain away Things, debunking critique presents an inconsistency in the way objects and agents are treated. The former shifts from being “either nothing but a screen on which to project human free will” to becoming “so powerful that it casually determines what humans think and do”(Latour 2004, p. 241). In a similar way, the agent shifts between being “so powerful that he or she can create everything out of his, her labor” and “nothing but a mere receptacle for the forces of determinations known by natural science” (Latour 2004, p. 241).

With compositionism, Latour calls for a closer engagement with Things, as a matter of getting close to and engaging with specific issues and looking at how they flick between matters of facts and matters of concern and how, in such a movement, humans and nonhumans are involved (Latour 2010); an engagement that acknowledges how each actant, being human or non-human, carries its own agendas and has an active role in shaping possible presents.

In this perspective, composing can be considered a specific approach to making which entails tentatively exploring diverse activities, practices and discourses together with actants in a specific context and to see what extent they may become possible presents. In such a way of operating, the researcher becomes part of the engagement in a very similar way to the other actants. The researcher does not explain or reveal the Thing; rather, she engages with it, trying both to construct possible presents as well as assessing them. In doing so, the researcher is not a neutral actor, her way of engaging stems from a particular interest and, as a design researcher, from the will of exploring the possibilities for changing the existing situation.

The interest of the design researcher in actuality sets the Thing in a particular context, which makes this action possible. The design researcher acts in located engagements where it becomes possible to compose that, in this work, can be understood as a matter of co-producing prospects within production and follow whether or not they are able to move forward.

4.2 Future and prospects: from potentiality to actuality

A central point in *The Compositionist Manifesto* is related to the shift from progress and future to progression and prospects. Latour states the need to move away from the idea of the future as being the result of the inevitable and irreversible “march of progress” (Latour 2010), since progress does not just unfold forward, but can also turn backwards (Latour 2010). Such a cryptic idea becomes clearer if we think how the environmental issue, and the inability to deal with it, represents one the outcomes of 200 years of industrial and economic progress. In such a perspective, it emerges how progress sometimes gets stuck, or worse, can take a U-turn. It could be said that the future is too often considered as matter of fact, while, when beginning to consider issues such as climate change, it rather appears more complex, rich in contradictions and not necessary a matter of moving forward.

Latour proposes a shift from the notion of inevitable progress towards a progressive, tentative and precautionary *progression* (Latour 2010), recognizing how the future is not a single monolithic horizon, but rather is made up by a number of fragmented and tentative *prospects*.

Which prospects get the possibility to develop is not given, it is decided on the battlefield (Latour 2005), where diverse agendas, actants and perspectives come together, and where different prospects encounter and struggle to become legitimated presents.

Latour does not provide very many explanations about how this battle develops, and what makes some prospects move forward and other disappear. This process can become slightly clearer if we consider prospects as Things, gathering a number of actants with diverse interests. To articulate the notion of interest, we turn to Stengers work, to which Latour often refers. In looking at research and how/ which knowledge is/gets to be diffused, she underlines the centrality of scientists' *interests*. As they represent

the way in which what one does interest others, that is, becomes an integral part of the present of others, or 'counts' for others, does not conflict with the way in which one is interested in what one does oneself, but is an ingredient of it. Who is interested, how can one be interested, at what price, by what means and under which constraints—these are not secondary questions associated with the 'diffusion' of knowledge. They are ingredients of its identity that is, the way in which it exists for others and the way in which it situates others (Stengers 2010, p. 27).

So which prospects get to travel further seems a matter of whom and what is interested in them, as well as how the prospects respond to *constraints*.

The notion of constraint has nothing to do with a limitation, ban, or imperative that would come from the outside, in other words, would be endured, and everything to do with the creation of values that I associate with the event of reciprocal capture. Moreover, the meaning of 'constraint' should be understood abstractly in a way that distinguishes it from 'condition'. Unlike conditions, which are always relative to a give existent that needs to be explained, established or legitimized, constraint provide no explanation, no foundation, no legitimacy. A constraint must be satisfied but the way it is satisfied remains, by definition, an open question.

A constraint must be taken into account, but it does not tell us how it should be taken into account. It gets its meaning only in the process of coming into existence, thereby allowing the condition explaining that one thing rather than another has come into existence to be formulated a posteriori (Stengers 2010, p.42-43).

This definition is quite abstract, but it becomes clearer when Stengers relates the notion of constraints to the one of *innovation*, which could be understood as the process through which prospects get legitimacy as presents:

To follow the way a new idea materializes is first and foremost to follow the operations of recruitment and alliance that will produce the real 'material' of innovation, the heterogeneous set of those who agree to be shaken up, modified, interested by it. Each of these could be said to 'present its conditions', but materialization is a real history; for the talent of innovators is to transform conditions into constraints, in other words, not to submit to existing relations of force, but to rework the implications, at least partially. It is after, and only after, the new set of relationships among all parties-human protagonists, technological devices, nonhumans, and so on- has been stabilized that we will be able to identify the factors explaining innovation (stakeholders, satisfied needs, reliability, profitability, etc.). In short why and how and in what sense the innovation 'works'. (Stengers 2010, p.43)

It could be said that the prospects that move forward are the ones that better succeed in responding to constraints. These are what keep the composition together, as the materialization of actants' interests in *conditions* which define the relationships between them. Such constraints are not a given, they can be shaped and transformed, thus changing how and in which terms the actants relate to each other, since constraints define which interests count; for example, who and what is valuable, and which futures are worth being acknowledged as possible presents.

Summing up, in trying to understand how prospects differ from futures, some points can be made. The first is a shift from considering

the future as an absolute and monolithic notion to rather a Thing made up by diverse prospects that can be in contrast with each other. Such prospects are partial and unstable ideas and practices, emerging from the composing performed by diverse actants who operate out from specific interests and relate to each other on the basis of given conditions and constructed constraints. Which prospects may travel further is decided, as stated, on the battlefield, and it depends very much on the ability of actants of (re)shaping constraints, of providing legitimacy and materialization to their prospect through alliances and adaption or by reworking existing force relationships.

The notion of prospects and their struggles becomes useful when thinking of what kind of presents commons represents. It allows one to discuss them in relation to expectations and scenarios that are to be found in the opening of production, but also to articulate how they may or not move forward.

5. Summing up: 'where', 'what', and 'how'

After having discussed the compasses and how they are used in this program, it becomes possible to articulate in more detail the 'where', 'what', and the 'how' of the program.

(WHERE) *The opening of production*. It is the landscape of open, collaborative and sharing-based production practices which is defined through the notion of commons and out from a compositionist perspective. It weaves together practical examples and theoretical considerations in order to map and problematize a number of future visions in relation to commons-based production forms.

(WHAT) *Commons and prospects*. On one side, it entails consideration of what the engagements are generating in the opening of production and how they do it. Here insights in relation to organizational forms, sustainability and value generated by open, collaborative sharing practices are brought up; also, in relation to the nature of commons as infrastructures.

On the other side, it considers the engagements in terms of prospects, what insights they provide in relation to scenarios and visions of the opening of production. It also accounts for how prospects may move forward, and how the engagements attempt to rework constraints.

(HOW) *Making commons as composing*. Here the focus is on how commons-gathering actors with diverse interests can be initiated, developed and eventually left. Particularly, the discussion is in articulating designerly approaches and understandings that may be at play in the making of commons and how they provide a specific understanding of openness, collaboration and sharing.

6. Some methodological considerations

As pointed out, the definition of the program also implies the definition of the kind of knowledge generated by the research as well as criteria of validity, rigor and relevance. This section attempts to address these issues, and it begins to do so by relating compositionism to other methodologies that are relevant in relation to the genealogies.

6.1 Compositionism and other methodologies

Composing in a programmatic approach from experiments to engagements
In trying to work with a compositionist approach, this thesis ended up being based not on experiments, but rather, engagements. These can be understood as extended design experiments (in terms of time, but also agenda) where I became part of the composition in order to follow the prospects as well as to account for other stakeholders' interventions and agendas in the making.

Initially, my understanding of what counted as a design intervention was mainly related to activities and initiatives that I was driving. However, I soon realized that making entailed the interweaving of activities driven by a number of diverse actants, and it was not possible to have full control over the situation. Thus, I began to consider the role that other humans and non-humans play in making;

shifting from a planned and controlled way of operating to trying to be part of what was evolving, hooking up with initiatives and activities that were close to my agenda. This is, for example, how I ended up being the co-founder of the textile corner inside Fabriken, as well as establishing a long-term collaboration with Carin from ReCreate focusing on how her project could develop. It also meant that I started to consider occurrences which had a strong influence on the work as experiments, even though, they were unsolicited or happened completely outside my control, such as the establishment of Connectivity Lab or the fire in HWA premises. These unsolicited experiments have provided concreteness to the program by raising issues and questions such as how to appraise the outcome of a design process or what the designer's responsibility may be in these processes.

My work is also full of attempts at making commons that never took off, such as the establishment of a collaboration with the local museum of design (see 15.2). These 'never-happened experiments', or aborted prospects, stretched the idea of what can provide concreteness to a design program. It is not only a matter of what *has happened* or what *can happen*, it can also be a matter of what *does not*, or *can not*, happen. By figuring out why things do not go through, it is possible to acquire understandings such as which skills does a designer need in order to be involved in composing or how trust and credibility play a major role in making commons.

Failures have also played an important role, as defeated prospects. The fact that, at a certain point, Fabriken/STPLN and Malmö Living Labs way of operating (see section 13) was considered a failure has provided me the possibility to reflect on the importance of how Things get to be assessed as well as learning about how constraints may or may not be reworked.

Composing also entails starting out by mobilizing a number of actants: technologies, materials, and people. In the engagements, a lot of time has been spent in aligning with these actants as well as creating opportunities for them to participate: finding resources to involve them and understanding how their agendas could fit together. These activities are usually not considered part of design (research)

practice; however, in my work, they were crucial moments that made the program more concrete, bringing insights about how to initiate commons. For this reason, I came to understand ‘what-happens-before’ as a part of the intervention. The way in which actors are mobilized and the way in which the designer relates to them is already a matter of composing. This resonates very well with what has been already pointed out by Clark (2007) and Pedersen (2007) who have both highlighted how the conditions from which a project is initiated play a fundamental role in shaping the design process.

In the same way, it becomes important to consider ‘what-happens-after’ the design(er) is done, and if or how prospects may move forward. I have been carrying out a number of interviews to account for the last developments at Fabriken/STPLN which have provided insights in relation to both commons and prospects. Considering ‘what-happens-after’ also implies discussing how to leave making commons. Engagements are about long-term commitment, but at a certain point, the designer may have to leave, for example, because their PhD is coming to an end. In this work, a number of insights emerged in relation to how it might be possible to leave making commons (see chapter 4).

Compositionism and PAR: action as knowledge and attempts at change

In discussing compositionism as a methodology, it becomes important to relate it to Participatory Action Research (PAR), since the latter represents a grounding approach in the PD tradition.

PAR is a methodology based on three characteristics: “the active participation of researchers and participants in the co-construction of knowledge; the promotion of self- and critical awareness that leads to individual, collective and/or social change; and the building of alliances between researchers and participants in the planning and implementation and dissemination of the research process” (McIntyre 2008, p.ix).

PAR has been a central approach in traditional participatory design, where the interest is in co-designing, together with users, technologies in order to bring ‘democracy at work’ (Ehn 1988, Simonsen and Robertson 2012). PD “grow[s] out of a concern about how design

could support resource-weak groups when information technology was introduced to the workplace. It also meant a clear positioning of the designer in controversies regarding how the design was implemented in use.” (Ehn 2008, p.8).

PAR becomes an important reference in articulating what kind of knowledge is generated in a compositionist approach by considering the diverse accountabilities which are at play. In PAR, the researcher is not just accountable to her academic peers, but also, and foremost, to research participants (McIntyre 2008). Accountabilities help the researcher in articulating the diverse forms of knowledge generated through practice and who they should be addressing. Lave (1993), in studying the kind of learning emerging from practice, defines it as open-ended and emerging from the interaction “with the social, material, and experiential resources at hand” (Lave 1993, p.13) in the specific situation. This means that the forms of knowledge emerging from collaborative practices may take diverse forms; they can be academic insights, but also an action which is undertaken by the participants (Simonsen and Robertson 2012). or an artifact that is produced in the collaboration.

In PAR, the development of knowledge is considered the main driver for change, as it builds on the Marxist assumption that self-acknowledgement of economic and social conditions represents the main driving force for change (McIntyre 2008). Thus, PAR offers a very specific take on change; it is a matter of providing knowledge and skills to participants for acting in their local-context (McYintire 2008). On the contrary, compositionism and its idea of change as matter of reworking constraints is, on one side, less certain about how change can be reached and, on the other, with the notion of constraints, it frames change as a matter of acting on relationships. This implies that compositionism results in a more attemptive and careful way of operating, and it requires to engage at the same time with diverse stakeholders, trying to affect and rework the relationships that bend them together. Thus composing cannot just be a matter of working with resource-weak groups: it becomes very much a matter of trying to develop new relationships between them and more established actors, to hopefully rework the constraints that make these initiatives marginal and precarious prospects.

Compositionism and case study research: commons as narratives, located power, and values

The centrality of located research processes is also present in commons research where case-studies play a major role. In order to analyze them, Ostrom and her group developed the framework of Institutional Analysis and Development (IAD)⁸ (Ostrom 1990, Hess and Ostrom 2007, Ostrom 2010, Ostrom 2011).

The IAD framework focuses on three areas: the external variables, the action situation, the interactions and the outcomes (Ostrom 1990, Ostrom 2011). The external variables articulate the context in which the commons operates, considering the bio-physical conditions (i.e. the characteristics of the shared resource) and the attributes of the community involved (e.g. cultural elements, and the rules-in-use of interaction). The action situation articulates how collaboration between the diverse actors works and what it could potentially generate. Finally, interactions and actual outcomes are considered and evaluated. The presence of both expected outcomes, as well as actual outcomes, is related to the fact that the IAD framework is often used to articulate and understand issues within existing institutions (Ostrom 2011). More recently, some adaptations to the IAD framework have been suggested (Hess and Ostrom 2007, Madison et al.2008, Ostrom 2010) in order to analyze “new commons”.

Through IAD, models about commons have been developed (Ostrom 2011). In 1990, Ostrom defined some of the recurrent design principles in successful commons. Although, in her later work, Ostrom warns about the temptation of generalizing such principles, underlining the importance for the long-term sustainability of commons of the development of context-specific rules that take in account for the local situation(Ostrom 1999).

It is also important to underline how the IAD framework has been developed from a specific field, political sciences, in a strong connection with game theory (Ostrom 2011) with the aim of analyzing existing

⁸The IAD framework responds to the questions of: who and what is involved in the commons? Which rules and norms are at play? How much control does each participant have and how much information do they have about the situation? Are all the actors equally informed? Are decisions being made to address short-term dilemmas, or are long-term solutions being sought? Are varying types of outcomes possible? What are the costs and benefits?

commons institutions (Ostrom 1990, Ostrom 2011). This means that the IAD framework is mainly used to study existing commons, considering them as a static matter. As pointed out by Ostrom (2011), an emerging challenge for commons studies is related to how to study the evolution of commons, articulating how processes and structures change over time (Ostrom 2011). Another challenge is related to experiment with commons in the field in order to explore more complex social or ecological settings (Ostrom 2011), such as those characterized by an asymmetric situation wherein participants have diverse rights and duties when it comes to harvesting and contributing to the commons (Ostrom 2011). This work is positioned very closely to these concerns as it provides insights in relation to commoning, and forms of commons with an asymmetric structure, wherein participants have diverse roles and possibilities of harvesting and contributing to the shared resource. Such insights are developed from a designerly perspective and also need to be accountable to the design discourse. For this reason, in this work, the IAD framework has been adapted in two ways. The first is a shift in language from a mathematical one, aiming at articulating universal and generalizable models, to a narrative one accounting for the specificities emerging from the cases. The relevance of narratives when it comes to organizational studies has been brought up by Flyvbjerg (2004, 2006) and Czarniawska (2004, 2010). The second way is a focus on making commons rather than commons, on the practice of developing and maintaining collective institutions as well as on considering how they might change in time. Thus, rather than addressing each specific feature of the IAD framework that provides a detailed, but static understanding of the commons, this work goes back to the basic questions behind IAD, looking at commons as ongoing processes.

Moreover, commons and attempts at commoning are also understood in this work as prospects and thus, it becomes important to understand the interests and the constraints which are at play, which means dealing with values and power. As pointed out by Flyvbjerg (2004, 2006), case studies can play a role in articulating issues of power and values (Flyvbjerg 2004) as, through them, it becomes possible to explore how values and power are at work in the specific situation and how they influence practice (Flyvbjerg 2004). This implies not only articulating how making commons is performed, but also tracing

what happens on the battlefield—which commons get to be successful and why. Flyvbjerg’s take on case studies allows for dealing with power and values by staying within the practice and by following the prospect.

6.2 Validity, relevance, and rigor

When it comes to the validity and relevance of this work, there are two main accountabilities to take in consideration: one towards academic peers and one towards the participants in composing.

When it comes to academic validity and relevance, aside from peers’ evaluation within each genealogy, it might be worth underlining some considerations that Flyvbjerg brings up in relation to case study research in social sciences (2006). He disregards generalization as a criterion that should be used to evaluate research studying human practice since “Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is, therefore, more valuable than the vain search for predictive theories and universals” (Flyvbjerg 2006, p. 224). In this perspective, this work should be judged from its ability to provide concrete and context-dependent knowledge and to which extent this knowledge can be appropriated by the actors involved in the diverse genealogies (that is design researchers, but also designers, practitioners and activists within the opening of production, as well as practitioners and researchers dealing with commons).

Therefore, when it comes to rigor, it should be verified through the criteria of novelty (to which extent the claims the research make represent a contribution to the specific genealogy) and clarity (how clearly the researcher articulates what she has learned about the situation).

When it comes to verifying novelty, this work addresses the commons discourse by describing particular forms of commons and by discussing approaches for establishing, continuing and leaving commons which gather actors with diverse interests. In relation to D4SI, the discourse around compositionism and prospects is seen as a contribution that may support the development of this emerging field by providing a

frame for performing D4SI as well as reflecting over it. Finally, in relation to PD, the main contribution is represented by the notion of making commons and how it can be used as a frame to discuss the actuality of co-production processes.

In addressing clarity, this work strives towards articulating what I learned from the engagements by highlighting how such learnings are tightened to practice and how theoretical notions can be used to further articulate them. In expressing these learnings, I aim to support appropriation by the reader and open up for further research that could challenge and surpass such learnings.

When considering the perspective of the participants, it becomes problematic to verify novelty and clarity, as it appears to be difficult, if not impossible, to actually access and define exactly what kind of knowledge is generated in collective processes. Not only because, as stated, knowledge can take diverse forms, but also because there is not a possibility to know in which way processes are understood and appropriated by participants. A criterion that seems to still hold up is the one of relevance as it might be possible to directly ask participants if they found the process giving and if they gained anything out of it. However, such a direct question is not always able to account for all the possible ways in which processes are relevant for participants. For this reason, this work relies also on a complementary approach, the long-term perspective, which allows one to follow the outcomes of processes and specific proposals if, for example, they are appropriated or not by the participants and in which ways.

In addressing multiple accountabilities towards academic peers and participants, this work is very much inspired by Suchman (2002), who frames it as a question of how to proceed in a responsible way when being entangled in networks of human and non-human actants. In this work, such a question has been addressed through a long-term commitment, where I tried to take care of the things I took part in initiating. It has been also a matter of assessing and framing what emerged from the engagements as a way of taking responsibility for what was generated in the engagements, to which extent it could be considered a matter of 'making' social innovation and alternative futures and how it could be appropriated by others.

6.3 Knowledge contributions

When it comes to the contributions, this work aims for:

In *design for social innovation*:

- understanding some of the possibilities and challenges for infrastructures supporting social innovation;
- understanding how commons-based production practices could (or could not) be at play for the establishment of a more environmental and social sustainable production system.
- providing the notion of compositionism as a possible approach to frame making in social innovation.

In *participatory design*:

- describing attempts at establishing collaborations between actors with diverse interests during use-time.
- providing the notion of making commons as a way to articulate co-production processes and how design approaches can support them.

In the *commons field*:

- describing cases of evolving commons in the opening of production, with asymmetric structure and transient participation;
- a possible role for partner-producers in supporting commons.
- presenting how design approaches could be at play in the making of commons.

In *the opening of production*:

- understanding how collaborative, open, and sharing processes are at play in production, which forms they can take, and how these forms are related to diverse values and visions about the future.
- presenting how design methodology, and the programmatic approach, can be used to navigate and understand this swamp.

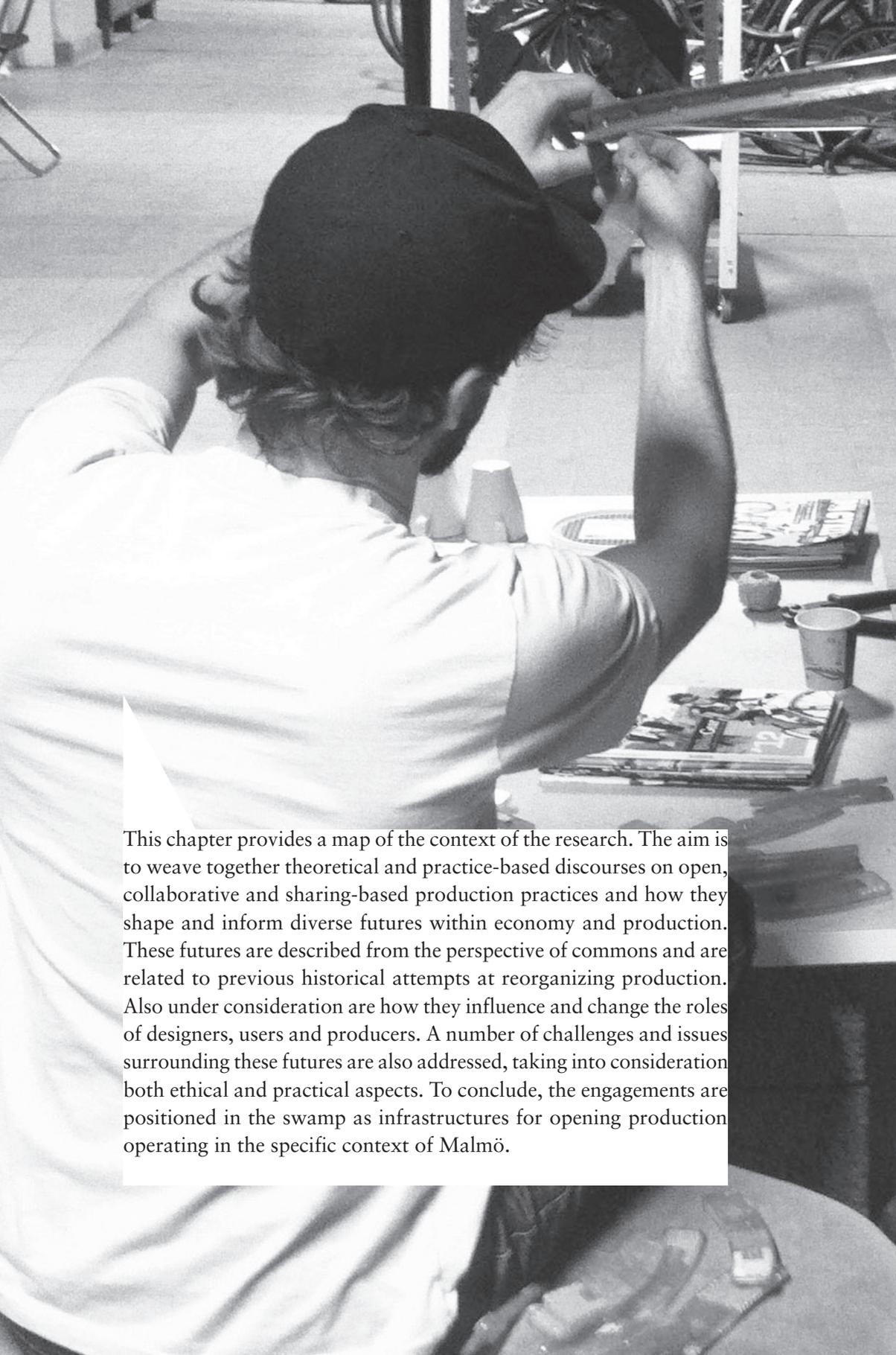
In addition to these specific contributions, this work aims to contribute to the academic design research field by further exploring and grounding the programmatic approach.

When it comes to the nature of the contributions developed in this research, they can be understood as attempts at accounting for phronetic knowledge. Aristotle distinguished between three kinds

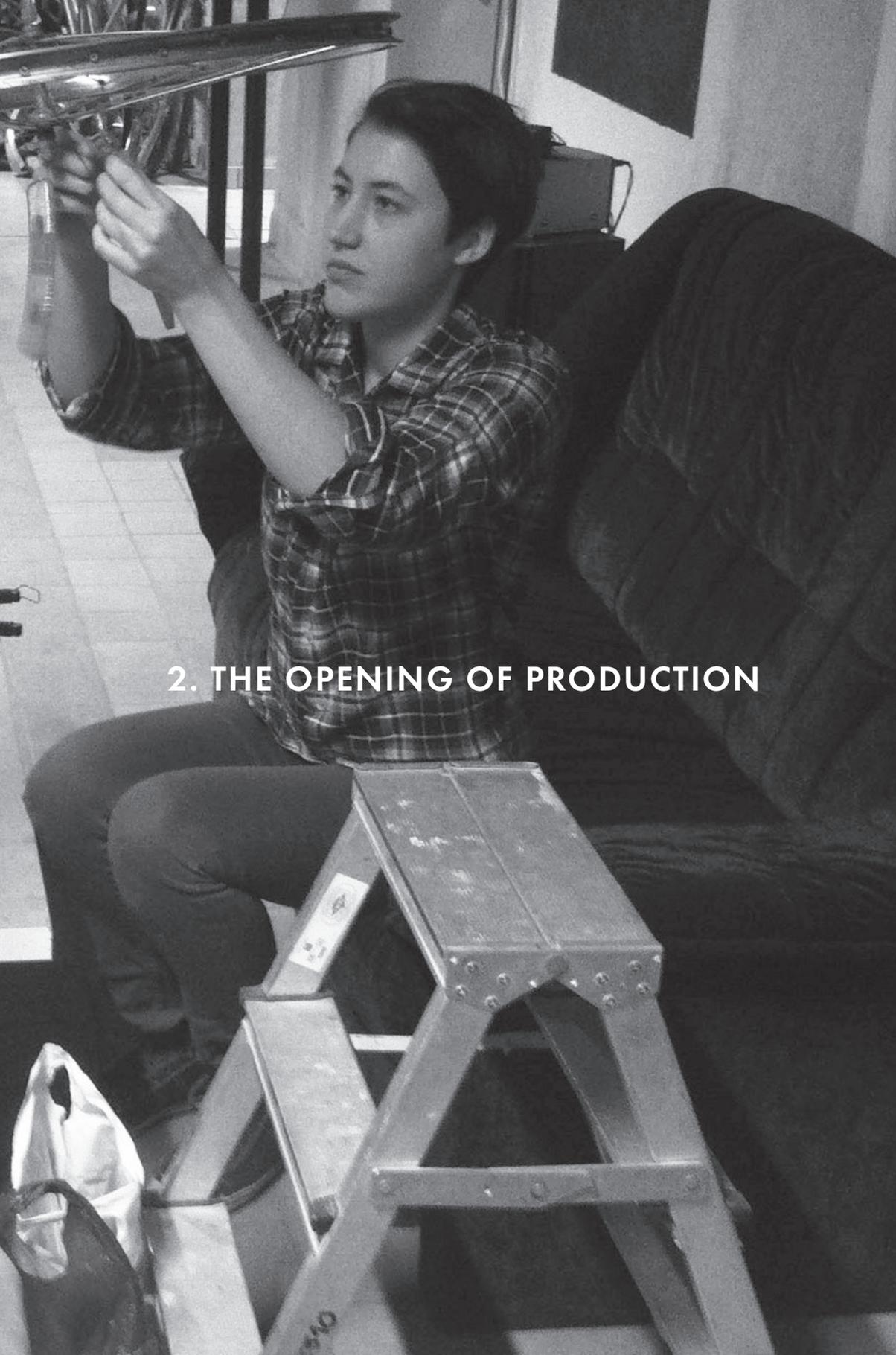
of knowledge: episteme (theoretical knowledge), techne (technical knowledge), and phronesis (as practical knowing or practical wisdom) (Flyvbjerg 2004). This work in particular builds on Flyvbjerg's understanding of phronesis as being a form of knowledge about practical knowing and practical ethics (Flyvbjerg 2004) which implies a focus not only on knowledge about how to act in a situation, but also an understanding of how power and values are at play in practitioners' actions (Flyvbjerg 2004). This latter aspect plays a fundamental role in addressing the question of responsibility, as it opens up not only for considering how to act in a specific situation, but also on the conditions that make such acting possible and the consequences that such action may entail.

Phronetic knowledge is entangled with practice and, thus, it cannot be fully expressed or transmitted through text and words. Therefore, the contributions developed in this work are described as attempts at accounting for phronetic knowledge, as a matter of trying to explicitate a particular understanding and way of engaging in co-production processes which developed within the engagements. In trying to do so, I provide insights from the specific occurrences from which learning emerged.

In addition, other forms of knowledge contributions were generated in this work. They are embedded, for example, in the objects built with ReCreate, in the sketches that were produced in the workshops with civil servants, and in the activities carried out with HWA and the refugee children. From a compositional perspective, they are important as they represent another way in which prospects may travel.



This chapter provides a map of the context of the research. The aim is to weave together theoretical and practice-based discourses on open, collaborative and sharing-based production practices and how they shape and inform diverse futures within economy and production. These futures are described from the perspective of commons and are related to previous historical attempts at reorganizing production. Also under consideration are how they influence and change the roles of designers, users and producers. A number of challenges and issues surrounding these futures are also addressed, taking into consideration both ethical and practical aspects. To conclude, the engagements are positioned in the swamp as infrastructures for opening production operating in the specific context of Malmö.



2. THE OPENING OF PRODUCTION

7. Mapping the opening of production

The practices which are opening production can be viewed as diverse approaches at making commons (i.e. constructing and running commons). Driven by diverse values and leading to quite diverse forms of collaboration, ownership, and sharing, these practices are paving the way for the emergence of different futures in the opening of production.

7.1 Hackers, makers, and freedom for commons-based production

The opening of production has been strongly boosted by the Internet. “[T]he networked environment makes possible a new modality of organizing production: radically decentralized, collaborative and non proprietary; based on sharing resources and outputs among widely, distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands” (Benkler 2006, p. 60). The first concrete example of this type of production was the GNU project, a computer operating system started in 1983 by Richard Stallman (1984). The idea was to create software that provided its users with the freedom to run, modify, improve, and share it. These principles lay the foundation for the Free and Open-Source Software (FOSS) movement which has dramatically changed the way the software field operates, proving that open and collaborative production processes can lead to valuable products. FOSS has developed its own practices, organizations, licensing, and business models which strongly influence production in other realms.

Ideals of freedom and democratic access form the basis for knowledge and information projects such as Wikipedia, the open-source encyclopedia, and Indymedia, one of the first independent, open-source journalism platforms formed by grassroots initiatives and which has been challenging the way information is produced and distributed since 1999.

In the last few years, collaborative and open practices in the software and media sector have grown exponentially and are described as forms

of social production (Benkler 2006) whose sustainability relies on social stands rather than financial ones, and where resources and outputs of production processes are treated as commons. This mode of production relies on a set of shared, non-rivalrous resources (commons) which are processed by individuals who interact with each other without the need for intermediaries (peer-to-peer) (Bauwens 2009).

This mode of production is characterized by the voluntary aggregation of individuals who are entangled in production processes where resources and outputs are shared. In terms of organization, peer-to-peer processes are characterized by equipotentiality (Bauwens 2006), and there is no a priori selection of who can participate; processes are open to anyone, with skills and capacities verified during production. This facilitates merit-based organizational structures and hierarchies which are modified according to the type of activity performed (Bauwens 2006).

In these practices, 'commons' is usually understood as open-access commons (Benkler 2013); specifically, in intangible commons-based peer-to-peer processes, resources, and outputs are usually made available through the Internet according to specific rules defined through various types of licensing. Open-source software has developed a number of diverse licenses with the aim of preventing the commons from becoming appropriated or free-ridden. The role of these licenses has been central in many open-source projects as they do not only protect the commons, but also represent a way to reinforce mutual trust between participants, as licenses explicitly ensure each other's commitment to the commons (O'Mahony 2003)⁹.

As in every form of making commons, commons-based peer-to-peer processes are fostering the emergence of social capital from the collaborative production of software, information and knowledge, binding together people around the globe through processes of making (Gauntlett 2011). In these collaborative processes, mutual learning and skills development are also often at play (Lakhani and Wolf 2003).

⁹An important note to be made, when it comes to open-source software, is that open-access commons in this field are non-rivalrous goods. This implies that, even if the license is violated, the shared resource is not depleted. However, this does not diminish the importance of licensing in commons-based, peer-to-peer production, as it becomes a social pact between participants.

The success of free and open-source software when it comes to self-sustainability and quality of output has fostered a discussion around commons-based production being a new form of production. Particularly, it is considered as a new way of making things, which can work both inside capitalism, as well as represent a possible alternative to it (Bauwens 2006, 2009).

Commons-based, peer-to-peer production does not necessarily imply withdrawing from the actual economic system. In the software sector, there are several examples where commons-based production and production for the market cooperate in sharing, producing and maintaining commons. Here, there is often an agreement between the community of peer producers and companies wherein the latter produce exchange value out of the commons while having employees contribute to the development and maintenance of the shared resource during working hours (Bechky and O'Mahony 2008). The relationship between the company and the community of peer producers is usually guaranteed by the establishment of an ad-hoc organization which manages the infrastructure for collaboration, ensuring the preservation of the collective resource (Bechky and O'Mahony 2008, Bauwens 2009.)

However, commons-based, peer-to-peer processes do challenge some basic assumptions of capitalist production (Hardt and Negri 2009). In regard to property, there is a shift from focusing on private to collective regimes, since the former is no longer the locus of freedom and innovation, but rather a hindrance to open-access, free-use and free-interaction (Benkler 2013). This is mainly related to the fact that notions of accumulation and valorization change since, in collective processes, the creation of value is directly linked to broadening the possibilities of accessing resources for production (Benkler 2013, Thrift 2006.) In this scenario, economic growth becomes directly linked to the notion of social growth (Hardt and Negri 2009) as the former “involves both an increasing stock of the common accessible in society and also an increased productive capacity based on the common” (p. 283). This opens up the possibility of rethinking production processes outside a market-logic, with use value and social values over-riding exchange value (Hardt and Negri 2009).

Commons-based peer-to-peer goes tangible (and maybe also big?)

Lately, the development of personal fabrication machines or 'fabbers', which are cheap, small-scale versions of industrial manufacturing machines, has fostered the emergence of collaborative (Stangler and Maxwell 2012) and personal (Lipson and Kurman 2010) manufacturing. Laser cutters, 3D printers, and small-scale mills lower the threshold to perform production processes, while the Internet facilitates the sharing of information and files around these processes. The outcome is the emergence of a number of practices where production is performed outside traditional structures and spaces, driven by individuals or small groups engaged in collaborating and sharing knowledge around grassroots digital fabrication (Smith and Hielscher 2013). There are diverse expectations around these initiatives; some regard them as attempts to move commons-based production from the intangible to the tangible realm (Benkler and Nissenbaum 2006). The envisioned scenario is that of a third industrial revolution (Anderson 2012), with digital fabrication machines going personal (Gershenfeld 2005) and with knowledge and information about production processes being shared on-line according to peer-to-peer patterns (Anderson 2012); leading to the democratization of manufacturing (Mota 2011).

The first experiments about grassroots digital fabrication were carried out by programmers and people working with electronics as they started to experiment with the possibilities of developing open-source hardware. They applied the same principles of open-source software to the design and production of hardware¹⁰ (Lock 2013) developing a number of very successful projects such as Arduino (an open-source microcontroller) and RaspberryPi (an open-source microcomputer). These attempts have fostered a meeting between the open-source world and the long-standing traditions of crafts and do-it-yourself. What emerges is a culture of self-production and small-scale production (Gauntlett 2011) known as 'maker culture'

10 "Open source hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design. The hardware's source, the design from which it is made, is available in the preferred format for making modifications to it. Ideally, open source hardware uses readily-available components and materials, standard processes, open infrastructure, unrestricted content, and open-source design tools to maximize the ability of individuals to make and use hardware. Open source hardware gives people the freedom to control their technology while sharing knowledge and encouraging commerce through the open exchange of designs." (Open Source Hardware Statement of Principles and Definition V1.0. <http://freedomdefined.org/Definition>)

(Anderson 2012), wherein making things is both a matter of acquiring skills and becoming empowered. Further, it is a way to connect with others by sharing knowledge, skills and tools for making things both on-line and off-line, via a number of emerging facilities where people meet to make and learn together (Gauntlett 2011).

Within the makers' community, there exist a number of visionary and sometimes successful open-source projects which experiment with commons-based, peer-to-peer production in the tangible realm: from cell phones to windmills and from medical equipment to cars (Wikipedia 2013). One of the most ambitious initiatives is Open Source Ecology, a volunteer-based project which aims to develop the open-source design of fifty basic industrial machines needed for a small, sustainable civilization with modern comforts (Open-Source Ecology 2013).

The growing number of initiatives around grassroots digital fabrication is fostering the emergence of scenarios that imagine how production could be completely re-organized according to a commons-based, peer-to-peer system (Bauwens 2009, Siefkes 2012, Helfrich 2013). These visions depict a production system wherein digital open-commons provide information for and around processes, natural resources are treated as commons (thus considering their scarcity and limits), and means of production are held in common (Siefkes 2012). Such a system would require the creation of "mechanisms that combine the non-reciprocal, peer production of designs for immaterial production with a separate system for physical production that relies on, cooperates and supports open design communities" (Bauwens 2009, p.129).

These visions share the basic understanding of commons as a locus of freedom for operation and low-cost experimentation (Benkler 2013) where the capitalist logic of scarcity is substituted with the logic of abundance (Hardt and Negri 2009). In such a perspective, the emergence of a post-capitalist economy and society is depicted, wherein production could be driven by use-value rather than exchange-value, working within planetary limits for the fulfillment of human needs through a system of local provision (Helfrich 2013).

However, this is only one version of the story. In the opening of production, the making of commons is also generating other possible futures.

7.2 Open and democratic innovation, publics and ethical economy

The opening of production is not just a matter of freedom and democracy, it is also a matter of profit and new possibilities for market economy. FOSS had a radical impact on the software sector, specifically with Linux, which showed how it might be possible to make a profit although the actual product is as a shared resource developed and owned not by a company, but by an open community of programmers. FOSS has had a major influence in this sector. In 2012, open-source software powered over 65% of the entire web-server market, 75% of all smart-phones, and nearly 94% of the top 500 supercomputers in the world (Lock 2013); further, in 2010, 40% of software companies were developing at least some free or open-source software (Benkler 2013).

This radical change in the software sector has met with emerging ideas about co-creation (Prahalad and Ramaswamy 2004) in the service sector, according to which value is created in the interaction between producers, suppliers and users (Lusch, Vargo, Tanniru 2010, Michel, Brown, Gallan 2008). The understanding of how value is generated has shifted from a chain model to a constellation one (Normann and Ramirez 1993), implying that value always emerges from collaboration, fostering the idea that processes of production and consumption are not separated.

“[T]he market as a forum challenges the basic tenet of traditional economic theory, that the firm and consumers are separate, with distinct, predetermined roles, and consequently that supply and demand are distinct, but mirrored processes oriented around the exchange of products and services between firms and consumers” (Prahalad and Ramaswamy 2004, p.135).

In the meantime, in the innovation field, ideas such as open and democratic innovation have begun to circulate. The concern is with how to mobilize innovative and creative potential outside the walls of companies and traditional innovation systems. Open innovation

(Chesbrough 2003) is interwoven with the celebration of the creative class and its almost mythical ability to positively impact the business sector and society as a whole due to its innate capacity for generating novelty (Florida 2005). The challenge for companies is, therefore, how to recruit creative people who could potentially greatly contribute to the innovation of their processes and products (Chesbrough 2003).

The paradigm of democratic innovation (Von Hippel 2005) shifts the attention from experts to end-users. Based on a series of successful case studies, Von Hippel states that not only experts, but also users, can be a source of innovation, showing the importance of involving in innovation processes not only technical experts, but also the forerunners of new practices and forms of use, the so-called lead-users.

These ideas have worked toward, and in parallel with, a reworking of production and consumption processes (Thrift 2006) whose distinction has been progressively challenged by the emergence of practices that Toffler had previously defined as prosumption (Toffler 1980). In these practices, end-users become producers (Bruns 2008) hybrid figures who actively engage in customizing, developing and finalizing products and services before using them. They are also associated with the romantic figure of the amateur who, during her free time in her garage, explores the possibilities of technology and builds prototypes. In doing so they often rely on information and knowledge found on the web and then share their results and achievements with on-line communities (Gauntlett 2011, Anderson 2012). These do-it-yourself activities are considered a potential source of innovation that can lead to innovative products and services (Von Hippel 2005). Here, broader access to means of production and shared technical knowledge are considered as key factors for the emergence of diffused micro entrepreneurship at the intersection between open-source software, personal fabrication machines, crafts, and the Internet of Things (Anderson 2012).

A key point from a market perspective is how to support, boost, and profit from users' creativity and making (Thrift 2006) which is leading to the development of diverse kinds of platforms. Some of them are

specialized in open innovation services, helping companies tap into the creative potential outside their walls. Others offer support for users' production, from customizable design services to repositories of tutorials and instructions for making things. Furthermore, other platforms provide users with the possibility of showcasing production results either simply for the sake of it, such as with YouTube, or for finding possible customers, as in Etsy¹¹'s model. Another type of platform is the crowdfunding one, which provides the opportunity for people with projects to collect grassroots financing to realize their idea. Finally, a number of facilities are emerging which offer access to technology and shared knowledge, and which are not only becoming platforms for learning and experimenting, but also incubators for a new wave of startups dealing with tangible production.

In these scenarios, when it comes to making commons, it is rarely a matter of commons as property regimes, but rather of open commons. Access to information and knowledge, as well as to shared production equipment, play a major role in increasing the rate of innovation and invention which represent the engine of knowledge-based capitalism (Thrift 2006). As argued by the legal school, patents and copyrights hinder innovation as they lead to the underuse of information and knowledge (Benkler 2013).

From a market perspective, the freedom of operation and low-cost experimentation that commons provides (Benkler 2013) makes it possible to cheaply test and develop new products and services, and thus, to cope with a complex and ever-changing market (Frischmann 2012). In the progressive merging of production and consumption, open commons are also the locus of value co-creation.

“Products and services are not the basis of value. Rather, value is embedded in the experiences co-created by the individual in an experience environment that the company co-develops with consumers” (Prahalad and Ramaswamy 2004, p.121)

Such co-creation processes can be considered forms of commoning, as companies can support and enhance them, although they do not have complete control over them (Thrift 2006). As every form of commoning

¹¹ Etsy is an online marketplace that provides crafters and small producers with the possibility to sell their products online.

generates social connections between the participants, affection, trust and reputation play an increasing role in market exchanges (Thrift 2006, Arvidsson 2013) and are leading to the emergence of notions such as *consumer communities* (Thrift 2006):

These communities gather round particular obsessions, which cover an enormous spectrum although many of the prototypes were in music, fashion and information technology. Sometimes these communities resemble mere interest groups, sometimes groups of fickle fans, sometimes hobbyists and sometimes cults. What is clear is that their existence is not predictable, in part because they are engaged in activities which find their own fulfillment in themselves, without necessarily objectifying these activities into ‘finished’ products or into objects which survive their performance. (Thrift 2006, p.290)

Recently, the transient and ephemeral nature of these gatherings suggests a shift in their definition from ‘communities’ to ‘publics’ (Ardivsson 2013). According to Ardivsson (2013), publics emerge from co-creation processes between actors which are not entangled in direct cooperation, but rather share resources and knowledge and operate at diverse times in diverse locations. Ardivsson (2013) underlines how they can not be defined as communities since what links them together are weak forms of associations based on affective connections that do not presuppose direct interaction. For this reason, he defines publics as “temporary aggregations of individuals, which are held together by a common affective intensity or ethos (a specific set of values and beliefs), and who do not perceive or understand themselves as collectives” (Ardivsson 2013).

The mobilization of affective stands and trust in value production, as well as the democratization of innovation and production processes, are framed as a two-fold phenomenon. On one side, as the ultimate strategy for long-term profiting, based on the commodification of affects and trust, and the systematic mobilization of creativity and tacit-knowledge (Thrift 2006), which are leading to a neo-liberalization of everyday life (Zwick 2013). On the other side, open commons challenge the current property regimes making the democratization

of innovation a phenomenon that could enhance society as a whole (Von Hippel 2005). Moreover, the general redefinition of what counts as value in the market (Thrift 2006) could also imply the emergence of an ethical economy (Arvidsson 2013) where publics brought together by common values could reform the market from within, by prioritizing ethics over exchange value, and with economic value being increasingly linked to a individuals' or corporations' ability to contribute to the commons (Arvidsson 2013).

The growing role of co-production, ethics and affective connections suggests a shift in the way in which the economy is structured and understood: a shift from Marxist to Tardian economics (Latour and Lépinay 2009), wherein the accumulation of capital is substituted by invention and the ability to gather and maintain publics. Such a shift opens up the necessity for substituting the centrality of efficiency and productivity with other values more related to ethics and wellbeing (Latour and Lépinay 2009). These alternative values are explored in more detail in the next two sections.

7.3 Sharing economy buen vivir and degrowth

Another future that emerges for the complex and evolving picture of the opening of production is connected to environmental and social sustainability. As already pointed out, commons entails the generation of social connections, but sharing products and services can also represent a strategy to decrease environmental impact.

In the beginning of the '00s, the idea of Product Service Systems (PSS) began to explore the possibility for companies to shift from selling goods to providing access to them instead. This approach was proposed in the frame of moving towards more sustainable production and consumption processes. Renting out a product instead of selling it fosters a more extensive and efficient use of the product itself, and it encourages investments in prolonging the lifecycle of goods (Manzini and Vezzoli 2000). PSS, however, encounters obstacles of implementation which are related to the complexity of managing and integrating a service over a physical product; this requires profound reorganization for companies whose core is the production of goods (Mont 2008).

Instead, over the last few years, a number of services have emerged which support the sharing of goods, skills and time directly between final users. These services often start out as grassroots community initiatives (i.e. time-banking, couchsurfing, etc.) which develop into companies (i.e. Task Rabbit and Airbnb) leading to the emergence of a new business sector, the one of collaborative consumption (Botsman et al. 2010) or sharing economy (Botsman 2013).

The main difference between PSS and sharing economy initiatives is that, while in the former, ownership is still private, in the latter, forms of commons are established (more or less mediated by third actors or companies). The advantage is that collaborative consumption is beneficial for the environment, while also generating social connections and trust between participants. Years before the boom of collaborative consumption, in the design field, the idea of collaborative service (Jegou and Manzini 2008) was proposed as a main feature in the transition towards a sustainable society. Collaborative services refer to local grassroots initiatives based on sharing and collaboration which have emerged in response to the specific needs of a community, from neighborhood workshops to collective purchasing groups. These initiatives are looked upon as promising cases where economic, social and ecological sustainability are brought together.

Collaborative consumption appears to be moving in two trajectories: the first and less-radical one is where sharing and collaboration is integrated within market structures, leading to a discourse which is similar to the one used by Arvidsson (2013). Another more radical trajectory connects sharing and collaboration with local autonomy and short supply-chain production systems (Carson 2010). This second trajectory is strongly linked to the localist tradition (Schumacher 1973, Illich 1973), which celebrates local provisioning systems as a more environmental and social sustainable way of organizing production. This approach has been recently rediscovered thanks to initiatives such as the Slow Food Movement and the possibilities connected to digital fabrication (Carson 2010). Here, sharing and collaboration happen on a local scale to help local economies thrive, and the paradigm of growth is substituted by the one of the *buen vivir* (Gudynas 2011) which aims at finding a balance between nature

and human activities. In this perspective, the commons should also include nature, not as a resource, but rather, as one of the stakeholders holding rights (Gudynas 2011)¹².

This second trajectory is rooted in the work about the limits of economic growth developed by environmental economics (Georgescu-Roegen 1971, Meadows et al 1972, Daly 1991) which invoke the necessity for limits to economic growth and the establishment of a steady-state economy in order to preserve not only nature, but human existence on this planet. A recent formulation of this perspective-Degrowth (Latouche 2004, 2008) - brings together planetary limits with *buen vivir* ideas. Latouche's position is quite radical; he states that the notion of sustainable development is an oxymoron and that in order to thrive on this planet, production must be downscaled and consumption literally de-grown, reducing the impact on the ecosphere by working, producing and consuming less, re-using (as a matter of repairing goods in contrast to buying new products) and recycling (Latouche 2008).

In the Degrowth and localist lines, commons are not explicitly mentioned, although both the notions of conviviality (Illich 1973) and community (Schumacher 1973) play a central role. Moreover, they call for similar way of organizing society: the establishment of semi autonomous, local communities. Such approach is sometimes considered a nostalgic view and understanding of the commons (Benkler 2013).

7.4 The opening of (re)production: a matter of care

Closely related to the previous stream, a fourth way in which production is being opened up is by challenging and experimenting with what counts as job, value creation and wellbeing.

The previous section presented a number of alternative models and notions that attempt to provide a more central role for nature and the finiteness of our planet in economics. This section focuses instead on notions and approaches that attempt to holistically define wellbeing,

¹² A main achievement of the *buen vivir* movement has been, in 2008, the integration in Ecuador of a constitutional law of the Right of Nature, which recognizes the inalienable rights of ecosystems to exist and flourish; it gives people the authority to petition on the behalf of ecosystems, and it requires the government to remedy violations of these rights.

work and production. Here, these two lines are presented separately, but they often merge, (e.g. in Latouche's work) thanks to a growing recognition of how environmental sustainability is fundamentally related to social sustainability (Jegou and Manzini 2003).

The broad definition of wellbeing, work and production received its main contribution from feminist economics which addressed how caring and household work were not being included in economic measurements. This resulted in a harsh critique against the notions of jobs, production and the standards used to evaluate wellbeing, as they did not account for forms of work not generating profit (Waring and Steinem 1988, Gibson-Graham 1996, Gibson-Graham et al. 2013).

Extensive work has been carried out to make the diverse forms of economy and production at play in our society (Gibson-Graham 1996, Gibson-Graham et al. 2013) more visible and tangible. A very famous example of this effort is the image that depicts work as an iceberg, where the visible peak is wage labor and the submerged part represents caring, volunteering and other forms of non-paid labor. This image is often used to bring forward and stimulate discussions around forms of invisible labor and value production. In particular, Community Economies¹³, the group associated with J.K. Gibson-Graham, has conducted extensive work in engaging communities in articulating what kind of work and production exists in their everyday lives and how they could be further supported and developed for the community itself to thrive (Community Economies 2009). Aside from providing visibility to care and other invisible forms of labor, their work focuses on understanding what kind of economy would be needed for a good life while not endangering nature (Graham-Gibson et al. 2013).

What constitutes a good life opens up a discourse for defining wellbeing and how it should be considered. A major contributor in this exploration is Nobel Prize winner Amartya Sen, who worked extensively to find new ways of defining and measuring standards of living (Sen 1985, 1999, Sen and Nussbaum 1993). In his seminal work around poverty and standards of living, he highlights how opulence

13 <http://www.communityeconomies.org/Home>

(material wellness) is only one factor in determining a person's quality of life. Specifically, he states that standards of living are based on the possibilities of being and becoming that any given individual has access to. These diverse functions depend not only on a person's internal capabilities, such as skills, but also external ones, such as social networks and access to services. Therefore, in Sen's view, opulence is one of the factors that determines quality of life, but it is considered together with, for example, access to education, social opportunities and so on (Sen 1985). Based on these ideas, Sen has worked on new metrics to measure standards of living which are used, for example, by the United Nations National Program. More recently, Sen's work has been further developed and connected to planetary boundaries (Jackson 2009, Boyle and Simms 2010), bringing up new metrics and ideas about how to measure and conceive economics (NEF 2012). Therefore, the opening of production seems to also be a matter of opening the aim of economics and deciding what forms of making should be prioritized.

Recently, it has been advocated that the rising popularity of openness, sharing and collaboration could also address the crisis which affects care and reproduction practices, meaning those which ensure the maintenance and continuation of our society (Gottschlich 2013). Gottschlich illustrates how, in western economies, forms of labor related to reproduction are becoming endangered by the transference of capitalist economic principles (such as productivity and efficiency) to care practices. Moreover, she points out that when reproduction is carried out as non-waged labor, there is little acknowledgment of the importance of these forms of making. Caring, in her view, is both understood as an activity connected to welfare, but also in a broader perspective, as care for the world and the society we live in. In this perspective, she underlines how capitalism, with a focus on individuals and private property, hinders care (Gottschlich 2013) and why commons, as matter of bringing people and things together, could represent an opportunity to finally merge production (as waged-labor for value creation) and caring (as non-waged labor for value creation).

According to Gottschlich, caring and commoning share similar traits: an emphasis on the human dimension, a basis on cooperation

and responsibility, and a foundation of ethics (care and reciprocity) (Gottschlich 2013). Such premises could be promising for an attempt at the creation of an economic system which includes and accounts for all the aspects which comprise a good life (Sen 1986, NEF 2012, Gottschlich 2013).

7.5 The opening of production: the same old story?

Before moving on, it is worth to engaging in a brief detour which relates the four streams presented above to older attempts at opening production.

In the third and fourth stream, some historical background has been already delineated in relation to academic fields such as feminist economics, environmental economics, as well as political movements such as localism and degrowth.

However, there are at least two other historical references worth mentioning to better identify the current attempts at opening production as attempts at humanizing and de-alienating processes through which things are made and services delivered.

As early as the first industrial revolution, John Ruskin, the English art critic, philanthropist, social thinker, and entrepreneur, attacked the emergent mass-production system as a dehumanized way of organizing production. Ruskin also strongly criticized the fathers of capitalism and the modern economy (Mill, Smith, Ricardo) for not considering social and community aspects in their theories, thus leaving out a great deal of what he defined as true economics (Ruskin 1985). In his seminal book *Unto This Last* (1985), he addresses a number of concerns around work, production and wellbeing that are very similar to those brought up in section 7.3 and 7.4. Furthermore, Ruskin's work strongly influenced William Morris, who founded the Arts and Crafts Movement. This movement opposed industrial production with craft production, which was viewed as a more humane way to organize and carry out processes of making, because it allows workers to develop their creativity and skills thanks to the establishment of a very close and unique relationship with the product of their work (Gauntlett 2011). Ruskin and the Arts and Crafts Movement

may be considered the starting point of an imaginary line which connects these early attempts at opening production with the localist tradition. It is further connected to the DIY lo-fi punk movement in the '80s (Gauntlett 2011), as well as ongoing marginal forms of production that have always been present on the side of capitalist mass-production.

The other historical reference occurred a century later, some years before Richard Stallman started to work on GNU (1983). From the beginning of the '70s, a number of practices began in Europe, and Scandinavia in particular, which centered around the idea of democratizing production and design (Simonsen and Robertson 2012). This was during the time of another industrial revolution, one which saw the introduction of ICT in industry, and with computers and CAD-CAM machines entering the shop floor. In Norway and Sweden, this epochal change led to a number of experiments wherein ICT designers and developers began to work together with unions, workers and company management to design machines and tools. These were the first steps of participatory design which emerged from the political will of bringing democracy to workplaces by allowing those who used the technologies to engage in the design and development of them (Simonsen and Robertson 2012). Such an approach was strongly influenced by, for example, Illich's ideas around convivial tools and it grew in parallel with the localist tradition (Schumacher 1973). Besides participatory design in Scandinavia, other experiments with the aim of bringing democracy to workplaces developed in regard to organizing and managing production. A significant example in this direction is the experience of Mike Cooley (1987) and the Lucas plan for human-centered, socially useful production (Cooley 1987). Being threatened by a major downsizing of the company in the early '70s, the workers of Lucas Industries, guided by Cooley, an internal designer, conceived and wrote down a plan for the industrial reconversion of Lucas Industries. Such a plan proposed to engage the company's production competences and technologies in the creation of 'useful' products such as kidney dialysis machines, heat pumps, a road-rail bus and airships, rather than arms (Cooley 1987). The plan was presented to company managers in 1976 and, although they turned it down, it did have a major impact on the labor movement in England and abroad (Steven 2006).

At that time, another source of inspiration for democracy at work was the Cooperative Movement, particularly the Spanish example of Mondragon, the biggest cooperative reality in the world today (Mondragon Corporation 2012). The Cooperative Movement, and its long history, is periodically brought up as a more humane option in organizing production and economy (de Peuter and Dyer-Whiteford 2010); the commons and economics stream (Bauwens et al. 2011) often regards cooperatives as the model for organizing work in and for the commons (de Peuter and Dyer-Whiteford 2010).

So what is new with the opening of production when it comes to alternative production? Not much, it would seem, it rather accounts for the ultimate form in which marginal ideas and practices about production have developed. An interesting aspect is the connections that are emerging between these ideas and practices such as, for example, the increasing synergies between local production and open-source approaches. Another very important difference is the role of technology and how its increased accessibility creates the opportunity to avoid possible bottlenecks and having, for example, production processes happening outside companies and the traditional production system.

Besides these promising differences, it is important to remember that the future of opening production is still unwritten. The scenarios delineated above, besides being often strongly interwoven with each other, are still far from representing concrete alternatives. This is further discussed in section 9, after considering what the opening of production means for the roles of users, producers, and designers.

8. What happens to the roles of users, producers, and designers?

As it has emerged in the previous section, the opening of production has profound consequences on the way in which producers, users and designers operate and on their roles.

In regard to users, they are traditionally understood as those that use a specific artifact or technology developed by the designer. In the opening of production, this understanding appears too narrow, since final users are not only using but also designing and producing, gaining freedom and responsibility over the production process. As previously mentioned, this change has prompted the emergence of new definitions, such as those of prosumers (Toffler 1980), lead users (Von Hippel 2005) and produsers (Bruns 2008).

In the design field, the notion of creative communities (Meroni 2007) has also emerged. This notion refers to self-organized groups of citizens who invent and drive solutions to cope with everyday issues ranging from childcare to home maintenance. These initiatives often develop into collaborative services (Jegou and Manzini 2008). Creative communities depict a different figure, which is neither the lead user, being rather experts of the everyday (Meroni 2007), nor part of the creative class, as creativity here is not intended as a characteristic of the restricted elite, but rather as a diffused potential (Meroni 2007). Another interesting aspect in contrast with other notions describing the change of the users' role, is the focus on the collective rather than the individual (Meroni 2007). The idea of creative communities also represents an effort to move beyond understanding the role of the 'former-users' only in light of being a consumer, considering how users could become also co-owners, gaining responsibility over production processes and eventually question the way in which products are made and service delivered.

As already pointed out, in order to support former-users design and production activities, a number of platforms have been emerging for the collaborating and sharing of tools, skills and knowledge. They take on diverse forms ranging from online platforms (such as repositories or tools for collaboration) to physical locations, with access to machines and services for production. These platforms range from self-organized, grass-root initiatives to commercial services offered by companies. They promote collaboration to diverse extents. In some cases, this happens only between final users, as Facebook does, but it may also be between participants and companies, for example, in the case of Linux and most of open-source software.

However, they also imply diverse ways and levels of collaboration, from simply sharing existing information and knowledge to support co-creation by providing tools and spaces, such as GitHub (an online tool for open-source projects) does or physical locations such as co-working facilities or shared workshops such as FabLabs, makerspaces and hackerspaces.

These platforms function, usually, in one of two possible ways. Grassroots platforms are often organized as commons, with production activities being partially dedicated to the construction and maintenance of the platform itself. Here, sharing facilities, technologies and knowledge is a strategy to lower the threshold of accessing and maintaining technical equipment and knowledge, but it is also an opportunity to foster encounters and collaboration between diverse actors. These platforms may present diverse levels of openness often relating to their level of rivalry; therefore, online initiatives tend to be easier to access than, for example, hackerspaces.

Another possibility is having a company or a third party develop a platform that provides possibilities for collaboration and sharing to the participants. Here, different models can be at play, from commons, to private property regimes with diverse degrees of openness. Usually, the provider of the platform retains ownership over it, and then, when it comes to its use, maintenance, and access, diverse models can be at play. Even in the case of platforms which are strictly controlled by the producers, with the latter, for example, retaining ownership over users' information and content produced, these platforms are still dependent on users' contribution for their sustainability. This means that the relationship between users and producers becomes tighter, with producers shifting from delivering finite products to becoming a partner for users' production process instead. The notion of partner has been used by Orsi (2009) to describe the possible role of public institutions in a commons-based regime as structures supporting citizens' possibilities of participation in democracy as well as having an active role in reducing inequalities. Similarly, producers can be understood as partners empowering former-user activities. The notion of partner-producer is more nuanced than the one proposed by Orsi (2009). The notion of partner-state is intrinsically positive,

with the State becoming an enabler of commons and citizens. The partner-producer's position, instead, is slightly more problematic as co-production can be both a matter of empowering users, but also harvesting their contribution.

The opening of production creates new possibilities even for the more traditional producers, according to the model of the long-tail market (Thrift 2006, Anderson 2008), where the Internet allows for small-players to access and aggregate dispersed niche markets. The growth of the makers' movement and renewed attention towards local production is shedding new light on artisans and small-scale producers. Crafts are no longer perceived as an immobile and nostalgic practice; they are now often celebrated as at the forefront of new patterns and models for production with the capability for combining the uniqueness and quality associated with crafted products with new opportunities of co-production. The Internet is increasingly populated by commercial platforms dedicated to crafters and other initiatives which, by connecting small-producers, designers and clients, allow one to find (and sometimes invent) new markets and possibilities for non-industrial production.

The result for designers is that they are not required to create finished products, but rather, shape solutions that allow former-users to directly design and produce. Specifically, the opening of production is a matter of design-after-design or how to design to create the possibility for others to design (Binder et al. 2011). Design-after-design raises technological and social challenges which play a central role in several design fields.

The field that has the longest tradition in supporting others' design practice is participatory design (PD). As already explained in section 7.5, since the '70s, PD has developed approaches to establish collective design processes aimed at involving users in the development of technologies and products that can better serve the needs of workers (Simonsen Robertson 2012). Starting from the ideal of bringing democracy to the workplace (Simonsen Robertson 2012), PD developed practices, theories and approaches to foster collaboration between designers and other stakeholders, trying to understand how

design could support collective creative efforts. These processes often generated meaningful artifacts, leading to more committed workers and more efficient work processes (Simonsen Robertson 2012); thus, PD approaches and ideas have begun to travel and be embraced in diverse design fields (interaction design, service design), being more generically defined as co-design (Sanders and Stappers 2008) and losing on their way the initial political driver.

In service design, the opening of production represents a key feature, since services are co-created in the interaction between producers and users (Meroni and Sangiorgi 2011). Co-design is often used in service design as a way to navigate the complexity of designing services by including final-users and service providers (Meroni and Sangiorgi 2011). Co-design has proved to be particularly useful in transformation design (Burns al. 2006) where service design and participatory approaches have been used to create new solutions to tackle social issues that span from the health sector to education.

Co-design is considered a basic approach even in design for social innovation, where the designer is seen as the facilitator with the ability to empower the emergence of social innovation that is products, services, new relationships that meet social needs and enhance society's capacity to act (Murray et al. 2010). Co-design is at play in fostering the creation of networks which bring together stakeholders belonging to diverse sectors (public sector, business branch and NGOs) but also supporting the development of grassroots initiatives through the establishment of enabling platforms, infrastructures of people, and tools with the ability to respond to the meta-technological demands of social innovation (Jegou and Manzini 2008).

Another field which is affected by the opening of production is Interaction Design, which is mainly concerned with the technological aspects of design-after-design: end-user development (Burnett and Scaffidi 2013) looks at how former-users design and produce, and meta-design (Fischer and Giaccardi 2006) is concerned with the development of platforms that could foster users in going from being 'couch potatoes' to active designers (Fischer 2002). However, the interest is not only around programming and information-based forms of production but also tangible processes. The open-

source microcontroller Arduino represents arguably one of the most successful examples of platforms for design-after-design.

Finally, newly-created Open Design (Van Abel et al 2011) explicitly focuses on how to empower former-users both on-line and off-line. Open Design is strongly connected to the tradition of open-software and, therefore, considers open-source patterns and creative commons licenses over products and drawings as key factors for the opening of production, together with the creation of physical infrastructures.

9. Issues and dilemmas in the future of opened production

In section 7 different scenarios about the opening of production have been presented. This section focuses on the issues and dilemmas emerging in relation to these futures.

9.1 Maintenance and provisioning of the commons

When it comes to commons-based production, several authors have outlined how, even if it could represent a possible alternative model to capitalist production, it is at the moment very much dependent on it (Benkler 2006, Bauwens 2007, 2009). Participants in commons-based, peer-to-peer production are always earning a living 'on the market' (Bauwens 2007, 2009). The main challenge is, therefore, how to make commons-based, peer-to-peer production able to provide for its participants. The complexity of such a challenge especially emerges when considering the shift from intangible to tangible forms of production.

Information and knowledge represent non-rivalrous goods, which means that they can be involved in diverse applications at the same time (Ostrom 1990). If a programmer uses a piece of code found on the web for generating a program, she does not lessen the possibility for another individual to utilize the same piece of code at the same time in another production process. Knowledge and information

are also durable goods, meaning they do not degrade throughout the production processes; a piece of code does not get worn out by being used again and again meaning that, in principle, there is no maintenance cost for the good itself because access to and provision of these goods require an infrastructure which, on the contrary, needs resources for its construction and maintenance. This clearly emerges in intangible, commons-based production where access to the code requires an Internet connection and working on-line platforms and repositories, revealing how time, as well as material resources are required.

In the shift towards production processes where tangibility is a prominent feature, things become even more complex since tangible goods are rivalrous and present diverse degrees of durability (Ostrom 1990). For example, a 3D printer is a rivalrous good since it can only print one object at a time and, consequently, being involved in only one production process at a time. In time, its components will wear out and eventually break down. Durability is even more critical if raw materials are considered: the plastic thread used by 3D printers can only be used once. In order to re-use it, the previous printed objects have to be melted down and the filament has to be regenerated through a process, which is costly in terms of energy, time and the means required. Moreover, every time a plastic product is recycled, it progressively loses its physical characteristics, making it useless after a number of cycles.

Rivalry and durability highlight how, in commoning tangible production processes, a main issue is how to maintain and provide for the commons. Ostrom (1990,1999) in addressing this issues, details the importance of having defined boundaries both in terms of the resource as well as when it comes to the participants (Cox et al. 2010). As already mentioned, these criteria may be problematic when it comes to open-commons due to the central role that open-access plays in their definition and livelihood (Benkler 2006, 2013, Rodotà 2013). This implies having loose boundaries and low-barriers for participants. Such a way of managing commons is often facilitated by the fact that open-commons are comprised of mainly non-rivalrous and durable goods such as information and knowledge. Even though, open-commons are often non-rivalrous and durable goods, the question of how to maintain and to provide for them still remains.

9.2 A very fine line between empowerment and exploitation

There are also a number of issues related to free-riding the commons as well as misuse of the shared resources. Beside a number of examples with external companies harvesting processes and results of commons-based, peer-to-peer production efforts (O'Mahony 2003), a tricky situation might emerge also in relation to partner-producers. As stated, partner-producers are involved in managing and driving platforms supporting co-production activities and end-users' production and design activities. Examining in detail how such platforms work, it seems that empowerment and exploitation are often two sides of the same coin. A central issue is, for example, related to open innovation and platforms supporting former-users' activities. Here, partner-producers both offer the possibility for end-users to emerge and show their talent, as well as benefit from end-users work and efforts (Bauwens 2009). Such a situation becomes particularly problematic when considering platforms where companies or other organizations launch challenges that former-users are invited to address with new ideas and solutions. Here, end-users' work, when rewarded, is only rewarded a posteriori, and may not necessary be paid; sometimes, it is a matter of providing visibility and social capital. In this latter option, often ideas and proposals are treated as commons. However it is debatable if all the commoners are equal and who earns the most out of these platforms: former-users who participate with the hope of getting fifteen minutes of fame or the partner-producers who can capitalize on the reputation they gain through the platform, as well as on the commons generated by former-users (Bauwens 2009). Although former-users are not completely powerless, as pointed out, platforms depend on their contribution for their sustainability, which provides them with some space for negotiation, as it emerged in 2009 when Facebook was forced to backtrack terms of use after users' protests¹⁴. Former-users are growingly concerned with how partner-producers manage platforms, as it emerged in 2012 with the Thingiverse affair. Thingiverse is an online repository of 3D printable objects, driven and managed by Makerbot, a 3D printer manufacturer with a reputation as a leading actor of the open-source scene. In 2012, the company partially changed the terms of use of the platform and, some months later, released a 3D printer that was not completely open-source. This

¹⁴ http://www.nytimes.com/2009/02/19/technology/internet/19facebook.html?_r=0

led to a massive protest called “Occupy Thingiverse”, where users strongly questioned the change of terms and which was led by one of the former founders of Makerbot, Josef Prusa. It also generated a major discussion¹⁵ around business models of open-source hardware companies and to the ethical, but also economical, consequences of open-source projects enclosing the commons.

9.3 The myth of the amateur?

Another issue emerging in relation to the role of end-users and the expectations around them is what can be defined as the amateur myth. The invention of the mountain bike (Von Hippel 2005)— with a group of riders in California getting together and constructing bikes to ride off-road on hills and mountains, and eventually inventing a new sport— is considered as an example of how grassroots initiatives can lead to innovation and new business opportunities. However, it also opens a number of issues. The first one concerns the boundary between leisure and work. Although the idea that, in her free-time, the amateur develops the next technological innovation (Von Hippel 2005 Anderson 2012) is empowering, it also erodes the division between work and leisure since, in this perspective, every hobby activity could be regarded as a potential professional occupation. A similar issue seems to emerge also in collaborative economy, where the tension is between gaining a complementary income or improving your social relations, and the systematic commodification of people’s time and possessions.

Moreover, as already pointed out, it is important to remember that the idea of democratic and open innovation still concerns a very small portion of the entire population who has the skills, time and resources to invest in these side activities (Björgvinsson et al. 2010). Even if the notion of creative communities opens up the discourse for what kind of innovation can be valuable and who can be involved, there are still (as it emerges also from the engagements on which this thesis is based) huge issues in relation to who gets to participate, to which extent, and what even counts as innovation.

¹⁵ more information on this can be retrieved at: <http://blog.hackerspaces.org/2012/09/23/the-makerbotthingiverse-move-to-the-dark-side/>
<http://hackaday.com/2012/09/20/makerbot-occupy-thingiverse-and-the-reality-of-selling-open-hardware/>
<http://marcuswolschon.blogspot.se/2012/09/occupy-thingiverse.html>

Moreover, even for those who get to participate, a number of issues seem to emerge in relation to democracy. Crowdsourcing is often celebrated as the solution that allows to jump over the bottlenecks related to finding resources for a project. One of the most celebrated cases is the one of Amanda Palmer, a music artist who, in 2012, crowdfunded the registration and production of her album¹⁶. Although, other lessons emerge from the case of the movie *Nasty Old People* which, in 2009, became the first movie distributed for free under creative commons license. The making of *Nasty Old People* reveals how, for crowdfunding to work, it may require a disproportionately huge effort to get the necessary visibility and exposure, as well as construct and feed a strong relationship with a potential public, ready to donate and support such a project (Björgvinsson forth). So even between those who have the possibility to participate in democratic and open innovation processes, there are initial conditions that make some former-users more equal than others.

Other issues around former-users' design and production activities are in relation to the outcomes of such practices. For example, there are a number of technical and ethical concerns related to liability: who ensures and is responsible for the safety of open-source products such as medical equipment? (Cruickshank and Atkinson 2013). Ethical issues are also emerging, as the ongoing discussion about 3D printed guns is currently revealing¹⁷. Another central concern is whether fabrication machines empower a more sustainable production-consumption system or, rather, feed the mass-consumption mechanism (Kohtala 2013b). Concerning this, it has also emerged that spaces for opening production, aside from their bespoke interest towards sustainability, often struggle with how to address such an issue (Kothala 2013a).

Moreover, when looking through online repositories of user-generated files for grassroots manufacturing, most of the examples are small-scale gadgets that seem to have limited innovation potential. Though, it may be fair to remember that fabrication technologies are, at the moment, in what can be defined as at the peak of inflated

16 http://www.ted.com/talks/amanda_palmer_the_art_of_asking.html

17 <http://mashable.com/2013/12/02/3d-printed-guns-law-renew/>

<http://www.forbes.com/sites/andygreenberg/2013/11/14/3d-printed-gun-stands-up-to-federal-agents-testfiring-except-when-it-explodes-video/>

<http://www.theguardian.com/world/2013/dec/04/3d-guns-house-renew-prohibition-plastic-firearms>

expectations (Gartner 2012); to really appreciate their potential we will have to wait five to ten years.

9.4 Going local and small: the risks of neo-medievalism

A number of issues emerge around localism and the celebration of small-scale, located production. A recent publication (Sharzer 2012) sums up many critical issues and limits in going local. Specifically, Sharzer discusses how local production is neither, at the moment, more ethical nor more environmentally sustainable than mass production, nor more economically fair or stable in the long run (Sharzer 2012).

Even the idea of commons as a way to reorganize society on more local and fair basis presents a number of issues. Firstly, there is the fundamental, practical problem of how to move from a capitalist system to a commons-based one. The second issue is that, even if such a system could be established, it is difficult to understand to which scale the commons would be managed and who should be involved. Rodotà (2013), a prominent commons scholar and activist, warns about the myth of societies organized around local-based commons moving beyond the state. According to him, the risk is neo-medievalism: a progressive fragmentation of the society in self-sufficient closed communities which may end up fighting with each other in the name of protecting their own commons (Rodotà 2013).

9.5 Infrastructures for commoning: struggling towards economies of scope

A final set of issues, which is particularly central in this work, is in relation to the sustainability of the infrastructures that make the opening of production possible. As already pointed out in commons-based, peer-to-peer production, a central question is how to provide and maintain commons over time, particularly when it comes to rivalrous and non-durable resources.

Looking at the feasibility of information and knowledge-based forms of commons-based production, two elements play a central role: the infrastructure (i.e. the Internet) and the means of production (i.e. personal computers). The Internet plays a central role in enabling commons-based intangible production processes because it lowers

the costs related to accessing, processing, and sharing information which represents the key resource in intangible production processes. Moreover, the distributed nature of the Internet eases participation, facilitating the spreading of production processes. The actual processes of production are carried out through personal computers that, exactly like the Internet, are characterized by the ability for multiple uses at the same time: sending work email, playing online games, chatting with a friend, and participating in production processes. Thus, the cost of purchasing and maintaining a personal computer is spread across diverse uses and this dramatically lowers the threshold of participation to commons-based production processes. The feasibility of commons-based production in intangible forms is related to the fact that few resources are required to participate, since it can basically be performed through infrastructures and means of production that are acquired for, and sustained through, other uses.

A major factor ensuring the sustainability of intangible commons-based production is that it allows for so-called economies of scope. There are two ways for writing off costs of production, either by reaching scale—increasing the quantity of one type of production—or by increasing the scope, which means to use the same equipment for diverse purposes. Economies of scope look for possibilities to involve the same means of production in diverse processes, spreading costs for acquiring and maintaining the equipment on a range of activities (Panzar et al. 1981).

In tangible commons-based production, when it comes to infrastructures, the economies of scope's pattern is often forgotten. Here, the discussion (and examples) focus on how to replicate the distributed nature of the Internet through the creation of a network of physical spaces for opening production through which users can access shared technology and collaborate beyond location constraints (Gershenfeld 2005, Carson 2010). Few discussions have been held about the actual self-sustainability of these hubs, how to manage and maintain them as commons (Troxler 2013) and to which extent economies of scope (as supporting a variety of uses and holding diverse interests together) could play a role in the viability of tangible commons-based production. Further, spaces for opening production have problems not only when it comes sustainability, but also in their

role as infrastructures. A survey on FabLabs concludes that “The labs were primarily offering infrastructures to students, and they were relatively passive in reaching out to other potential users. They had so far created a limited innovation ecosystem, which got used rather rarely.” (Troxler 2010 p. 9). More recently, FabLabs have even been declared dead (Zijlstra 2013) due to their failure in developing meaningful relationships with actors in their own local context, as well as failing to promote the sharing of knowledge and information around production on a global scale.

10. The engagements: two infrastructures in the swamp

At this point, it is now possible to introduce the engagements in more detail and position them in the swamp. As previously stated, this work is based on two main engagements, the work with Fabriken and the collaboration with Herrgårds Women Association within the frame of Malmö Living Labs (MLL) as well as one minor experiment, the establishment of Connectivity Lab (CL).

Both MLL and CL can be looked upon as infrastructures for the opening of production, whereas Fabriken and CL relate mainly to practices of commons-based production and open and democratic innovation. In further contrast, the Neighbourhood activities are mainly woven with the notion of the opening of (re)production and sharing economy. However, before looking specifically at the two engagements, it may be worthwhile to describe the city where this work is being developed, Malmö, Sweden.

10.1 Malmö: a city in the opening of production¹⁸

The context in which the two engagements have developed is the city of Malmö and two of its neighborhoods in particular, Västra Hamnen

¹⁸ This section strongly builds on the content and the reasoning developed by Ehn P., Nilsson E., Topgaard R. (forth), Introduction in Ehn P., Nilsson E., Topgaard R. (eds) *Making futures, marginal notes on innovation design and democracy*. Cambridge, MA: MIT Press.

and Rosengård. This section provides some general background information regarding Malmö and how this city relates to issues and challenges which are depicted when discussing the landscape of the opening of production.

In 1995, the city newspaper came out with a slogan for their advertising campaign: “Haur du sitt Malmö haur du sitt varden” (trans: *If you have seen Malmö, you have seen the world*). A very bold statement to describe a city with half a million citizens situated in the very south of Sweden. Although, upon closer inspection, what might sound like an ironic claim, may actually be true as the challenges the city has had to face, and is currently facing, resemble the ones that many other cities around the world confront. In the 20th century, Malmö has grown as an industrial city, attracting workers from all around Europe to work in its shipyards and harbor. In the ‘80s, like in many other industrial cities in the world, companies started downsizing and moving production abroad. Such a crisis was further amplified by the financial difficulties that affected Sweden in the early ‘90s. In those years, the seeds for Malmö’s current state were planted: the establishment of the University, the construction of the bridge connecting Malmö to Copenhagen, and the transformation of the old harbor, with knowledge workers and ICT companies progressively taking the place of welders, metalworkers and shipyards. The city simultaneously continued to attract people from abroad. As from 2011, Malmö has representatives of 175 different nationalities (Malmö Stad 2011) and one-third of its inhabitants are born abroad (Malmö Stad 2012).

Today, Malmö is known for its efforts and achievements in becoming a climate-neutral city but also, on the other hand, for being a segregated city with life expectancies varying up to seven years from one neighborhood to another (Stigendal and Östergren 2013), and with periodic riots and violence exploding in its peripheries.

In this perspective, Malmö condenses in a relatively small town the challenges that many larger cities in the world face relating to how to attain social, environmental and economical sustainability. The city can be considered as a backdrop for these challenges and how they

relate to different ways of understanding what counts as innovation and futures in economy and production.

This emerges particularly strongly when looking at the two neighborhoods where the engagements are situated. On one side, there is Västra Hamnen (where Fabriken and Connectivity Lab are placed), which is the former shipyard area now hosting the university, ICT and media companies, as well as being one of the most environmentally-sustainable neighborhoods in the world. In contrast, on the other side, Rosengård (where HWA operates) is an area built in the '70s with a huge complex of apartments housing 20,000 people of which 86% have a foreign background (Malmö City 2007).

In Västra Hamnen, ideas such open innovation, ethical and sharing economy seem to be the driving force, most of the time leaning toward the market and rarely becoming a matter of commons-based, peer-to-peer production. Just 8 kilometers away in Rosengård, the situation could not be more different; high levels of unemployment (Malmö City 2007) and poor living conditions (Stigendal and Östergren 2013) seem to leave very little space to discuss about alternative futures, with degrowth not being a conscious choice, but rather a forced condition. However, to a closer look, Rosengård is also a place where alternative forms of economy and production are actually at play, with mutual support and care-related forms of production having a major role.

10.2 Fabriken and Connectivity Lab: infrastructures for tangible production

When it comes to Fabriken and CL, it could be said that they belong to the family of the shared machine shops which includes a number of diverse formats of facilities offering access to production means and knowledge, such as FabLabs, makerspaces and hackerspaces. Hackerspaces are community-driven spaces where people interested in technology share tools and knowledge to experiment with physical production according to the similar values and aims which drive FOSS (Hackerspaces 2013). The concept of FabLab was developed at MIT with the aim of creating an open-source infrastructure for learning and experimenting with personal fabrication machines. The format of FabLab is rapidly spreading all around the world, as spaces

where it is possible “to produce (almost) anything” (Gershenfeld 2005). FabLabs are often supported by larger institutions, such as universities or foundations, since they tend to present issues of self-sustainability and participation (Troxler 2010, Zijlstra 2013). More recently, makerspaces (e.g. Open Design City in Berlin¹⁹, Los Angeles MakerSpace²⁰, MT.Elliott Makerspace in Detroit²¹) are also emerging as infrastructures where fabrication machines are paired with more traditional equipment for crafts and small-scale production. Makerspaces are often community-driven and they aim for broad participation. There are also spaces working more as incubators, such as Techshops²² focusing on fabrication machines, or spaces like the Artisan’s Asylum²³ focusing on crafts. Other spaces are backed up by ICT industry, such as Kitchen Budapest, which is financed by the Hungarian Telecom industry, others by academia, such as the New Factory in Tampere. These latter examples are embracing open and democratic innovation paradigms with the aim of generating new products and services for the market.

The work with Fabriken and STPLN represents the main engagement on which this inquiry is based. It provides insights in relation to what kind of production may be entailed by commons, how they can be organized when participation is transient and diverse interests are at play. It also provide insights in relation to commoning as it becomes possible to see how openness, collaboration and sharing may change over time. In regard to possible presents, or prospects, Fabriken and STPLN provide some insight into the challenges for commons-based, peer-to-peer production forms.

When it comes to Connectivity Lab, it provides a number of insights in relation to how openness, collaboration and sharing can be at play for not creating commons.

10.3 The Neighbourhood and HWA as enabling platforms

The Neighbourhood is closer to another infrastructure repertoire connected to the notion of social innovation, the one of enabling

19 <http://opendesigncity.de/>

20 <http://lamakerspace.com/>

21 <http://www.mtelliottmakerspace.com/>

22 <http://www.techshop.ws/>

23 <http://artisansasylum.com/>

platforms (Jegou and Manzini 2008). Enabling platforms can consist of services, networks, and incubation facilities able to support the emergence of social innovation (Jegou and Manzini 2008). The notion of enabling platforms mainly focuses on how to support creative communities (Meroni 2007) which represent self-organized, bottom-up initiatives driven by citizens who organize themselves in response to specific challenges related to their everyday lives. Recently, the design field has also introduced the notion of Public Innovation Places (Manzini and Staszowski 2013), recognizing the importance of connecting grassroots initiatives to more established actors in the public sector as a way to promote the spreading of social innovation. The relation between bottom-up initiatives and top-down structures is seen as a fundamental feature in the development and spreading of social innovation, where the metaphor of *'the bees and the trees'* has been formulated (Murray et al. 2010). The bees represent the 'bottom-up' initiatives—they move quickly, cross-pollinate, and develop initiatives to respond to local needs. The trees represent the conservative and stable structures that are slower, but have the potential and resources for the further development an idea or initiative (Murray et al. 2010).

The Neighbourhood started out as an enabling platform; however, in time, the importance of engaging civil servants and more established actors for the diffusion and thriving of grassroots initiatives has emerged (Hillgren et al. forth).

Even though HWA is just one of the cases of the Neighbourhood Lab, it brings up several issues and dilemmas surrounding creative communities. In particular, it highlights what role enabling platforms and Public Innovation Places can play in boosting creative communities, and also in supporting the emergence of new relationships and collaborations between them and more established actors, both in the public and business sectors.



Figure 5 Infrastructures for opening production



6(a)



6(b)



6(c)

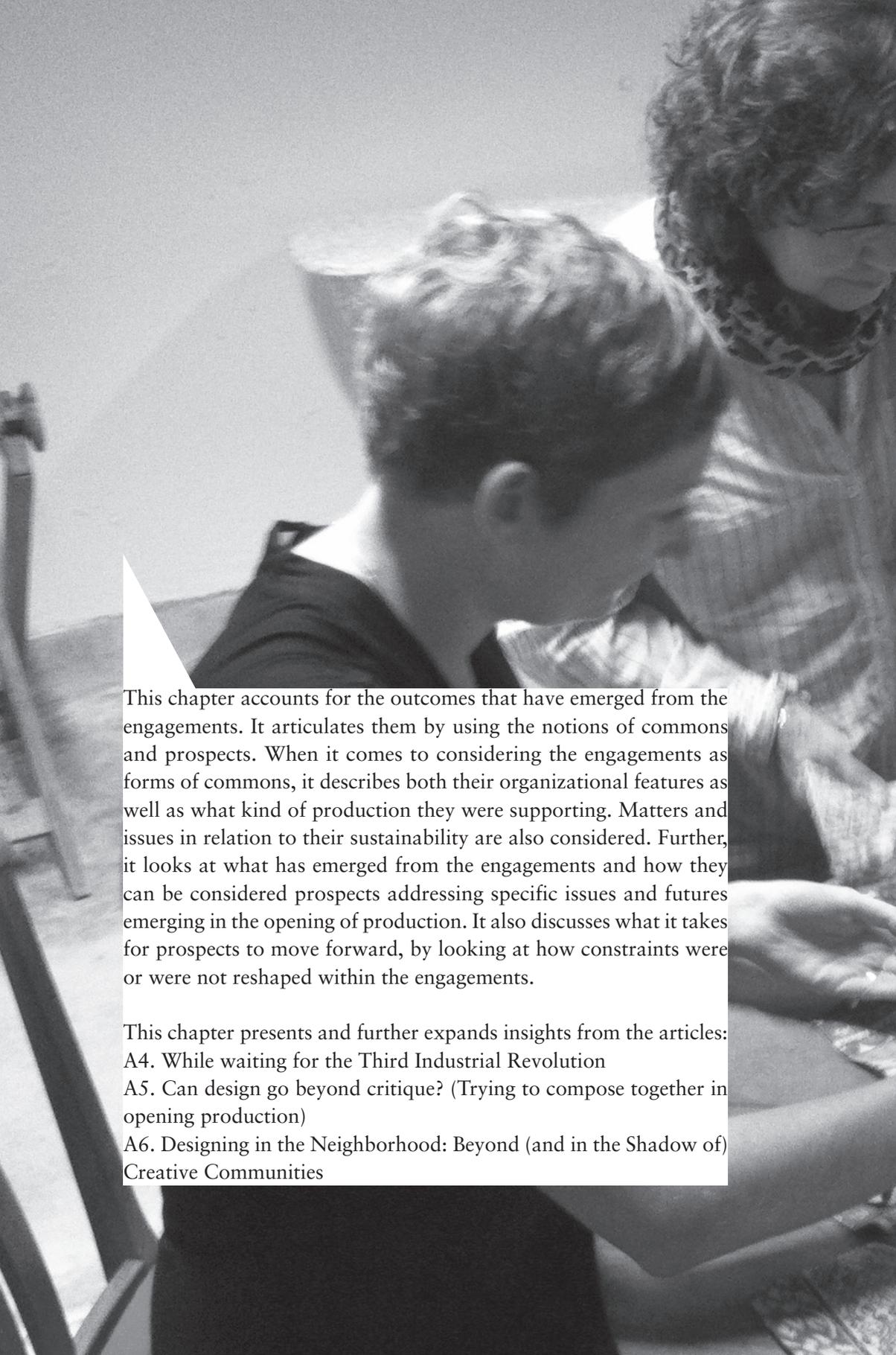


6(d)



6(e)

Figure 6 Enabling platforms
6(b) photo courtesy of Per-Anders Hillgren



This chapter accounts for the outcomes that have emerged from the engagements. It articulates them by using the notions of commons and prospects. When it comes to considering the engagements as forms of commons, it describes both their organizational features as well as what kind of production they were supporting. Matters and issues in relation to their sustainability are also considered. Further, it looks at what has emerged from the engagements and how they can be considered prospects addressing specific issues and futures emerging in the opening of production. It also discusses what it takes for prospects to move forward, by looking at how constraints were or were not reshaped within the engagements.

This chapter presents and further expands insights from the articles:
A4. While waiting for the Third Industrial Revolution
A5. Can design go beyond critique? (Trying to compose together in opening production)
A6. Designing in the Neighborhood: Beyond (and in the Shadow of) Creative Communities



3. COMMONS AND PROSPECTS

11 Fabriken and HWA as commons in the opening of production

This section accounts for why and how the engagements can be considered commons in the opening of production and what they are generating.

Both Fabriken and HWA are characterized by openness, sharing and collaboration aiming at value generation. Fabriken opens up processes of material production providing the possibility for former-users to engage in the making of artifacts. Sharing is at play both when it comes to the space and production equipment, as well as with skills and knowledge. As a consequence, diverse forms of collaboration can be observed between participants and their initiatives. The HWA opens up possibilities for a specific group of former users (i.e. non-Swedish women living in a specific area of Malmö) to engage in diverse forms of production, from catering to crafts, but also for skills-acquisition and knowledge production. The possibility of performing such processes depends on the women collaborating and sharing resources, knowledge and time.

Fabriken and HWA are commons for value creation in the opening of production; they entail new roles for citizens, NGOs, and civil servants. They perform production practices that merge together the creation of artifacts with the development of skills and social bonds.

11.1 What kind of production?

When it comes to Fabriken, the activities happening in the space resemble forms of personal, small-scale production and, more specifically, do-it-yourself (DIY) and crafts practices. The former entails processes where making is seen as a way to re-appropriate production, a possibility of learning by doing and acquiring skills, as well as a form of self-expression and creativity. Moreover, do-it-yourself at Fabriken often entails collaboration and the generation of social bonds, resembling what Gauntlett (2011) defines as ‘do-it-together’ (DIT).

The notion of crafts (in the definition formulated by Greenhalgh as a consortium of genres that makes sense together for artistic, economic and institutional reasons) (2003) refers to practices which do not differ much from do-it-yourself activities, since they also generate skills and knowledge and they can eventually also be driven as a collective practice. However, crafts distinguish themselves from do-it-yourself practices, due to their focus on the quality of the output and on the generation of use value which is the concrete way in which a thing meets human need, or it is functional in satisfying a specific need (Harvey 2010). While in DIY or DIT, the focus is on the making per sé, in crafts there is an additional focus on what is generated, on the quality of the output.

Similar patterns characterize HWA activities, which mainly resemble do-it-together practices. Cooking and crafting (for example, carpet weaving) become ways for the women to get to know each other and generate social bonds, as well as to value each other's skills and competences. In HWA's production activities, the generation of social connections is always a central aspect not only between the members, but also in relation to external actors and clients. The relational qualities of HWA have emerged in diverse occasions as a very peculiar characteristic of this group, who seems to be very skilled in generating and maintaining its social capital. By working with them and trying out a number diverse constellations, we noticed how, despite the language difficulties, the women can easily bond with diverse kinds of stakeholders.

When it comes to the motivation driving production at Fabriken and STPLN, practices are rarely aimed at generating goods for the market; often, it is about production for personal use, or individual/collective explorations of technologies and techniques. Quite often production activities are also framed as part of professional practice, for example, architects laser cutting models, or sound artists building instruments for their work. Within HWA, production for the market is more present, since the women are running a catering service and, lately, have been experimenting with the possibility of selling hand-made bags and other products in crafts shops.



Figure 7 Do-It-Yourself practices at the Grannies workshop

In both the engagements, it emerges how production activities within Fabriken/STPLN and HWA is only partially a matter of generating new products and services and mainly a way of acquiring and proving competences and developing social connections. By working with HWA, the invisible work they do for the well-being of their local community has slowly emerged: supporting the members in times of family crises, engaging children in their events and routines, actively intervening in quite delicate matters, as when they acted as a mediator in a case of forced marriage by ensuring support to the bride who did not want to get married, and by mediating between the families to solve the controversy.

Once the kinds of output the commons generate are described, it becomes possible to examine who and what is involved and how the commons is organized.

11.2 HWA as a commons: consensus, collective identity, the premises

When it comes to HWA, they resemble a more traditional commons as they are characterized by symmetrical access to, and production of the common resources, as well as conducting a consensus-based mode of governance. Specifically, HWA commons is organized according to the level of participation. The core group consists of the most engaged women who make decisions and lead the association. Around it, there is a network of less-committed participants who engage in relation to specific activities and interests. In the core group, decisions are made on a consensus basis and all the members have equal status. All HWA core members have the same decisional power, but they have very different roles based on their interests and skills. While Jila is in charge of coordinating the association and speaking with external actors (as she is the more skilled in Swedish), Alima is in charge of the crafts activities, and Aisha handles the catering. At the same time, each of them follows and participates in all activities. With HWA, it clearly emerges how being a collective is a strategy to overcome a number of barriers in driving their activities: such as poor Swedish, lack of confidence or family duties. The collective way of operating eases the burden and allows them to step in for each other; for example, when family duties may hinder possibilities for participation. Their organization and way of working might seem redundant and slow,

but it actually works quite well for the women, ensuring them the possibility of participating despite language issues, lack of confidence, and pressure and control from their families.

A very important element in HWA commons is the premises, the space where they meet and drive their initiatives together. Even if most activities are carried out in the women's homes (e.g. cooking for catering orders), the premises play a central role as the space where the women regularly meet, store materials, and spend time drinking tea and chatting. The importance of the premises for HWA strongly emerged when, in June 2011, an unknown arsonist set it on fire. The women lost everything and were very distressed. In the aftermath, they worked very hard to find a new place since having the possibility to meet everyday plays a central role in ensuring the NGO's existence.

Collective groups versus peer-to-peer networks?

In working with HWA, some issues in relation to consensus-based, collective commons emerged when trying to relate to other organizations. Such an issue emerged when trying to stage a collaboration between HWA and the Mike Network, a Swedish women's organization providing peer-to-peer support to their members. Such a process was mediated by MakeItReal, an on-line platform aimed at matching people and projects. This attempt brought up a number of different issues; in particular, the clash between the collective nature of HWA and the focus on individuals within the Mike Network.

MakeItReal set up the process with the aim of creating groups which mixed women from the two organizations. These groups were formed around a specific interest with the goal of developing a project. The process seemed to work well until it had to be put on hold by the dramatic fire that destroyed HWA premises in June 2011.

This break allowed some issues to emerge: some women of the Mike Network complained about the low commitment of HWA members in the process, since they were not present at all the meetings, they were often late, and they were not very active in formulating and developing the proposals. When it came to HWA members, they

were extremely worried as they felt that splitting up into separate groups was endangering the NGO, as their collective nature was put under threat.

With MakeItReal, we discussed the possibility of modifying the process to adjust to the collective nature of HWA, but they responded in a negative way. In their view, the group was not a support to the women, but rather a hinder in expressing their full potential as individuals. Supporting the collective nature of HWA would have meant, according to them, to perpetrate a disempowering situation. MakeItReal's perspective was looking at HWA commons as a close and conservative structure in which, for the thriving of collaboration and the shared resources, it is important that roles and tasks are maintained in time. Therefore, when confronted with the more individual focal structure of the Mike Network, it may appeared that some of HWA members are 'stuck' in roles that do not allow them to express their full potential. Another issue relates to the consensus model on the basis of which HWA operates which makes decision-making and organizational development extremely slow. However, on the other hand, HWA commons is also very rewarding for its members, providing them with ownership, confidence and inclusion, as well as offering some of them the possibility to carry out activities that they would never do otherwise. Although a few HWA participants could potentially get a job as an 'individual', most of the participants in the group would not even leave their homes if it was not for the collective.

In relation to commons, this opens up for nuancing between collective and consensus-based structures and more peer-to-peer, individually-based ones. Moreover, it brings forward a central question: to which extent is it possible to have the advantages of consensus-based collectives commons without their disadvantages? How can commons be organized according to a structure which evolves in time, providing individuals the possibility to change roles? Some insights in relation to this point emerge by looking at Fabriken.



Figure 8 HWA and the Mike Network women at work

11.3 Fabriken commons, form 1: transient participation, lack of consensus, and the NGO as a partner

When it comes to Fabriken, it becomes important to distinguish between two modes of commons which have been at play. This section accounts for the first one and section 11.4 details the second one.

In the first mode, when it comes to the kinds of resources that were held together, similarly to HWA, they were various: from skills to machines. In Fabriken, tools and machines were available to everyone, with the exception of the laser cutter and the CNC mill whose keys were placed in a ‘secret’ drawer in one of the storage rooms. To be able to use them, it was necessary to come on a Thursday evening and learn from the more-experienced participants. Similarly to HWA, these diverse resources were used in various practices: building furniture, sewing clothes, experimentation with electronics, laser-cutting pieces for architecture models, etc.

The main difference is that HWA always had the same group of people driving these diverse activities; in contrast, Fabriken involved diverse participants.

A core group within Fabriken was represented by the local hacker community who brings together a variety of people from programmers to electronic musicians. The space was also frequently used by representatives of Malmö's cultural and arts scene. Students from the Interaction Design program of Malmö University were also regulars in the space, but unlike other spaces for opening production, they represented quite a small group. It is difficult to categorize the rest of Fabriken's participants: all were interested in diverse forms of making and self-production, most of them were well-educated and, consequently, had fairly well-paid jobs; however, there were also some unemployed people and knowledge workers struggling to make a living. Fabriken was also a space for a few people on long-term sick leave who came to the space almost everyday mainly for tinkering and chatting. There were also three retirees, two engineers and a teacher regularly present in the space, driving diverse activities. Besides private individuals coming to the space in their spare time, Fabriken has also hosted two fashion design ateliers which have been based in the Textile Department and focused respectively, on textile design in a broad sense and on up-cycling old garments in particular. These initiatives were driven by people who had a regular occupation and who, in their spare time, were trying to build a career out of their passion.

An important note in relation to participation in the space is in relation to its transient and diverse nature. There were only few participants who had been consistently using the space since the beginning; most of them moved in and out. Moreover, participants did not share a common understanding of the space's purpose, since they used it for different aims. As explained in chapter 4, this was, in the beginning, deliberately supported in order to attract diverse practices and participants to the space. This meant, when comparing it with HWA situation, that participants also had, to some extent, the possibility to change and experiment with diverse roles in the space.

However, it also implied the need to have an actor able to weave together these diverse interests into a whole, as it was not possible to work on a consensus basis in this case. This entailed that the NGO played a central role as a partner-producer ensuring the functioning of the commons. In Fabriken, the NGO did not run or lead specific activities; rather, it provided support for the diverse projects and it ensures the preservation of the commons by intervening in disputes around sharing and by regulating access to the space.

In Fabriken, participants were given the possibility to co-own the premises. Since the very opening of the space, the idea was to involve participants in its management and reward the most active participants with a special status; for instance, getting the space's keys, achieving social recognition, or being given the opportunity to be involved in deciding what equipment to purchase. This led to a model of managing the premises where the NGO was taking care of the general functioning of the space while the participants focused on specific tasks directly connected to their own interests with, for example, skilled users taking care of the machines and leading courses in the space.

An interesting insight relates to the kinds of tasks these core participants were willing to take up. They seemed more interested in specific and quite complex activities (such as fixing the laser cutter) rather than the general management of the space (which became, consequently, a task of the NGO people). However, not all the participants were so actively engaged in the space; most of them were not involved in the maintenance of Fabriken at all. There were diverse layers and possibilities of participation that ranged from simply accessing and using the shared resources to actually engaging in their maintenance and educating newcomers.

An interesting aspect of the relationship between the NGO and the participants was how the latter could leverage on their presence as a way to negotiate with the NGO. The NGO is financed by the municipality based on the number of activities and people they are able to mobilize. Consequently, participants could exert power through their sheer presence, or rather with their absence. There

was a mutual interdependency between participants and the NGO. The former were dependent on the NGO for accessing the space and its basic management, and the NGO was aware that without participants, the premises were endangered.

The NGO role was particularly important when considering how, in Fabriken, a lot of projects were temporal and people easily moved in and out from the space. The NGO ensured the continuity of the commons while the participants in the space were changing. The role of the NGO was ambivalent. On one side, it certainly enabled commoning by facilitating sharing and collaborating between participants; on the other side, it could also be said that the organization running Fabriken hindered commoning as they retained the main control over the space management in order to enable participants in carrying out their activities by sharing the premises and the equipment.

It is important to remember that Fabriken is a commons inside a broader commons represented by STPLN's entire premises. STPLN works in a very similar way to Fabriken, involving individuals with temporal projects and the NGO, where the former perform production practices and the latter guard the shared resources.

A similar relationship can be found even between the NGO and the two long-term initiatives hosted in the premises, ReCreate and The Bicycle Kitchen. These two projects are hosted in the STPLN premises on a long-term basis in exchange for contributing to the activities and the running of the premises. In particular, the founders own the ideas and drive the initiatives, while the actual projects are formally owned by the NGO. This is because both initiatives received funding through the NGO itself. This situation implies that the in-house initiatives and the NGO are mutually bonded in a commons where the former is providing competences, activities, and human resources to run the initiatives, while the latter provides the financial resources to make such initiatives possible.

Issues with transient participation

As stated, Fabriken as a commons went through a major change, as the first mode began to present a number of issues and shortcomings.

Initially, the learning process and the skills-transfer was not regulated by a system since there were not very many newcomers, meaning that the more experienced participants had to spend only a couple of hours here and there to teach others how the machines worked. As time went by, the number of new people coming to space increased, and a need emerged: organizing proper courses around the machines, as it was important to establish a standard around what people needed to be taught (in order to do not ruin the equipment) and keep track of who attended the courses. Some of the most experienced participants took on, in a more formal way, the task of educating newcomers. This had to be done at the expense of the time they could dedicate to their own experimentations and projects, and there was no way of further compensating their efforts. This led to discontent as participants felt that they were investing a lot into the space without getting enough in return.

At the same time, it was difficult for newcomers to understand and accept the way in which Fabriken and STPLN worked. The idea of a commons, where everyone takes care of the space, seems difficult to grasp since it does not represent a widespread model. Participants often looked for ‘someone in charge’, on whom they could rely. The trickiest situation emerged with sporadic users: only by being in the space daily, you could realize the importance of cleaning up after yourself and putting the tools back in their place. This increased the regulars’ frustration, because they often had to spend time cleaning up someone else’s mess, but also had tools or materials disappear from the space. Moreover, as already explained, the space has been hosting a number of temporal projects, which implies that some participants may become very engaged for a while and then disappear from the space.

The issues emerging in Fabriken and STPLN can be partially explained when compared with Ostrom’s general design principles for sustainable commons (1990, 1999). Between regulars, sporadic users, and newcomers, there was an issue of fairness, meaning that there was no proportional equivalence between the effort invested by the diverse participants and the benefit they gained. The newcomers and sporadic users got a bigger benefit in proportion to the one that



Figure 9 Transient participation at Fabriken

the regulars received. This highlights how there might have been issues around how the rules of use and access were communicated to newcomers. Moreover, Fabriken was also missing a system to verify and sanction misuse of the shared resources (Ostrom 1990, 1999), as a consequence, this triggers the question of how to consistently allow for control over the commons and for sanctioning, when participation is transient or sporadic.

In Fabriken and STPLN, there was a clear tension between embracing new participants and allowing participants to change roles, and the intrinsic necessity for the commons to have defined boundaries (Ostrom 1990, 1999); specifically, boundaries between legitimate participants and non-participants (Cox et al. 2010).

Another interesting aspect is how, in trying to avoid free-riding and misusing the setting up of courses and systems to control access to the machines, it became something that actually made Fabriken more

difficult to access and threatened the role of the NGO as a partner. As regular users started to run courses and, for example, install a username and password system to run the laser cutter, it meant that they gained control over Fabriken resources and functioning, while the NGO's role as a partner was undermined. Paradoxically, what started out as a way to better regulate and facilitate access to space ended up making the premises even more closed.

11.4 Fabriken commons, form 2: from commoning with individuals to commoning between organizations

The discontent among regular participants and the NGO concern about difficulties for newcomers in accessing the space brought to decision of changing the way in which Fabriken was organized. In autumn 2012, the decision was to look for resources to cover the position of a lab manager, who would take care of the space and machines, run basic introduction courses and manage sharing in the space.

An opportunity emerged when, one of the researchers who was initially involved in Fabriken, decided to move in the space with his company. The company is the Swedish branch of Arduino²⁴ (Arduino Verkstad) whose focus is on how the open-source platform can be used for educational purposes. The idea was that Arduino Verkstad could have their offices in STPLN, in exchange for contributing to Fabriken: covering part of the salary of a dedicated technician, who would take care of the machines and courses, and contribute to the salary of one of the NGO's employees to take care of managing events and activities as well as the organization of the space. In addition, the idea was to introduce a membership fee that would provide participants access to the space, machines, courses and workshops. Such a membership fee would have been integrated with a credit system where participants, by working and engaging in the space, could gain credit that could be spent for accessing machines and attending courses.

Initially, this idea was discussed between Arduino Verkstad and the NGO and then brought up to Fabriken participants who seemed almost all in favour of its implementation. The actual implementation

²⁴ Arduino is an open-source micro-controller, one of the leading actors in the opening of production, see chapter 2.

of this new system happened after I moved out from Fabriken and STPLN, however through a series of interviews²⁵, I was able to get a picture of what happened during the implementation and running of the new organization.

In particular, the new system strongly influenced who could participate in the space, as well as their relationship with Fabriken. According to the project manager of Fabriken, the membership system has brought in new people opening up for designers and architects who were not very present before. The average age has also increased, being now between 29 and 40 years old. There is still a predominance of male participants, but female ones are increasing. Moreover, the space is increasingly used by families with kids, since Arduino organizes workshops and activities for children in the space. At the same time, however, Fabriken's old participants have left the space. According to Fabriken project manager, this was due to both personal reasons (some of them got a job, some others moved out of town), but also as it turned out they were not in favour of the membership system, even though they were offered a six month free membership. In discussing this with the project manager of Fabriken, it emerged how difficult it had been to explain for old and even new participants, why the space needed to be accessed under a fee and how such a fee was not a matter of making profit, but rather ensuring machine maintenance and the technician's salary. In addition, as pointed out by STPLN's project manager, a communication breakdown may also have occurred, for example, when they had to close down Fabriken between December 2012 to August 2013 in order to carry out renovation work and bring in new machines. She also brought up how, for the old users, the change from mode 1 to mode 2 was quite dramatic: they went from having keys and the possibility of accessing machines whenever they wanted to having to pay a membership fee and come to the space during specific time slots. It can be said that the new system affected their privileges and also limited their ownership over Fabriken.

Considering ownership an interesting insight emerges in relation to how, in the new system, participants do not contribute to the

²⁵ these interviews have been carried out during March 2014 at STPLN/Fabriken premises and have involved: the project manager of STPLN, the project manager of Fabriken (also belonging to the NGO STPLN), Arduino Verkstad business developer, Arduino Verkstad founder.

functioning of the space. Fabriken's project manager points out that after six months they decided to shut down the possibility of gaining access to machines and equipment by working rather than paying, as none of the actual members was taking advantage of that possibility; they preferred to pay than to work in the space. In relation to this point, it could be discussed whether or not Fabriken participants (or rather maybe at this point 'users') are still even part of the commons. On one side, they are still contributing to the shared resource (i.e. by paying the membership fee) but, on the other side, they are not actively contributing to its construction and maintenance anymore and, therefore, giving up their ownership over the space.

Where it is still possible to talk about commons is in the relationship between STPLN and Arduino Verkstad, who co-own Fabriken. From all the interviews, it has emerged how, for both parties, it has been quite a challenge to find a form to collectively own Fabriken and collaborate in its functioning and development. Since the beginning of the collaboration, there was an agreement in relation to each partner's role, with STPLN taking care of the general running of Fabriken (covering also expenses in relation to electricity and space renovation) and Arduino contributing with specific machines as well as competences and ad-hoc activities in relation to digital fabrication, programming etc. However, as it has been pointed out by both parties, having a commons between a non-profit organization, whose goal is to engage as many people as possible, and a start-up business, which struggles to reach economical sustainability, turned out to be not very easy.

Issues with expectations and ownership

From the interviews, it has emerged that a number of tensions grew between the two partners in relation to each other's expectations regarding commitment and ownership over Fabriken. Specifically, the NGO and Fabriken project managers relate how they were expecting a broader commitment from Arduino Verkstad in the running of Fabriken (for example, in contributing to the salary of project manager). However, they also pointed out that, since the company is a startup, it was also understandable that their focus was, in those first months, on getting the company up and running. Moreover, it seems

that during the design phase, issues related to the specific context were underestimated. As Fabriken's manager points out, a great effort was initially put in looking at existing examples of makerspaces, and in trying to adapt models that worked elsewhere; however, it turned out that the expectations regarding the possible number of members were too high. This emerges also in the interview with Arduino Verkstad's Manager, who feels that Fabriken should improve the way events and activities are communicated and marketed. What emerges in the interview with him is also how, for Arduino Verkstad, a main problem in the commons was related to ownership and control over Fabriken. He pointed out how, in regard to Fabriken, Arduino Verkstad would like to set up the same kind of model that characterized ReCreate and The Bicycle Kitchen, where STPLN provides the space and general support, but the founders of the initiatives are responsible for organization, activities, and communication. In a similar way, he hoped that Fabriken would become an Arduino Verkstad initiative inside STPLN. In this way, according to the manager, Arduino Verkstad would have more incentives in investing in the space while, at the same time, they could focus more on communication and marketing issues.

At the time of the interviews, an agreement between the parties had not yet been reached. They were in a phase of re-negotiating rules and each partner's role on the basis of the issues that emerged in the first year of collaboration. All those interviewed referred to a contract that was at that moment being co-written by the two parties. Both Fabriken's project manager and Arduino Verkstad's business developer thought that the contract was extremely important as it would make explicit a number of issues in relation to the collaboration that would avoid, in their opinion, the emergence of tensions. In commons terms, this contract can be considered as a way to sum up, but also define, shared rules. Its importance is in line with what Ostrom's writes about sustainable commons (1999) when it comes to the centrality of having shared and transparent rules regulating collaborative access, use, and the maintenance of resources. Why then, was such a contract not defined since the beginning? Both STPLN and Fabriken managers pointed out how a draft of this contract was there since the beginning, however, it was only through actually engaging in the

everyday practice of the collaboration that the details of what needed to be discussed and specified emerged. STPLN's manager underlined how, according to her, the main challenge in the first months of the collaboration was not related to the actual disagreements but rather to the fact that it was difficult to discuss with Arduino Verkstad the terms of collaboration. This again seems very in line with Ostrom's considerations (1999) about the need for having arenas to discuss controversies as well as having the possibility to modify and change rules governing the commons. Moreover, it also could be said that, somehow, it seems that it is not possible to start with rules straight away, that rules and specification can only emerge after having engaged in the commons.

11.5 Commons sustainability: rivalry and durability and economies of scope

In looking at the long-term sustainability of HWA and, particularly, Fabriken as commons in the opening of production some considerations can be made.

Nuancing rivalry and durability

As discussed in 9.1, rivalry and durability are extremely important when it comes to commons as they determine how goods can be shared. For example, in sharing a hammer, it is important to consider maintenance, as it will wear in time, but also how to regulate access to it, as it can be used only by one person at the time. When it comes to knowledge about hammering, it does not require maintenance, nor, usually, is it considered as a rivalrous good. However, this is just in principle, because sharing knowledge about how the hammer is to be used, implies very different degree of durability and rivalry if it is performed, for example, through a direct and in-person interaction or through an on-line tutorial.

In both engagements, it emerges how increasing levels of rivalry and decreasing levels of durability pose greater challenges to commoning as they demand, respectively, the implementation of a system to avoid congestion and an ongoing flow of external resources to maintain the commons; a main question in relation to sustainability is how to guarantee this resource flow.

In relation to rivalry and durability, another point can be made: in commons literature, these characteristics are usually defined from the nature of the goods, however, what has emerged in the engagements is how congestion and degradation depend very much also on the context in which the resource is at play. For example, in Fabriken, some machines turned out to be more popular than others, meaning that they became more rivalrous and less durable than other similar goods. The fact that rivalry and durability are dependent on the context in which the resource is shared and co-used is brought up also by Finidori (2013) who calls for the necessity of moving beyond a definition of rivalry and durability that considers only the intrinsic characteristics of the resource itself. She suggests rather to consider also the context and the use situation, which means to account for the way shared resources are at play in practices.

Economies of Scope

In 9.5, the concept of economies of scope has already been discussed as one of the elements playing a central role in the sustainability of

Figure 10 Wood-working and rivalry



infrastructures for opening production. In both Fabriken and HWA, it has been possible to understand how economies of scope can be at play with a set of shared resources which are engaged in a variety of activities generating diverse kinds of value. Both HWA and Fabriken seem to work towards economies of scope rather than scale. HWA engages in catering activities, craft production, education and so forth; in Fabriken, practices range from building robots to sewing clothes, from wood carving courses to social hangouts. Such a variety of activities implies a number of diverse outputs that are not just a matter of use value, but also skills and social connections (as pointed out in 11.1). In this perspective, it can be said that the two engagements try to work according to economies of scope for the generation of diverse forms of values which are then put at play to ensure the maintenance and production of the commons. It is easy to see how, for example, within HWA, the catering activity provides some financial resources that are then used to buy materials and tools for cooking, but also crafting. In a similar way, in STPLN, premises are rented out for conferences and events to obtain some financial resources.

Less obvious patterns emerge in relation to how the other generated values are at play in the sustainability of the space. In Fabriken, the skills acquired by experimenting with machines and processes have been in the first commons mode involved in fixing and maintaining the equipment. In the same way, the diverse skills of HWA members are at play when it comes to specific issues, e.g. Jila's Swedish when interacting with civil servants. Also, the social connections generated in the commons are at play, being used when needed to acquire specific information or ask for help and support in relation to a certain matter.

The possibility of reaching sustainability through economies of scope with diverse values at work is related in both the engagements to the ability of relating to the specific context in which they are operating. In both HWA and Fabriken, it emerges the importance of working not in relation to standardized models of what a creative community and makerspace are, but rather from the specific characteristics and conditions in which the two commons operate. In such a perspective, it might be worth talking about located production, rather than local, to highlight the importance that understanding and solutions

from the specific local perspective have in the sustainability of the two commons.

11.6 Connectivity Lab a non-commons

But do openness, collaboration and sharing always entail the establishment of commons? A preliminary answer to this question emerges from the minor engagement of Connectivity Lab.

Here collaboration, sharing, and openness have quite a specific aim: fostering connections between researchers and big companies in the region. When it comes to the activities organized by the Lab, they are mainly short-term commitments where one of the actors brings in a specific challenge that should be addressed ‘collaboratively’. The vision of Medea management is that the lab should both apply for research projects, but also focus on attracting commissioned work by companies (conversation with Medea director, spring 2013), where the researchers would apply their knowledge and competences to developing prototypes and solving challenges brought in by business partners. In the collaboration between the business partners and Medea there is no space to negotiate what the issue is to explore, and its ownership, as both are defined by the external actor. Thus, the notion of collaboration is not to be understood in the context of establishing a long-term commitment in sharing and co-ownership (i.e. commons).

When it comes to the actual sustainability of open, collaborative, and sharing processes, without the establishment of shared ownership and long-term relationships, there are as yet, not enough results to discuss. However, it can be worth bringing forward one of the recommendations formulated by the external evaluators of the MNM project (which financed the Malmö Living Labs and Connectivity Lab). They state the need for the academic and business sector to have neutral arenas where they could meet and decide the rules of the game, and they suggested that Connectivity Lab could become such an arena. However, they also underline the importance of setting up mechanisms to avoid the interests of some stakeholders taking too much space. Further insights in relation to specific issues and conflicts that this way of operating may entail are presented in chapter 4.

The way CL decided to operate shows how working with openness, collaboration and sharing does not necessary imply commoning and, therefore, it highlights the importance of not only discussing openness, collaboration and sharing, but also articulating how ownership and decision-making are carried out in processes and practices of opening production.

12. Prospects in the opening of production

What has emerged from the engagements can also be related back to discourses and expectations around the opening of production.

12.1 Creative communities struggles

As already mentioned, HWA's engagement provides a number of insights in relation to creative communities, sharing economy and the possibility of redefining the notions of work and of an enterprise. Fabriken also provides some insights around these prospects.

When bees and trees do not match

The importance of connecting bees (grassroots initiatives) and trees (established institutions) has been already introduced as a central point when supporting social innovation. The engagement with HWA provided a number of insights in relation to the difficulties and dilemmas that might emerge when trying to create such a connection.

Since we started the collaboration with HWA, they often expressed their interest in improving and developing their business activities as a way to reach sustainability and provide some income, at least, for some of the members. The work carried out by HWA and their way of operating has been recognized as extremely valuable by a number of diverse actors: NGOs, civil servants, and companies, as well as consultants working with business development. However, when it came to find a possible way to structure their activities as a business, a number of issues emerged; for example, how their relational qualities

could be valued in a business frame. After a couple of iterations with HWA women meeting the refugee children, we encountered the manager of the healthcare company that was looking after the children to check for the possibility of those meetings becoming a service that the NGO could provide. Even though, he and the caretakers could see how beneficial these encounters were for the children, since the women related to them in a very different way than the professionals could do, he told us that it would have been difficult for him to formulate a request to the central administration to allocate resources for these meetings as it was difficult to measure and communicate the value generated in the encounters²⁶.

Other issues emerged in relation to a lack of hybrid formats existing between profit and non-profit organizations. When presenting the work with the refugee children to a group of organizations and civil servants involved with this issue, a union representative stated that NGOs should not be doing these kinds of activities because, due to their fiscal regime, they end up competing unfairly with companies working in the branch.

Also in the project with the Mike Network, it emerged how, in moving towards becoming a business, there was very little space to maintain HWA's actual way of working, which mobilizes a high number of people for short time spans. More 'efficient' ways of working, i.e. involving fewer participants for longer commitments, often seemed the only legitimate forms according to which an enterprise can work.

With the Mike Network, besides the difficulties with finding appropriate formats, another issue has been in relation to the business way of structuring processes and the language used. MakeItReal's decision was to involve a coach to mediate the process, whose approach was very business-oriented. Quite early in the process, questions such as "Who is your potential client?" and "What is your value proposition?" were introduced. They turned out to be problematic since, even though they might sound as quite standard and easy questions, they were completely new and far from how HWA

²⁶ He was quite generic in explaining in which sense this value was difficult to communicate, but things become more clear if we consider that the company was taking care of the children under public procurement and that offering this service to the children would not have provided them any competitive advantage when applying for a public tender.

used to frame their activities. They required skills that few participants had. It was also frustrating to notice how some of the Mike Network members considered the difficulties for HWA women to relate to this kind of language as the major hindrance to their possibilities of being recognized as a resource by Swedish society, and as the only way to provide a concrete and valuable contribution to the community is to establish a successful business.

Spaces and resources for experimentation and continuity

The most frustrating aspect in the collaboration with HWA was not the lack of alternative models and notions of what a job can be and what an enterprise can produce but, rather, the lack of possibilities of experimenting with these topics. In the process between HWA and the Mike Network, a key problem has been the lack of resources to ensure the participants' commitment to the process. MakeItReal founders, but also most of the Mike Network members, were often stressing the importance of quickly developing a business proposal that could be used to ask for financing. This put pressure on the process and did not allow enough time for the women to get to know each other and explore how a common language could be developed.

The lack of space for experimenting with possible alternative models is not just a matter of having resources to ensure the participants' commitment and freedom of action; it is also a problem of safety. One might wonder if the fire at HWA premises was also related to the activities that the women have been carrying out with us; besides providing them with further contacts and possibilities, these activities resulted in more visibility for them, possibly leading to envy and frictions that may have resulted in their premises being destroyed.

From this perspective, Fabriken/STPLN's role becomes quite relevant, as a safe space that provides resources and possibilities for experimentation that might be very hard to find somewhere else. What emerges from the interviews with some of the projects hosted in STPLN is how the space enabled them to try out an idea that they would not have had the chance to try out somewhere else, even with all the limits that being a cultural house may entail. For example, the

initiator of the café for parents with small children²⁷ points out: “We have been trying out the café format here for some months, but we had problems in attracting people because STPLN is out from the city center and regular users do not bring their children here”. She also adds: “However, it has been great to have the opportunity to start somewhere, to try out the idea (...) After some months here in STPLN, we moved to Moriskan (another cultural house in the city) where we got many more people”. In relation to spaces and opportunities

²⁷ This project has been initiated as weekly evening where parents with kids could meet have dinner and play together with their children. As the founder points out: “I am a single mum myself and I think there are too little opportunities in Malmö to meet with other parents with small children”



11(a)



11(b)



11(c)

Figure 11 A cooking session between HWA and the refugee children.
11(b) and 11(c) photos courtesy of Helen Granqvist

to try out ideas, she makes some interesting considerations: “It was easy to start the café here, people were helpful and there was not so many papers to fill in (...) Before coming to STPLN, I tried to contact Malmö city to ask for support, but they wanted the project to be more focused, for example, towards single mothers. But, I wanted the café to be more open, not to become some sort of ‘social project’ (...). I also applied for funding through the Reach for Change program (a program financing social innovation initiatives), but they excluded my idea because it was not considered innovative enough...”.

Similar considerations are brought up by the founder of ReCreate, who found in Fabriken and STPLN, not only the resources and skills for experimenting and developing her idea, but also ad-hoc support in to how to start up a project. The NGO people initially supported her with a very strategic skill: how to relate to the trees (established institutions). Particularly, they helped her write down and formulate the application for funding, since, by being a NGO for quite some time, they had specific knowledge related to how to formulate financing requests. This aspect turns out to be a central issue also for HWA; one of the biggest difficulties for HWA is related to how to file applications for funding and, in more general terms, how to relate to public agencies.

Aside from finding resources and possibilities to take their first steps, another issue that emerges from HWA, The Bicycle Kitchen and ReCreate, relates to how the bees can ensure continuity to their initiatives. In all the three cases, after receiving an initial grant that helped them establish their initiative, the projects have been striving to find ways to maintain and continue their activities. In a late interview, Bertil Björk, the founder of The Bicycle Kitchen, brought up quite strongly a number of issues in relation to the kind of financing that is available at the moment for social innovation initiatives, which is mainly project-based and focused on supporting the start-up phase. Particularly, he discussed the situation of The Bicycle Kitchen that, after a three year start-up grant, was struggling to find stable finances that would allow the project to continue forward. He addressed how, when it comes to social innovation, there are many possibilities for starting up a project and too little financing available to continue it.

The risk is, therefore, that social innovation initiatives rather than focusing on a long-term perspective, which seems necessary when it comes to evaluating their impact, embrace a project-based way of operating where every two years their goal and aims need to be reformulated in order to get another grant. This ‘projectification’, according to Bertil, is problematic in two ways: the first one is that it does not allow to actually evaluate the impact of these initiatives as their goals are always changing. The second one is that the initial phase requires investment in structuring the organization rather than on production activities, risking that a lot of money gets to be invested for minimal results.

This underlines the urgency of nuancing and problematizing the notion of creative communities, in order to better articulate what kind of support they need, and what, for each case in particular, having a safe space for experimentation may entail. It also implies reflecting on the way in which the bees may access resources, and if it might be the case to move from short-term funding to more long-term support schemes which would allow both continuity to the initiatives as well as the possibility of an ongoing evaluation of their results.



Figure 12 ReCreate prototyping workshops and objects at Fabriken

Supporting the trees?

In both HWA and Fabriken, it emerged how established institutions are often not easily reachable for grassroots initiatives, opening up the discussion of what could be the most fruitful way of establishing a relationship between them. A possible hint in this direction emerges when looking at the latest developments of the Bicycle Kitchen. In the latest interview with the founder, he briefly described a recent application that the Bicycle Kitchen, together with the municipal environmental department has filed for the establishment of an innovation center in relation to cycling culture. The center aims at supporting the development of a cycling culture in the city as well as supporting the development of new services and products that could support the transition towards more cycle-friendly and sustainable cities. In the constellation, the role of the Bicycle Kitchen is that of being a bridge in between bicycle producers, the municipality, and grassroots cycling cultures and initiatives. Informally, the Bicycle Kitchen has already had this role; for example, by supporting the development of the first Swedish logistics company using only bikes (Move by Bike) but also having an ongoing conversations and collaboration with diverse departments of the municipality.

In formalizing the role of the Bicycle Kitchen as a mediator, the environmental department is not only recognizing the importance of connecting with grassroots initiatives, but also that, in doing so, a specific mediator is required. In this perspective, both STPLN and HWA could play a role as mediators, bridging between creative communities and established actors. In particular, supporting the trees in understanding who and what creative communities are and what kind of support they may need.

12.2 While waiting for the third industrial revolution

With Fabriken, a number of insights are emerging in relation to prospects around commons-based, peer-to-peer production, localism, and open innovation.

Commons-based, peer-to-peer production goes tangible: articulating openness

The high level of rivalry and low degree of durability of the tangible resources involved in commoning at Fabriken trigger some reflections in relation to commons-based production going tangible.

First of all, it highlights, as already pointed out, how sharing a hammer is very different from sharing a piece of code on the net. Consequently, it further shows how open-access commons may present serious issues when it comes to ensuring the sustainability and preservation of tangible commons. Commoning at Fabriken has revealed how traditional commons practices and approaches can only partially respond to the issues raised by commons-based, peer-to-peer production going tangible, as spaces for opening production are often characterized by transient participation and they often gather participants with diverse interests. This means that boundaries are difficult to define and a consensus-model might be difficult to apply. Fabriken brings up the solution of the partner-producer as a way to manage transient and non-consensus based commons, showing both the advantages and limits of this way of operating.

What strongly emerges from Fabriken is that managing commons in the opening of production is a very complex (and located) question that requires articulating openness in relation to the practices and context, as well as developing ad-hoc ways of ensuring and preserving the commons, which move beyond those used in open intangible commons.

Dealing with material scarcity

How to get a hold of materials for production represents a key issue in spaces for opening production, since the possibility of accessing machines, equipment and even knowledge does not generate anything if materials are not available. Finding ways to access materials has always been a main concern within Fabriken, leading to the development of a number of strategies around waste. Besides basic approaches such as taking apart electronic products for parts, or collecting old clothes to be remade or reused, more complex strategies have also been developed. The Bicycle Kitchen, for example, had an agreement with the company managing waste handling in Malmö to procure the bikes that people no longer wanted. The company put out a container dedicated for bicycles in one of their facilities where citizens bring their garbage. Users bringing bicycles could decide whether to throw them away in the metal container or donate them to the Bicycle Kitchen instead.



Figure 13 Some of ReCreate materials

Initially, the idea was to use the same strategy to get other kinds of materials for Fabriken, but it turned out to be too complicated. The practices in Fabriken are so diverse that many containers would be needed. Moreover, some extra work would be required to choose and sort out materials since, for example, the activities in the space do not need just wood in general terms: they need plywood for the laser cutter, boards to build furniture, etc.

Another issue is that even if the materials could be procured, there remains the issue of where to store them. Recently, the Bicycle Kitchen decided to stop the collaboration with the waste company because they were getting too many bikes and did not have enough space for all of them.

An interesting opportunity around materials seemed to emerge when ReCreate entered the space since, besides getting interesting materials, they were also sorting them out. Some experiments have been made, for example, in collaboration with the Textile Department, where a high-quality, waterproof textile (that ReCreate received from

a company producing sails) was used to make diverse products. However, this represents an exception rather than the rule. Most of the materials ReCreate gets are semi-finished products, which means that they are often already shaped and therefore not very easy to reuse. Moreover, sometimes it is difficult to know the exact constituents of the items ReCreate collects and, consequently, it can be difficult to decide what one can do with them, for example, if they can be used on the laser cutter or not.

Working with scrap and waste is a common practice in Fabriken in overcoming material scarcity, although this approach is unable to fulfill the needs of most of the activities. Materials scarcity represents a main hindrance for commons-based tangible production, opening up the need to develop new strategies and tactics to acquire resources.

Amateurs, but not necessary entrepreneurs

Fabriken's stories allow one to reflect on the myth of grassroots technical innovation and the expectations around 'users becoming entrepreneurs'.

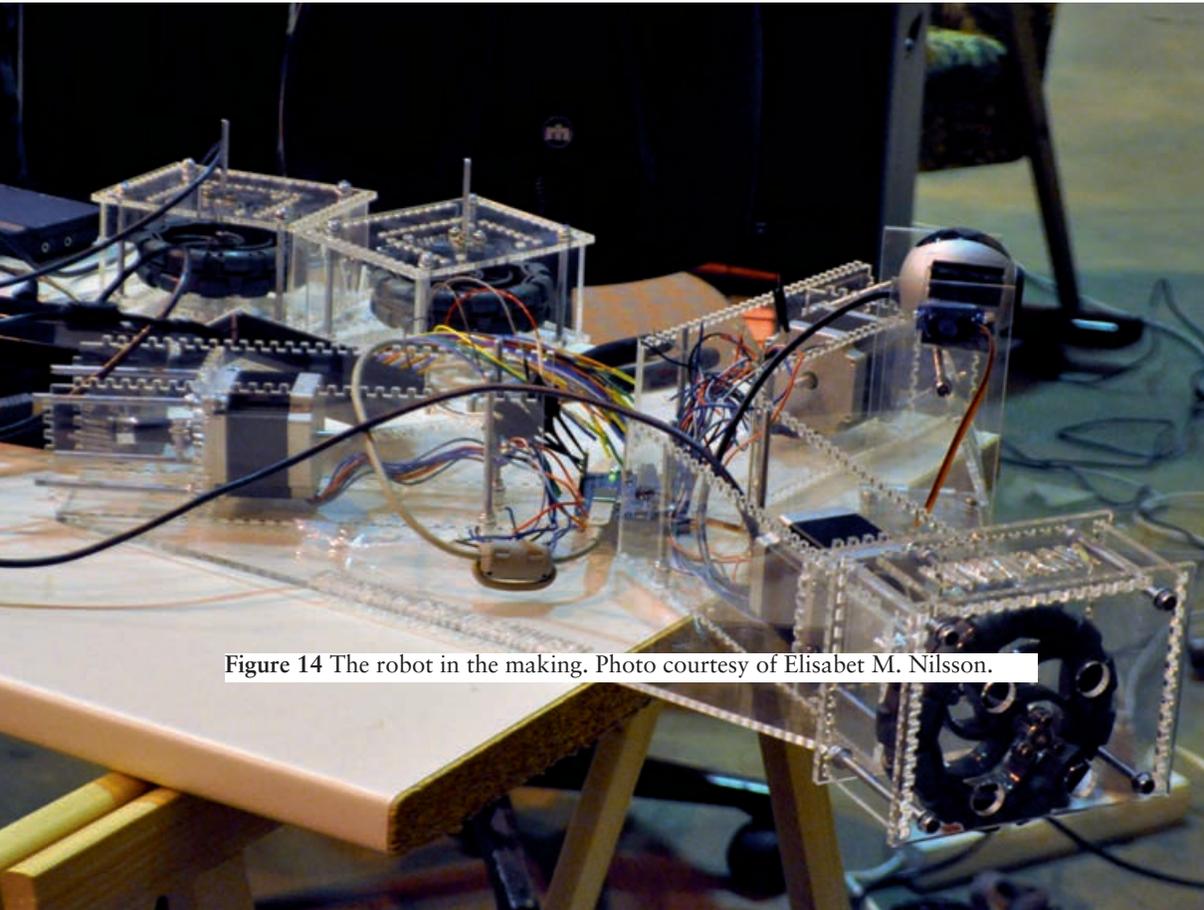


Figure 14 The robot in the making. Photo courtesy of Elisabet M. Nilsson.

Some of Fabriken's regulars worked for several months to develop a robot that could move around, changing direction easily, and remotely steered through an online website. The robot was also equipped with a camera, a microphone, and a speaker allowing for the person steering it to see, talk, and hear through the robot. The robot was the pride of Fabriken and it was often moving around in the space or 'interacting' with people passing by. After the first prototype, some extra exemplars were also built.

One of the researchers initially involved in the space was enthusiastic about the robot and decided to connect the guys who developed it with a local company working with surveillance systems. The company was interested in the robot and offered the inventors some financing to further develop a prototype that could be used to guard buildings. However, the developers turned down the offer, stating that they were not interested in spending their free-time in developing a product for a company. Some of these inventors had well-paid jobs, while others were freelancers looking around for new job opportunities, but all of them turned down the opportunity.

Around this case, two reflections can be made around the prospect of 'everybody-becoming-an-entrepreneur'. The first one is that besides the hype around startups, there is, at least between Fabriken regulars, awareness of the risks and the consequences that embarking on such a journey would imply. These inventors seemed to be very aware and keen of keeping separate work from leisure.

The second, and perhaps most interesting reflection is in relation to how 'successful and valuable' is defined. The robot was developed for fun, to prove competences and learn more. Does the fact that the guys turned down the offer of the company make the robot less valuable or interesting? In the opening of production, making a way of acquiring skills and generating social connections is often celebrated; although, when it comes to understanding the impact of makers and amateurs, often the only assessment which is used is a business-related one: did they turn out to be a company? Did they develop a commercial product? It seems, therefore, worth exploring other ways to express and articulate notions of value that do not necessarily simply refer to metrics of profit and business success.

New producers and old producers: alliances in the margins?

When it comes to participants at Fabriken, besides their differences, they may be described as ‘new producers’: prosumers, amateurs, and lead users, generally speaking, end-users who approach production processes. What is lacking in the space are more traditional producers such as artisans or small producers. A relationship with them could be particularly rewarding when it comes to accessing competences around making, but also in finding new strategies to acquire materials.

Through ReCreate, a number of contacts with small producers have been made. However, a proper collaboration (besides getting scrap materials from production processes) arose only with a developer of die-boards (used, for example, to punch packaging boxes). With him, ReCreate has an on going collaboration around punching foils of diverse materials to create modules for building activities with the children. Meeting and working with Bertil, the owner of the die-board company, allowed me to understand the situation of small, local producers, revealing how promising, but also difficult it could be to involve them in a space for opening production.

In the collaboration with ReCreate, Bertil works for free. When Carin, the founder of ReCreate, tried to discuss paying him for his work and the die-boards, he just smiled and pointed out how expensive developing a die-board is. However, Bertil, who is in his seventies and ready to retire, seems to appreciate the fact that his skills and knowledge can be applied in new areas and, in some way, passed on. Bertil not only has knowledge about traditional techniques of die-cutting, he is also a laser cutting expert which makes him a great potential resource for Fabriken. Through Bertil, it has also been possible to get in contact with a large supplier of plastic materials and get some materials from them. Moreover, working with Bertil has led to a better understanding of the discouraging situation of small producers in Malmö. The die-boards company has very few clients left since, as Bertil once said, die-cutting, together with many other production activities, is nowadays a Chinese business.

In this perspective, the opening of production could also be about finding alliances between new and old producers to exchange skills, knowledge, and material resources, but also as a way to support each other’s practices and defining new forms of local production.

However, the collaboration with Bertil has been an exception; a number of attempts have been made in Fabriken to connect with small producers, but none of them succeeded. Once, for example, Fabriken hosted a workshop with a professional woodworker. When discussing the possibilities of collaborating with the space, he stated how the venue could work well as space for teaching the basics of carving wood, but he could never use the facilities for his professional practice since that would require buying expensive machines that would be difficult to share as he would need to use them for long periods of time.

13. Which prospects get to travel? (Constraints making)

Fabriken and HWA provide a number of insights around prospects in the opening of production, but a question is still to be addressed: which ones get to move forward? And why? From a compositional perspective, the prospects which are able to travel are a matter of who and what is interested in them, and how the prospects are able to respond to the constraints or to rework them by creating new relationships and factors legitimating them as possible futures.

In order to better understand how constraints work and how they are made, this section focuses on the unfolding of the minor experiment, Connectivity Lab, and of the evaluation process of the Malmö Living Labs. Through them, it becomes possible to see how diverse prospects emerging from the engagements were or were not legitimated and what it takes to rework constraints.

A few months after Fabriken opened, Medea management decided to re-allocate the Living Lab resources for the establishment of a new lab inside the university premises. The rationale was that the new lab could better respond to the goals of innovation, entrepreneurship, and growth set by the project financing the Malmö Living Labs, the Malmö New Media project (MNM). The official motivation for the development of

Connectivity Lab was that Living Lab Fabriken resulted in “a creative workshop rather than an innovation arena for external entrepreneurs and companies. The specific placing of the premises (inside STPLN) required a constant dialog and synchronization with other activities at STPLN. These two factors proved to be difficult for the development of more entrepreneurial oriented projects” (Malmö New Media slutrapport²⁸, translation by the author). CL had also focused on prototyping and digital fabrication, but it was aiming at becoming an “innovation and entrepreneur oriented initiative” (Malmö New Media slutrapport, translation by the author) easing the collaboration between researchers, companies, and professionals in the realm of digital media.

Concerns about the Malmö Living Labs not working as innovation platforms also emerged from the MNM mid-term evaluation report that was delivered in July 2011²⁹, summing up some of the participants’ perspectives on the Malmö Living Labs processes. The document states that the Labs have been successful in processes of idea generation and validation, in providing support to small actors within the media sector. Specifically, the participants appreciated the fact that the Labs combined technical and social aspects, as well as their competences in managing complex processes. Through the lab processes, participants acquired knowledge and competence as well as developed a broader network of contacts. However, processes in the Labs rarely led to the development of commercial products and services and, as pointed out by some stakeholders, the Labs’ activities rarely developed into new business possibilities.

So were the Malmö Living Labs spaces for innovation or not? Contributing or not to growth? In the next sections, it emerges how the answers to these questions are related to the kind constraints which are at play.

13.1 The making of CL and the delegitimization of Fabriken

The setting up of CL had profound consequences on Fabriken; here, the focus is on how it delegitimized the prospects emerging from

²⁸ this was the final report delivered by Medea about MNM project activities. The report has been compiled by Medea management (Appendix 2: Slutrapport_MNM).

²⁹ when the mid-term report came out, Fabriken had been operating only for few months. So the report was mainly referring to activities carried out in the Malmö Living Labs The Neighborhood and The Scene. (Appendix 2: Rapport uppföljning av målgrupper och intressenter 110707-1.pdf)

the space. As already illustrated, Fabriken was hosting a variety of initiatives and production practices ranging from clothes redesign ateliers to making and crafting as a way to acquire skills and develop social connections. Some of them were entrepreneurial projects, others were leisure activities. What is interesting is how they were intertwined and contaminated each other, opening up new possibilities to understand production and how to support the emergence of new initiatives around it. The opening of CL did not jeopardize activities at Fabriken, but it hindered their possibility of reworking constraints around the notions of innovation and entrepreneurship. When Medea moved out from the space, it took away the possibility to engage the actors and actants that played a key in role in defining constraints in relation to these notions.

Fabriken and HWA, as well as the work with the other Malmö Living Labs, can be considered as framed by MNM external evaluators attempts at working with a broad definition of innovation aimed at addressing social challenges³⁰. Working towards such an aim requires one to mobilize a number of actors to create spaces for experimentation; in a nutshell, to redefine the constraints of innovation and entrepreneurship, as it becomes very difficult to account for such an aim within the frame of more traditional constraints. This is explicitly disclosed in the final report describing the activities performed by Malmö Living Labs and the establishment of Connectivity Lab (see footnote 28). The report, which has been compiled by Medea management, represents an attempt to fit the activities of the Malmö Living Labs in the frame of a more traditional and market-based idea of innovation (since the aim of the report was to show how the Labs respond to the growth and job creation goals of the project). Fabriken is reduced to a space for “developing and creating products and solutions based on Internet of Things” which led to “a number of dialogue processes between external companies and Medea around Internet of Things aiming at increasing visibility of this emerging branch” (translation by the author). There is no mention of the activities less tech and business related, such as the work done to support the development of ReCreate or the fact that some of the regular participants were people who had been out of

30 Appendix 2: Följeutvärdering av MMSS1 och MNM_Sammanfattning av slutsatser och rekommendationer.pdf

the job market for a long time. Further, it lacks a description of the small craft initiatives and other projects which were temporally hosted in the premises. Moreover, there is no discussion about the idea of making as a way of developing skills and creating social contacts.

A similar situation can be found in the description regarding Living Lab The Neighborhood whose activities have been about “looking for and building a network of interesting and potential innovators in Rösengård and Fosie, two of Malmö’s multicultural areas, with the aim of connecting them to business and academic partners” (translation by the author). The centrality of business is also to be found in the description of the activities within HWA that aim “in the long run (to) increase their business potential as a commercial cooperative” (translation by the author). There is no mention of the work in relation to how to connect the *bees* with the *trees* (more on this in Appendix 1, A6).

Through the diverse reports, accounts, and interviews with the lab participants, a quite contradictory way of understanding the Malmö Living Labs and their activities emerges, as well as their actual results in terms of supporting (or not) innovation, entrepreneurship and economic development. In the final evaluation report of MNM project (see footnote 30), for example, one of the recommendations is to continue the work of addressing social challenges and towards a broad definition of what innovation might be. At the same time, some of the Lab participants, in stating their motivation for joining the labs’ activities declared that the main triggers were “trying out something that has never been done before, and ‘to do good’”³¹ (translation by the author).

Fabriken and the Malmö Living Labs, whether they are environments for innovation or not and whether they support economic growth or not, seem very much a matter of which understandings of innovation and entrepreneurship are at play that determines who gets to participate and what kind of results are considered valuable. The development of Connectivity Lab is not a matter of responding to specific project demands, but is, rather, a matter of becoming accountable to a certain prospect and idea about the future by adapting ideas of openness, collaboration, and sharing within certain constraints.

³¹ Appendix 2: Rapport uppföljning av målgrupper och intressenter 110707-1.pdf

13.2 Others constraints making: regaining legitimacy

Despite the happenings around CL, some of the prospects emerging from the Malmö Living Labs have had the opportunity to move forward. A main role in this has been played by two other research projects, and other developments.

The first project was an independent evaluation analyzing the results of MNM and other projects financed through EU structural funds in Sweden, looking at their impact on growth. In the final report, the researchers introduced the importance of considering social factors in economic growth.

“Social cohesion, and especially what we in the report call collective empowerment, should be seen as a value in itself and considered on its own merits. When people are strengthened and empowered to jointly contribute to solving different problems, this is something which may also have a bearing on growth. However, projects working with such dimensions may not be able to exhibit short-term results in terms of new jobs and new businesses. Then, the possible success will not be highlighted by current performance measures and indicators. Therefore, a new approach is needed on the assessment of results. The current system is in danger of pushing projects in the wrong direction. As we see it, it is better to fully affirm that some projects will not generate any new jobs and businesses, but in the longer term perspective they can be very important in the interaction between social cohesion and economic development dynamics.” (Tillväxtverket, 2012, p.7-8)³².

In this report, the work of the Malmö Living Labs is described as a series of attempts at working towards inclusive growth (Tillväxtverket, 2012, see footnote 32) by attempting to address the question of “how to address in a new way diversity in big cities and how, out from new ideas of growth, it might be possible to support collaboration between people” (Tillväxtverket 2012, translation by the author, see footnote 32). Particularly, the Living Lab experiences are used to bring forward the necessity of new forms and indicators to account for inclusive growth since traditional metrics are unable to account

³² Potentialer för tillväxt och sammanhållning (Appendix 2: Rapport_152_web.pdf).



15(a)



15(b)



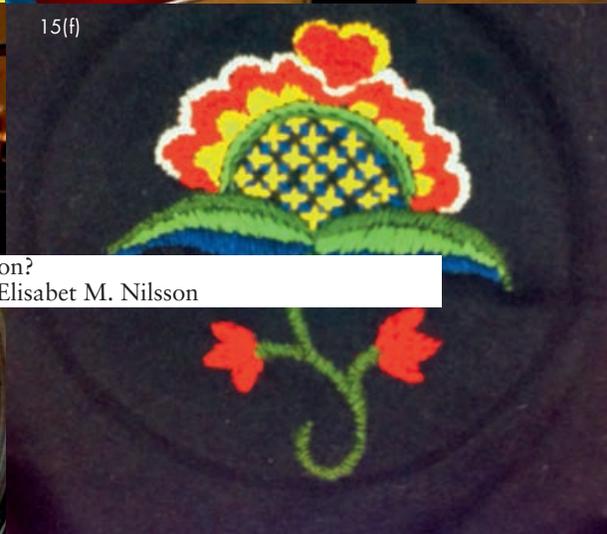
15(c)



15(d)



15(e)



15(f)

Figure 15 Useful or useless production?
15(a) and 15(e) photos courtesy by Elisabet M. Nilsson

for it. In prospects' terms, this might be considered a call to rework constraints in order to account for practices experimenting with alternative forms for growth, like the ones developed by the Malmö Living Labs.

It may be difficult to trace how much impact this report has had, but what is interesting to notice is that, a year and half later, the public agency which manages EU structural funding in Sweden, and who commissioned the research, has, in collaboration with an innovation agency, financed a number of makerspaces around the country³³.

The second research project has been carried out on behalf of Malmö Municipality by the Malmö Commission, an independent group of researchers. The Malmö Commission's task was to investigate the causes of growing health inequalities in Malmö and to formulate a set of strategies to reduce them (Stigendal and Östergren 2013). Particularly, the Commission's work has been based on a perspective that links the three dimensions of sustainability (environmental, social, and economical) and links health conditions to economical growth. In discussing Malmö's situation, very serious data are brought forward (see 10.1) and the researchers underline how, looking at the huge gaps in health and living conditions between the diverse neighborhoods, the contrasts in the city should be much worse than they actually are (Stigendal and Östergren 2013). So, why is Malmö not burning? According to the Commission, an answer may be found in the culture and voluntary sectors work, where associations and initiatives act as "a bonding cement bonding the city together and affecting people's health, participation and sense of cohesion" (Stigendal and Östergren 2013, p. 47, translation by the author) supporting the development of social capital.

The work of the commission has been extremely important for reworking constraints around notions of economic growth and innovation in relation to the city of Malmö and its civil servants. In the work with HWA, and, generally, with Living Lab The Neighborhood, a number of collaboration and long-term relationships have been set up with some civil servants since the questions and issues we were trying to investigate were very close to their concerns. However, it has often

³³ For more info, check: <http://www.ungasinnovationskraft.se/nyheter/detail/de-far-bygga-motesplatser-for-unga-innovatorer/>

been difficult for these civil servants to find a mandate to work with us while, at the same time, for us, it has been difficult to provide evidence about what was the point in exploring new understandings of and roles for NGOs. The Malmö Commission's work, by making visible the relationship between economic growth, health, and social conditions in the specific context of Malmö, offers a new set of constraints to legitimate the work we have been trying to do, but it also provides a mandate for the civil servants trying to work with these issues.

However, it is not just a matter of reports and evaluation documents. The fact that Fabriken and STPLN are out there continuing their activities certainly plays a major role in having prospects around the opening of production moving forward. While writing this thesis, makerspaces seem to be gaining momentum within civil servants working in the city of Malmö. In different part of the city, ideas and proposals about setting up makerspaces are emerging as a way to tackle social exclusion, but also long-term unemployment. It is too early to say if they will develop in something concrete, but they certainly account for the spreading of practices, ideas and discourses which have emerged from STPLN and Fabriken.

13.3 Shaping 'matters of fact', actants, and relationships

Both the Malmö Commission and the independent evaluation on EU structural funds projects have had a key role in providing more legitimacy to the work of the Malmö Living Labs and supporting the prospects which were generated there in moving forward. These official documents partially reworked constraints in relation to economic growth by providing 'matters of fact' showing why economic growth, health, and social conditions are connected, and providing evidence about why social cohesion plays a central role in supporting innovation and entrepreneurship. As already brought up in the previous section, these formulations play a central role when trying to involve other actors in making commons, since they provide the possibility to place the specific engagement in a broader landscape which has coherence and legitimacy. Therefore, when presenting the work of HWA, it is not just about a group of immigrant women doing diverse activities trying to integrate in Swedish society; it is also a matter of HWA being one of those organizations that are actively

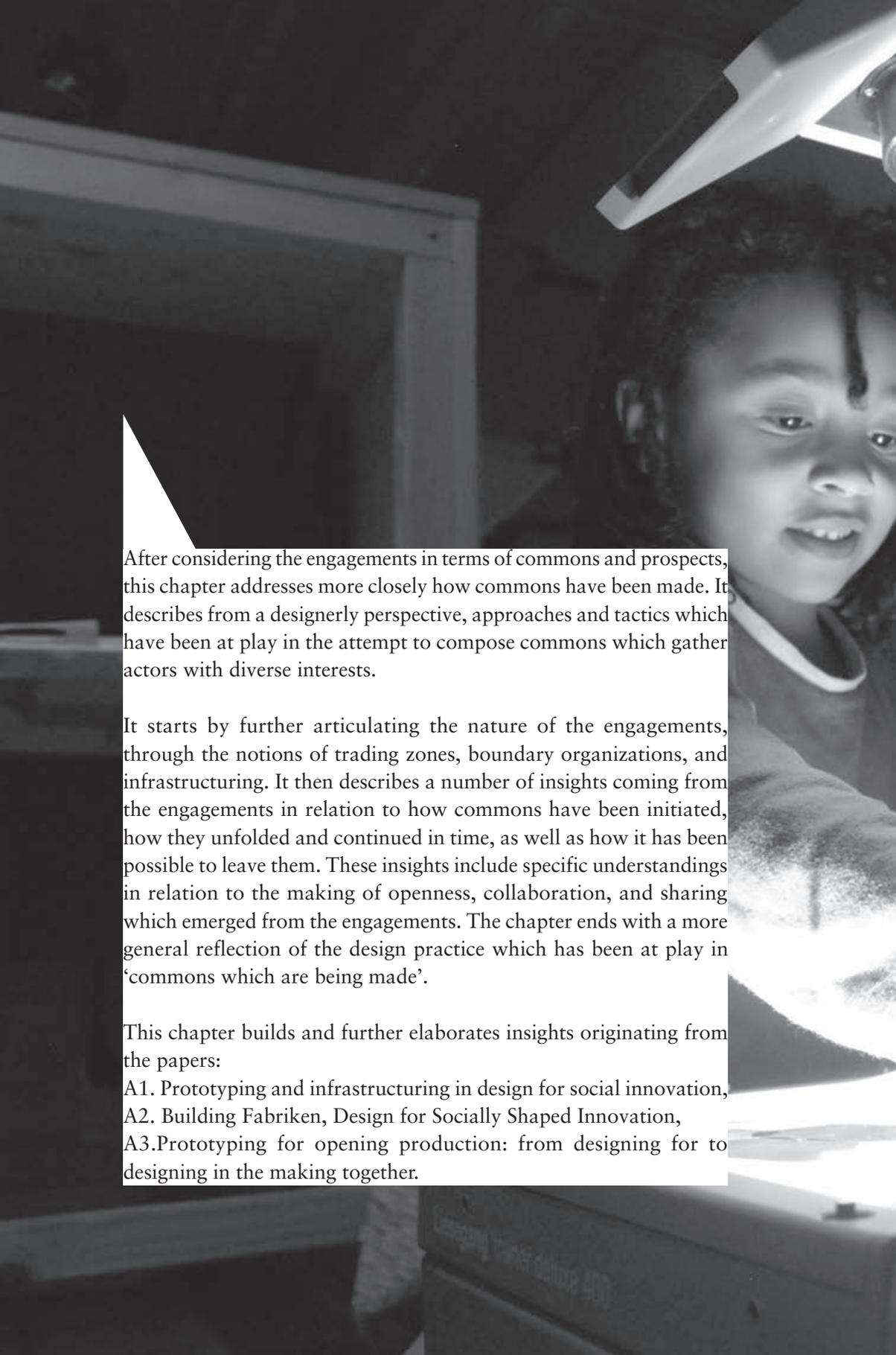
contributing to mitigating Malmö's inequalities. 'Facts' provide a collective dimension to the specificity of the prospects and beyond the specific interests of some actants.

However, 'facts' are not enough to reshape constraints; it would be too easy to think that since the Malmö Commission's report, there are more possibilities to explore alternative notions of growth, innovation and entrepreneurship. To have such a space, it becomes fundamental to mobilize actants around such a prospect and, specifically, those actants which have a key role in defining and guarding those notions. If 'facts' provide a solid ground to redefine constraints, their actual redefinition is a matter of a collective exploration with the actants that are held together by those constraints. To involve such actants, matters of trust and legitimacy are extremely important, and that's why the setting up of Connectivity Lab hindered the possibilities to explore new constraints around production, since, by creating a new arena for big players, it reduced Fabriken/STPLN legitimacy in engaging with such actors³⁴.

Although, even when diverse actants are brought together to explore new forms, there is no certainty that constraints will be reworked. In the engagement with HWA, the involvement of diverse actors has become a way to articulate a matter of concern, i.e. how HWA's value production could be framed and supported, by exploring alternative business forms and alternative relationships between the third, the business and the public sector. However, we did not succeed in creating new forms in relation, for example, to businesses and organizations. Reworking constraints requires time and, therefore, it is not just a matter of mobilizing actants and creating spaces for experimentation; it is also a matter of understanding how commitment can be supported and spaces can be maintained.

The prospects that get to travel are the ones that matter, those that count for diverse stakeholders, and those that are taken care of. This means focusing on actants, looking at how they can be brought together, and focusing on how *making commons as composing*.

³⁴It is interesting to notice how such an opportunity came back with Arduino Verkstad moving into the space. Since then, the company has been collaborating on a number of events and activities with big players (e.g. Sony Eriksson)



After considering the engagements in terms of commons and prospects, this chapter addresses more closely how commons have been made. It describes from a designerly perspective, approaches and tactics which have been at play in the attempt to compose commons which gather actors with diverse interests.

It starts by further articulating the nature of the engagements, through the notions of trading zones, boundary organizations, and infrastructuring. It then describes a number of insights coming from the engagements in relation to how commons have been initiated, how they unfolded and continued in time, as well as how it has been possible to leave them. These insights include specific understandings in relation to the making of openness, collaboration, and sharing which emerged from the engagements. The chapter ends with a more general reflection of the design practice which has been at play in 'commons which are being made'.

This chapter builds and further elaborates insights originating from the papers:

- A1. Prototyping and infrastructuring in design for social innovation,
- A2. Building Fabriken, Design for Socially Shaped Innovation,
- A3. Prototyping for opening production: from designing for to designing in the making together.



**4. MAKING COMMONS
AS COMPOSING**

14 Commons which gather actors with diverse interests

In considering the engagements in terms of commons and prospects, a particular way in which making commons has been carried out emerged: by involving actors with diverse interests and by trying to find forms and possibilities to hold them together. This is because the engagements have been aiming at composing, exploring, and trying out how it would be possible to construct possible presents in relation to the opening of production. Thus, making has been a matter of involving bees and trees, trying to cut across sectors and structures, and to develop commons which do not rely on consensus nor perfect alignment between the actors. In order to further develop a possible understanding of what these commons may be about, other compasses are introduced: the notions of boundaries, trading zones and boundaries organizations which allow one to further articulate the understanding of making commons as composing.

14.1 Boundaries, boundary objects, boundary organizations and trading zones

The notion of boundaries has been developed within organizational studies to analyze how collaboration between individuals and groups belonging to diverse communities of practice³⁵ may arise, despite their differences, and without necessarily reaching consensus. The notion of boundary in this field has to be understood as a space of contact between actors with divergent interests: “Often, boundary implies something like edge or periphery, as in the boundary of a state or a tumor. Here, however, it is used to mean a shared space, where exactly that sense of here and there are confounded.” (Star 2010, p.602-603). On these boundaries Star and Griesemer (Star and Griesemer 1989) observed the emergence of non-consensus based collaboration (Star 2010) and how it could be supported by particular kinds of objects, which are to be understood in a quite broad sense as something people act toward and with (Star 2010). They define

³⁵ The notion of community of practice has been developed by Etienne Wenger and Jean Lave (Lave and Wenger 1991, Wenger 1998) and it entails a group of people sharing a profession and how they are hold together by explicit and implicit elements such as values, techniques, beliefs, etc.

them as boundary objects “which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. They may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is key in developing and maintaining coherence across intersecting social worlds.” (Star and Griesemer 1989, p. 393). How boundary objects allow for collaboration without consensus is explained according to a specific dynamic:

- “ 1) The object (remember, to read this as a set of work arrangements that are at once material and processual) resides between social worlds (or communities of practice) where it is ill structured.
- 2) When necessary, the object is worked on by local groups who maintain its vaguer identity as a common object, while making it more specific, more tailored to local use within a social world, and therefore useful for work that is NOT interdisciplinary.
- 3) Groups that are cooperating without consensus tack back-and-forth between both forms of the object.” (Star 2010, p. 604-605).

Boundary objects allow the development of a shared language game between the participants (Ehn 1988), without necessarily having a common language or reaching for a perfect translation (Christmas 1999).

The boundary objects, as said, move between a less and a more structured form. Through this movement, the object can scale up or get standardized, becoming things that, as Star has pointed out, have not yet been fully studied as such (Star 2010). Trading zones and boundary infrastructures can be looked upon as two possible forms that these Things may take. Specifically, trading zones are more loosely emergent structures, while boundary organizations are more formalized. In both cases, collaboration is reached not by blurring boundaries, but rather by articulating convergent and divergent interests, and by not favoring the collapse or merging between

divergent worlds, but rather bridging between them (O'Mahony and Bechky 2008). In these perspectives, they are relevant both when it comes to the functioning of non-consensus based commons, gathering actors with diverse interests, as well as in terms of having prospects travelling, as they can become a possible format that could support the reworking of constraints.

But what are the key characteristics that define boundary organizations and trading zones?

The notion of trading zone has been developed to describe cross-disciplinary interactions where local coordination of ideas and actions takes place despite differences in community purposes, norms, meanings and values (Kellogg et al. 2006). The notion of trading is not intended to evoke “the commodified transactions of efficient markets, but the complex interactions of distinct communities encountering each other for purposes of exchange.” (Kellogg et al. 2006, p.39). Such forms of interaction are emergent and performative and, therefore, trading zones support coordination which is fast-paced, temporary and volatile (Kellogg et al. 2006). For this reason, “the enactment of a trading zone is an ongoing accomplishment that depends on members’ temporal accommodations and resistances as they engage with each other and their technologies (...) the trading zone is always in the making” (Kellogg et al. 2006, p.39).

Kellogg et al. (2006) point out how, in their case, the trading zone allowed to display work across boundaries (i.e. making it visible and accessible to other communities), to represent work across boundaries (i.e. express it in a form that was legible to other communities), and to assemble work across boundaries (i.e. reuse, revise, and align work over time and across communities). Kellogg et al. (2006) also noticed some tension and issues emerging while enacting a trading zone such as: identity conflicts emerging between participants and participants losing or being afraid to lose control over their work and thus resisting coordination across boundaries.

Practices involved in trading zones are informally structured since issues of governance are not articulated. Instead, boundary organizations “require participants to make lasting decisions about

key organizing domains, such as governance, which forces them to confront and delineate interests” (O’Mahony and Bechky 2008, p. 453-454).

The notion of boundary organization has been formulated within organizational studies to describe structures that foster collaboration between diverse organizations and sectors by bringing together actors belonging to diverse structures and being at the same level or across hierarchical levels (Schneider 2009). This notion was firstly used to describe organizations bringing together researchers and politicians (Guston 2001), where collaboration between the diverse participants was made possible by the fact that the ad-hoc organization is accountable to both parties (Guston 2001). More recently, the notion of boundary organization has been used to describe attempts at collaboration between grassroots initiatives and more-established structures. In particular, O’Mahony and Bechky (2008) describe how boundary organizations have been used in the collaboration between open-source software projects and software companies.

14.2 Engagements: infrastructuring for boundary organizations and trading zones

In relating the engagements to these two notions, an obvious way to go would be to consider Fabriken and Connectivity Lab as boundary organizations, since in these cases, notions of membership, governance, ownership, and control of production are explicit, while the engagement with HWA could be looked upon as a series of attempts to establish trading zones, since commoning was never formalized and, thus, they resemble more ongoing and emerging practices.

In this perspective, trading zones can be considered as a way to prototype (towards) a possible commons. In such a perspective, for example, the numerous attempts at reaching out to the city of Malmö in the engagement with HWA (see Appendix 1, A6) can be considered as a way to prototype diverse modes of commons. Through these numerous, and more or less successful attempts, it has been possible not only to explore possibilities, but also set up long-term relationships connecting HWA with some civil servants and providing more visibility to their work.

However, trading zones seem to be not just happening *before* the commons, but also *within* the commons.

Fabriken and CL can be considered boundary organizations since they present explicit rules around governance, membership, ownership and control over production. But they can be also considered as made up of trading zones where the ongoing everyday practices of collaboration unfold. Trading zones are not just prototypes of commons, they also allow for articulating the details of the unfolding of collaboration, openness and sharing that happen within and on the side of explicit rules and forms.

When it comes to articulating the making which has been at play in the engagements, it might be worth restating the notion of infrastructuring which was presented in 3.3 and how it has been used in PD to articulate long-term efforts in aligning human and non-human actants to support and explore specific practices. In such a perspective, the engagements can be considered a matter of infrastructuring towards boundary organizations and trading zones. Therefore, the insights which are brought forward in this part are also to be considered as specifications of the kind of infrastructuring which has been at play in the engagements.

15 Initiating commons

This section accounts for insights emerging from the engagements in relation to how commons can be initiated. Through them, a particular understanding of the practice of openness is also articulated.

15.1 Exploring boundaries: finding common interests and articulating differences

There are two key questions when trying to engage stakeholders in a collaboration: what could trigger their involvement? How an alignment between their diverse interests could be found? Trying to answer these questions implies a slow and careful exploration of boundaries.

Boundary, as explained, “is often understood as edge or periphery, as in the boundary of a state or a tumor. Here, however, it is used to mean a shared space, where exactly that sense of here and there are confounded.” (Star 2010, p.602-603). Exploring boundaries aims at finding the space where diverse stakeholders can gather together and develop a collaboration.

Exploring boundaries implies acknowledging each actor’s agenda and having the sensibility to perceive which interests could be shared and how, out of them, a collaboration could develop. It requires gaining a deep understanding of participants’ practices and motivations and then, to find a possible convergence between diverse agendas. This convergence is not always already there; sometimes it has to be constructed.

Exploring boundaries also requires the ability to articulate and understand the differences between the involved actors; it is not enough to find or construct a common ground. It is important to understand how this ground is at play in the stakeholder’s world, and what kind of interests, practices, and motivations constitute it. Differences play a critical role in collaboration; for example, in the engagement with HWA and the Mike Network, the relationship between us (the researchers) and MakeItReal turned out to be quite difficult. In the beginning, we felt that we were aligned since we had a common interest (considering the encounter between the two organizations as a promising possibility for both groups) and we also shared ideas about how the process should be articulated (being based on encounters on equal terms). However, we did not spend enough time articulating the differences in relation to how these common approaches were at stake in each other’s world. When the process started, these differences dramatically surfaced, leading to tensions. We suggested that we could help in designing and structuring the match-making process between the women, offering our experience with this kind of processes, as well as our long-term relationship with the women. However, MakeItReal declined the offer, choosing to work with a professional coach instead. This led to tensions, as we felt that we were somehow cut out of the project. A possible way to understand the reason behind MakeItReal’s decision is considering how the project was, for them, a fundamental step in proving them as matchmakers. From this perspective, it was

important for them to feel ownership and control over that process. It took a while to articulate this difference, leading to contrasts between us and MakeItReal. If we had sensed this before, we could have tried other ways to offer our support rather than a direct request to co-manage and co-structure the process.

Exploring boundaries requires time and often, there is a need to try out possible collaborations, as it has emerged in Fabriken, when exploring the boundaries between ReCreate and Fabriken's core participants. A key issue for the core participants was how to acquire materials. For this reason, the establishment of ReCreate seemed to be an unique opportunity for initiate a collaboration triggered by, on one side, the need for materials, and on the other, the interest in exploring potential applications and possibilities of scrap. For this reason, together with the founder of ReCreate, some dedicated workshops for Fabriken regulars were organized to showcase materials; however, only few participants showed up and they did not seem particularly interested. It appeared to be the perfect place to set up a trading zone, but actually was not, until Carin, ReCreate's founder, and

Figure 16 ReCreate laser cutted card-board boxes



I started to experiment with the laser cutter. Firstly, we cutted out boxes from cardboard, and later, we experimented with the possibilities of laser cutting some foam and plastic foils alike. By engaging with the laser cutter, it became possible to establish a collaboration between Carin and some of Fabriken's regulars, as it became more clear to them, the ways in which ReCreate's materials could have a role in their practices. A trading zone was established, from where, later on, diverse collaborations have emerged. Laser cutting has worked as a boundary object (Star and Griesemer 1989), being a shared practice, but performed with diverse aims and having a different value for the stakeholders involved, allowing the establishment of a language game (Ehn 1988) between ReCreate and some of Fabriken participants. Trying out diverse approaches has allowed for the articulation of how cast-off materials could make sense across the boundaries.

Although, iteration is not always possible; sometimes, there is only one opportunity to meet a stakeholder and invite her to participate. In this case, a very important approach in exploring boundaries relates to having an open agenda. Instead of approaching a stakeholder with a defined idea about what could be a common interest, it might be worth to start out from an exploration of who is the stakeholder and what are her interests. In this way, a possible boundary can be co-constructed with the involved stakeholders. In establishing a relationship with HWA, my colleague Per-Anders Hillgren always emphasized how it has been particularly important to spend time with the women at their premises, in order to get to know them and understand their way of operating and their interests.

15.2 Giving trust, lending/borrowing trust

Initiating commons is not just a matter of being able to map stakeholders' interests and agendas looking for possible common areas, it is also a matter of trust. In the engagement with HWA, for example, the commitment of the women to the prototypes was often connected to the fact that they had confidence in our ability to create new opportunities for them. At the same time, engaging civil servants and the health care company has been possible because we could somehow lend some of our credibility as university researchers to the women.

But trust can also be borrowed, as it happened when I was trying to approach the local design museum in order to reach out to Malmö's design community and invite them to Fabriken. The idea came from Luisa (the founder of the textile corner) who, at that time, was working on a project for the local design museum. We discussed how to involve more designers in Fabriken, and she suggested that a collaboration with the museum could be a unique opportunity to reach out to the local design community. She took charge of organizing a first meeting with the museum staff. They were interested in exploring the topic of the opening of production, particularly in relation to the consequences that personal fabrication machines will have on design practice. We discussed a possible concept for an exhibition, where a more traditional showcase of stories and machines in the museum premises could be combined with a series of practical workshops and demonstrations at Fabriken. It seemed that a common interest was found and that the format of an unconventional exhibition would work as a perfect boundary object. However, despite the reciprocal commitment and enthusiasm, nothing happened. After a couple of meetings, Luisa backed away from the project since there were no financial resources to cover her commitment and she was already busy following other projects. This meant that the person the museum trusted as an event organizer (since they were already working with her) was no longer part of the project and thus, the trust that would making this collaboration possible had also gone.

15.3 Non-humans mobilizing humans: laser cutters and stories

In the engagements, non-humans have often played a central role as boundary objects able to create very interesting trading zones in their own right. In Fabriken, for example, it has been impressive to see how the laser cutter was able to activate and support collaboration between diverse participants. It triggered discussions, knowledge exchanges and established social connections more than anything (and anyone) else in the space. No matter how experienced one might be, when the machine is working, all participants tend to pass by to take a look to see what others are doing but, especially, for the never-ending fascination of watching the laser engraving plastic or MDF pieces. The large, glass top of the machine provides a perfect view of the magic of laser cutting; around it, old and new participants gather and start talking about materials, projects, and technologies.



Figure 17 The magic of laser cutting, CNC milling and drilling
17(c) photo courtesy of Elisabet M. Nilsson

Also with HWA, non-humans had a central role in triggering collaboration, in particular, stories. With the increasing diffusion of the notion of social innovation and its legitimization on a local level thanks to reports such as the one of the Malmö Commission, mobilizing and finding stakeholders has become easier, since it led to the emergence of a growing common frame that one can refer to when explaining HWA activities and our work together with them.

It has also been interesting to notice how the specific stories of our experiences with the women have been very effective in mobilizing stakeholders. For example, when approaching the Mike Network, but also some civil servants, it seemed much more fruitful to refer to the very specific and very concrete hindrances and opportunities we could see in the work with HWA, rather than to more general considerations about, for example, the role of NGOs in providing social support to Malmö citizens in the margins. It seems that ‘matter of facts’ work better as boundary objects. A possible explanation could be that, ‘matter of facts’ can fit in diverse prospects and understandings of a situation, and they can be part (or become) diverse ‘matters of concern’. In this perspective, stories can easily be accommodated in diverse sets of values and agendas, and can bring together diverse actors. The issues start to emerge when the stakeholders find out about how these stories represent very different matters of concern for each other.

15.4 Openness as matter of constructing the stakeholder

A very basic question in attempting to establish commons is in relation to how and where to find stakeholders. It might seem quite a moot question, but, as it emerges from the engagements, who gets to be involved turns out to be a key element in defining what kind of collaboration, openness and sharing the commons is working towards.

The encounter with HWA happened thanks to another NGO (The Voices and Movements of the Street, gathering youth with non-Swedish backgrounds) with whom my colleagues have been collaborating for some years in the initial phases of the Malmö Living Labs (for more information see Björgvisson et al. 2010). The leader of that NGO set up a meeting between HWA and my colleagues, when the latter

expressed their interest in getting in contact with other NGOs working in the same neighborhood. According to my colleague Per-Anders Hillgren, if it was not for the other NGO, it would have been very hard to find HWA. In the neighborhood where they operate, there are a number of other actors, mainly NGOs, which are considered the ones working with social innovation. Some of them have been working there for a long time, some others less, but what they have in common is visibility in local media and being considered as reliable actors by the municipality and other structures in the city. Despite the over ten-year long history, HWA lacks visibility and connections, which often makes their activities invisible. Working with them instead of with more-established organizations has also meant exploring how legitimacy and visibility make some stakeholders easier to find than others, and how, therefore, there is a risk of ending up in very close circles and with very narrow definitions of what and who creative communities are.

When it comes to Fabriken, the situation was quite different as there was just a very limited network in place when the collaboration between the NGO and Medea started³⁶. The NGO had some contacts with artists interested in making and some of the researchers had contacts with a local network of hackers who, already before the opening, got involved in the space. Although, even here, the idea was to try to go beyond the usual suspects: hackers and people interested in electronics are often, and fairly, the core participants of spaces for opening production. However, as pointed out in 9.5, these spaces are facing issues of long-term sustainability, as they are often unable to establish meaningful relationships in the surrounding context. For this reason, we wanted to explore how other stakeholders interested in making could be connected to the space, and we wanted to do it from a very local perspective: how could Fabriken open up production processes that make sense in and for Malmö? To do so we have tried out a number of approaches, for example, events, which have been used to reach out and involve possible participants, but also as frames to experiment modes of collaboration. Particularly, in the setting up of the space, events have been used to mobilize and reach out for participants, as well as to include them in the making of Fabriken.

³⁶ When such a collaboration started, the NGO had, for some years, already been organizing workshops and activities around 3D printing and robot building.

These events have been planned according to a format which, instead of proposing specific activities, resembles a looser frame, inside which participants are asked to carry out their own activities. These events aimed at both working as boundary objects, bringing in actors with diverse interests, as well as being temporal trading zones in which one could experiment with modes and formats for collaboration between old participants, newcomers, and Fabriken founders.

By carrying out a number of these events, it emerged how they worked well in attracting specific communities rather than cutting across them. When the first hackathon³⁷ was organized, right before the opening of the space, we thought that it would have been enough to add some craft workshops to involve crafters. In the end, some people interested in crafts did show up, but the majority of the participants were still hackers. In time, we also saw how in reaching out for a wider public, more-structured events (with planned activities and workshops) worked better than hackathon-based formats wherein participants were asked to have a more active role. We could also see that, while events were often mobilizing only specific communities of possible users, on an internal level, their organization often involved diverse participants engaged in the space. Setting up and managing an event has often worked as a way to bring together diverse practices and knowledge allowing for the experimentation with trading zones between current participants.

From both engagements, it emerges how finding stakeholders is a crucial point in establishing commons. More specifically, it seems possible to state that rather than *found*, stakeholders are *constructed*. The formats and approaches that are used *to interest them* are never neutral; they play a central role in determining who and what is invited. This also implies a change of perspective towards openness from a matter of 'the broadest and the more inclusive as possible', to rather 'the most specific and tailored as possible' perspective: open in which ways, under which constraints? Open for whom?

This is clearly evident in Connectivity Lab where openness is declined in a much defined way which matches a specific set of constraints

³⁷ A Hackathon is a format developed within the hacker community as a 24-48 hour event where people gather to code, hack, and make things together.

related to ideas of innovation and economic growth. However, even when trying to work toward more inclusive and less predefined notions of openness, the importance of problematizing these ideas and thinking about how stakeholders are constructed emerges. In Fabriken, initially, finding stakeholders turned out to be a very time and energy-consuming activity, whose results were often frustrating. The great efforts in organizing the first open events rarely matched the expectations in terms of newcomers entering, and then staying, in the space. For this reason, we (the NGO people, some other researchers, and I) tried out other formats, such as small-scale interventions (i.e. setting up a common garden outside the premises) or engaging and investing in more long-term initiatives (i.e. the establishment of the textile corner). Even if these approaches seem to be the opposite of openness as a matter of broadness and inclusivity, in a long-term perspective, they have been the ones who ensured that a variety of practices and communities were part of Fabriken.

Fabriken highlights also a tension, when it comes to the importance of reframing openness and the practice of finding/constructing stakeholders. In particular, the need emerged to find a balance between pursuing the involvement of certain stakeholders and, at the same time, accepting that some actors were very difficult to reach. In this perspective, it seems that finding and constructing stakeholders is a practice that needs to move in between awareness about which kind of openness is being pursued and a more pragmatic approach, which entails to work with and for the participants you are able to reach.

16 Unfolding commons

After focusing on how commons can be initiated, this section accounts for insights in relation to the unfolding of commons and how this may relate to diverse ways of performing of collaboration.

16.1 From co-design to non-consensus-based commoning

The first insight is related to how making, particularly in Fabriken, has allowed for non-consensus-based commoning.

The initial phase (May 2010–December 2010) of the collaboration between the NGO, the research center, and the interaction design company resembled what can be labeled as a traditional co-design process; the idea was to carry out a number of workshops from which a shared concept of the space would emerge. The first workshops (May 2010–August 2010) included both traditional co-design workshops, as well as more hands-on initiatives where certain activities were tried out. From this initial phase, a rough concept about the space emerged, characterized by some key concepts such as sustainability, open-source approach, and user-involvement in the running of the space. The plan was then to organize another series of workshops (September 2010–December 2010) aimed at narrowing down and specifying aspects of Fabriken’s concept, according to a funnel process (Westerlund 2009), where, from a fuzzy front end and through iterations, a concrete and shared plan would emerge. However, this never happened. The co-design process did not bring the expected results: no shared concept of Fabriken was generated and there was no agreement about how the key issues should be tackled. Instead, it generated a competitive discussion frame (Westerlund 2009) wherein each participant tried to maximise his or her winnings at the expense of the creative process. Many conflicts and discussions emerged that nearly compromised the project, but they also created the space for a diverse design strategy to emerge.

The limits of such a co-design process seemed to relate to three issues. The first was the impossibility of foreseeing use at design time. A grounding idea in implementing Fabriken was related to the fact that the space had to support users’ activities. From the beginning, it was clear that some stakeholders would have play a main role, such as a the local hacker community; however, we could neither agree nor be sure about which other users would be joining the space. As Redström (2006) points out, “The ‘use’ that we simulate, create and invite as part of a design process, be it iterative or participatory, cannot deal with what it means for something to become someone’s, what it means for an object to become part of someone’s life” (p.130).

The second issue was related to the assumption that a consensus between the involved stakeholders should be reached. This would have meant leaving behind some agendas, questioning and compromising the role and the possible future engagement of the three stakeholders. As the participatory design tradition points out: “conflict and disagreement seem to be unavoidable elements in participatory design in practice, and have to be acknowledged and managed” (Sjöberg, 1996, p.24) since they obviously emerge when multiple needs, objects, and motives are brought together (Gregory, 2003). In this perspective, striving for consensus in commoning with stakeholders with diverse interests seems not only impossible, but also undesirable. In trying to reach for consensus between the diverse visions, we were looking for a concept of Fabriken on which everybody could agree on. This meant that possible conflicting aspects had to be excluded from the concept. By excluding them, however, we were arriving at a quite general idea of the space which was not representing any of the actors’ interests, and thus not motivating them to participate in its development. By aiming for a common denominator, processes based on consensus risk to becoming exclusionary and encouraging non-participation, gaining the passivity of people rather than their active participation (Hamdi, 2004).

This dead-end forced us toward another approach, where diverse interests and understandings could coexist. Therefore, the decision was to start with the participants: open up the space by organizing events and activities, invite possible stakeholders and, from there, slowly and organically build up the space. This shift toward design-in-use and making not only allowed to mold the space according to participants needs, but also to accommodate different understandings about what Fabriken was, allowing a non-consensus-based commons to emerge. In this sense, making becomes an opportunity to explore how to hold together a commons without operating on a previous consensus, but rather using an activity as a boundary object which allows for the establishment of a more or less permanent trading zone between diverse stakeholders. In Fabriken, events, but also the everyday making practices, have often worked towards this direction.

16.2 Collaborative making without commons?

When it comes to Connectivity Lab, it is interesting to notice how collaborative making has also played a central role, allowing one to discuss how such an approach can make sense when establishing boundary organizations which are not commons-based.

In CL, making is viewed as a possible trading zone between academia and industry. The lab focuses on offering possibilities of prototyping and test concepts, products, and services as a way to make the knowledge and competences of the researchers available to actors in the society. As a consequence, events and practical activities are, like in Fabriken, becoming a way to both implement the lab, as well as to try out possible collaborations and new formats for doing so. However, while in Fabriken the focus on making has been a way to foster collective ownership over the space, in CL, collaborative making is framed as a matter of short-term processes with defined goals and expectations, resembling more a way of performing consultancy. Hackathons and prototyping sessions are gathering diverse actors, not for exploring an issue together by engaging in the making, but rather, by solving and responding to specific questions posed by one of the participants. It can be said that CL aims at making without commons, making together, but not toward shared forms of ownership.

The way in which CL works reveals certain issues related to having making without commons. For example, the opening event (which was a hackathon), despite the huge effort put in planning and preparation³⁸, failed to engage actors from the local creative class (small companies, freelancers, etc.) while it largely succeeded in engaging students. In a making commons perspective, this could be seen as a matter of long-term expectations in relation to the lab. While for the local creative class, besides their involvement in planning and participating to the event, there seemed to be no possibilities to somehow co-own the lab; for the students, there seems to be many more opportunities to take advantage of CL premises, and this indeed has happened, since, after the opening, the students of the Interaction Design Master's program have been regularly using CL for their activities.

³⁸ The preparation of the opening of CL started months before the actual event, it entailed a number of pre-workshops with representative of the local creative class and having two persons working half-time with communication and networking strategies.

16.3 Co-ownership for long-term commitment

In ensuring long-term commitment in co-making, co-ownership seems to play a central role. In Fabriken's first commons form, providing a special status to the regular members (giving them the space keys, provide them with a special status, asking them about what type of events and activities they would like to have) has been extremely rewarding in terms of gaining their active participation and commitment to the space because it resulted in them feeling a sense of ownership over the premises. At the same time, when on some occasions, participants' ownership had been undermined, it was possible to see quite quickly how this had a negative impact on their commitment over the space and the shared rules.

Co-ownership implies also co-responsibility; it is not just a matter of sharing control, but also the burden of looking after and taking care. This, again, emerges quite evident from Fabriken with regular participants involved in taking care of the equipment and cleaning the space. From the same engagement, however, as explained later on in this chapter, it also emerges that maintaining co-ownership and co-responsibility requires a major effort in giving the possibility to co-control each others behavior.

It is also important to underline how some actors might be reluctant to engage in co-ownership as it happened in the process with HWA and the Mike Network, where MakeItReal did not want to share ownership, control and responsibility over the match-making process with us researchers. A similar situation emerged also in Connectivity Lab, where processes are to be owned and driven out from the interests of external actors, and where a number of issues emerged in relation to researchers wanting to have more possibilities to control and influence the lab activities (more on this in 16.5).

In terms of making commons, both engagements seem to point toward the same conclusion: the sustainability of processes of collaboration between stakeholders with diverse interests does not depend on a perfect alignment of the participants, i.e. consensus, but rather on the possibility of sharing control and responsibility over it; that is, owning the trading zone together.



Figure 18 Co-making, co-owning and long-term commitment
18(d) photo courtesy of Elisabet M. Nilsson

16.4 Diverse and non-overlapping interests

The previous section discussed the importance of co-ownership and co-responsibility in making commons and how that might be possible without consensus between the stakeholders. A very important aspect that emerges from both engagements is related to roles. Long-term alignments between actors with diverging agendas seem to be easily achievable when actors' roles do not overlap in the commons. In the long-term collaboration with ReCreate, a very important aspect was related to the fact that I was bringing in certain designerly and prototyping skills that Carin did not have. Instead, in the collaboration between HWA and the Mike Network, a main issue was related to the fact that both we (the researchers) and MakeItReal were bringing similar competences and were interested in the same aspects, even though they originated from diverse interests. Also, in the long-term engagement with Fabriken, it emerges how collaborations run more smoothly when there are very different interests at play, as between the NGO people and the core participants of Fabriken, where the former's aim was the good functioning of the space, while the latter's aim was the possibility to experiment with machines and technologies.

In the relationship with the NGO running Fabriken, I understood the importance of having diverse expertise and, consequently, respect others' role and fields of actions. My industrial design skills were very appreciated, however, as soon as I started to deal with or discuss more organizational matters (what could be defined as the service design aspects of Fabriken), some frictions with the NGO people emerged. Even if I was highly interested in exploring some organizational aspects of Fabriken together with the NGO, I never got that possibility. A possible explanation is that, exactly like with MakeItReal, working with those aspects would have meant an overlapping of roles and competences; it would have meant operating within the area that the NGO felt was its own and, therefore, somehow threatening their role in and ownership over the commons. The general management of the space is not only a core aspect of Fabriken, but is also what provides the NGO its status and legitimacy as a partner. Letting others act over it, it would have meant putting under discussion their role in the space.



19(a)



19(b)

Figure 19 Doing workshops together with ReCreate

The importance of not having overlapping interests, however, may diminish in time. With ReCreate, the collaboration started out with bringing in industrial design competences, but as time passed, we started discussing more strategic and core issues, since by working together, trust between us was built and some level of co-ownership was achieved. Making commons with ReCreate worked so well that, when Carin got financing to develop her project, she asked me to join the material library on a regular basis with a paid position.

16.5 Collaboration: trading or bending?

In looking at the unfolding of commons in the engagements, it seems that when it comes to collaboration between actors with diverse interests two possible approaches have been at play: trading and bending.

In Fabriken, the shift towards a making approach not only allowed to practically articulate how different understandings of the space could be at play, but it also revealed the importance of having diverse agendas coexist for the sustainability of the space. Further, collaboration became possible as the involved parties acknowledged the centrality of each others' interests in making the collaboration possible. This required not only articulating how a collaboration could constitute a benefit for the involved actors, but also finding a specific form that could simultaneously accommodate those diverse interests.

A more challenging situation emerged in the collaboration between HWA and the Mike Network. In this case, attempts at trading crashed when it came to dealing with diverse understandings in relation to collective groups and in what actually defines an enterprise.

A possible reason which may explain the difficulties in reaching a plurality of understandings in this case could be that these notions are linked to very strong constraints which define norms and values in relation to personal identity and economy. Attempting to open up for multiple understandings in this situation would mean a reworking of roles and how power is distributed between the parties. In the case of HWA and the Mike Network, it would mean reconsidering who is the expert and who is in need of capacity-building in such a collaboration. It needs to be stated, that the possibility of reworking

such constraints depends partially on the participants, but also on the context in which they are operating. With HWA and the Mike Network, as pointed out in 12.1, a main hinder has been finding financing that could ensure the participants' involvement in a long-term process where roles and relationships could be further explored.

Trading, as a matter of establishing collaborations where diversity between the parties is articulated and not reduced, is very challenging since it requires the involved parties to acknowledge each other interests and, while doing so, finding ways to relate to each other. Such relationships may be difficult to adopt as they may challenge the constraints from which each participant acts and understands her actions.

A less challenging way of establishing collaborations is by bending, which entails predefining the roles and relationships of the parties by bending to a specific set of constraints.

Such an approach has been at play, for example, in Connectivity Lab where priority was given to interests and constraints related to mainstream notions of innovation and economic growth. Aligning with such a strong and established prospect can make it easier to involve and mobilize actors, but it can turn out to be problematic in the long run. In Connectivity Lab, a number of tensions have emerged between the management of the Lab and the researchers in regard to how the latter's interests have been framed in a way that could be suitable and appealing for companies. For example, in spring 2013, a breakdown emerged with the release of a catalog draft of commissioned activities that CL would offer to external actors. Such a draft was sent both to an external organization working with business development and to the researchers involved in Medea. The listed priced activities included workshops and panels with researchers, which had not been discussed *a priori* with the researchers, resulting in a strong conflict between the management of the Lab and the researchers, as the latter felt not only that they should have been consulted about this, but also expressed their disagreement with the idea of having researchers doing consultancy work within the university³⁹. In bending to external actors interests, the Lab management

³⁹ three arguments were brought forward: commissioned worked done by the researchers through university can jeopardized researchers' credibility as the line between what is research and what is consultancy can become very thin; some activities listed in CL catalogue were close to the one offered by local design studios and companies, thus the risk was that of having the university ending up competing with former students; there is very little incentive for researchers to do consultancy work through university, as they could do it on their own by setting up their own company, outside the university.

defined roles and practices of a possible trading zone in a way that was appealing for external actors, but not for the researchers.

Another possible issue with bending is in relation to co-ownership. The fact that roles and practices of the trading zone are predefined implies that parties do not have many possibilities to work together in shaping them and therefore co-ownership (and co-responsibility) over the trading zone is limited, with the risk of hindering commitment towards collaboration.

17 Continuing commons

In looking at the engagements, it seems that a central challenge resides in how to keep the commons ongoing, and how to move from temporal trading zones to more durable boundary organizations. With HWA, this stage has never been reached; instead, Fabriken and Connectivity Lab provide some insights in relation to how more stable forms of commons can be reached and how sharing can be understood from this specific perspective.

17.1 Control over production

According to O'Mahony and Bechky (2008), boundary organizations, by defining governance, allow for the possibility of a more systematic confrontation of parties' interests as well as a clearer definition of the terms of collaboration and sharing. The importance of defined and clear rules in commons has been already brought up, this section articulates how, in structuring collaboration and sharing, a very central issue resides in defining control over production.

In Fabriken, the decision to move from the first commons mode to the second one was mainly related to the fact that control (and responsibility) over access and use of the machines, in time, shifted too much towards core participants, with the NGO progressively losing control over the space. In a similar way, the tensions between the NGO and Arduino

Verkstad in the second commons mode seems to be a matter of controlling production, with Arduino Verkstad asking for a greater role in managing and running the space. In a similar way, the breakdown that occurred within Connectivity Lab in relation to the catalog of commissioned activities can be described as an issue of defining control over production, with researchers claiming control over the definition of their role in collaborative processes with external stakeholders.

Also, in the cases that O'Mahony and Bechky analyzed, control over production has been a central and problematic issue (2008). A solution that seemed to work in the collaboration between open-source projects and companies was in having control over production activities left to the open-source projects and not allocated to the boundary organization. In transferring this model to the engagements it means that when for example, considering Connectivity Lab, researchers would need to have more control over its activities. For the same reasons, when it comes to Fabriken, it seems that Arduino Verkstad's requests for more control over the space are reasonable and should be addressed. However, in this case, it is important to consider how for the NGO Fabriken represents a core part of the organization, which makes the issue of who controls production there quite delicate as it would definitely affect not only who owns Fabriken, but also the identity of the NGO itself. In this perspective, it emerges once again how there is no ultimate model when it comes to commons, but rather forms and rules need to emerge from the specific practice via iterations and ongoing experimentation in trading zones.

17.2 Sharing as a necessity and (safe) trading zones

From the engagements, it emerges how iterating and prototyping forms of commons in trading zones presents two issues. The first is the temporal nature of trading zones, which raises the question of how to keep stakeholders engaged. The second issue is in relation to the consequences of experimenting with forms of collaboration. In looking at Fabriken's latest evolution, what seems to be keeping the two parties together, beside the diverging views and contrasts, is a mutual understanding of their interdependence. They are both interested in Fabriken's success as a makerspace and they are both aware of how, for that to happen, they need to collaborate. In a similar way, but on a smaller scale, in the first commons mode, the

laser cutter's ability to trigger collaboration could be explained by the fact that participants who wanted to use it were getting trapped in the necessity of sharing it and finding ways to deal with this. In 15.3, it has been discussed how stories around social innovation and activities with HWA worked well in mobilizing actors. However, they were not strong enough to keep actors involved in the trading zone. In this perspective, the engagement with HWA may be looked upon as an attempt at finding *some-Thing* that could be shared on a long-term basis between diverse actors. As discussed in 16.3, in reaching this long-term basis, a common interest may not be enough, it becomes important to co-make and, consequently, co-own the Thing.

It also emerges how trading zones are quite dangerous places as well, particularly for those who end up in the middle. In the interview with Fabriken's project manager, it emerged how the tensions which surfaced between STPLN and Arduino Verkstad had been very distressing for her, as she felt both caught in the middle, but also that her role was unclear. Her possibility of action was hindered, since there was no clear definition of the collaboration between the two organizations. I found myself in a similar situation in the collaboration between Medea and STPLN after the decision to set up Connectivity Lab. This was due to tensions in relation to possible conflicts of interests between the two labs, but also because, the relationship between the NGO and Medea became unclear. Despite the fact that, in formal terms, the collaboration between the two stakeholders was continuing, in more practical terms, Medea pulled back from Fabriken and stopped investing in the space.

Moreover, failures in collaboration are quite costly as they tend to affect relationships between involved parties. In the latest interviews, it emerged how the tensions between Arduino Verkstad and STPLN in finding a suitable commons form have affected mutual trust between the stakeholders with the risk of jeopardizing the collaboration. In a similar way the conflicts during the initial phase of Fabriken have badly affected the relationship between the researchers, the NGO people, and the interaction design company. However, when we found a possible way of working together such trust was, at least between the NGO people and the researchers, slowly rebuilt.

In this perspective, it seems that a central issue resides in finding ways that allow for exploring forms of commons without risking the loss of participants' commitment and mutual trust.

18 Leaving commons

This section focus is on how, after being part for some time of a commoning process, it might be possible to leave it. In relation to this concern, the engagements with Fabriken/STPLN and HWA have worked towards opposite directions.

In Fabriken/STPLN, I was always aware that even though I was one of the participants, my status was quite different, as I was part of the space under specific conditions and constraints (being paid as a researcher and with the aim of carrying out a PhD). This meant, that I was always thinking about the fact that initiatives and activities in which I was involved in should not depend on me. Collaboration, as a consequence, has become the main approach and, when starting something new, I always tried to ground it in the space and create opportunities for others to take over. For example, my engagement in establishing the textile corner was related to the fact that I was interested in expanding the practices at Fabriken; however, it happened because I could co-run the initiative with someone else, Luisa, who could potentially have a longer engagement. However, approximately six months after the opening of the textile corner, Luisa left. In the months thereafter, I tried to carry out the activities on my own, but I was concerned by the fact that the initiative was not sustainable on its own, as the other participants' commitment was quite low. Fortunately, after a while, a retired lady who recently moved into the neighborhood came to visit the space because she had read about Fabriken in the local newspaper. She turned out to be really eager to work with the textile corner and the community around it. I tried to support her in the initial phases and especially encouraged her to take ownership over the initiative. A very important aspect of 'passing over' the space has been about moving out, so that the lady and the participants she is involved with could have the freedom to do what they thought was best.



20(a)



20(b)



20(c)

Figure 20 Activities at the Grannies Workshop/Textile Department

Building a way in and out from initiatives has also been the way in which the collaboration with ReCreate developed. The initial commitment was quite intense; we worked together planning workshops and activities, building furniture and objects for the material library, prototyping activities and meeting with stakeholders. When Carin received three-year financing, and I turned down her offer of joining ReCreate on a permanent basis, I slowly started to step aside, particularly, after she employed a project assistant.

In the same way when the decision of establishing a long-term collaboration with Arduino Verkstad was taken, I slowly moved out from Fabriken, as I did not want to create possible tensions (since I belonged and represented the ‘old’ Fabriken) and also because it was time for me to start focusing on writing this thesis.

However, even if I tried to move out progressively, it has been difficult to reach closure. On one hand, this might be a positive aspect as it allows the case for re-opening the commons (as it is happening while writing this thesis, thanks to a project guided by the city of Malmö, which is providing the possibility to re-open/continue the collaboration with Fabriken/STPLN). On the other hand, it might be problematic as other stakeholders’ expectations can vary. In the last year of the PhD, when sporadically going back to Fabriken/STPLN, I got often comments about the fact that I ‘disappeared from the space’.

Issues with closure emerged also with HWA, where commons was never actually established, and where, often, closure has been forced rather than constructed. In the attempt with the Mike Network, we have tried in several ways to keep the commons ongoing; however, the lack of resources and disagreements between stakeholders made it impossible to drive it further. Moreover, we also had to face a transition in relation to project funding, which meant that we had to focus on activities related to project management rather than commoning. This resulted in a lesser possibility to meet the women after the clashing with the Mike Network and, consequently, HWA founders were upset that we were less present than we used to be⁴⁰.

⁴⁰ Such discontent was expressed in the meetings we had with the women during the autumn 2011. It is important to underline how that was also a very critical moment for HWA, since they were left without premises after the fire that happened in the summer.

These insights reveal that, even if just temporal, closure needs to be carefully designed and carried out in commoning. Closure does not necessarily imply the end of a relationship with a specific stakeholder, but it does imply a change in the type of commitment and in reciprocal expectations. When trying to work towards closure, the aim should be to create the possibility to re-open the commoning if an opportunity in that direction surfaces again. In this sense, it becomes important to keep thinking about closure quite in advance in order to give the opportunity for the relationship between the stakeholders to change. It is also important, as it has emerged with the Textile Department, to create the conditions for others' ownership and commitment to emerge.

Thinking about closure since the beginning might seem in contradiction to the idea of commons and engagements as a matter of long-term commitment. I would argue that is not, particularly when it comes to the role of a researcher, whose position and possibility to participate in commons might be related to a specific temporal project. Therefore, thinking about closure since the beginning is not a contradiction, but rather a matter of taking responsibility to not jeopardize the process of making commons.

19 Design(er) and making commons

The previous sections reflected on possible approaches and understandings emerging from the engagements in relation to making commons as composing. This section addresses in more general terms what they imply for design as a practice and the designer's role.

19.1 Collective prototyping and making rather than facilitating

One of the recurring questions that I had to face during my research was to which extent what I have been doing in the engagements can still be considered as a form of design and in what terms. A possible way to frame this kind of practice is to rely on the participatory design tradition and ideas emerging in the design for social innovation field about the designer as a facilitator of others' designs and, in

this case, production activities (Meroni 2007, Jegou and Manzini 2008, Simonsen and Robertson 2012). However, I often felt that such definition did not quite fit what I was doing, as rather than facilitating, I was engaged in prototyping and making.

With the exception of the first co-design workshops about Fabriken, I never worked as facilitator. I never had that role, as being a facilitator implies that others recognize you as having such a role, and that never happened in Fabriken, nor with HWA. Instead, I engaged in co-making stuff, co-organizing events and activities, and co-prototyping services. In both Fabriken and HWA, my work turned out to be a matter of making and prototyping and only secondary and eventually, a matter of facilitating. “Not being afraid to try out things”, as Carin, the founder of ReCreate, once framed prototyping; it has been often a skill which has allowed me to gain a role in making commons, but also in enabling others’ making.

Building furniture, setting up a common garden outside Fabriken, and meeting with civil servants has not been a matter of facilitating, but rather a matter of trying to change a specific situation and, at the same time, exploring and understanding what the situation is about; a matter of exploratory and move-testing experiments (Schön 1983). What strongly emerged from the engagements is how these experiments required the involvement of others (both humans and non-humans) to be carried out. Involving others has also often been a prerequisite for exploring certain issues; for example, I would never have had the opportunity to know and work with the die board company if it was not for the collaboration with ReCreate. In this perspective, the notion of collective is also to be found in the definition of who and what the agent is. The idea of the single designer driving the process is substituted for the idea of a designing network (Jegou et al. 2008) which accounts for the system of actors involved in the making. Such involvement can present conflicts and tensions, as actors have diverse interests and move in various directions. When it comes to my role, I have been a node in the network; I did not stand above the network or in its center, but rather, just been a part of it. What I have been trying to do was understand how the network is held together, and how constraints and conditions holding actors together could be reworked. This meant that I have had different roles in relation to diverse situations.

In Fabriken, I have been the researcher when writing applications and interviewing participants, as well as discussing and reflecting with certain participants about ideas and expectations around the opening of production. I was the designer when it came to organizing and carrying out courses around 3D modeling, building furniture and, in the collaboration with ReCreate, when prototyping with materials and workshop formats. I have been one of the participants in the space when it came to painting the premises, learning to use the laser cutter. I have been a core participant when it came to setting up the textile corner, organizing events, testing out initiatives such as setting up the collective garden outside the premises. A similar pattern is also to be found in the work with HWA where, however, the numbers of roles have been less extensive. There, I worked mainly as a researcher, when meeting and trying to engage civil servants and other stakeholders, and a designer, when co-participating in prototyping sessions and co-designing with my colleagues and HWA possible strategies to move forward. Further, in the work with HWA, I have been also been a facilitator, as more traditional workshops with civil servants and other stakeholders have been organized.

19.2 Making power, practicalities and friendly hacking

In discussing the shift toward making, it might be worth bringing up some considerations about power.

In (co)-design processes, the control over the process is usually held by the designer. Since she is recognized as the expert on imaginative and experimental activities, she has a stand in defining how the process should be carried out (for example if users are to be involved and to which extent), but also during the process itself, it is still the designer who sets the scenes, provides the tools, and whom participants turn to in the unfolding of the process.

The engagements suggest that, when it comes to making, the situation is radically different, as power it is held by those who are able to make things happen, either because they have resources or because they can mobilize stakeholders. Fabriken core participants, in the first commons mode, could often leverage on their competences and skills in the relationship with the NGO to obtain resources. In the



21(a)



21(b)



21(c)



21(d)



21(e)



21(f)

Figure 21 Designer' possible roles.
Photos courtesy of: 21(f)Anders Emilson and 21(a),(b),(d),(e) Elisabet M. Nilsson

conflicts that emerged in the first co-design phase, the interaction design company leveraged on their tight connections with the local hacker community to bring forward their interests.

In such a perspective, making power can be understood as a matter of practicalities. Pedersen (2007) defines them as the activities that generate the conditions for a project to emerge. They entail the practical work of making implementation possible, such as having or finding financing and competences for things to happen. For example, in the engagement with Fabriken, I spent a considerable amount of time writing applications and looking for possibilities for funding, particularly after the withdrawal of Medea, as a way to gain making power and having the resources to try out some projects.

Making power has also a relational aspect, meaning that, even if you have resources and access to networks, for things to happen, you also need to be acknowledged as having a stake in the process by other parties involved in the making.

In trying to gain legitimacy for our work and concerns, particularly in relation to the work with HWA, my colleagues and I have tried to establish alliances with civil servants in the city of Malmö as well as with researchers from other disciplines whose role may be more established and may have a greater influence on civil servants (Hillgren 2013). We call this way of operating as friendly hacking (Hillgren 2013, Emilson et al. forth.), borrowing the idea from the 27th Region, a French organization working with social innovation within the public sector. These alliances provide us more legitimacy in what we do and, at the same time, open up the possibilities for exploring how prospects may move forward with our allies. In the work with HWA, it has been particularly important to work closely with civil servants who could help us in understanding Malmö municipality's interests and constraints, as well as, with Urban Studies researchers working with alternative notions of job and economic growth.

19.3 Beyond workshops: other collective forms

Engaging in the making, it also means that I have been exploring diverse forms for being together with others in a design process.

Workshops are usually the format which is used in participatory design to perform collective action; however, in this inquiry, as stated, workshops have played a minor role. On one hand, this was related to an interest in actuality rather than potentiality, which meant shifting the focus from collective explorations to collective making. On the other hand, in working often without making power, I had to look for emerging opportunities to make together, rather than having more structured and formalized occasions. This meant the opportunity to explore collective forms that would suit the stakeholder rather than the designer. In Fabriken and HWA, there have been possibilities to explore how making can become a frame for collective learning and the exploration of an issue that might be more or less related to the making itself. Being in Fabriken on a regular basis and engaging in diverse projects from knitting to laser cutting, became a possibility to initiate trading zones with other participants and discuss issues that went beyond the actual activity: for example, around how Fabriken was organized, how things could be improved, or how to start a collaborative project together. In a similar way, in the work with HWA, the workshop format has worked to some extent, but other possible formats, such as spending time with the women and taking part in the prototypes, have provided a more in-depth understanding of some issues as well as favored the development of mutual trust and commitment. A very interesting insight in relation to this also emerges from the attempt to establish a collaboration between HWA and the Mike Network. In this case, the workshop format revealed all its limits in fostering a mutual commitment and in having the women meet on an equal basis. While MN members were comfortable with the structure, timing and language of workshops, HWA members often had difficulties in participating and expressing their opinion and concerns, for example, in relation to how the process was structured. This meant that while MN members were quite active, HWA ones were often silent and passive. This condition being a problem of the workshop format emerged quite clearly during one of the encounters between the women which was organized by MakeItReal founder at her home in a small village in the woods. The women spent a day picking herbs, cooking and eating together, as well as discussing and getting to know each other. In that occasion, none of the participants

were passive or silent, even HWA members which were less skilled in Swedish actively took part in the activities, collaborating and communicating by ‘doing’ rather than talking.

To try out these other collective forms has been quite challenging as they question the traditional understanding of the (co-)designer’s role and practice. At the same time, they reveal that, if the aim is to engage with someone and something, it is important to find out which way is the most appropriate one and how workshops represent only one of the possible forms.

19.4 From strategies and methods to located prudent tactics

When it comes to discussing the nature of design practice which emerged from the engagements, it could be summed up as a matter of shifting from strategies and methods to located prudent tactics.

The engagements do not bring forward any ultimate method or tool in relation to design for social innovation; instead, they underline the importance of a located and specific approach that does not rely on theories or pre-assumptions about how practice should be carried out. Instead, the engagements are characterized by a careful and attemptive way at approaching the specific situation and at developing a possible approach out from local conditions rather than by using predefined methods. This allows to have space for serendipity and ‘the unplanned’ in the design process. As stated in regard to Fabriken, I spent a lot of time just being in the space, making and engaging in conversations with other actors as a way to spot an opportunity to explore boundaries. This way of operating can be defined as tactical as it entails “adjustments to, appropriations, or manipulations of design products and processes to accommodate purposes beyond the common, often historically and professionally constrained, purposes of design.” (Di Salvo 2009, p. 52).

The tactical way of operating emerges also as a response to not having a mandate and trying to involve actors who did not always recognize the legitimacy of my, or other actors, initiatives. Such a way of operating clearly emerged with HWA when trying to engage civil servants or other powerful outsiders that could help overcome barriers that we met in the activities with the women.



Figure 22 Workshops and other collective forms

Together with tactics, another important concept that emerged from the engagements in relation to the design practice is the one of accountability towards other actors. When HWA premises burned down, but also when Carin from ReCreate asked me to join her project on a permanent basis, I questioned myself in relation to my position and role in making commons and what kind of responsibility I had in regard to the people I was involved with: which expectations was I raising? To which extent could I maintain them? Where did my mandate come from? How could I respond if things went badly?

My colleagues and I felt very frustrated and powerless during the meetings that we had with HWA in the autumn after the fire, because we saw how scared and demoralized the women were and how little we could do to in relation to this. We also reflected on how, despite our joint attempts at composing, it seemed that nothing really improved for the women and that, what we achieved together, in terms of connections and recognition of HWA work, was still not enough in securing a long-term perspective to HWA activities.

The notion of phronesis introduced in 6.3, can also be related to prudence as the ability of deliberating rightly about what is good and advantageous (Flyvbjerg 2004). In this perspective, design, when it comes to composing, could be understood as a matter of prudent tactics, where practical ethics and judgment need to be at play, since it becomes a form of practice that ends up dealing with people's hopes, desires and expectations, but also situations that are out of the participants' control. However, being able to decide what is good and advantageous is not always easy as situations may be quite complex, having a number of different stakes and concerns at play. Thus, exerting judgment as well as practical ethics may be difficult, especially when lacking the experience in how to deal with such situations. In order to face such difficulties, the engagements bring forward the importance of having a long-term engagement and continuously reflecting on who and what is involved in composing and what interests are at play. Thus, the designer turns out to be prudent in a more general sense, as someone acting with care and thought for the future.

5. CONCLUSIONS





20 Summing up contributions

20.1 Answering the questions

What kind of co-production practices are emerging in the opening of production?

This inquiry addresses this issue through the notion of making commons, which allows to articulate co-production practices both in terms of the outcomes they generate and the processes they represent.

By using the frame of commons, this work provides, firstly, an overview of the rising of co-production practices depicting how openness, collaboration, and sharing are increasingly at play in making things and delivering services, and also what kinds of opportunities and challenges this entails. In this overview, four scenarios are presented. The first one is that of commons-based, peer-to-peer production, which developed within software and is now spreading to other forms of making and it is considered as a possible alternative way of organizing production. The second focuses on how commons-based forms of production have been adopted in the traditional market economy, fostering ideas such as those of democratic innovation and ethical economy. The third scenario focuses on how openness, collaboration, and sharing are seen as promising for the development of a more environmentally sustainable production system. The fourth scenario focuses on how the opening of production is seen as an opportunity to re-work the established understanding of useful production and work; this opens up for considering care and other forms of non-waged production and their role in the reproduction and maintenance of our societies.

In relation to these scenarios, diverse issues are brought up: from more practical concerns about the viability and sustainability of such practices and the infrastructures supporting them, to ethical issues in relation to possible exploitation mechanisms that may be at play in open, collaborative, and sharing-based production. A main concern is related to problematizing expectations and visions around the opening of production: from discussing limits of small-scale local production to questioning the potential of users and amateurs as innovators.

The long-term engagements provide more specific insights in relation to co-production forms and what they generate. HWA is described as a consensus-based commons, while Fabriken/STPLN as a non-consensus-based commons with transient participation and supported by a partner. In both engagements, commons have been at play in supporting do-it-yourself and craft production practices for the generation of use value, social relationships, and skills. By discussing the attempt at establishing collaboration between HWA and the Mike Network, issues in relation to the conservative and close nature of commons are brought up, with the question of how to have a commons that allows for participants to change their role over time. A possible answer in this sense is offered by Fabriken/STPLN and its first form of commons which allowed for transient participation and non-consensus-based commoning thanks to the NGO who worked as a partner supporting participants' sharing and collaboration. Here, however, a number of problems emerged in relation to fairness between participants, which pushed for a reorganization of Fabriken/STPLN according to a second form of commons. In this second form, commoning is not happening anymore between the NGO and the participants but between the NGO and another organization, Arduino Verkstad. What emerged from this second mode is how the definition of ownership and stakeholders' reciprocal expectations are critical factors in determining viability of the commons.

When it comes to commons' sustainability some reflections are provided in relation to how levels of rivalry and durability are defined not only by the intrinsic properties of a good, but also by the specific situation in which the resource is at play. Rivalry and durability have a relational aspect, meaning that the specific context and actors involved in the practice play a major role in defining the levels of congestion and degradation of shared resources. Moreover, it is discussed how economies of scope as possible patterns toward the long-term sustainability of commons have been at play in the engagements, underlying how, in trying to support diverse practices, it becomes important to work from a local and situation-specific perspective. Through the minor engagement, it also becomes possible to discuss when openness, collaboration, and sharing are at play, but

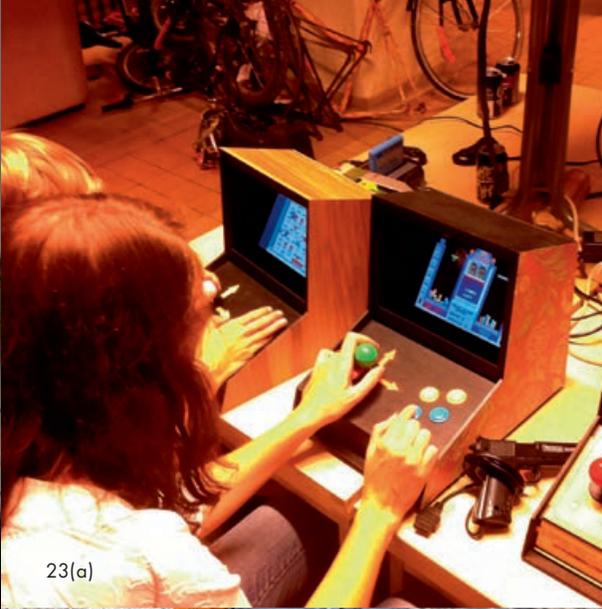
not for the generation of commons.

To what kind of (alternative) futures do they relate? Which of them may move forward as possible presents?

This question is addressed through the notion of composing prospects. Compositionism in this work is used as a frame which offers a preliminary understanding of how futures may become possible presents. Particularly, compositionism underlines the role of actors' interests and their way of framing reality in determining if and how futures can travel further.

The compositional perspective is firstly used in the mapping of the opening of production, and then more specifically in the engagements by looking at what kind of presents they represent and how they could travel further. When it comes to the opening of production, by building on existing literature, a number of futures are articulated in relation to different expectations of the role that openness, collaboration, and sharing may entail when it comes to the way production is performed. As pointed out in the previous section, a number of limits and challenges in relation to such futures becoming presents are brought up by building on existing literature and previous research. Other limits and challenges are then developed by looking at what emerged from the engagements. Particularly, it is discussed what kind of support may be needed for grassroots social innovation initiatives to thrive and their difficulties in the encounter with institutions and top-down structures. From Fabriken's engagement, a number of specific insights are brought up in relation to the notion of commons-based production and what kinds of issues emerged in the makerspace in relation to openness, material scarcity, amateurs becoming entrepreneurs, and possible alliances between former-users and more traditional producers.

By looking at how the engagements developed over time, it also becomes possible to discuss what it takes for alternative futures to become possible presents, how notions of what counts as innovation may or may not be reworked and how. With the establishment of Connectivity Lab, the work of the Malmö Living Labs (to which the two engagements belong to) was judged as failure when it came to its ability to contribute to innovation and economic growth. This



23(a)



23(b)



23(c)



23(d)

Figure 23 Making prospects

judgment had been overturned later on, by a research report, which highlighted the Malmö Living Labs work as an attempt to work with alternative forms of innovation and explore alternative ways of understanding what growth may entail. The delegitimization and re-legitimization of the work of the Malmö Living Labs allows for the discussion around what it takes to rework constraints and notions of innovation, as well as the importance of shaping ‘matters of fact’ able to mobilize actors and keep them engaged on a long-term. How to work in such direction is addressed by looking at how design can be at play in co-production processes.

How can design be at play in co-production practices as a matter of making possible presents?

The two engagements provide a number of insights about commons which are being made, and particularly about commons bringing together actors with diverse interests. In this work, these kinds of commons are articulated through the notions of boundary organizations and trading zones, which are then used to reflect from a designerly perspective, on how, in the engagements, commons have been initiated, how they unfolded and continued over time, and how they have been left. A number of considerations in relation to practice and approaches are pulled out from the engagements. On the basis of such insights, some more general considerations in relation to openness, collaboration and sharing are then elaborated. When it comes to openness, the importance of who and what is invited to participate and the importance of working pro-actively with such invitations is discussed. In terms of collaboration, it emerges how trading (as establishing long-term collaborations between actors with diverse interests) may be quite challenging since it may entail re-discussing roles and the power distribution between stakeholders. Another possible approach is bending, where instead, collaboration develops as actors bend their interests to a specific set of values and ways of framing a situation. When it comes to sharing, the engagements reveal how it might be a promising starting point for long-term collaborations as it implies that stakeholders are entangled in the joint ownership of something. The issue becomes then, how to experiment with different forms for sharing without jeopardizing the actors’ relationships and mutual trust.

When it comes to providing a more general framing for design practice in co-production processes as matter of making presents, this work proposes an approach that entails a collective understanding of the design action where both humans and non-humans work together. It brings forward the importance of making and prototyping over facilitating when it comes to the specific role that the designer might have in such collective. In relation to making, it also discusses power issues and how designers may engage in friendly hacking when trying to gain opportunities and resources for making. It suggests the importance of exploring other forms than workshops for collective and participatory making efforts.

Such an approach is defined through the notion of prudent tactics. Tactics allow for the articulation of how designerly approaches need to adapt to the specific situation and how it might be possible to act without a mandate. These tactics are characterized as being a matter of prudence (i.e. the ability to deliberate upon what is ‘right’ and ‘good’), which requires a long-term engagement and an ongoing reflection about who and what is involved in composing and what interests are at play.

20.2 Design practice-based approach, as a matter of making futures

This work uses a design-practice-based approach to engage in the exploration of possible futures, where insights and knowledge emerge not in relation to speculation and forecasting, but rather in attempts at implementing such futures.

Chapter 2 illustrates a number of possible futures that the opening of production may entail, which are then problematized by discussing limits and issues. The existing literature about the opening of production can be divided in two groups: grand hopes and disappointing descriptions. The hopes consist of a number of visions depicted in books, papers and pamphlets. These are visions about how an alternative production system could be put in place (Benkler 2006, Carson 2010, Siefken 2011), why it would be more sustainable from an environmental and social point of view (Latouche 2004, 2008, Hardt and Negri 2009, Bauwens et al. 2011), in which

ways the opening of production will be the next source of innovation boosting capitalism (Andersson 2012). On the other side, there are a growing number of ethnographic and quantitative studies (Kothala 2013a, Sharzer 2012, Troxler 2010), as well as more theoretical connected reflections (Bauwens 2006, 2009, Caffentzis 2010), but also blog entries (Zijlstra 2013) which reveal how the grand hopes are quite far from what is actually happening in the field, suggesting some critical reflection and exploration about the actual potential and possibilities of the opening of production. However, these studies rarely offer (Troxler 2013) any concrete ways forward.

This work wishes to exemplify how design-practice-based research can address this specific issue through a direct engagement with practices, people, and contexts. Being based on interventions, design research becomes a way to move beyond grand hopes and disappointing descriptions, focusing instead on making by engaging with and reflecting on practices in the opening production.

Design research is concerned with the actionable; therefore, it becomes an opportunity to suggest, as well as reflect on what happens when trying to move from alternative futures to possible presents. Thus, it provides insights which may be useful in reflecting on how specific practices can be supported and developed in time, how futures may or may not become presents.

20.3 Reflecting on the programmatic approach

In regard to the programmatic approach, there are two main concerns that emerge from this work.

Actionable program, knowledge-able experiments, a matter of where

As stated in chapter 1, it has taken a long time to come to a stable definition of the program of this inquiry. This long detour provides some insights on the nature of the elements involved in a programmatic approach and, more specifically, the ideas of actionable programs and knowledge-able experiments.

As already pointed out, a program consists of what to explore, and how to do it which needs to be tuned in order to lead to experiments

that can actually be done. For instance, I probably would have been able to explore the ideas of production for well-being and local production if I had chosen to work, for example, with a critical design approach instead of from a collective and collaborative perspective. In the former case, I would not have needed to engage so many diverse actors and agendas. Although, a critical design approach was never an option for my program, as it was somewhat in conflict with the findings that emerged from my previous experiments (i.e. master thesis work), discourses, and approaches in design for social innovation which instead, point to a collective and collaborative way of working. However, as already mentioned, to explore local production and production for well-being from a collective and collaborative perspective, turned out to be very difficult, leading to the need for reformulating the program and bringing in the notion of commons.

In more general terms, it seems important to consider to what extent the program is actionable, how and if it triggers experiments that can actually be done, as well as considering to what extent experiments are knowledge-able, how and if they feed back the program. It is not just a matter of defining a program that can trigger or frame the experiments, but also what can be expanded and challenged by the latter.

In this work, issues around an actionable program and knowledgeable experiments emerge quite clearly from the Fabriken's early papers, where the notions coming from heterodox economics are used to frame the experiment, but they are never discussed and challenged from the insights emerging from Fabriken until the notion of commons is brought in. These early papers are a detailed definition and exploration of a 'how' (a possible way of operating guided by certain principles), but they miss a critical reflection on the 'what' they generate. They reveal the incapability of the experiments to be knowledge-able in regard to certain elements of the program; that is, the ability of making sense beyond the partial and normative nature of the program.

This journey reveals the importance of considering very carefully, in programmatic research, the interaction between the program and

experiments as being the core from which knowledge is generated and questions are answered. In order to consider if a program is actionable and an experiment knowledge-able, it seems important to reflect on how they are related, but also on how this relation represents a possible knowledge contribution to the overarching genealogies and/or the broader practical context of the research. For this reason, the program of this research became not just a matter of ‘what’ and ‘how’, but also ‘where’. Defining the latter was a way to depict the context of the work, both in practical and theoretical terms. Its definition has been extremely useful in supporting an ongoing reflection in relation to which extent the interaction between the program and the experiments was, or was not, providing insights to the opening of production and in which ways.

From experiments to engagements

This inquiry also brings up the necessity to extend and further explore the notion of experimenting in the programmatic approach, particularly, when it comes to working with the genealogies of design for social innovation and participatory design. In particular, this work suggests the possibility of moving from experiments to engagements, whose long-term frame allows one to consider ‘what-happens-before’ and ‘what-happens-after’ the specific designerly intervention. Engagements extend the notion of experiment in terms of time in order to account for not only the design, but also for the making. In doing so, they also broaden to consider other actants’ agendas and interests, accounting for how the designer’s action (and possibility of action) is intertwined to other human and non-human participants and their interests.

Engagements allow one to consider the conditions that make a designerly intervention possible as well as to follow it and accounting for how it travels and thus, assess and discuss the outcome of a design process.

21 Aftermath reflections

After summing up the contributions of this work, this section looks at what kind of further explorations the program might trigger in relation to the diverse genealogies it has brought together.

21.1 Prospects in the opening of production

When it comes to exploring possible presents in the opening of production, this work should be considered just as a starting point, many more engagements are required to further understand possibilities and hindrances. However, some preliminary considerations can be already be made in relation to the diverse futures presented in chapter 2. In particular, the hindrances and challenges that emerged in the engagements seem to call for lower expectations about commons-based production forms whether they are considered as the ultimate way of boosting capitalism or a possible way to construct an alternative production system. It also seems that practices which tend to move in between diverse visions open for interesting possible prospects that might be worth further explorations.

Community-supported production

The collaboration between ReCreate and the die boards producer, the attempts at establishing a collaboration with the local museum, as well as the fact that Luisa, who has been engaged initially in setting up the textile corner, is now running a local association for promoting traditional handcrafts (hemslöjd förening), open up for further considering the alliances between more traditional producers and former-users, where the notion of ‘traditional producers’ stretches from small industries to artisans. What would be interesting to explore is how these alliances could support a local sustainable production mode blending industrial production with crafts and new modes of production supported by personal fabrication technologies. Such alliances could take diverse forms, from production-related collaborations, like in the case of ReCreate and the die boards producer, to materials-related ones, like, again, how ReCreate collects production leftovers or the Bicycle Kitchen collecting old

bikes. Interesting possibilities may be also related to how personal fabrication technologies could be used within more traditional forms of crafts, as well as open up for sharing and easing the diffusion of knowledge and skills around such forms of production. When it comes to small industries, it would be interesting to explore to which extent their competences and equipment could be at play in a local production system. Such a perspective recalls the medieval guilds way of operating where production skills were treated as commons within a community of practitioners, who learned from each other and experimented with techniques and technologies in shared workshops. However, there is a substantial difference, while guilds represented very conservative and close commons, in looking for alliances it would be fundamental to open up for engagements between diverse forms of making and including diverse kinds of producers, designers and former-users in the perspective of working along and across production chains rather than within them.

This possible prospect is very close to some of the developments that have happened in agriculture in the last years, such as in the examples of community-supported agriculture (Adam 2006) and civic agriculture (Lyson 2004). The basic idea is that of a mutual collaboration between farmers and consumers aimed at supporting the local economy as well as taking care of the local environment and community. These examples may vary from having consumers organized in local groups to buying directly from farmers to having consumers buy shares of farms and even collaborate with farmers in production activities. How could such experiences be transferred to other forms of production? How could former-users and more traditional producers find ways to collaborate which support local, sustainable and fair economies? What role could designers have in those alliances?

Makerspaces, meeting-by-making, and learning-by-making

When it comes to makerspaces, the experience with Fabriken/STPLN reveals that these facilities can work as infrastructures for experimentation, meeting and learning through and around making, according to a very similar way in which medieval guilds workshops used to work; but again, with the fundamental difference of striving for including diverse actors and cross-sector collaborations.

In this perspective, it would be interesting to further explore making as a way to support encounters between diverse actors as well as a driver for learning processes. Fabriken/STPLN engagement offers a number of insights in relation to how making can promote encounters between diverse actors and the development of social connections, as well as being at play in informal learning processes.

On one side, it would be interesting to experiment with how makerspaces could more explicitly address the challenge of how to promote the meeting between the bees and the trees. So, besides being spaces where grassroots initiatives can find resources to start and, perhaps, also continue their activities, makerspaces could also work as mediators able to foster communication between bottom-up projects and more established actors, being spaces where one may prototype possible alliances and collaborations for community-supported production. Here, a number of questions arise in relation to what kind of competences and processes can support such alliances and how it would be possible to gather actors with such different interests around the same concern.

On the other side, it would be worth exploring how makerspaces could be at play in vocational training and incubation processes. As stated, Fabriken/STPLN's activities and practices stretched from leisurely to more professional attempts at setting up businesses, from learning how to fix a flat tire to acquiring very advanced skills about programming. It would be interesting to explore how makerspaces could work as a sort of space in between informal and formal education and in between spontaneous, amateur, and professional production. Particularly, the issue would be in relation to understanding how to find a way for diverse forms of learning and production to co-exist, as well as how to support the possibility for participants to move from one kind of learning and production to the other.

21.2 Making commons and design

In considering how such prospects could be explored, one of the central issues resides in how to make non-consensus-based commons. Such an issue, which this work began to explore, represents a way to express a fundamental question for co-production processes and social innovation: how to create long-lasting collaborations involving actors



24(a)



24(b)



24(c)

Figure 24 Learning and meeting by making.

belonging to diverse sectors and having contrasting interests? This question, I would argue, represents a key challenge for participatory design and design for social innovation fields.

When it comes to the former, it entails exploring how to move from collective explorations of potentialities to collective explorations of actualities. Participatory design has a long experience in dealing with processes gathering actors with diverse interests and understandings of the situation, with the aim of collectively imaging and proposing alternative futures (Simonsen and Robertson 2012). Participatory design has often dealt with the question of how to support collaboration beyond consensus, and how to navigate challenges and conflicts that emerge in such processes. However the answers that emerge in relation to these questions are referring to processes which are time-limited and deal with the potentiality rather than the actuality of such futures, the design phase rather than the making.

In exploring the making of such futures—how they may or may not become possible presents—entails a number of questions and issues in relation to approaches and ways of operating in the making of commons. In answering such questions, traditional participatory design learnings and understandings of collective design processes may certainly play a central role, but new insights and approaches are also needed.

Such exploration strongly brings forward the importance of accounting for the outcome of such processes, both in terms of understanding what is the nature of the future which is to be made and the nature of what is being made. This appears to be a fundamental concern particularly in design for social innovation, which, perhaps, even more explicitly than participatory design, aims for change. But how is this change to be assessed?

This work relied on existing literature and understandings around the opening of production and the notion of commons to articulate the nature of engagements' outcomes as well as the way in which they were able to travel in the specific context where they developed. A possible further step would be to look for how the diverse stakeholders perceive and understand value and how such framing is at play in the making. For example, when it comes to economics, there

are a number of diverse and emerging discourses which introduce different ways of accounting for value production (i.e. Gibson-Graham et al. 2013); however, what needs to be further explored is how such frames may or may not be embraced. In a compositional perspective, this entails considering to which extent constraints gets to be reworked in co-production processes.

This attention towards the outcome is strictly related to the idea of prudence which is brought up in this work, and in particular, how designers and design researchers may find ways to take responsibility for collective design practice through a long-term engagement aimed at following and being part of the making in order to understand how possible futures may or may not become presents.

22. The latest update on people and projects

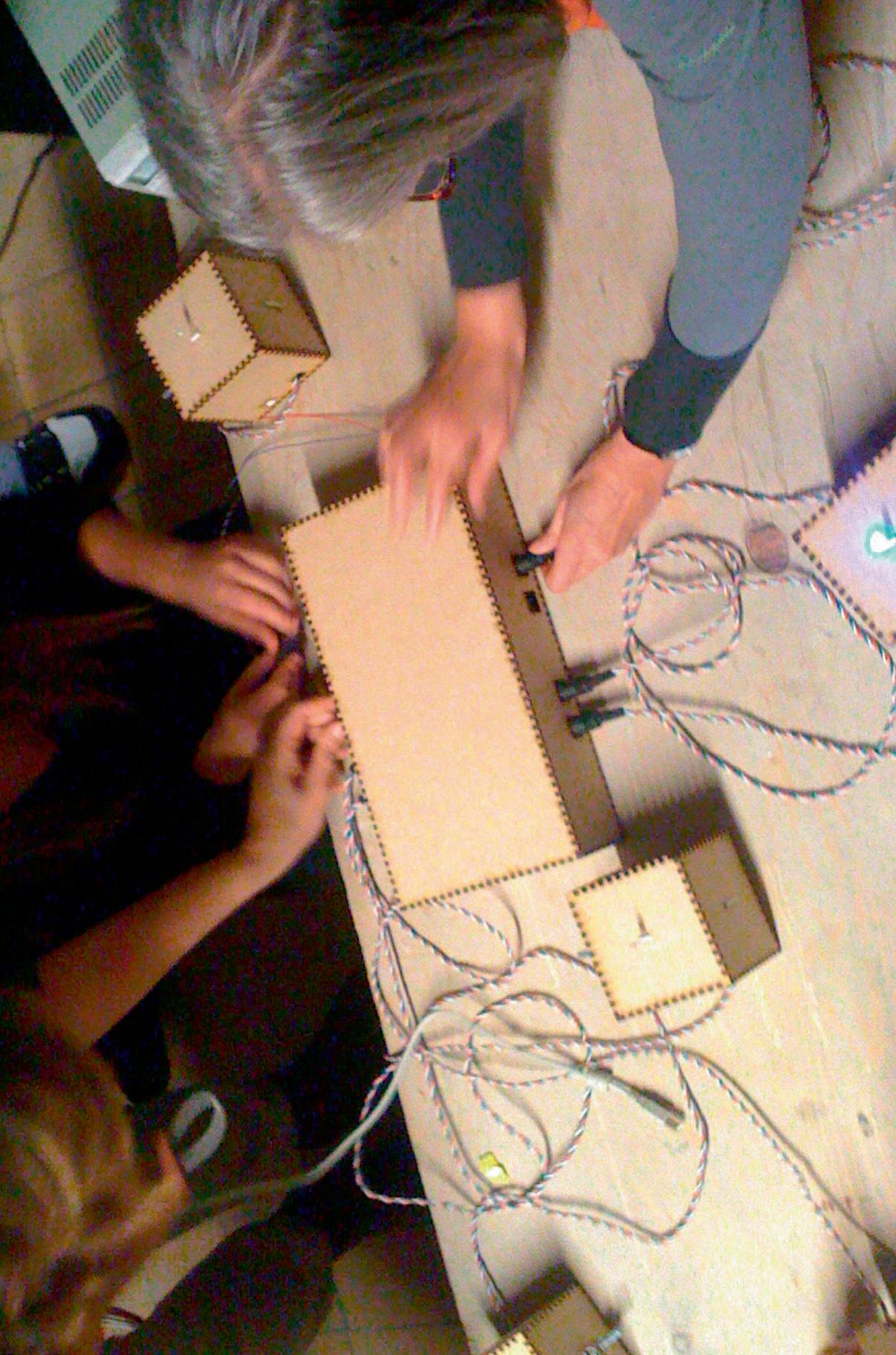
Herrgårds Women Association—After being hosted by other NGOs, in 2013, HWA finally received the possibility by the municipal housing company of using an apartment as their premises at no cost to them. They will have the location for all of 2014; however, as the relationship with the housing company seems to be good, they hope they will have the opportunity to stay longer. HWA continues to be involved in a number of projects and collaborations with diverse stakeholders. With us researchers, they are involved in a test-bed for developing new healthcare and home assistance services.

Fabriken/STPLN—The NGO running the premises has just received a three-year financing deal for further developing Fabriken, focusing on involving children in particular. At the present time, the NGO and Arduino Verkstad are discussing the details of a contract to formalize their collaboration regarding the running of Fabriken, while Arduino Verkstad is moving its offices at Malmö Business Incubator premises. In the frame of other research projects, we, the researchers, are working together with the NGO to plan some activities in relation to how maker culture could be spread to other areas of Malmö.

ReCreate—Two people are currently employed here aside from Carin Hernqvist: Cia Borgström and Elina Lindblad. Re-Create activities are financed until Spring 2015; in the meantime, a number of promising opportunities and collaborations have emerged, for example, with the municipal school department. The work of the initiative is also becoming increasingly recognized and continues to gain visibility on a local and national level.

The Bicycle Kitchen—Aside from the project with the environmental department in relation to the creation of an innovation hub for cycling culture, the organization has been struggling in the past months to ensure basic funding for the initiative. Their start-up funding ended in January 2014, and already by Autumn 2013, The Bicycle Kitchen entered in dialog with diverse departments at Malmö municipality to explore possibilities for acquiring funding of 50,000 Euros per year. However, although there were a number of promises, a definitive decision about this was not granted until May 2014 after The Bicycle Kitchen went public with the issue and announced that they would have to close down if funding was not found. At that point, a private citizen offered to go in with 25,000 Euros if the municipality would put up the other half. The municipality responded positively and it seems that, at least for another year, the Bicycle Kitchen will be able to continue their activities.

The Textile Department—It currently receives financing from the NGO running STPLN to organize regular workshops around learning how to use the machines and experimenting with diverse textile-related techniques and practices. Its activities are, at the moment, mainly driven by Monika Ståle and Cia Borgström.



6. SAMMANFATTNING

Oversätt av Pelle Ehn.

Denna avhandling är en designmässig undersökning av det träsk som omger föreställningar om en mer öppen produktion. 'Att öppna produktionen' syftar mot ökad öppenhet, samarbete och delning i de processer genom vilka ting skapas och tjänster förmedlas. Detta definieras som ett träsk, eftersom det representerar ett komplext landskap, där teori och praktik möts och där olika föreställningar och förståelser av betydelsen av öppenhet, samarbete och delning är sammanflätade.

Intresset för att undersöka detta träsk har sitt ursprung i två problemställningar. Den första gäller karaktären hos praktiker för öppen, deltagande och delad produktion, och i vilken utsträckning dessa kan leda till mer miljömässigt och socialt hållbar produktion och förmedling av ting och tjänster. Den andra problemställningen gäller möjligheten för designers att inte bara engagera sig i arbete med visioner och prototyper, men också i själva konstruktionen av öppna, samarbetsinriktade och delade produktionspraktiker.

Metodologiskt bygger avhandlingen på en programmatisk ansats, vilket betyder att kunskap produceras i interaktionen mellan den praktik och det program som definierar undersökningens fokus, samt mellan vad som undersöks och hur detta görs. Vad gäller avhandlingens praktik så baseras den på två långvariga engagemang: utformning och drift av en produktionsverkstad av typen "maker space", Fabriken, och ett långvarigt samarbete med en NGO sammanslutning av invandrade kvinnor, Herrgårds Kvinnoförening. Programmet syftar till att undersöka 'making commons' (skapandet av och genom kollaborativa gemenskaper) utifrån ett intresse i 'composing prospects' (lokal och kollektiv konstruktion).

Begreppet 'making commons' knyter detta arbete till teorier och ramverk från akademiska diskurser kring "commons" (d.v.s. kollektiva och samverkansorienterade organisationsformer), i avsikt att artikulera karaktären hos öppna, samverkansorienterade och delande praktiker. Begreppet öppnar upp för diskussioner av engagemangen, vad de producerar och hur de gör det, samt för överväganden kring hur dessa praktiker har initierats, implementerats och genomförts över tid.

Begreppet 'composing prospects' pekar mot ett specifikt sätt att undersöka alternativa framtider genom engagemang i kollektiva och lokaliserade försök att konstruera dessa framtider. Det definierar således en möjlig väg för designers att engagera sig i skapande produktion och konstruktion (making). Dessutom öppnar begreppet för möjligheten att relatera engagemangen till förväntningar och bredare scenarier som växer fram kring öppnandet av produktion, och till att artikulera vad slags 'making' som kan komma i spel i erkännandet av hypotetiska framtider som möjliga nu (possible presents).

Denna studie bygger på och adresserar forskningsfälten 'design för social innovation', 'participatory design' och 'commons'.

7. REFERENCES

- Adam, K. L. (2006). *Community supported agriculture*. ATTRA-National Sustainable Agriculture Information Service.
- Agger-Eriksen M. (2012). *Materials Matters in Co-Designing*. PhD Dissertation. Malmö, Sweden: Malmö University.
- Anderies M.J. and Janssen M.A. (2013). *Sustaining the commons*. Available from <http://sustainingthecommons.asu.edu/>.
- Anderson, C. (2012). *Makers: the new industrial revolution*. New York: Random House.
- Anderson, C. (2008). *The long tail: Why the future of business is selling less of more*. New York:Hyperion Books.
- Arvidsson, A. (2013). The potential of consumer publics. *ephemera: theory & politics in organization*, 13(2), 367-391.
- Bannon, L.J., Ehn P. (2012) Design Matters in Participatory Design. In Simonsen, J., & Robertson, T. (Eds.). (2012). *Routledge handbook of participatory design*. New York- London: Routledge.
- Bauwens, M. (2006). The Political Economy of Peer Production. *Post-autistic economics review*, 37, 33-44.
- Bauwens, M. (2009). Class and capital in peer production. *Capital & Class*, 33(1), 121-141.
- Bauwens, M., Bollier, D., Busaniche, B., Helfrich, S. (2011) *Commons Strategies Group*. Retrieved 30 November, 2013 from <http://www.commonstrategies.org/>
- Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. Yale University Press.
- Benkler, Y. (2013). Commons and Growth: The Essential Role of Open Commons in Market Economies. *University of Chicago Law Review*, 80 (3),1499-1555 .
- Benkler, Y., & Nissenbaum, H. (2006). Commons-based Peer Production and Virtue. *Journal of Political Philosophy*, 14(4), 394-419.
- Binder, T., De Michelis, G., Ehn, P., Jacucci, G., & Wagner, I. (2011). *Design things*. Cambridge, MA: MIT Press.
- Binder, T. & Redström, J. (2006). *Programs, Experiments and Exemplary Design Research*. Paper presented at the Design Research Society Underground conference, Lisbon, Portugal 1st-4th. November, 2006.

- Björgvinsson, E. (forth.) The Making of Cultural Commons: Nasty Old Film Distribution and Funding. In Ehn P., Nilsson E., Topgaard R. (Eds) *Making futures, marginal notes on innovation design and democracy*. Cambridge, MA: MIT Press.
- Björgvinsson, E., Ehn, P., & Hillgren, P. A. (2010). Participatory design and democratizing innovation. In *Proceedings of the 11th Biennial Participatory Design Conference* (pp. 41-50). ACM.
- Björgvinsson, E., Ehn, P., & Hillgren, P. A. (2012). Agonistic participatory design: working with marginalised social movements. *CoDesign*, 8(2-3), 127-144.
- Blyth, S., Kimbell, L. (2011). *Design Thinking and the Big Society: From solving personal troubles to designing social problems*. London: Actant and Taylor Haig.
- Boyle, D., & Simms, A. (2009). *The new economics: a bigger picture*. London: Earthscan.
- Bollier, D., & Helfrich, S. (Eds.). (2012). *The Wealth of the Commons: A world beyond market and State*. Florence, MA:Levellers Press.
- Botero C. (2013) *Treating Knowledge, Culture and Science as Commons*. Keynote at the Economics and the Commons Conference. Berlin May 22-24, 2013. Retrived from <http://commonsandecomomics.org/>
- Botsman, R., & Rogers, R. (2010). *What's mine is yours: The rise of collaborative consumption*. New York:HarperCollins.
- Botsman, R. (2013). *The Sharing Economy lacks a shared definition*. Retrieved 29 November, 2013 from <http://www.collaborativeconsumption.com/2013/11/22/the-sharing-economy-lacks-a-shared-definition/>
- Brandt, E., & Binder, T. (2007). *Experimental design research: genealogy, intervention, argument*. Paper presented International Association of Societies of Design Research conference, Hong Kong 12th-15th November 2007
- Brandt, E., Redström, J., Eriksen, M. A., & Binder, T. (2011). *XLAB*. Copenhagen: The Danish Design School Press.
- Brown, T. & Katz, B. (2009). *Change by design: how design thinking transforms organizations and inspires innovation*. New York: Harper Business.
- Bruns, A. (2008). *Blogs, Wikipedia, Second Life, and Beyond. From Production to Prodsusage*. New York: Peter Lang
- Burnett, M. M. & Scaffidi, C. (2013). End-User Development. In: Soegaard, Mads and Dam, Rikke Friis (eds.). *The Encyclopedia of Human-Computer Interaction*, 2nd Ed.Aarhus, Denmark: The Interaction Design Foundation. Retrived 29 November 2013 from http://www.interaction-design.org/encyclopedia/end-user_development.html

- Burns, C., Cottam, H., Leadbeater, C., Vanstone C. & Winhall, J (2006). Transformation Design. Retrived 30 November 2013 from www.designcouncil.info/.../transformationdesign/TransformationDesignFinalDraft.pdf
- Caffentzis, G. (2010). The Future of 'The Commons': Neoliberalism's Plan B or the Original Disaccumulation of Capital?. *New Formations*, 69(1), 23-41.
- Carson K.A. (2010). *The Homebrew Industrial Revolution*. BookSurge.
- Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard: Harvard Business Press.
- Chrisman, N. (1999). *Trading zones or boundary objects: Understanding incomplete translations of technical expertise*. Paper presented at 4S meetings, San Diego.
- Clark, B. (2007). *Design as Sociopolitical Navigation. A Performative Framework for Action-Oriented Design*. PhD thesis. Mads Clausen Institute for Product Innovation, University of Southern Denmark.
- Community Economies (2009) *Community Economies*. Retrived 30 November, 2013 from <http://www.communityeconomies.org/Home>
- Cooley, M. (1987). *Architect or Bee?: the human price of technology*. London:Vintage.
- Cox, M., Gwen, A., Villamayor T. S. (2010). A review of design principles for community-based natural resource management. *Ecology and Society*, 15(4), 38.
- Cruikshank, L., & Atkinson P. (2013). *Closing in on Open Design: comparing casual and critical design challenges*. Paper presented at EAD Crafting the Future Conference. Gothenburg 17-19 April 2013.
- Czarniawska, B. (2004). The use of narratives in social science research. In M. Hardy, and A. Bryman (Eds.) *Handbook of Data Analysis*. London: Sage.
- Czarniawska, B. (2010). The uses of narratology in social and policy studies. *Critical Policy Studies*, 4(1), 58-76.
- Daly, H. E. (1991). *Steady-state economics: with new essays*. Washington DC: Island Press.
- de Peuter, G., & Dyer-Witthford, N. (2010). Commons and cooperatives. *Affinities: a journal of radical theory, culture, and action*, 4(1).
- DiSalvo, C. (2009). Design and the Construction of Publics. *Design Issues*, 25(1), 48-63.
- Ehn, P. (1988). *Work-oriented design of computer artifacts*. Stockholm: Arbetslivscentrum.
- Ehn, P. (2008). Participation in design things. *Proceedings of the 9 th Biennial Participatory Design Conference 2008* (p.92-101). ACM.

- Ehn P., Nilsson E., Topgaard R. (forth), Introduction. In Ehn P., Nilsson E., Topgaard R. (Eds). *Making futures, marginal notes on innovation design and democracy*. Cambridge, MA: MIT Press.
- Emilson A, Hillgren, P-A., Seravalli, A. (forth) Designing in the Neighborhood: Beyond (and in the Shadow of) Creative Communities. In Ehn P., Nilsson E., Topgaard R. (Eds). *Making futures, marginal notes on innovation design and democracy*. Cambridge, MA: MIT Press
- Finidori H. (2013). Show me the action, and I will show you the commons!. *Lo squaderno, explorations in space and society*, 30, 29-31.
- Fischer, G. (2002). Beyond "couch potatoes": From consumers to designers and active contributors. *First Monday*, 7(12).
- Fischer, G. & Giaccardi, E. (2006). Meta-Design: A Framework for the Future of End User Development. In H. Lieberman, F. Paternò, V. Wulf (eds.), *End User Development — Empowering people to flexibly employ advanced information and communication technology*. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Flyvbjerg, B. (2004). Phronetic planning research: theoretical and methodological reflections. *Planning Theory & Practice*, 5(3), 283-306.
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative inquiry*, 12(2), 219-245.
- Florida, R. (2005) *Cities and the Creative Class*. New York-London: Routledge.
- Frischmann, B. M. (2012). *Infrastructure: The Social Value of Shared Resources*. Oxford: Oxford University Press.
- Fuad-Luke, A. (2009). *Design activism: beautiful strangeness for a sustainable world*. London: Earthscan.
- Gartner (2012). Gartner's 2012 Hype Cycle for Emerging Technologies Identifies "Tipping Point" Technologies That Will Unlock Long-Awaited Technology Scenarios. Retrieved December 1 2013 from <http://www.gartner.com/newsroom/id/2124315>
- Gauntlett, D. (2011). *Making is connecting*. Cambridge: Polity.
- Gershenfeld, N. (2005). *Fab: the coming revolution on your desktop--from personal computers to personal fabrication*. Cambridge MA: Basic Books.
- Georgescu-Roegen, N. (1971). *The entropy law and the economic process*. Cambridge, Mass./London: Harvard UP.
- Gottschlich, D. (2013). *Doing away with "labour": working and caring in a world of commons. Expeditions into (re)thinking the role of human (re)productive activity and its inherent nature in a generative commons network*. Keynote at the Economics and the Commons Conference. Berlin May 22-24, 2013. Retrieved 29 November, 2013, from <http://bit.ly/18gBMST>.

- Gibson-Graham, J. K. (1996). *The end of capitalism (as we knew it): A feminist critique of political economy*. Oxford: Blackwell Publishers.
- Gibson-Graham, J.K., Cameron, J., Healy, S. (2013). *Take back the economy*. Minneapolis, London: University of Minnesota Press.
- Greenhalgh, P. (2003). *The persistence of crafts: the applied arts today*. New Jersey: Rutgers University Press.
- Gregory, J. (2003) Scandinavian Approaches to Participatory Design. *Int. J. Engng Ed.* 19(1), 62-74
- Gudynas, E. (2011). Buen Vivir: Today's tomorrow. *Development*, 54(4), 441-447.
- Guston, D.H. (2001). Boundary organizations in environmental policy and science: An introduction. *Science, Technology and Human Values*, 26: 399-408.
- Hackerspaces. (2013). *Hackerspaces*. Retrieved from <http://hackerspaces.org/wiki/>
- Hamdi, N. (2004). *Small change. About the Art of Practice and the Limits of Planning in Cities*. London: Earthscan.
- Hardin, G. (1968). The Tragedy of the Commons. *Science*, 162, 1243-1248.
- Hardt, M. & Negri, A. (2009). *Commonwealth*. Harvard: Harvard University Press.
- Harvey, D.(2010). *A companion to Marx's Capital*. New York and London: Verso.
- Helfrich, S. (2013). *Economics and Commons?! Towards a Commons-Creating Peer Economy*. Keynote at the Economics and the Commons Conference. Berlin May 22-24, 2013. Retrieved 29 November, 2013, from <http://commonsandconomics.org/>
- Hess, C. (2008). *Mapping the new commons*. Paper presented at The Twelfth Biennial Conference of the International Association for the Study of the Commons, Cheltenham, UK, 14-18 July.
- Hess, C.& Ostrom, E. (2003). Ideas, Artifacts, and Facilities: Information as a Common-Pool Resource. *Law and Contemporary Problems* 66 (1/2), 111-145
- Hess, C. & Ostrom, E. (eds.)(2007). *Understanding knowledge as a Commons*. Cambridge, Ma: MIT Press.
- Hillgren, P.A. (2013). Participatory design for social and public innovation: Living Labs as spaces for agonistic experiments and friendly hacking. In Manzini, E. & Staszowski (Eds.). *Public and collaborative: Exploring the intersection of design, social innovation and public policy*. DESIS Network.
- Illich, I. (1973). *Tools for conviviality*. New York: Harper & Row.
- Jackson, T. (2009). *Prosperity without growth: economics for a finite planet*. London: Earthscan.

- Jegou, F., & Manzini, E. (2003). *Sustainable everyday. Scenarios of urban life*. Milano: Edizioni Ambiente.
- Jegou, F., & Manzini, E. (2008). *Collaborative services: Social innovation and design for sustainability*. Milano: Poli.design Edizioni.
- Karasti, H., & Syrjänen, A. L. (2004). Artful infrastructuring in two cases of community PD. In *Proceedings of the eighth conference on Participatory design* (pp.20-30). ACM.
- Kellogg, K. C., W. J. Orlikowski, and J. Yates. (2006). Life in the trading zone: Structuring coordination across boundaries in post-bureaucratic organizations. *Organization Science* 17, (1), 22-40.
- Kohtala C. (2013a). *Shaping Sustainability in Fab Labs*. Paper presented at the Participatory Innovation Conference 2013. Lathi, Finland.
- Kohtala C. (2013b). *Environmental studies on Additive Manufacturing II*. Retrived 30 November, 2013 from <https://blogs.aalto.fi/makerculture/2013/08/31/additive-manufacturing-ii/>
- Koskinen, I., Zimmerman, J., Binder, T., Redström, J. and Wensveen, S. (2011) *Design research through practice: from the lab, field, and showroom*. Waltham, MA: Morgan Kaufmann.
- Lakhani, K., & Wolf, R. (2003). Why hackers do what they do: Understanding motivation and effort in free/open source software projects. *MIT Sloan Working Paper*, No. 4425-03.
- Latouche, S. (2004). *Survivre au développement: De la décolonisation de l'imaginaire économique à la construction d'une société alternative*. Paris: Mille et une Nuits.
- Latouche, S. (2008). *Petit traité de la décroissance sereine*. Paris: Mille et une Nuits.
- Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical inquiry*, 30(2), 225-248.
- Latour, B. (2005). *Reassembling the social: an introduction to actor-network-theory*. Oxford: University Press.
- Latour, B. (2010). An Attempt at a "Compositionist Manifesto". *New Literary History*, 41(3), 471-490.
- Latour, B., & Lépinay, A. (2009). *The science of passionate interests*. Retrieved November 30 2013 from <http://www.bruno-latour.fr/sites/default/files/downloads/100-TARDE-ECO-GB.pdf>
- Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge Univ. Press.
- Lave, J. (1993). *The practice of learning in Understanding practice*. Edited by Chaiklin, S & Lave, J., 3-32. New York: Cambridge University Press.
- Lessig, L. (2002). *The future of ideas: The fate of the commons in a connected world*. New York: Random House Digital, Inc.

- Linebaugh, P. (2009). *The Magna Carta manifesto: liberties and commons for all*. Berkeley:University of California Pr.
- Lipson, H., & Kurman, M. (2010). *Factory@ home: The emerging economy of personal fabrication*. A report commissioned by the US Office of Science and Technology Policy.
- Lyson, T. A. (2004). *Civic agriculture: Reconnecting farm, food, and community*. Lebanon, New England: University of Tufts Press.
- Lock, J. (2013). *Open Source Hardware. Can embedded electronics companies thrive through the use and/or development of open-source hardware?* Department of Technology Management and Economics Division of Management of Organizational Renewal and Entrepreneurship – MORE
- Löwgren, J., & Reimer, B. (2013). *Collaborative media: Production, consumption, and design interventions*. MIT Press.
- Lusch, R. F., Vargo, S. L., & Tanniru, M. (2010). Service, value networks and learning. *Journal of the Academy of Marketing Science*, 38(1), 19-31.
- Madison M.J, Frischmann B.M, Strandburg K.J. (2008). Constructing Commons in the Cultural Environment. *Legal Studies Research Paper Series*. Working Paper No. 2008-26 August 2008. PittLaw:Pittsburgh, USA.
- Malmö Stad (2007). *Rosengård*. Retrieved 30th March 2014 from <http://www.malmo.se/download/18.10d69f8c11884193e5d80003762/20.ROSENG%C3%85RD.pdf>
- Malmö Stad (2011). *Malmöbor födda i utlandet*. Retrieved 30th March 2014 from <http://malmo.se/download/18.6e1be7ef13514d6cfcc800030661/Malm%C3%B6bor+f%C3%B6dda+i+utlandet%2C+f%C3%B6delsel%C3%A4nder.pdf>
- Malmö Stad (2012). *Malmöbor med utländsk bakgrund*. Retrieved 30th March 2014 from <http://malmo.se/download/18.6e1be7ef13514d6cfcc800030664/Malm%C3%B6bor+med+utl%C3%A4ndsk+bakgrund.pdf>
- Manzini, E. (2010). Small, Local, Open and Connected: Design Research Topics in the Age of Networks and Sustainability. *Journal of Design Strategies*, 4 (1).
- Manzini, E. & Staszowski, E. (eds.) (2013). *Public and Collaborative Exploring the intersection of design, social innovation and public policy*. DESIS Network. Retrieved December 13, 2013 from <http://www.desis-clusters.org/documents/10157/d769f32e-dc89-4353-8a09-47a273a6dee6>
- Manzini, E., Vezzoli, C. (2000). *Product-Service Systems and Sustainability*. United Nations Environment Programme Division of Technology Industry and Economics (DTIE) Production and Consumption Branch.
- McIntyre, A. (2008). *Participatory action research*. Los Angeles: Sage Publications.

- Meadows, D. H., Meadows, D. H., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report to The Club of Rome*. New York: Universe Books.
- Meroni, A. (2007). *Creative communities: People inventing sustainable ways of living*. Milan: Edizioni Poli.Design.
- Meroni, A., & Sangiorgi, D. (Eds.). (2011). *Design for services*. London: Gower Publishing, Ltd.
- Michel, S., Brown, S. W., & Gallan, A. S. (2008). Service-Logic Innovations: How to Innovate Customers, not Products. *California Management Review*, 50(3), 54-66.
- Mondragon Corporation (2012) *Annual Report 2012*. Retrived 30 November, 2013, from <http://www.mondragon-corporation.com/LinkClick.aspx?fileticket=ZzxamLvmVgk%3d&tabid=331>
- Mont, O. (2004) . *Product service systems: panacea or myth?*. Saarbrücken, Germany: VDM Verlah Dr. Müller.
- Mota, C. (2011). The rise of personal fabrication. In *Proceedings of the 8th ACM conference on Creativity and cognition* (pp. 279-288). ACM.
- Mulgan, G. (2009) *Strengths, weaknesses and a way forward?*. Retrived 26 January , 2011, from <http://www.socialinnovationexchange.org/designforsilblog?page=1> .
- Mulgan, G (2010). *In improving public services and social innovation, the design world has vital insights to offer. But designers must go beyond evangelism to show greater rigour about methods and limits*. Retrieved 9 December 2013, from <http://blogs.lse.ac.uk/politicsandpolicy/archives/6394>
- Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. London: National Endowment for Science, Technology and the Art.
- NEF (2012). *Happy Planet Index*. Retrived 30 November, 2013, from <http://www.happyplanetindex.org/>
- Normann, R., & Ramirez, R. (1993). From value chain to value constellation: designing interactive strategy. *Harvard business review*, 71(4), 65-77.
- O'Mahony, S. (2003). Guarding the commons: how community managed software projects protect their work. *Research Policy*, 32(7), 1179-1198.
- O'Mahony, S., & Bechky, B. A. (2008). Boundary organizations: Enabling collaboration among unexpected allies. *Administrative Science Quarterly*, 53(3), 422-459.
- Open Source Ecology (2013). *Open Source Ecology*. Retrieved 30 November 2013 from <http://opensourceecology.org/>
- Orsi, C. (2009). Knowledge-based society, peer production and the common good. *Capital & Class*, 33(1), 31-51.

- Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.
- Ostrom, E. (1999). *Design Principles and Threats to Sustainable Organizations that Manage Commons*. Paper presented at the VI Conferencia Electronica y Exposicion Virtual en Internet "De Cara a la Globalizacion: Organizaciones Economicas Campesinas en America Latina y el Caribe. Retrived from: <http://www.fidamerica.cl/actividades/conferencias/oc/ostroing.html>
- Ostrom, E. (2010). Response: The Institutional Analysis and Development Framework and the Commons. *Cornell Law Review*, 95, 807- 816.
- Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal*, 39(1), 7-27.
- Ostrom, E., Ostrom, V. (1977). Public Goods and Public Choices. In E. S. Savas, (ed.) (1977). *Alternatives for Delivering Public Services: Toward Improved Performance*. Boulder, CO: Westview Press.
- Ostrom, E., Dietz, T., Dolšak N., Stern P.C., Stonich S., Weber E. (Eds)(2002). *The Drama of the Commons*. Committee on the Human Dimensions of Global Change Washington, DC: National Research Council, National Academy Press.
- Panzar, C.J. , Willig, D.R. (1981). The economies of scope. *The American Economic Review*, (71) 2, 268-272.
- Pedersen J. (2007). *Protocols of research and design, Reflections on a participatory design project (sort of)*. PhD Dissertation. ITU University Copenhagen.
- Pipek, V., & Wulf, V. (2009). Infrastructuring: Toward an Integrated Perspective on the Design and Use of Information Technology. *Journal of the Association for Information Systems*, 10 (5), 447-473.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of interactive marketing*, 18(3), 5-14.
- Redström, J.(2006). Towards user design? On the shift from object to user as the subject of design. *Design Studies*, 27(2),123-139.
- Redström, J. (2011). *Some Notes on Programme-Experiment Dialectics*. Paper presented at Nordes, Nordic Design Conference, Helsinki, May 29th - 31st, 2011.
- Rodotá S. (2013). *Constituting the Commons in the Context of State, Law and Politics*. Keynote at the Economics and the Commons Conference. Berlin May 22-24, 2013. Retrived 30 November, 2013, from <http://boellblog.org/wp-content/uploads/2013/10/ECC-Rodota-keynote.pdf>
- Rose, C. (1986). *The comedy of the commons: custom, commerce, and inherently public property*. *The University of Chicago Law Review* 53(3),711-781.

- Ruskin, J. (1985). *Unto this Last*. London: Penguin.
- Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *Co-design*, 4(1), 5-18.
- Schneider, A. (2009). Why do Some Boundary Organizations Result in New Ideas and Practices and Others only Meet Resistance?: Examples From Juvenile Justice. *The American Review of Public Administration*, 39(1), 60-79.
- Schön, D.A. (1983). *The reflective practitioner: how professionals think in action*. New York: Basic Books.
- Schön, D.A. (1987). *Educating the reflective practitioner: toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.
- Schön, D.A. (1995). Knowing in action: The new scholarship requires a new epistemology. *Change: The Magazine of Higher Learning*, 27(6), 27-34.
- Schumacher, E. (1973). *Small is beautiful. A study of economics as if people really mattered*. London: Blond Briggs.
- Schuman, S. (2010). Design thinking is not enough [Web log post]. Retrieved from <http://www.inwithfor.org/2010/01/design-thinking-is-not-enough/>
- Sen, A. (1985). *The Standard of Living*. The Tanner Lectures on human values. Retrieved 30 November, 2013 from http://tannerlectures.utah.edu/_documents/a-to-z/s/sen86.pdf
- Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.
- Sen, A. & Nussbaum, M. (1993). *The Quality of Life*. Oxford: Oxford University Press.
- Sharzer, Greg. (2012). *No local: why small-scale alternatives won't change the world*. Winchester, UK: Zero Books.
- Siefkes C. (2012). Beyond Digital Plenty: Building Blocks for Physical Peer Production. *Journal of Peer Production*. Retrieved from: <http://peerproduction.net/issues/issue-1/invited-comments/beyond-digital-plenty/>
- Simonsen, J., & Robertson, T. (Eds.). (2012). *Routledge handbook of participatory design*. New York- London: Routledge.
- Sjöberg C. (1996). *Activities, Voices and Arenas: Participatory Design in Practice*, PhD dissertation. Linköping: Linköping University.
- Smith A. & Hielscher S. (2013). *Grass-root digital fabrication and makerspace: reconfiguring, relocating and recalibrating innovation?* SPRU Working Paper Series. University of Sussex. Retrieved 30 November, 2013, from <https://www.sussex.ac.uk/webteam/gateway/file.php?name=2013-02-swps-aps-sh-gdf-working-paper.pdf&site=25>
- Stallman, R. (1984). *The GNU Manifesto*. Retrieved 30 November, 2013, from www.gnu.org/gnu/manifesto.it.html
- Stangler, D., & Maxwell, K. (2012). DIY Producer Society. *Innovations*, 7(3), 3.

- Star, S.L. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science, Technology, & Human Values*, 35, (5), 601-617.
- Star, S. L., & Griesemer J. R.(1989). Institutional ecology, translations, and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-1939. *Soc. Stud. Sei.*, (19), 387-420.
- Star, S.L., & Bowker, G. (2010). How to infrastructure. In L. Lievrouw, & S. Livingstone (Eds.), *Handbook of new media: Social shaping and social consequences of ICTs*. London: SAGE Publications Ltd.
- Star, S. L., & Ruhleder, K. (1996). Steps toward an ecology of infrastructure: Design and access for large information spaces. *Information systems research*, 7(1), 111-134.
- Stengers, I. (2010). *Cosmopolitics I. 1, The science of wars. 2, The invention of mechanics. 3, Thermodynamics*. Minneapolis, Minn.: University of Minnesota Press.
- Steven (2006). 1976: *The fight for useful work at Lucas Aerospace*. Retrieved 30 November, 2013, from <http://libcom.org/history/1976-the-fight-for-useful-work-at-lucas-aerospace>
- Stigendal, M.I and Östergren, P-O. (2013). *Malmö's väg mot en hållbar framtid. Hälsa, välfärd och rättvisa*. Malmö: Kommission för ett socialt hållbart Malmö.
- Suchman, L. (2002). Located accountabilities in technology production. *Scandinavian journal of information systems*, 14 (2), 91-105.
- Svampa M. (2013) *Commons Beyond Development: The Strategic Value of the Commons as a Paradigm Shift*. Keynote at the Economics and the Commons Conference. Berlin May 22-24, 2013. Retrieved 30 November, 2013, from <http://commonsandeeconomics.org/>
- Thrift, N. (2006). Re-inventing invention: new tendencies in capitalist commodification. *Economy and Society*, 35(02), 279-306.
- Tillväxtverket (2012). *Potentialer för tillväxt och sammanhållning* (Rapport 0152). Stockholm: Tillväxtverkets publikationer.
- Tonkinwise, C. (2010). *Politics please, we're social designers*. Retrieved 9 December 2013, from: http://www.core77.com/blog/featured_items/politics_please_were_social_designers_by_cameron_tonkinwise__17284.asp
- Toffler, A. (1980). *Future shock: The third wave*. New York: Bantam books.
- Troxler, Peter.(2010). Commons-based Peer-Production of Physical Goods Is there Room for a Hybrid Innovation Ecology? *3rd Free Culture Research Conference*. Berlin, October 8-9, 2010.

- Troxler, Peter (2013). Making the 3rd Industrial Revolution. The Struggle for Polycentric Structures and a New Peer- Production Commons in the Fab Lab Community. In J. Walter-Herrmann & C. Büching (Eds.) (2013) *FabLabs: Of Machines, Makers and Inventors*. Bielefeld: Transcript Publishers.
- van Abel, B., Klaassen,R., Evers, L., Troxler, P. (2011). *Open Design Now: Why Design Cannot Remain Exclusive*. Amsterdam: BIS Publisher.
- Von Hippel, E. (2005). *Democratizing Innovation*. Cambridge MA: MIT Press.
- Waring, M., & Steinem, G. (1988). *If women counted: A new feminist economics*. San Francisco: Harper & Row.
- Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Westerlund B. (2009). *Design Space Exploration*. Phd Dissertation. Stockholm Sweden: KTH.
- Wikipedia (2013). *List of open-source hardware projects*. Retrived 30 November, 2013, from http://en.wikipedia.org/wiki/List_of_open-source_hardware_projects
- Zijlstra, Ton (2013). *The Failings of FabLabs*. Retrived 30 November, 2013, from <http://fablab.nl/2013/09/29/the-failings-of-fablabs/>
- Zwick, D. (2013) Utopias of ethical economy: A response to Adam Arvidsson. *ephemera: theory & politics in organization*, 13(2), 393-405.

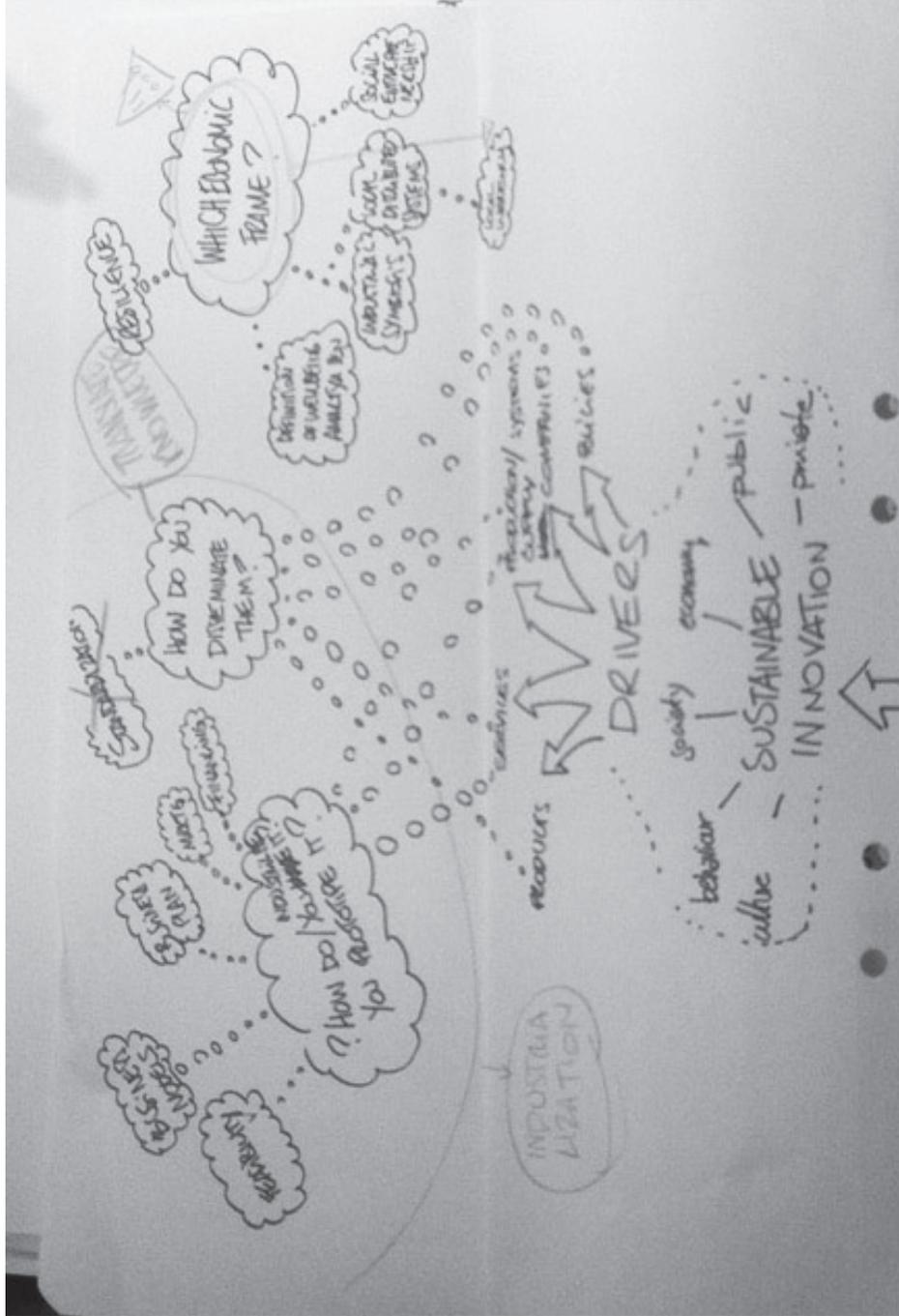


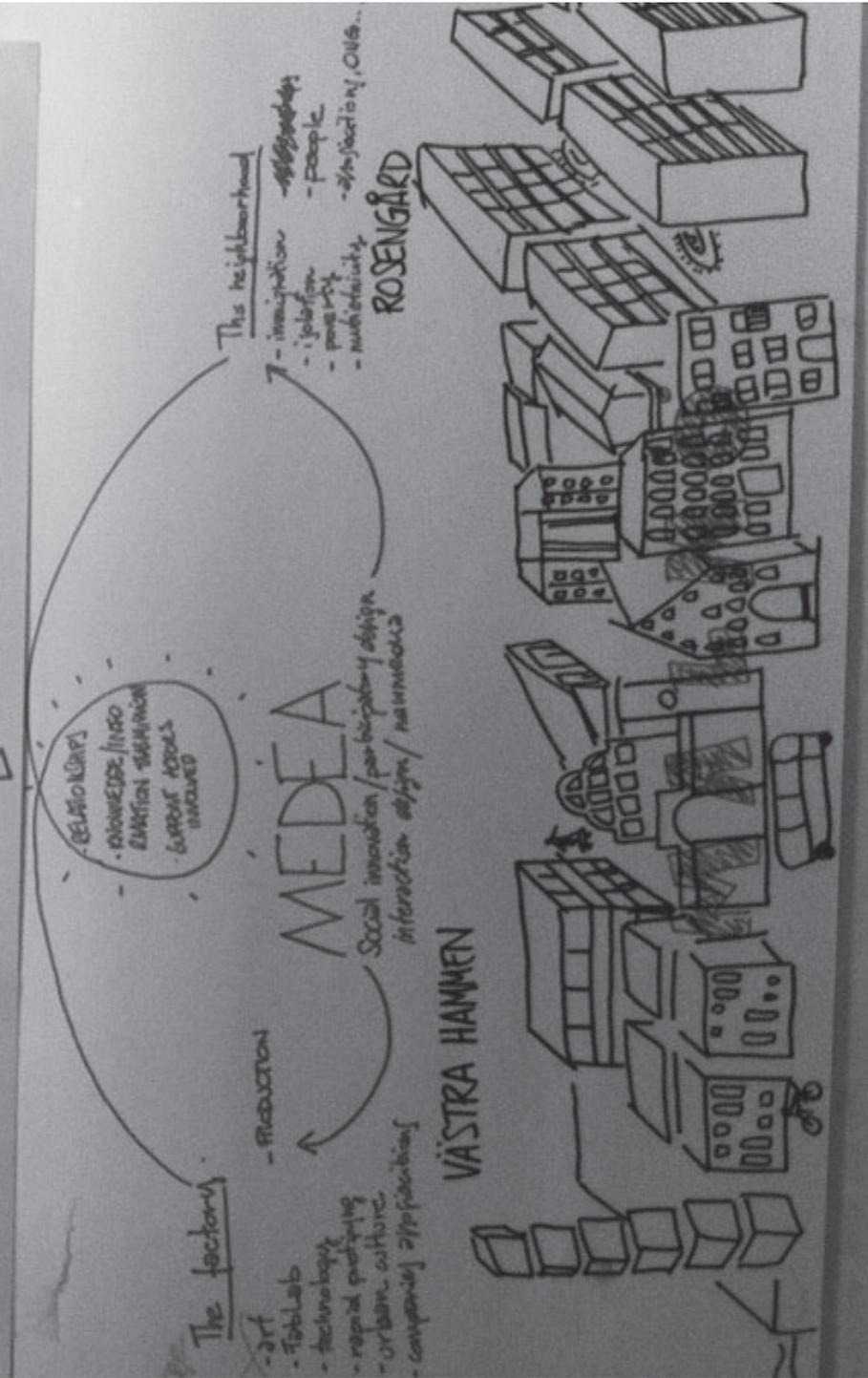


APPENDIX 1

THE FIRST MAP OF THE PROGRAM

June 2010





Prototyping and infrastructuring in design for social innovation

Per-Anders Hillgren, Anna Seravalli and Anders Emilson*

MEDEA Collaborative Media Initiative, Malmö University, Malmö, Sweden

(Received 28 January 2011; final version received 1 September 2011)

During the past five years design has been recognised as a powerful innovation driver. Design methods and tools have also been applied in new fields. One of them is social innovation, which is aimed at developing new ideas and solutions in response to social needs. While different initiatives have demonstrated how design can be a powerful approach in social innovation, especially when it comes to systemic thinking, prototyping and visualising, some concerns have been raised regarding the limitations of applying design in this field. Through a specific case, this paper will discuss and suggest some approaches and concepts related to design for social innovation. Coming from a participatory design tradition, we focus on the idea of infrastructuring as a way to approach social innovation that differs from project-based design. The activities that are carried out are aimed at building long-term relationships with stakeholders in order to create networks from which design opportunities can emerge. We also discuss the role of prototyping as a way to explore opportunities but we also highlight dilemmas.

Keywords: design for social innovation; participatory design; prototyping; infrastructuring; Thing; agonistic space

1. Introduction

Since the beginning of the twenty-first century there has been a global awakening regarding the complexity of the social, economic and ecological challenges we have to face. It has also been clear that old models do not meet these challenges in an adequate way. Therefore, both politicians and business leaders are now looking to social innovation as a way to develop new solutions. During the past five years designers have also increasingly started to be engaged in this field. The design approach, based on a user-centred perspective, involvement of stakeholders through participatory design and rapid prototyping, has proven to be useful in social innovation (Murray et al. 2010). However, a number of failed projects have also highlighted the fact that designers need to develop new approaches to be able to contribute in this new field (Mulgan 2009).

With a background in participatory design, we have been engaged in setting up Medea Living Labs, an innovation environment at Malmö University, Sweden. The aim with these labs is to collaborate with diverse stakeholders [non-governmental organisations (NGOs), municipalities, business partners] in the city of Malmö to explore how new services to tackle social issues could be developed. In these activities

*Corresponding author. Email: anders.emilson@mah.se

we are using the knowledge gained from our previous experiences in participatory design projects and elaborating them to fit the context of social innovation.

In this paper, we will discuss some of the concept and approaches that have emerged through our research. We will introduce and discuss the concepts of 'things' and 'agonistic space' (Björgvinsson *et al.* 2010) to stress how prototyping could be seen as a vehicle that reveals both opportunities and dilemmas. We will also present the concept of 'infrastructuring' (Björgvinsson *et al.* 2010) to highlight how design could move beyond the 'design project' towards a more open-ended long-term process where diverse stakeholders can innovate together. We will then connect these concepts to a case and finally discuss how they relate to other ideas from the field of social innovation.

A1

2. Social innovation and design

According to the Young Foundation (one of the most prominent organisations in promoting social innovation), existing structures and policies lack solutions to some of today's most pressing issues, such as climate change and chronic diseases (Murray *et al.* 2010). Therefore, more and more actors (non-profit organisations, politicians and business leaders) and turning to social innovation for new solutions. The Young Foundation defines social innovation as:

new ideas (products, services and models) that simultaneously meet social needs and create new social relationships or collaborations. In other words, they are innovations that are both good for society *and* enhance society's capacity to act (Murray *et al.* 2010, p. 3).

At the core of social innovation is openness and participation:

involving users at every stage as well as experts, bureaucrats and professionals; designing platforms which make it easy to assemble project teams or virtual organisations (Murray *et al.* 2010, p. 7).

Examples of social innovation include The Open University, Wikipedia, micro-loans, hospices, fair trade and magazines for homeless people, such as *The Big Issue* (Mulgan 2006).

Social innovation is not a new idea, but it has attracted increased attention in recent years from both political and economic leaders. In the USA, President Obama has created the Office of Social Innovation and Civic Participation in recognition that the 'best solutions to our challenges will be found in communities across the country' (SICP 2010). Social innovation has also become a key priority in the European Union's latest innovation policy and is considered to be a new field which should be nurtured:

It is about tapping into the ingenuity of charities, associations and social entrepreneurs to find new ways of meeting social needs which are not adequately met by the market or the public sector (European Commission 2010, p. 21).

Among the many hundreds of methods and tools from different fields that are used in social innovation, design approaches have been recognised as important instruments (Rockefeller Foundation and Continuum 2008, Murray *et al.* 2010). The Director of the Young Foundation, Geoff Mulgan, has listed, starting from experiences in the field, strengths and weaknesses in applying design in social

innovation. Some of the strengths are: visualisation techniques that support the involvement of diverse stakeholders in the process, a user-centred approach to complement top down methods, fast prototyping to rapidly test models in practice, and systemic approaches to food, energy and care systems (Mulgan 2009).

One early example of professional designers starting to 'tackle social and economic issues through design led innovation' (Design Council RED 2004) was the British Design Council's RED, unit which was active between 2004 and 2006 (Design Council RED 2004). The members of the RED unit (with backgrounds in design, social sciences and policy) have contributed to the theory of a new social focus in design, mainly through the reports *Health: co-creating services* (Cottam and Leadbeater 2004) and *Transformation design* (Burns *et al.* 2006), as they have named the new emerging design discipline. The transformation design approach includes involving heterogeneous stakeholders from the beginning through participatory design. By the statement 'design is never done' (Burns *et al.* 2006, p. 26), they mean that the professional designer should transfer capacities among the actors to enable their 'continually responding, adapting and innovating' (Burns *et al.* 2006, p. 21). The RED unit states that transformation design is aimed at leaving behind 'the tools, skills and organisational capacity for ongoing change' (Burns *et al.* 2006, p. 21).

In 2007 the RED unit developed into the social enterprise Participle which, together with service design companies such as live|work, Think Public and Engine, has made the UK a leading scene in design for social innovation. There are several reasons for this development in the UK. First, the Design Council has actively supported the use of design in responding to social challenges through projects like the RED unit and demonstrative programmes like *Designs of the time* (Dott Cornwall 2010a) and *Public services by design* (Design Council 2010). Secondly, in the UK there are close links between social responsive designers and leading organisations for social innovation, such as the Young Foundation, the think-tank DEMOS and the innovation organisation Nesta, which have highlighted that today's challenges need new kinds of responses and new kinds of public policies and services. Thirdly, the public sector has collaborated with, mainly, service designers to develop better health services (Think Public 2010) and new platforms for co-creation such as the Social Innovation Lab for Kent (SILK 2010). Furthermore, design for social innovation has also acquired a political role because of the government's Big Society policy, which aims at increasing the possibilities for citizens to participate in and co-create public services. This policy has clear parallels to the ideas that drive both social innovation and designers involved in this field, for instance the Dott programme (Dott Cornwall 2010b).

Another important centre in the development of design for social innovation has been Politecnico di Milano, where Ezio Manzini and François Jégou have been leading an international network of design researchers and design schools interested in design for social innovation and sustainability. For many years these network activities have been manifested through the platform called the Sustainable Everyday Project (SEP 2010). Also based at the Politecnico is the international network DESIS (Design for Social Innovation and Sustainability), which works to promote and support social innovation developed through design (DESIS 2010). The DESIS network vision states that the professional design community has a major role to play in facing social innovation and the new emerging designing networks. A designing network is:

a complex system of interwoven design processes that involves individuals, enterprises, non-profit organizations, local and global institutions who imagine and put into practice solutions to a variety of individual and social problems (Jégou and Manzini 2008, p. 40).

One interesting example of how design can contribute to social innovation is represented by the French organisation La 27e Région (La 27e Région 2010), which supports regional governments in developing collaborative projects to respond to local issues by establishing temporary laboratories where multidisciplinary team of civil servants, designers and citizens co-design new solutions in response to issues such as health, employment, education and obesity.

In the USA there is a growing interest in design for social innovation: it is among the expertise areas offered by companies such as IDEO, Continuum and Frog Design. However, design for social innovation in the USA is often related to projects in developing countries (Brown and Wyatt 2010) and in that way differs from Europe, where design for social innovation means co-designing with public servants or communities to develop solutions for local needs (Design Council 2008, Jégou and Manzini 2008). Working more in a European way is the DESIS Research Lab at Parsons The New School for Design in New York, which works with local creative communities in the Lower East Side to develop collaborative services and sustainable lifestyles (New School's DESIS Lab 2010). Project H Design is working with a local community in rural USA, bringing design skills into public education (Project H Design 2010).

2.1. *Limits of design for social innovation*

Some actors working with social innovation have recently expressed concerns about the role of design in this field, pointing out the weaknesses of designers and the limits of design methods. These reflections made it clear that design must be adapted to this new landscape in order to avoid naïve and superficial approaches. Going back to Mulgan's (2009) list, the weaknesses concern: lack of economic and organisational skills, inabilities in driving the implementation process, the high cost of design consultants who often do not have a long-term commitment to the projects, and the superficiality of some proposals due to the fact that by ignoring the evidence and field experiences designers tend to 'reinvent the wheel'.

Criticisms are also coming from the design community. The studio InWithFor questions the 'design thinking' approach in social innovation and underlines the necessity of moving beyond scenarios and isolated cases towards large-scale interventions able to foster long-term change:

if we want to solve big social problem we need more than design thinking. Big social problems have many causes; involve real tradeoffs; and require solutions that can work with multiple user groups across multiple levels. We need the critical questioning of social policy alongside the creative freshness of design. Indeed if we want to achieve long-term social transformation, we must be equipped to develop, test and spread robust theories of change (Schulman 2010).

These and other concerns are drawing attention to the competences and skills that designers are missing in both the project development and the implementation process, when the proposed scenarios and prototypes should be developed in concrete services and solutions. Finally, some of them are highlighting the need to

find strategies for scaling up social innovations in order to achieve systemic change.

To respond to these challenges, as Mulgan (2009) suggested, design needs to collaborate more closely with other disciplines involved in social innovation as well as importing tools and methods that could support the development of robust proposals and their implementation in real contexts. This relates to the idea that designers have to acknowledge that other disciplines are creative and need to define a role and position for themselves within a designing network (Jégou and Manzini 2008).

Coming from the research tradition of participatory design, we believe that this field could contribute towards tackling some of the limitations described above. First, participatory design has for many years been concerned with power relations (e.g. Ehn 1987, Beck 2002). This means paying attention to 'weaker' voices and social exclusion, which in turn demands more than a short design intervention. Secondly, some approaches emerging from participatory design stress long-term engagement and close collaboration between disciplines (e.g. Hartswood *et al.* 2000). In addition, the concepts of 'thing', 'agonistic space' and 'infrastructuring' that we have been elaborating within our own participatory design work could potentially provide some new insights. However, first we will look at the role of prototyping in social innovation.

3. Prototyping for social innovation

Prototyping is at the core of design and it has been stressed in design thinking and transformation design as a way to 'fail early to succeed sooner', especially when it is conducted in the actual context of use (Burns *et al.* 2006, Brown and Wyatt 2010). According to Murray *et al.* (2010), refining and testing ideas is important in the social economy:

because it's through iteration, and trial and error, that coalitions gather strength (for example, linking users to professionals) and conflicts are resolved (including battles with entrenched interests) (Murray *et al.* 2010, p. 12).

Different types of prototype are used in social innovation. For example, Fast prototyping, originally from software development, has spread into service prototyping and the social field, where it is often important to move quickly into practice.

In contrast, a more long-term approach to prototyping has been suggested from both social innovation practitioners and the participatory design community.

For example, the Young Foundation refers to slow prototyping as a process that can be used in situations where new capacities are necessary for a new model to succeed and where a more organic evolution is preferred:

Slow prototyping takes an idea and refines it slowly throughout extensive user testing before a final version is delivered. Slow prototyping can accommodate a gradual scaling up process – making sure that the final version can be adaptable to accommodate the nuances of specific geographical areas or communities of need (Young Foundation 2011).

A similar approach has emerged in the participatory design community, where researchers have stressed how design work and prototyping should be performed

through co-creation on a long-term basis in the actual context (Hartswood *et al.* 2000, Björgvinsson and Hillgren 2004). Sarah Schulman, replying to the article *Design thinking for social innovation* (Brown and Wyatt 2010), argued that, when dealing with social innovation, prototyping needs to move beyond rapid prototyping (that mainly focuses on testing the user experience of a future service) into a more long-term exploration that includes future roles and resource flows within the public systems. She also describes how prototypes can be a way of creating good teams and building capacity, which ‘means enabling policy people, practitioners, and users to run parts of the prototype’ (Schulman 2010).

From our experience, prototyping can also be seen as ‘things’. ‘Things’ in ancient Nordic and Germanic societies were originally assemblies, rituals and places where disputes were dealt with and political decisions made. The concept stresses that a prototype can be viewed not only as a thing (an object) but rather as socio-material relations where matters of concerns can be dealt with (Björgvinsson *et al.* 2010).

Another related perspective is to consider prototypes as vehicles able to raise questions as well as highlight controversies and dilemmas. The importance of allowing controversies to exist side by side, instead of negotiating them into consensus, has been stressed by Chantal Mouffe as ‘agonistic spaces’. For her, ‘agonistic spaces’ allow polyphony of conflicting voices which, despite their opposition, respect each other and are united by passionate engagement (Mouffe 2000).

We argue that these concepts are important because social innovation deals with complex problems that intertwine with and affect many different systems and actors in society. We also think that prototypes can provide support to foresee how a radical change can affect power relations or different political views. These concepts may be seen as abstract but we will soon try to elaborate them through the case of the Herrgårds women’s association. First, we will give a brief background to our working environment and research setting.

4. Malmö Living Labs and the NGO Herrgårds Kvinnoförening

Malmö Living Labs consist of three environments (The Scene, The Neighbourhood and The Factory) which are part of MEDEA, an academic initiative at Malmö University exploring new media and collaborative processes. In recent years, Living Lab environments have spread considerably in Europe, developing slightly different identities. However, most of them define themselves as user-driven innovation milieux aimed at developing new technological services and products in real-world environments by fostering collaboration between researchers, companies, public and civic sector (Stålbröst 2008). The activities of Malmö Living Labs focus on supporting local actors in developing grassroots social innovation, through processes aimed at exploring possibilities and at building win win connections between heterogeneous stakeholders. This way of working implies the creation of robust and long-term relationships between the involved actors and an ongoing investigation aimed at identifying new possible partners. This continuous research led us to meet Herrgårds Kvinnoförening (HKF) in 2009.

HKF is an NGO of immigrant women, founded by five women eight years ago in Rosengård, Malmö, as a response to their feeling excluded from Swedish society. The organisation has approximately 400 members (200 of whom are children) with different nationality backgrounds: Iranian, Iraqi, Bosnian and, most of them,

Afghan. Most of them are living on social security funding and have limited skills in Swedish; many are illiterate and they generally lack higher education. The activities of the NGO focus on cooking, textile design, traditional clothing and carpet production. They also have an important role in the neighbourhood, dealing with social issues (e.g. so-called honour-related violence) and organising educational events in collaboration with the city regarding health issues (e.g. sexual health). The core group of five women meets regularly and, depending on what kind of activities are carried out, other members participate (Figure 1).

HKF is an NGO of immigrant women, founded by five women eight years ago in Rosengård, Malmö, as a response to their feeling excluded from Swedish society. The organisation has approximately 400 members (200 of whom are children) with different nationality backgrounds: Iranian, Iraqi, Bosnian and, most of them, Afghan. Most of them are living on social security funding and have limited skills in Swedish; many are illiterate and they generally lack higher education. The activities of the NGO focus on cooking, textile design, traditional clothing and carpet production. They also have an important role in the neighbourhood, dealing with social issues (e.g. so-called honour-related violence) and organising educational events in collaboration with the city regarding health issues (e.g. sexual health). The core group of five women meets regularly and, depending on what kind of activities are carried out, other members participate (Figure 1).

During the first meetings with the women they expressed a desire to be more integrated in Swedish society by finding opportunities where their abilities and skills could be valued. Proving that HKF activities (considered to be 'leisure' by the authorities) can be viewed as more 'professional' would demonstrate how an immigrant NGO could be a socio-economic resource for Swedish society.

Together with HKF, we started to map their qualities and to look for possible partners (companies, civil servants, NGOs) by arranging workshops and meetings. This initial exploration identified actors who were interested in trying out some activities by collaborating in different prototypes.



Figure 1. The core group of Herrgårds Kvinnoförening.

4.1. Prototype 1: Catering service

Following a suggestion from HKF, we started to develop some prototypes around their cooking activities. Initially, we tried to understand how their cooking skills could be developed into a service including knowledge about the food ingredients and the original cultural context. We also explored whether the women could play an active role when delivering the food, rather than just handing it over at the door. Facilitated by us, the women produced leaflets about the food to be distributed to the clients and we supported them in getting some catering orders (Figure 2).

On one occasion, we put them in contact with an architects' firm and accompanied them to the pitch, where the women provided some tastes of Afghan and Iraqi food to the CEOs of the company. The architects clearly expressed their enthusiasm about the additional cultural experience and quickly adopted the Afghan terminology: 'Could you please bring me one more Kobbe?' It seemed that both of the stakeholders were satisfied and that the studio would place the order, so, as designers, we stepped back, leaving the women doing their business. Unfortunately, a few days later HKF informed us that the architects had turned down their offer, apparently because they thought that HKF was suddenly too expensive. We telephoned the studio and discover that there had been some miscommunication: the company was asking the women to provide them with a formal offer, stating the menu and the quantity of food they would deliver. The women were not used to these kinds of requests, and something went wrong in the communication between the actors: the architects thought that the quantity of food HKF would deliver would not be fair for the price they were charging them.

Looking back, we should have helped the women to structure their offer in a clear way. (We are about to do it now.) However, during the prototyping with HKF, it has always been problematic to find a balance between the support we should provide to them and making the women feel weak, fragile and overdependent on us.



Figure 2. The catering prototype: setting up the table.

4.2. *Prototype 2: Cultural intermediation*

Early on, the women expressed that they would like to try to arrange some activities for refugee children in Malmö. These children, aged mainly between 13 and 17 years, are living in Sweden without their families, having escaped from countries at war. In recent years the city of Malmö has welcomed a lot of Afghan and Iraqi orphans and, since they share the same cultural background, the women felt they could offer something to them. However, working with refugee orphans is a sensitive issue and we needed to facilitate the creation of trust between HKF and the responsible department at the Malmö municipality. The women, together with the authors, proposed to the city to organise some meetings with the children through which they could explore a possible intercultural mediation service that HKF could offer to the public agencies. The municipality was positive about the initiative but they did not want to have an active role and suggested that we should contact the healthcare company Attendo, which provides accommodation to children in Malmö. Attendo were much more interested and we set up some trials. An issue we were particularly concerned with was the emotional impact that this prototyping activity could have on the women and the children: could the encounter undesirably evoke some of their memories?

Therefore, we decided to start out carefully. The first step was simply to invite the children to the HKF's premises for an Afghan meal. They came there together with an Attendo employee and it quickly transpired that most of them had not eaten homemade Afghan food for several years (since they left their families). It became clear that the food could play an important role and the children wished that there could be other occasions for meeting the women and eating together. (The importance of food from the native country for refugee children has been highlighted by Kohli *et al.* 2010.) According to the women, several of the children were quite depressed and, to some degree, the women were emotionally shaken, but the experience was definitely compensated by the joy of feeling helpful.

The next step was to offer a cooking class to the children, which was done in collaboration with one of MEDEA's business partners: the media company Good World, which provided HKF and the children with access to its kitchen. During this encounter the children could alternate cooking with the women with using Good World's computers to explore social media together with some employees (Figure 3). The experience was quite positive for all the involved actors (the CEO of Good World said, 'I feel extremely inspired by meeting the women') and it revealed an opportunity for a mixed service where the children could both learn to cook Afghan food and explore Internet resources. The chance of establishing a solid connection between HKF and Good World also emerged, which could open up new scenarios based, for example, on a mutual exchange of services (Figure 4).

4.3. *Next prototypes*

So far, these experiments have demonstrated how HKF has the potential to play a new role in the Swedish socio-economic context. Regarding the activities with the refugee children, some municipality representatives stated that the women's engagement is valuable 'because they relate to the orphans in a different way than a Swedish civil servant would do'. The care company Attendo similarly recognised that the women, given their shared background, hold a unique position in providing



Figure 3. The cultural intermediation prototype: Herrgårds Kvinnoförening women cooking together with the refugee children at Good World premises.



Figure 4. The cultural intermediation prototype: the refugee children eating together with Herrgårds Kvinnoförening women.

temporary support to the children and discussing with them what it means to live in Sweden. However, despite the positive feedback, it seems that the service of ‘intercultural mediation’ needs to be further refined: none of the involved actors was ready to pay the women for the services (during the prototypes Malmö University has covered HKF expenses for the ingredients and for the preparation of the cooking class); the local manager at Attendo expressed the need for a more structured offer that he could use to convince the company’s board to allocate resources.

Another aspect that we would like to explore more is whether, and how, new media could play a role in the relation between HKF and the refugee children; for example, whether video-recorded material from the women (cooking instructions, advice, encouragement, etc.) would be valuable for the children and whether it could be worth using social media to reinforce the relationship between the women and the children.

By discussing the prototyping activities with HKF, it emerged that the women lacked a full understanding of the Swedish cultural context and some specific skills, related for example to business. We think that these difficulties could be overcome by connecting HKF with other stakeholders. Opportunities emerged to connect them with Göran Network, a huge network of businesswomen, and to elaborate a possible partnership with Good World.

Both these actors have expressed interest in developing their contacts with HKF; however, since they were too busy for a long time, we had to wait for several months before we could start to explore how the three stakeholders could establish balanced relationships based on mutual exchange of services and resources.

These trials, sometimes positive and sometimes less so, have been quite effective in revealing to the participants the potential and the limits of the different activities and relationships. At the same time, they allow us to understand the importance of being able to step back and wait for the availability of a specific actor. There is also some value in trusting the power of serendipity by keeping the process as open as possible and being ready to develop opportunities that suddenly emerge.

5. Discussion

5.1. Prototyping to reveal opportunities and dilemmas

For us, coming from a participatory design background, much is still to be explored about how prototyping can be done and how it can be considered not only as a way to test potential solutions but also as 'agonistic spaces', where the different stakeholders do not necessarily reach a consensus but rather create an arena that reveals dilemmas and makes them more tangible.

For example, during the prototyping process with HKF some trade union representatives responded very negatively to the idea of a non-commercial NGO doing business and accused the women of competing under unfair conditions and 'stealing' regular jobs. Another dilemma, revealed through the prototyping, concerned power relations within their families. The women stated that their position within the family is complex. In some senses they are strong, but upholding patriarchal traditions is also common in many Afghan and Iraqi families. The husband is seen as the family provider: he earns money and deals with politics and societal issues or similar matters of concern. However, most of these men have lost their authority since arriving in Sweden, as many of them are unemployed. If HKF develops into a successful business, it will give the women a position in society that their husbands lack. The women are not sure how to handle this; traditionally, their strategy has been to keep quiet about what they do to avoid trouble at home.

Conducting prototyping in social innovation evokes dilemmas that cannot be easily solved. In this sense, even if these activities do not always evolve into a concrete product or service, we believe that acting out these 'things' reveals questions, controversies and opportunities that can have an impact for social change in the long run.

5.2. Design as long-term infrastructuring

What we have described in the case above is a process quite different from the more traditional project-based approach used in design, which is characterised by a defined timespan during which designers have to respond to a given brief that eventually

could be reframed, by involving actors and different kind of materials (Dubberly 2005). Although a more structured approach is also being considered suitable for social innovation (Brown and Wyatt 2010), as we have seen earlier, a more long-term engagement could contribute differently, especially when it comes to the implementation phase and to having a real impact (Mulgan 2009, Schulman 2010).

The design work outlined in the case has been driven by what we define as 'Infrastructuring'. This process, in line with Mulgan and Schulman, focuses on long-term commitment, but it also provides an open-ended design structure without predefined goals or fixed timelines. Infrastructuring is characterised by a continuous process of building relations with diverse actors and by a flexible allotment of time and resources. This more organic approach facilitates the emergence of possibilities along the way and new design opportunities can evolve through a continuous matchmaking process (Björgvinsson *et al.* 2010). For example, the connection between HKF and Good World was not planned, it emerged by chance when we were looking for a facility with a kitchen where the women could cook together with the refugee children (see Section 4.2), and it revealed new opportunities that we could not have imagined beforehand. The longer timespan and a more open-ended approach have been especially valuable because, as we have seen above, a lot of the design opportunities have related to how new networks and resources have been able, step by step, to connect and align with the women. We had preliminary deadlines (such as aiming for a workshop with organisation X before time Z) and, early on, we had ideas about who could be relevant stakeholders. However, quite often, we had to adapt and rearrange the design direction depending on emerging circumstances. In addition, the complexity has been of such a level that it has been hard to know in advance which stakeholders and goals would be the most interesting to work with and achieve.

Infrastructuring also provides the ground for building the 'relational qualities' that Jégou and Manzini (2008) stress as a precondition for collaborative organisations: 'Peer-to-peer collaboration calls for trust, and trust calls for relational qualities: no relational qualities means no trust and no collaboration' (p. 33). Indeed, in the HKF case, 'trust' has often been a key element in the design process: the women were committed in the prototypes because they felt they could rely on us. At the same time, the established actors, such as the city or the healthcare company, joined the prototypes because we act as a 'trust mediators' by lending some of our credibility as university researchers to the women. The infrastructuring process allows the stakeholders to do things together on a long-term basis and fosters the creation of trust between them. Mutual trust relationships are critical to achieve social change because:

whereas in business the firm is the key agent of innovation, in the social innovation field the drive is more likely to come from a wider network, perhaps linking commissioners in public sector, providers in social enterprises, advocates in social movements, and entrepreneurs in business (Murray *et al.* 2010, p. 7).

Jégou and Manzini describe these complex stakeholder systems as 'Designing Networks' (Jégou and Manzini 2008) and we think that infrastructuring can be considered a process of generating and supporting these networks in a long-term, open-ended way.

Another important issue regards the interplay between bottom up and top down as well as different scales of intervention. Social innovation practitioners have

stressed the need to develop new approaches to connect grassroots initiatives with more established actors:

linking up the ‘bees’ – the individuals and small organisations that are buzzing with ideas and imagination – and the ‘trees’, the bigger institutions that have power and money but are usually not so good at thinking creatively. On their own, the bees cannot achieve impact. On their own, the trees find it hard to adapt (Murray *et al.* 2010, p. 125).

This metaphor fits well with our infrastructuring process, where we apply a conscious strategy of constantly looking for opportunities to connect larger institutions and businesses with smaller initiatives.

Although the infrastructuring process has proved to be valuable in revealing possibilities that could not emerge with a more structured project approach, it also has its disadvantages: being flexible means that we need to continuously plan and replan the activities according to the situation, which can become complex, with several opportunities emerging at the same time or at a moment when we lack the resources to develop them. For example, in order to start the collaboration between HKF and the Göran Network we had to wait for several months, owing to unexpected circumstances making the Göran Network unavailable. When the two stakeholders finally began to collaborate, several other interesting opportunities for collaboration appeared at the same time. A fair-trade fashion company (Righteous Fashion) and a Swedish woman passionate about traditional textile techniques both expressed interest in initiating activities with HKF. It is not easy to manage all these opportunities simultaneously. During this delay, we as researchers also had to pay attention to other issues, which meant that we could not attend as much as planned when their collaboration started.

6. Conclusion

We have proposed some strategies that could contribute to the development of the practice and theory of design for social innovation. The first concerns how to set up the design process by moving from a project-based approach to long-term open-ended infrastructuring. The second concerns exploring the potential of prototyping in this field as a tool to try out proposals but also to evoke dilemmas. This seems to connect with some of the contemporary discussions about the use of design in social innovation. However, we have also seen some disadvantages in this approach, such as managing the flexible and open-ended process.

Acknowledgements

Thank you to Jila Moradi, Herrgårds Kvinnoförening, DoDream and Nätverket Göran.

References

- Beck, E.E., 2002. P for political: participation is not enough. *Scandinavian Journal of Information Systems*, 14 (1), 77–92.
- Björgvinsson, E. and Hillgren, P.-A., 2004. On the spot experiments within healthcare. In: *Proceedings of the 8th participatory design conference (PDC 2004)*, Toronto, 27–31 July 2004, Vol. 1, 93–101.
- Björgvinsson, E., Ehn, P., and Hillgren, P.-A., 2010. Participatory design and ‘democratizing innovation’. In: *Proceedings of 11th participatory design conference (PDC 2010)*, Sydney, December 2010, 41–50.

- Brown, T. and Wyatt, J., 2010. *Design thinking for social innovation* [online]. Stanford Social Innovation Review. Available from: http://www.ssireview.org/articles/entry/design_thinking_for_social_innovation/ [Accessed 27 January 2010].
- Burns, C., et al. 2006. *Transformation design* [online]. Design Council. Available from: www.designcouncil.info/./transformationdesign/TransformationDesignFinalDraft.pdf [Accessed 25 January 2010].
- Cottam, H. and Leadbeater, C., 2004. *HEALTH: co-creating services* [online]. Design Council. Available from: www.designcouncil.info/RED/health/REDPaper01.pdf [Accessed 25 January 2010].
- Design Council, 2008. *Design Council briefing 02: the role of design in public services* [online]. Design Council. Available from: <http://www.designcouncil.org.uk/our-work/Support/Public-Services-by-Design/The-role-of-design-in-public-services-briefing/> [Accessed 28 January 2011].
- Design Council, 2010. *Public services by design* [online]. Design Council. Available from: <http://www.designcouncil.org.uk/our-work/Support/Public-Services-by-Design/> [Accessed 25 January 2011].
- Design Council RED, 2004. *RED is a 'do tank' that develops new thinking and practice on social and economic problems through design-led innovation* [online]. Design Council. Available from: <http://www.designcouncil.info/mt/RED/about/> [Accessed 25 January 2011].
- DESIS, 2010. *DESIS network design for social innovation and sustainability* [online]. DESIS. Available from: <http://www.desis-network.org/> [Accessed 26 January 2010].
- Dott Cornwall, 2010a. *What's Dott?* [online]. Dott. Available from: <http://www.dottcornwall.com/about-dott/whats-dott> [Accessed 25 January 2011].
- Dott Cornwall, 2010b. *Big society by design* [online]. Available from: <http://www.dottcornwall.com/about-dott/dott-review> [Accessed 27 January 2011].
- Dubberly, H., 2005. *How do you design?* [online]. Dubberly design office. Available from: <http://www.dubberly.com/articles/how-do-you-design.html> [Accessed 27 January 2011].
- Ehn, P., 1988. *Work-oriented design of computer artefacts*. Stockholm: Arbetslivscentrum.
- European Commission, 2010. *Europe 2020 flagship initiative innovation union* [online]. European Commission. Available from: http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=keydocs [Accessed 27 January 2011].
- Hartswood, M., et al., 2000. Being there and doing IT in the workplace: a case study of a co-development approach in healthcare. In: *Proceedings of the participatory design conference*, 28 November–1 December 2000, New York.
- Jégou, F. and Manzini, E., eds., 2008. *Collaborative services: social innovation and design for sustainability*. Milan: Edizioni POLI.design.
- Kohli, R.K. S., Connolly, H., and Warman, A., 2010. Food and its meaning for asylum seeking children and young people in foster care. *Children's Geographies*, 8 (3), 233–245.
- La 27e Région, 2010. *A propos* [online]. La 27e Région. Available from: <http://la27eregion.fr/A-propos-> [Accessed 26 January 2010].
- Mouffe, C., 2000. *The democratic paradox*. London: Verso.
- Mulgan, G., 2006. *Social innovation: what is it, why it matters and how it can be accelerated*. London: Young Foundation.
- Mulgan, G., 2009. *Strengths, weaknesses and a way forward?* [online]. Social Innovation Exchange. Available from: <http://www.socialinnovationexchange.org/designforsiblog?page=1> [Accessed 26 January 2011].
- Murray, R., Caulier-Grice, J., and Mulgan, G., 2010. *The open book of social innovation*. London: Young Foundation, NESTA.
- New School's DESIS Lab, 2010. *Amplifying creative communities* [online]. Available from: <http://amplifyingcreativecommunities.net/> [Accessed 27 January 2011].
- Project H Design, 2010. *Project H Design* [online]. Project H Design. Available from: <http://projecthdesign.org/> [Accessed 27 January 2011].
- Rockefeller Foundation and Continuum, 2008. *Design for social impact: workshop* [online]. Available from: <http://www.rockefellerfoundation.org/news/publications/design-social-impact> [Accessed 28 January 2011].
- Schulman, S., 2010. *Design thinking is not enough* [online]. Available from: <http://www.inwithfor.org/2010/01/design-thinking-is-not-enough/> [Accessed 27 January 2011].

- SEP, 2010. *Sustainable Everyday Project* [online]. SEP. Available from: <http://www.sustainable-everyday.net/> [Accessed 26 January 2011].
- SICP, 2010. *About SICP – the community solutions agenda* [online]. Office of Social Innovation and Civic Participation. Available from: <http://www.whitehouse.gov/administration/eop/sicp/about> [Accessed 25 January 2011].
- SILK, 2010. *Social Innovation Lab for Kent* [online]. SILK. Available from: <http://socialinnovation.typepad.com/silk/> [Accessed 26 January 2011].
- Stålbröst, A., 2008. *Forming future IT: the living lab way of user involvement*. Doctoral thesis, Luleå University of Technology.
- Think Public, 2010. *Case studies* [online]. Think Public. Available from: <http://thinkpublic.com/case-studies/> [Accessed 26 January 2011].
- Young Foundation, 2005–2011. *Prototyping and piloting* [online]. Young Foundation. Available from: <http://www.youngfoundation.org/our-work/local-innovation/strands/local-government-innovation/innovation-methods-local-government/14> [Accessed 27 January 2011].

Building Fabriken, Design for Socially Shaped Innovation

Design Research Society Conference Bangkok 1-4 July 2012, peer-reviewed article

Anna SERAVALLI^a

^aMEDEA, Malmö University

Recently, there has been a growing attention to innovation processes based on the involvement of diverse actors in co-creation activities. A new innovation model is evolving, relying on collaboration, openness and participation as drivers for the development of novelty in diverse fields. This model has a central role in social innovation, which is claimed to arise from collaborations across various sectors and social structures. In trying to understand how innovation arises in co-creation processes, this paper relies on the idea of socially shaped innovation, according to which novelty emerges from local interactions through tensions and argumentation.

In exploring how design could support socially shaped innovation, the paper discusses the experience of designing Fabriken, a socially shaped infrastructure for socially shaped innovation. Particularly, the focus is on the design process and on the shift from a design-in-the-studio strategy, based on a funnel model, to a design-in-use strategy, where some participatory tactics such as prototyping, small-scale interventions and long-term engagement are used by diverse stakeholders to explore the design space.

Keywords: *Socially shaped innovation; collaborative, open and democratic innovation; Design-in-use; Prototyping; Small-scale interventions; Long-term engagement.*

1. Introduction



Figure 1: Thursday evenings at Fabriken

It is Thursday evening at Fabriken, a maker-space located in the basement of an industrial building in Malmö, Sweden. Davey is helping some guys with the CNC mill. Chris and Frank are working on an old vending machine, trying to make it suitable for vending hardware boards. Someone else is mending a flat bike tire. In the textile corner, Luisa is teaching a guy how to crochet. Quinn is in the kitchen, preparing food for tomorrow's catering. Some guys are sitting on the sofa testing a robot they recently built. Jonathan is trying is new cello built using scrap material

What is the relation between these activities and the emerging innovation discourse that emphasizes collaboration, openness and democracy? What contributions could a maker-space like Fabriken bring to the discussion about innovation? This article uses the author's experience of being part of designing Fabriken to discuss how to design in and for the emergence of innovation in collaborative processes.

The discourse on innovation has recently shifted from a focus on close processes and creative elites to collaboration, openness and democratization (Leadbeater, 2008; Cheeseborough, 2003; von Hippel, 2005). This discourse is also relevant in the field of social innovation, which calls for collaborations across the public, private and third sector

and for alliances between grass-root initiatives and established organizations. By discussing the implementation of Fabriken as an infrastructure for collaborative, open and democratic innovation, this paper aims to provide two contributions: (1) the understanding of collaborative processes for innovation as processes of social shaping, where novelty emerges from local interactions through tensions and argumentation; (2) the understanding of how to design in and for a process of social shaping through a design-in-use strategy based on the tactics of prototyping, small-scale interventions and long-term engagement.

1.1 Research approach

With regard to the research approach, some considerations have been taken into account. The content of this paper is the result of a research *through* design process (Frayling, 1993) “where the action is calculated to generate and validate new knowledge or understanding” (1993:4). Fabriken is carried in a frame of constructive design research (Koskinen et al., 2011) “in which construction—be it in product, system, space, or media—takes center place and becomes the key means in constructing knowledge” (2011:5). Specifically, the Fabriken project can be described as constructive research in the field (Koskinen et al., 2011) with a focus on exploring how people understand, design and make use of Fabriken.

Fabriken’s case is part of a research program (Binder et al. 2006) which uses participatory design practices involving grass-root initiatives and more established actors in the context of Malmö city to investigate issues related to democracy and involvement in the innovation discourse (Björqvist et al. 2010, Ehn 2011, Hillgren et al. 2011). This paper uses the case of Fabriken to discuss social shaping as a way to understand open, collaborative and democratic processes in innovation and suggests the strategy of design-in-use when designing for such processes.

Fabriken is presented as a case study where the role of stakeholders (such as Caroline, the NGO’s manager¹) and users is highlighted in order to account for the messy, open-ended and ambiguous nature of experience (Mowles, 2010).

The author of this paper belongs to the research centre involved with the Fabriken project and has taken part in the design and the running of the maker-space (see 4).

A temporal map of Fabriken is provided (Figure 6) positioning in time the diverse steps and activities presented in the article.

¹ Such a point of view has been summed up during an interview/ conversation which has taken place at Fabriken’s premises on 04/11/2011

2. Understanding innovation as socially shaped innovation

2.1 Innovation: collaborative, open and democratic

In recent years, thinkers and practitioners within the innovation field have embraced the idea that innovation arises from networks (Tuomi, 2002) where diverse actors are involved in processes of co-creation (Prahalad et al., 2004). In the business sector, relationships between companies and suppliers are no longer perceived merely as value chains but as value constellations (Norman & Ramirez, 1993) where value is co-created by companies, suppliers and customers (Lusch et al., 2010).

In the technology sector, there has been a shift from closed to open innovation processes, recognizing that sources of innovation can be found outside the company (Cheesbrough, 2003). In particular, the role of end users has been challenged: they are no longer seen as passive consumers but as key resources for innovation (Von Hippel, 2005).

The discourse about collaborative (Leadbeater, 2008), open (Cheesbrough, 2003) and democratic (Von Hippel, 2005) innovation is spreading, emphasising the importance of networks and co-creation processes for the emergence of novelty.

Co-creation is a central idea in social innovation, which can present shifting roles between the public, private and non-profit sectors with the creation of partnerships between non-profit organizations, companies and public bodies (Phils et al., 2008). This can lead to the creation of bonds between previously separate individuals and groups, which in turn can create a fertile ground for the emergence of new ideas (Mulgan, 2007).

Collaboration between diverse actors characterizes social innovation, but it is also a condition for its development: for identifying unmet needs and generating and implementing ideas (de Ouden et al., 2010). These collaborations seem particularly promising when involving "the bees and the trees" (Mulgan 2007), where the "bees" represent small organisations and entrepreneurs that are mobile, fast and cross-pollinating, while the "trees" are large, resilient organizations that can scale ideas. In design for social innovation, these alliances have been described as designing networks, systems of diverse stakeholders designing together (Jegou and Manzini 2008).

A central question is how to support the development of innovation in co-creation processes involving diverse stakeholders. In trying to understand the practice of open, collaborative and democratic innovation, this paper relies on the idea of social shaping.

3. Understanding co-creation: social shaping of innovation

An extended understanding of co-creation processes is provided by the field of participatory design (PD), based on forty years of experience in supporting co-creation of

knowledge and change in work places (Gregory, 2003) and, recently, in broader public arenas (Björgvinsson et al., 2010; Halse et al., 2010). PD processes engage diverse stakeholders in envisioning possible futures (Gregory 2003) and developing a particular understanding of innovation as a process of social shaping (Buur & Laarsen, 2011): "We see innovation as the emergence of novelty that comes about in local interactions between people with different intentions" (Buur et al., 2010, p.123).

The idea of "social shaping of innovation" is partially grounded in a specific branch of management literature (Stacey, 2000; Stacey, 2007; Mowles, 2010) which uses complexity theory to look upon collaborations between people in organizations. In their perspective, change in human organizations "does not arise as a consequence of abstract idealising, but in the daily exploration of similarities and differences as people co-operate and compete" (Mowles, 2010:8).

The idea of social shaping highlights some key empirical aspects of collaborative processes. An important aspect in social shaping is the role of participants that are looked upon not as generic stakeholders, but as individuals with multiple and concurring agendas. In social shaping, conflicts are seen as key drivers for the emergence of innovation, which is described as the negotiation of meaning between people with crossing intentions (Buur et al., 2010).

The idea that change is negotiated and shaped by social interactions accounts for a certain degree of unpredictability in such processes (Stacey, 2005), in which "approximation and serendipity are the norm- the search for scientific precision is displaced in favour of informed improvisation, practical wisdom, integrated thinking and good judgement based on a shared sense of justice and equity and on common sense" (Hamdi, 2004: xxiii).

Another key aspect of social shaping is represented by the local framework as the conditions, in terms of resources and constrains, in which the process is developed and how these conditions are negotiated (Clark 2007).

Finally, another issue is related to how to develop the preconditions for social shaping, which is the creation of a designing network. Previous literature has argued that long-term engagement (Hillgren et al. 2011) is promising when it comes to fostering trust and mutual relationships between possible stakeholders.

To summarize, understanding innovation as a process of social shaping means focusing on the actual practice of creating and implementing change more than on the general discourse; it also means recognizing the empirical complexity that characterizes co-creation and participatory processes.

The idea of socially shaped innovation represents an interesting starting point for exploring how to design in and for social innovation.

4. Fabriken, a maker-space for social(-ly shaped) innovation

Fabriken is a maker-space located in Malmö, Sweden. Maker-spaces are workshops that offer access to machines and tools for experimenting with technology and production processes; they are characterized by a culture of openness that relies on sharing knowledge, skills and tools.

Fabriken has been co-designed by three actors: MEDEA, a research centre at Malmö University working with co-creation processes in the field of new media; STPLN, a local NGO (Non-Governmental Organization) dealing with youth coaching and empowerment; and 1scale1, an interaction design consultancy. The maker-space is located in an industrial building in the old harbour area, which has recently been converted into a residential and office neighbourhood. The building is run by the NGO as a facility for diverse activities, from concerts to art exhibitions and from office work to skateboard training. Fabriken is physically located in the basement of a building together with Cykelköket, a bicycle repair workshop, and Tantverket, a textile laboratory.

By exploring the experience of establishing and running Fabriken, challenges of designing in and for social shaping innovation are highlighted. Specifically, the focus of this article is on the shift from a design-in-the-studio to a design-in-use strategy (Ehn, 2008). In the following paragraphs, some design-in-use "tactics" (Di Salvo, 2009) are presented, such as prototyping for the temporary alignment (Suchman, 2000) of conflicting interests, small-scale interventions for explorations of the design space, and long-term engagement for enlarging the designing network.

Before moving to the narrative, some considerations are made on the role of maker-spaces in the innovation discourse and on the reasons why they seem particularly promising in terms of socially shaped innovation.

4.1 Maker-spaces and innovation

Maker-spaces have been considered environments for a hybrid innovation ecology (Troxler, 2010) where the potential of fabrication machines and open-source culture can boost technological innovation and improvements in the production processes. The historical background of such spaces can be found in Karl Hess' (2005) shared machine workshops from the mid-seventies:

The machine shop should have enough basic tools, both hand and power, to make the building of demonstration models or test facilities a practical and everyday activity. ... For

A2

inner-city residents the shared machine shop might be a sensible and practical doorway to the neglected world of productivity as well as being a base for community experimentation and demonstration. (p.96)

A similar concept drives hacker-spaces, which are community-operated physical places where people can meet and work on their projects. In short, they are real locations (as opposed to online meeting places) where like-minded people gather and hack (Hackerspace, 2010). The culture of these spaces is strongly characterized by hacker ethics (Levy, 1984) which, besides the hands-on imperative, are driven by an open culture that, through a sharing attitude and a peer-to-peer approach, can enhance the development of distributed networks and social bonds (Bauwens, 2006).

Hacker-spaces have been boosted by the development of personal manufacturing machines, also called fabbers: these are the small-scale, low-cost descendants of industrial machines such as 3D printers, laser cutters, and programmable sewing machines (Lipson et al., 2010). As CAD-CAM based systems (Computer Aided Design-Computer Aided Manufacturing), these machines offer the advantages of mass-production processes on a small-scale, thereby empowering individuals to make (almost) anything (Gershenfeld, 2005). The potential of these machines in an open culture context has been recognized by MIT (Massachusetts Institute of Technology) which, through the concept of FabLabs (Gershenfeld, 2005), has made maker-spaces accountable in the collaborative, open and democratic innovation discourse.

Six years after Gershenfeld's book, some observations have been made (Troxler, 2010) about the impact of FabLabs: In terms of technological innovation and production processes, their impact is still small; their innovation ecosystem is often limited and they have not yet found a sustainable business model .

In contrast, users' empowerment and community strength are claimed to be the main prides of these spaces (Troxler, 2010). This could be due to the fact that a sharing culture can be looked upon as a form of gift economy where mutual reciprocity can reinforce social relationships (Mauss, 1990); however, this is only partially true since in a peer-to-peer approach, there is no obligation of reciprocity involved (Bauwens, 2006). The creation of social capital in maker-spaces seems to rely more on a "do-it-together" approach in which cooperative "making" generates new "connections" between things, ideas and people (Gauntlett, 2011).

A key issue resides in understanding how to support the emergence of these social networks in maker-spaces and what potential they have in terms of socially shaped innovation.

4.2 The social shaping of Fabriken

As previously mentioned, STPLN is an NGO with extensive experience in working with youth empowerment and coaching. It supplies organizations, individuals or unorganized groups of people with support in various forms: equipment, coaching, or just someone to bounce ideas off. STPLN has been running its activities in an old industrial building owned by the City of Malmö. The premises also host the interaction design company 1scale1, which has a history of collaborating with STPLN. One of the members of 1scale1 is also part of MEDEA, the research centre at Malmö University. In 2009, the building was put under renovation by the City of Malmö, creating an opportunity for these three actors to imagine how the space could be further developed and how part of it could become a maker-space co-designed by these actors.

This setting seemed particularly promising in terms of socially shaped innovation since the diversity of the three actors would be fertile ground for creating networks across sectors and social structures and for connecting grass-root initiatives with established organisations.

4.2.1 Design-in-the-studio phase

The purpose of the design-in-the-studio phase was to develop a shared concept of Fabriken. This phase was structured as a funnel process (Westerlund, 2009) where from a fuzzy front end, through iterations, a unique concept should emerge. The process was based on four workshops: the first was aimed at creating a general concept, while the other three were dedicated to analysing some key issues that emerged from the first one, specifically issues like how to embrace sustainability in the space, how to create an open culture, and how to set up an internal currency system for facilitating the sharing between the users.

This first phase (August-December 2010) was driven by the design researchers and took place in the MEDEA studio, since Fabriken's premises were not yet available. The workshops were designed as a process of collaborative divergences and convergences (Design Council, 2005), each of them was aimed at developing a collaborative exploration ending with a temporal closure that could be re-opened at the next workshop. The aim was to progressively shrink down the design space towards a shared unique concept of Fabriken.

A2



Figure 2: design-in-the-studio phase
 Source: Courtesy of Elisabet M. Nilsson (2010)

The process did not bring the expected results: no shared concept of Fabriken was generated and there was no agreement about how the key issues should be tackled. Instead, it generated a competitive discussion frame (Westerlund, 2009) where each participant was trying to maximise his or her winnings at the expense of the creative process. A great many conflicts and discussions emerged that almost compromised the project, but they also created the space for a diverse design strategy to emerge.

4.2.1.1 The limits of design-before-use strategy

The first limitation of this process resided in its structure, which was organized according to a design-before-use (Redström, 2006) approach but without the direct involvement of users; therefore, it was problematic to envision future use. However, we could not set up a participatory process since it was unclear who the users would be. Even if it was evident that some groups would have a central role in the space—such as the local hacker community—it was not possible to foresee all the possible users.

Moreover, we were facing the challenge of trying to understand the use of the space before its actual use. As Redström (2006) points out, "The 'use' that we simulate, create and invite as part of a design process, be it iterative or participatory, cannot deal with what it means for something to become someone's, what it means for an object to become part of someone's life" (p.130). Structuring the concept, deciding which machines should be bought or trying to implement an internal currency system would have meant reducing the possibilities of users' design activities.

4.2.1.2 Consensus as a threat to the process

The process was leading to tension and frustration because it was based on the assumption that a consensus between the involved stakeholders should be reached. This would have meant leaving behind some agendas, compromising the role and the possible future engagement of the three stakeholders. As the participatory design tradition points out, "conflict and disagreement seem to be unavoidable elements in participatory design in practice, and have to be acknowledged and managed" (Sjöberg, 2006, p.24), since they obviously emerge when multiple needs, objects and motives are brought together (Gregory, 2003).

Furthermore, individuals are part of different collective activities, and, consequently, they are characterized by multiple interests which might differ or even conflict (Bødker, 1991). This aspect was also becoming apparent during Fabriken's design process. With regards MEDEA, its members have diverse interests in being part of the process, and these interests often clashed. A similar pattern was emerging in the NGO as well: Caroline stated, "It was just two of us, me and Julia, but I was the only one working with the development of the space, while Julia was focusing mainly on her specific projects" (Lundholm, 2011).

In this perspective, striving for consensus in collaborative processes seems impossible and undesirable. By aiming for a common denominator, processes based on consensus tend to become exclusionary and to encourage non-participation by gaining the passivity of people and not their active participation (Hamdi, 2004).

4.2.1.3 Ignoring the local framework

Designers tend to overemphasize the role of stakeholders' encounters, and they give too little consideration to the negotiation of the project resources and to the local framework in which the project is developing (Clark, 2007). In the initial phase of designing Fabriken, great emphasis was put on the workshops while little consideration was given to the conditions from which the project was arising.

As Caroline underlined, "In this phase we never talked about the previous experiences that STPLN had in trying to establish a maker-space before the collaboration with 1scale1 and MEDEA. We started to work with the idea of having a maker-space already in 2006 and we looked for diverse possibilities of collaboration as well as we tried diverse strategies" (Lundholm, 2011). These experiences were never brought into the design process, leaving out insights that could have been useful in this phase.

Another framework aspect influencing the process was the delay in the premises' renovation. Due to bureaucratic issues, the possibility to enter the building was postponed

from December 2010 to February 2011, and, finally, to April 2011, thereby delaying the commencement of the activities.

4.2.1.4 Conflicts as explorative occasions

Even if this phase was quite frustrating, it also felt necessary. The emergence of such strong conflicts allowed us to understand that the approach was failing. This brought a shift from trying to resolve the conflicts to acknowledging that the diverse interests would never find a perfect match. A diverse design strategy was needed: one able to support a process of social shaping. Conflicts have opened new possibilities (Bødker, 1991) for the project to develop, becoming a key driver in the Fabriken's social shaping process.

4.2.2 The design-in-use phase

This second phase (April 2011-on-going) can be described as a process where the three stakeholders, together with the users, are shaping the space. This process is not based on a funnel structure but on explorations of the design space, where a multiplicity of visions and concepts co-exist (Westerlund, 2009). These explorations are performed using some participatory design approaches, such as prototyping, small-scale interventions and long-term engagement (Hillgren et al., 2011). These approaches can be described as *tactics* (Di Salvo, 2009) since they represent designerly means that broaden the participation to the design process. They distinguish themselves from traditional design activities driven by designers since they can be manipulated beyond the common purpose of design (Di Salvo, 2009) and, in the case of Fabriken, appropriated by the users to drive their own design activities.

4.2.2.1 Prototypes for design-in-use

After the design-in-the-studio phase, the three stakeholders decided to interrupt the design process until the premises would be available. However, a few weeks later, 1scale1 and STPLN decided to organize a Hackathon² in a warehouse close to the premises under renovation. This event was aimed at getting in contact with possible future users of Fabriken.

By organizing this event, 1scale1 and STPLN were claiming back their driving role in the project, but they were also opening the possibility for a new design strategy to emerge: an approach based on interventions where stakeholders and users are engaged together in exploring Fabriken's design space.

The event was quite successful in terms of participation and projects that were developed. During the two days, diverse activities were happening related to the stakeholders' diverse

² A hackathon is an event where a group of hackers gather for several days to collaboratively build programs, applications or objects.

agendas. While 1scale1 was focusing on physical prototyping and electronics, MEDEA's researchers were facilitating connections between participants and establishing activities not related to electronics. The NGO, STPLN, was advertising Fabriken.



Figure 3: The Hackathon

Some projects were driven directly by the participants, who had the chance to express their expectations towards Fabriken in terms of equipment and infrastructure. The Hackathon allowed for a temporal alignment (Suchman, 2000) of the three stakeholders and became a prototype of how it would be possible to shape Fabriken without reaching consensus and by involving the users.

After the Hackathon, other prototypes were arranged, such as the official opening after the renovation (April 2011); Vårstädning (May 2011), a weekend of workshops on the theme of sustainability; and Christmas Bizarre (December 2011), a weekend of workshops on the theme of Christmas. At the opening, the NGO focused on the organization of the event while the design researchers were involved in organizing practical workshops and a pitch for ideas, an open-contest for projects that could be developed in the space; for example, the Christmas Bizarre was initiated by one of the users, Quinn. While STPLN's people together with Quinn were taking care of the overall strategy, the author of this paper, along with one member of 1scale1 and other users, was involved in organizing and driving different workshops.

These occasions allowed for prototyping roles and activities. By rehearsing these events, the stakeholders could undertake diverse roles and try different collaborative constellations.

4.2.2.2 Small-scale interventions for exploring the design space

Organizing events is quite demanding in terms of time and resources. A less laborious tactic is the one of small-scale interventions, which is based on narrow design actions such as setting up a "collective urban garden" outside Fabriken's premises (May-September 2011) or organizing short workshops about specific activities.



Figure 4: Setting up the urban garden outside Fabriken

Source: Courtesy of Ellsabet M. Nilsson (2011)

These actions have been defined as small-scale interventions, referring to the strategy of small-changes in city planning (Hamdi, 2004); this strategy recognizes the value of narrow design actions inside a broader strategy as a way to acknowledge serendipity and uncertainty in the design process. Small-scale interventions are used to explore and enlarge the design space of Fabriken. They work both as prototypes for investigating possible futures and as provotypes (Mogensen, 1994) challenging the present understanding of the space. Moreover, these interventions require few resources and can be quickly organized and modified according to opportunities appearing in the local framework.

The small-scale interventions' tactic has also been adopted by Fabriken's users, who are initiating their own activities on the basis of the available resources.

4.2.2.3 Tantverket, long-term engagement for enlarging the designing network

Another tactic is to work more with a long-term engagement (Hillgren et al., 2011); the establishment of the textile laboratory is a good example of this.

The idea was to expand the designing network beyond the regular users, the members of the local hacker community (Forskningavdelingen), and the volunteers of the bicycle repair shop (Cykelköket). The opportunity came by when Luisa, who is, as she defines herself, a textile geek, contacted Fabriken. She was working on a feasibility study for her project Mormors Verkstad (Grandma's Workshop), a place for reclaiming and learning traditional textile skills. As a part of this study, she was interested in setting up a textile community. On this basis in May 2011, Tantverket (the Grannies' Group) was established as a weekly meeting where people with interests in textile could gather and work together. The idea was to buy some tools and fabrics, to initiate the group activities and then to let the participants take the lead. However, building a community needs time and intervention. In addition to being in the space every Thursday evening to meet the participants, Luisa and the author have tried several activities, from organizing workshops to setting up swap parties³ and participating in Fabriken events.

A2

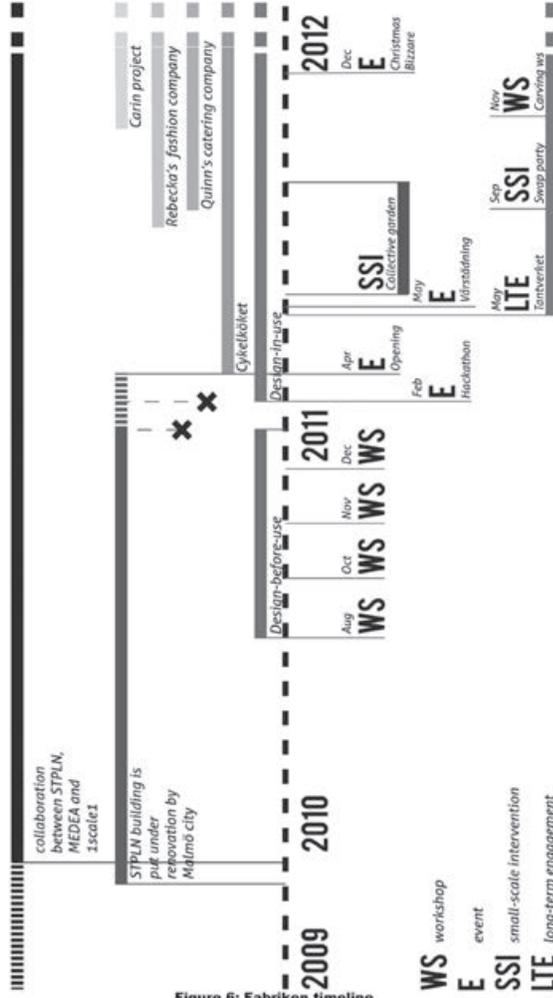
³ Events based on bartering of garments



Figure 5: Tantverket

After six months, the community's Facebook group counted more than 90 subscribers and Tantverket's activities had a high media exposure (Luisa has been interviewed four times by local newspapers and radio). The online community was quite active, and if an event or a workshop was organized, the response was always good in terms of participation; however, the number of regular participants remained quite low and some evenings nobody showed up.

Unlike the other two Fabriken groups (Forskningavdelingen and Cykelkøket), Tantverket is not involved in daily activities and discussions. However, its members are part of the Fabriken designing network. Some of them represent external actors that can be temporarily involved in the social shaping of Fabriken on specific occasions (e.g. workshops, larger events). Others have entered the space through Tantverket and are now driving their own activities and developing relationships with other users.



A2

5. Fabriken, a socially shaped infrastructure for socially shaped innovation?

Eight months after the opening, some considerations can be made about social shaping at Fabriken.

Collaborative networks are emerging, involving not only Fabriken, but also the whole premises. While people are sewing, soldering and laser-cutting in the basement, STPLN is hosting events and managing a co-working facility at the ground level, using the same collaborative, open and democratic approach that drives Fabriken. Users are moving from one space to the other, developing alliances and taking advantage of all the possibilities.

One of these users is Carin, a former teacher, who contacted Fabriken to get support for starting her project. Her idea is to create a space where children can develop their creativity and environmental awareness by playing with cast-off materials from manufacturing processes. Fabriken is supporting Carin's project in different ways: On the one side, it provides her access to a workshop where she can experiment with materials and do activities with children. On the other side, it allows her, by being in the space, to become part of Fabriken's network and to get to know possible partners.

In terms of the broader innovation discourse, Fabriken also works as a space for technological experimentations. Forskningavdelingen's members have been involved in the creation of several different prototypes of robots, software applications and hardware boards; some of these experiments have been commercialized. A number of users use the facilities as a support for their start-ups: Quinn has started a catering company using the premises' kitchen. Rebecka, a fashion designer, has also recently founded her own company and is using Tantverket as her atelier.

Beside users coming to the space for setting up a small company or exploring the possibilities of technologies and machines, there are also participants who have been unemployed or on sick leave for a long time. In this sense, Fabriken counts in the social innovation discourse, but in a way that we never expected.

From these outcomes, it seems that the Fabriken experience can bring a contribution to the general discourse of collaborative, open and democratic innovation. In fact, the phenomena appearing in the space seem to indicate that novelty emerging from social shaping is manifold since it simultaneously involves diverse dimensions, from technological to social ones, from economical to organizational ones.

6. Conclusions

This article has developed two contributions: the first is the understanding of collaborative, open and democratic innovation as processes of social shaping; the second is the understanding of how to design in and for social shaping.

Social shaping is used to describe processes of co-creation, underlining the complexity and challenges of participatory practices where, in a specific local framework, a designing network is developed by involving stakeholders with diverse agendas. To explore how to design for and in a process of social shaping, the case of Fabriken is presented. In particular, the article describes the shift from a design-in-the-studio to a design-in-use strategy, which creates the possibility of having participatory explorations during the use phase through the tactics of prototyping, small-scale interventions and long-term engagement.

Based on Fabriken's experiences, social shaping seems promising for the generation of manifold grass-root innovation, and design-in-use appears to be successful in supporting these processes.

However, further research is needed to investigate the role of the designer in social shaping and to define more precisely the competences needed in the shift from a funnel process, where designers have a leading role, to a design-in-use process, where leadership is distributed between participants, conflicting agendas are navigated and local framework is considered.

Acknowledgements

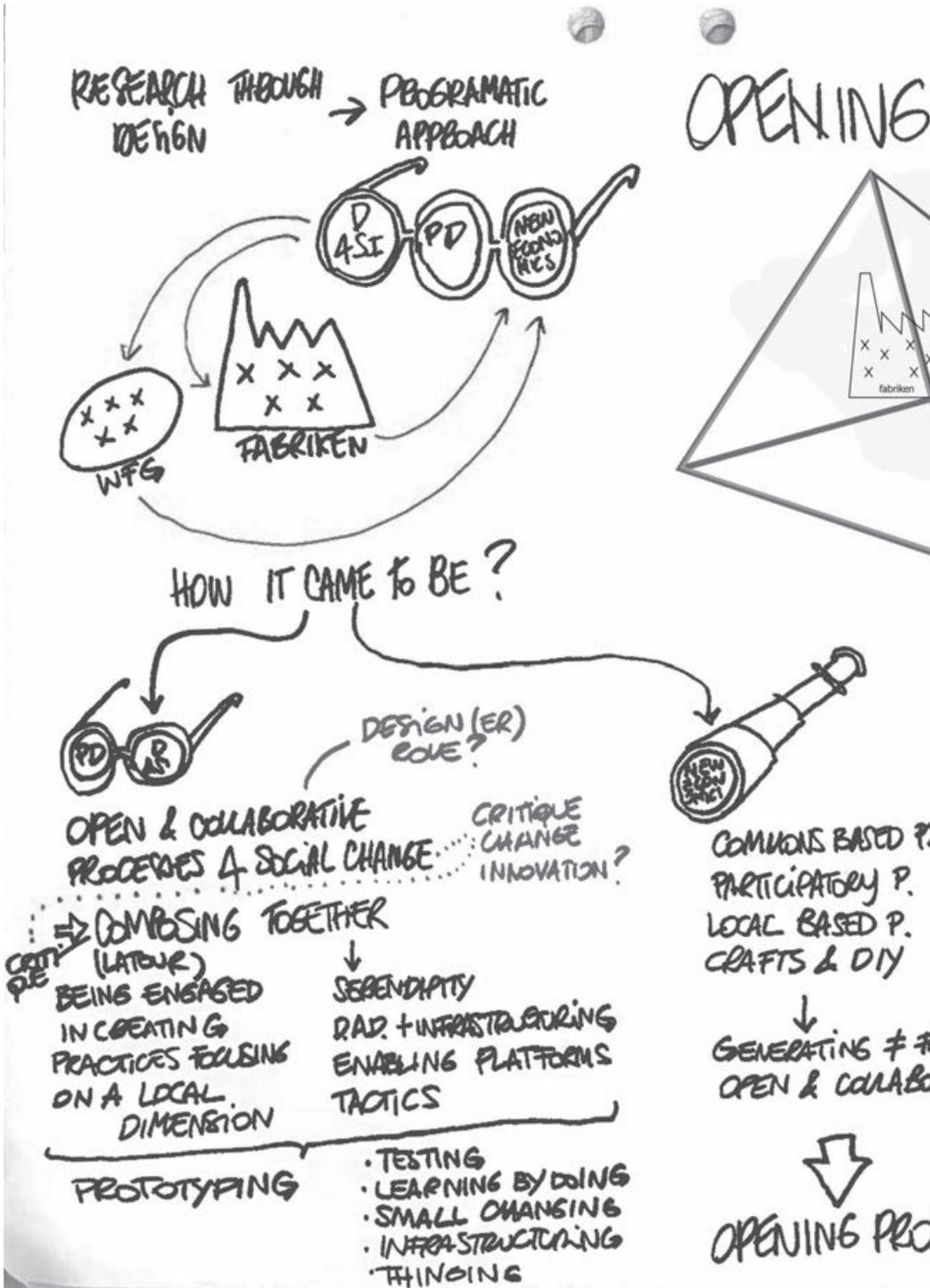
Thanks to Pelle Ehn, Elisabet M. Nilsson, Richard Topgaard, Caroline Lundholm and STPLN people, Fabriken Team, 1scale1, Luisa and Tantverket, Cykelköket, Forskningavdelningen and all the people participating in the social shaping of Fabriken. Additional thanks to the participants of the Summer School "Social Shaping of Innovation" at SPIRE Center, Denmark.

References

- Bauwens, M. (2006). The Political Economy of Peer Production. *Post-autistic economics review*, 37(3), 33-44.
- Binder, T. Redström J. (2006). *Programs, Experiments and Exemplary Design Research. DRS Wonderland Conference 2006*.
- Björgvinsson, E., Ehn, P., Hillgren, P.-A. (2010). Participatory design and 'democratizing innovation'. In *Proceedings of the 11th Conference on Participatory Design, PDC 2010*. Sydney, AU
- Buur, J., Day, D., Laarsen, H., Mack, A. (2011). Social Shaping of Innovation. Summerschool. SPIRE Centre. Sønderborg, DK.
- Buur, J., Laarsen, H. (2010). Quality of conversations in participatory innovation. *Co-design*, 6(3), 121-138.
- Bødker, S., (1991). *Through the Interface – a Human Activity Approach to User Interface Design*. Hillsdale, NJ: Lawrence Erlbaum Associates.

- Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Clark, B. (2007). *Design as Sociopolitical Navigation: A Performative Framework for Action Oriented Design*. (PhD Dissertation). University of Southern Denmark, Odense.
- Design Council. (2005). The 'double diamond' design process model. Retrieved 2 January, 2012, from <http://www.designcouncil.org.uk/designprocess>
- Di Salvo, C. (2009). Design and the Construction of Publics. *Design Issues*, 25(1), 48-63.
- Den Ouden, E., Valkenburg, R. (2010). Balancing value in networked social innovation. In *Participatory Innovation Conference 2010* (pp. 307-313). SPIRE center. Sønderborg, Denmark
- Ehn, P. (2008). Participation in design things. In *Proceeding of the 10th Conference on participatory Design, PDC 2008*. (pp.92-101). Bloomington, Indiana, USA.
- Frayling, C. (1993). Research in art and design. *Royal College of Art Research Papers*, 1, 1-5.
- Gauntlett, D. (2011). *Making is connecting*. Cambridge: Polity Press.
- Gershenfeld, Neil A. (2005). *Fab: the coming revolution on your desktop—from personal computers to personal fabrication*. New York: Basic Books.
- Gregory, J. (2003). Scandinavian Approaches to Participatory Design. *Int. J. Engng Ed.* 19(1), 62-74.
- Hackerspaces. (2010, 1st January). Hackerspace. Retrieved 23 December, 2011 from <http://en.wikipedia.org/wiki/Hackerspace>
- Halse, J., Brandt, E., Clark, B., Binder, T. (2010). *Rehearsing the future*. Copenhagen: The Danish Design School Press.
- Hamdi, N. (2004). Small change. *About the Art of Practice and the Limits of Planning in Cities*. London: Earthscan.
- Hess, K. (ed. 2005). *Community Technology*. New York: Loompanics.
- Hillgren, P.-A., Seravalli, A., Emilson, A. (2011). Prototyping and infrastructuring in design for social innovation. *Co-design*, 7(3-4), 169-183.
- Jegou, F., Manzini, E. (2008). *Collaborative Services*. Milano: Edizioni POLI.Design.
- Koskinen, I., Zimmerman, J., Binder, T., Redström, J., Wensveen, S. (2011). *Design Research Through Practice: From The Lab, Field and Showroom*. Waltham: Elsevier
- Leabeater, C. (2008). *We-Think*. London: Profile books.
- Levy, S. (1984). *Hackers: Heroes of the Computer Revolution*. London: Penguin.
- Lipson, H., Kurman, M. (2010). *Factory@Home: The Emerging Economy of Personal Manufacturing*. USA: US Office of Science and Technology Policy.
- Lundholm, C. (2011). Private conversation. Recorded on 04 November 2011 at STPLN premises, Malmö.
- Lusch, R. F., Stephen L. V., Mohan T. (2010). Service, value networks and learning. *Journal of the Academy of Marketing Science*, 38, 19-31.
- Mauss, M. (1990). *The Gift: The Form and Reason for Exchange in Archaic Societies*. Abingdon: Routledge.
- Mogensen, P. (1994). Towards a Prototyping Approach in Systems Development. *Scandinavian Journal of Information Systems*, 4(1), 31-53.
- Mowles, C. (2010). *Rethinking Management: Radical Insights from the Complexity Sciences*. London: Gower.
- Mulgan, G. (2006). *Social Innovation: what is it, why it matters and how it can be accelerated*. London: The Young Foundation.
- Murray, R., Caulier-Grice, J., Mulgan, G. (2010). *The Open Book of Social Innovation*. London: The Young Foundation, Nesta.

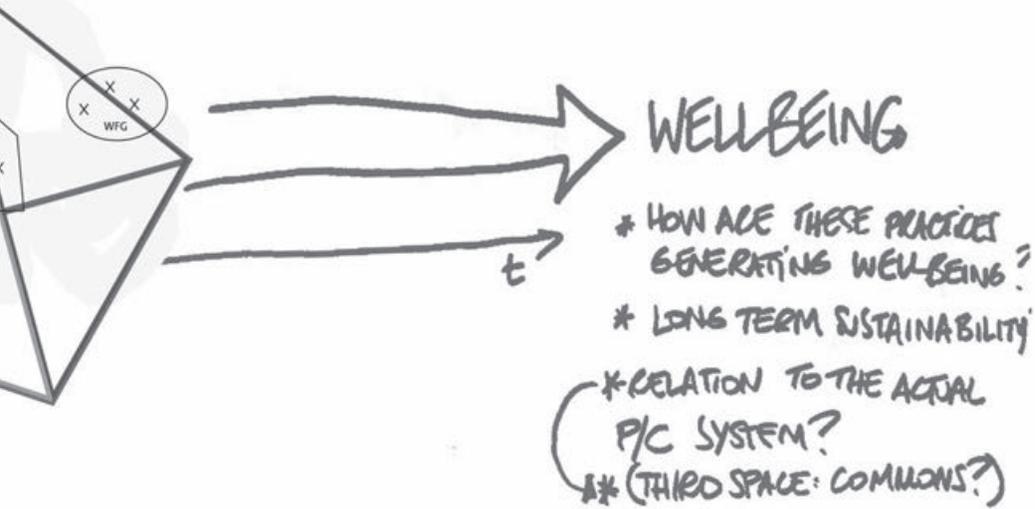
- Normann, R. and Ramirez, R.(1993) From Value Chain to Value Constellation: Designing Interactive Strategy. *Harvard Business Review*, 71, 65-77.
- Phills, J.A., Deiglmeier, K., Miller, D.T. (2008). Rediscovering social innovation. *Stanford Social Innovation Review*, Fall 2008, 34-43.
- Prahalad, C.K., Ramaswamy, V. (2004). Co-Creation Experiences: The Next Practice in Value Creation. *Journal Of Interactive Marketing*, 18 (3), 5-14.
- Redström, J.(2005). Towards user design? On the shift from object to user as the subject of design. *Design Studies*, 2 , 123-139.
- Sjöberg C. (1996). *Activities, Voices and Arenas: Participatory Design in Practice*. (PhD dissertation). Linköping: Linköping University.
- Stacey, R. (2000). *Complexity and management: fad or radical challenge to systems thinking?* Abingdon: Routledge.
- Stacey, R. (2005). Local and Global Processes in Organizational Life. In Stacey R. (Eds.). *Experiencing Emergence in Organizations*. London: Routledge.
- Stacey, R. (2007). The Challenge of Human Interdependence: Consequences for thinking about the day to day practice of management in organizations. *European Business Review*, 119(4), 292-302
- Suchman, L. (2000). Organizing alignment: a case of bridge-building. *Sage*, 7, 311-327.
- Troxler, P. (2010). Commons-based Peer-Production of Physical Goods Is there Room for a Hybrid Innovation Ecology? In *3rd Free Culture Research Conference*. Berlin, D.
- Tuomi, I. (2002). *Networks of Innovation*. Oxford: Oxford University Press.
- Von Hippel, E. (2005). *Democratizing Innovation*. Cambridge: The MIT press.
- Westerlund B. (2009). *Design Space Exploration*. (PhD Dissertation). Stockholm, Sweden: KTH



50% SEMINAR MAP OF THE PROGRAM

October 2012

PRODUCTION



M2



Prototyping for *opening production*: from *designing for* to *designing in* the making together

Anna Seravalli

K3 Malmö University, Malmö, Sweden

anna.seravalli@mah.se

Abstract

Open and *collaborative* processes are assuming a growing role in the generation of goods and services. There is an increasing number of examples where production processes are opened, relationships between producers and final users become blurred and where *making together* represents a central strategy in generating value.

Design is increasingly involved in supporting *opening production* both in terms of developing technical infrastructures and in facilitating and nourishing processes of *making together* trying to understand how design can boost *collaboration* and *openness* in diverse fields.

In trying to contribute to the discussion about how to design for *making together*, this paper reflects on the experiences made in the establishment and running of the maker-space Fabriken in the city of Malmö, a research project where the author is involved. The focus is on *prototyping* and how it has been used to foster *collaboration* and *openness* in the *making* of Fabriken.

From these experiences it emerges how *prototyping* (the design approach), has been a fruitful way for experimenting, learning by doing and conducting small-scale interventions. Moreover, in order to account for *togetherness*, prototyping has also been used as a way of *infrastructuring* and *thinging*.

In conclusion it emerges how prototyping in Fabriken has become a compositionist tactic that can be appropriated by participants to drive their own *making* activities and shaping the space according to their needs. From this understanding a new role for the designer involved in processes of *making together* starts to appear and also issues about how to support them. From the experiences of Fabriken it emerges how design for *opening*

production should be concerned with how to *design in the making together* rather than how to *design for making together*.

KEYWORDS: prototyping, making together, infrastructuring, thinging

The rising of *openness* and *collaboration* in production processes

By reflecting on the experiences of a research project, this article aims at contributing to the understanding of how design can support *opening production*. *Opening production* accounts for the progressive emergence of *openness* and *collaboration* in processes generating goods and services.

Collaboration between stakeholders belonging to diverse sectors is increasingly being recognized as an important source of innovation. Open and democratizing innovation paradigms (Cheesbrough 2003, Von Hippel 2005) are calling for the development of new relationships between final users and producers and between citizens and public institutions. These paradigms look at open production processes as a key source of innovation.

Within the networked society (Castell 1996), *opening production* has flourished thanks to the fact that knowledge and information have gained a central role in production processes and on the other side technologies are providing social networks with the possibility to treat and manage information in a way that has never been possible before (Benkler 2006).

The combination of the growing role of information-based processes and the wide distribution of means of production has fostered the *opening of production*, which entails that processes of value creation and innovation are not anymore confined inside the companies but are involving final users and sometimes are driven directly by them (Von Hippel 2005).

The first examples of opened production can be found in the software field, where, in 1984, Richard Stallman started to work on the first open-source operating system, GNU (GNU is not Unix). After Stallman's work came Linux that introduced a highly decentralized production model based on small incremental improvements by widely dispersed people (Benkler 2006). According to the usual assumptions about volunteer projects and non-hierarchical structures, this model could not succeed. But it did. Open-source development has proved that an alternative mode of production based on shared effort and non-proprietary basis can be successful (Benkler 2006).

A3

Later, the *opening of production* has interested also the information and knowledge sectors. Started in 2001 Wikipedia, an open encyclopaedia, counts today 10 million articles in 273 languages written by 650,000 contributors (Wikimedia 2011) and it represents a new model about how knowledge is produced and distributed. In the information and cultural sectors, *openness* has had great impact in modifying the access to the content. Alternative copyright licenses (e.g. Creative Commons) and providing unrestricted access to scholarly journal articles (i.e. Open Access) have changed the way in which information and culture is distributed.

In the last years some attempts of *opening production* have been developed also in the tangible realm, such as hardware and product development. This has been boosted by the diffusion of personal fabrication machines. These are the small-scale, low-cost descendants of industrial machines such as 3D printers, laser cutters, and programmable sewing machines (Lipson et al., 2010). Being based on CAD-CAM system (computer aided design-computer aided manufacturing) these machines offer the advantages of mass-production processes on a small-scale, empowering individuals to make (almost) anything (Gershenfeld 2005).

In the *opening of production*, *openness* refers to the availability of information and knowledge about production processes, but also the way in which such resources are generated, often through collaboration between stakeholders. As pointed out by Benkler (2006), the *opening* of processes of value generation has led to the emergence of a new model of organizing production that is:

“radically decentralised, collaborative and non proprietary; based on sharing resources (...) among widely, distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands” (Benkler, 2006 p.60).

The sustainability of what Benkler calls social production (2006) relies on the generation of social bonds and recognition for the participants, making social and human capital a main feature in *open* production processes.

The idea of *opening* is affecting also “traditional” forms of production. Collaborative consumption (Botsman 2010) accounts for emerging business models in the consumers’ goods sector, where the focus shifts from the delivery of finished products to fostering sharing and collaborative practices between peers or between producers and consumers.

Moreover Lusch and Vargo (2004) have introduced a model to understand the way in which value is produced which basically describes all processes of production as collaborations. According to this model, value is not generated inside the firm but in the interactions with suppliers (Lusch, Vargo, Tanniru 2010) and customers (Michel, Brown, Gallan 2008). Collaboration is implicit in the whole process of value creation that is described not as a chain but as a constellation (Normann Ramirez 1993) where the

diverse stakeholders are bound together in producing value through exchanges of specialized knowledge and skills (Lusch, Vargo 2004).

Production of goods and services is increasingly becoming a matter of *openness* and *collaboration*, or as phrased by the track theme, of *making together*. *Openness*, as the increasing possibility for final users to participate in processes of value creation; and *collaboration*, as the emergence of new relationships between stakeholders and consequently social capital that open processes entail.

Design for making together

The increasing role of *openness* and *collaboration* in both intangible and tangible production is also influencing design, where the discussion about approaches and methods for supporting *making together* is rapidly developing.

Open design (Van Abel et al 2011) is still an emerging definition that tries to account for all the forms of design working in and for *opening production*. From the open-source design of finished goods and machines, such as the open-source ecology project (Open Source Ecology 2012), to the creation of new construction and design standards, such as Open Structures (Open Structures 2012). Beside the development of the technical infrastructures for *making together*, open design is also paying attention to how to facilitate processes of *collaboration* where diverse stakeholders are brought together.

The interest in how to support and facilitate processes of *making together* can be found in diverse design fields. In trying to manage the complexity of services, service design is looking at *making together* not only as the way in which the service is generated but also as the preferred way in which it should be designed (Holmid 2009, Agger Eriksen 2012). There is a shift from *designing for* to *co-designing with* (Agger Eriksen 2012) where *togetherness* becomes a core aspect of the design process as a way to foster *collaboration* after the design phase when the service is delivered.

This shift is present also in transformation design (Burns et al. 2006) and generally in design for social innovation (Jegou et al. 2008) which is recognizing that the only way of tackling complex societal challenges is by designing for *making together*, fostering alliances through sectors and between the bees and trees, grass-root initiatives and more established organizations that through collaboration can develop new ideas and initiatives to respond to contemporary challenges (Murray et al 2010).

A long tradition of practicing and reflecting on *togetherness* in design can be found in participatory design (PD) which “entails collaborative partnerships and co-construction of knowledge in analysis and co-construction of changes in social practices.” (Gregory 2003 p 62).

A3

PD has for over than 30 years dealt with processes of co-envisioning possible futures (Gregory 2003) where users and other stakeholders have been involved in designing objects, processes and services.

However, it is important to underline how *designing together* differs from *making together* since *collaboration* at project-time does not necessarily imply or facilitate *collaboration* during use-time. In trying to understand how design could play a stronger role during use-time, in the last years some researchers in PD have begun to focus on design-after-design, which:

“shifts towards seeing every use situation as a potential design situation. So design take place during a project (“at project time”) but also while the object of design is in use (“at use time”). In other words, there is design (in use) after design (during the project)” (Binder et al. 2011 p.171).

From this perspective, supporting *making together* can be looked upon as a matter of supporting users’ activities and design during use-time. Designing for design-after-design (Binder et al. 2011) entails two main challenges: the first is about how to foster *collaboration* between diverse stakeholders (*togetherness*) and, second, how to support their design and initiatives during the use-time (*making*).

In trying to understand how design can support *making together*, this paper reflects on a case and articulates the idea of prototyping for *making together* as a compositionist tactic for *thinging* (Björgvissón et al 2012) and *infrastructuring* (Binder et al. 2011). Before deepening these ideas the case is presented.



Image 1 Fixing bikes at Cykelköket

Fabriken, a space for *opening production*

The case has been developed at MEDEA a research centre working at the intersection between design, new media and co-creation at Malmö University. Specifically, Fabriken is one of the three Malmö Living Labs which represent an “open innovation milieu where new constellations, issues and ideas evolve from bottom-up long-term collaborations among diverse stakeholders” (Björgvissón et al. 2012). The three labs are working on diverse themes (cultural production, social innovation and tangible production) becoming arenas where local actors of the city of Malmö can meet and experiment possibilities of *making together*.

Fabriken is a public workshop where people can freely access tools and machines for experimenting with technology and *opening production*. The lab has been established as a collaboration between MEDEA, the NGO STPLN, working with youth empowerment, and the interaction design company 1scale1. The space was opened in 2011 and have become an arena where individuals and small organisations have the possibility to prototype in a broad sense: from building robots to learning to sew, from starting a company to exhibit art work.

Fabriken is run as a collaboration not only between the three main actors but also with the participants which are actively participating in the *making* of the space. Fabriken is continually being shaped and reshaped by the activities and emerging opportunities becoming a platform for *opening production* which is also *made together* (Seravalli 2012 b)

The building where Fabriken is hosted is owned by the city of Malmö and is managed by the NGO STPLN. On the ground floor there is a co-working facility, a room for concerts and exhibitions and a fairly big kitchen. In the cellar there is Fabriken, Tantverket (the textile atelier), Cykelköket (a bicycle repair workshop) and since a few months Återskapa (an atelier where cast-over materials of industrial production are used



Image 2 building robots at Fabriken

A3

for creative activities with children and adults).

The space was opened in April 2011, however the collaboration between MEDEA, the NGO STPLN and the company Iscaler started one year before when a collaborative process was set up to design the space (for more info see Seravalli 2012a). After the opening, the role of the company has become progressively marginal while external actors such as Cykelköket (bicycle repair shop) and the local hacker community have become quite central in the management and running of the space. Several initiatives have been hosted in Fabriken for longer or shorter time: two fashion design ateliers, a catering company, a café for families with small children and lately a company working with urban gardening. Since several months a long-term initiative has been established in the space, Återskapa, an atelier driven by a former teacher aimed at improving people's creativity and environmental awareness by working with scrap material. Beside professional activities several participants are using the space during their free-time to build and make things and tinkering around with electronics, textiles, screen printing and laser cutting. The author has taken part in the design and the running of the space, assuming diverse roles and investigating how design, and specifically prototyping, could be used to support the collaborative making of Fabriken and the emerging of activities in the space.

Designing for *making together*: prototyping for *infrastructuring, thinging* and as compositionist tactic

As have already been pointed out, design for making together can be understood as a matter of designing for design-after-design: designing for activities carried out together during use-time. Which approaches can be used to reach this goal? The experiences from Fabriken have showed the importance of prototyping as a way to explore how to support making together.

Prototyping as testing, learning by doing and small-changing

Prototyping is traditionally one of the most established design approaches which has been defined as a way of *thinking with hands* in opposition to abstract thinking (Kelley in Brown 2009). When facing complexity, the best way to decide among competing directions is to perform early experiments to explore them: "the faster we make our ideas tangible, the sooner we will be able to evaluate them, refine them, and zero in on the best solution" (Brown 2009, p.89). The basic logic behind prototyping can be summarized as

fail early to succeed sooner; trying out ideas and activities at early stages becomes a way to explore and experiment with alternative futures (Mogensen 1994).

Prototyping can also be looked upon as way to inquire into reality and to learn by doing, it becomes a way to explore the context more than propose a possible solution.

In participatory design prototyping has been used as a way of making tacit-knowledge more explicit and foster dialogue between diverse stakeholders. Through mock-ups and prototypes diverse practices can be explored becoming a way to establish a design game through which a process of mutual learning between the involved stakeholders can be established (Ehn 1988). In learning by doing prototyping can also be aimed at provoking, as stimulate an action, through a concrete experience (Mogensen 1994). Prototyping as *provotyping* becomes a tool for investigating the context by stimulating reactions and sometimes challenging what is taken for granted.

In complex situations, however, actions change the context and prototyping becomes not only a way to test ideas and provoke but also a way to actually implement a solution through small-scale interventions and iterations. This perspective has been developed by Hamdi (2004) who has worked for long time in city planning. He stresses the importance of small-actions inside a broader strategy as a way to take into consideration the progressive evolution of the context with the opportunities but also issues that can emerge. In this understanding prototyping becomes a way to cautiously progress in the *making*, by taking small steps and each time try to understand changes in the context and how to keep on.

These three understandings of prototyping allow to introduce the reasons why it can be considered a central approach in designing for *making together*.

First, prototyping can be used in its more traditional understanding as a way to test the *making together* by creating occasions and events where diverse forms of *opening production* can be tried out. In setting up Fabriken, for example, a key role has been played by events, which were aimed at attracting diverse groups of participants to the space. These events have allowed to test diverse roles and forms of collaboration between the three initial stakeholders and also to try out how participants could have a role in the *making* of the space (for more info see Seravalli 2012a).

Second, prototyping has been used as a way to provoke by carrying out small interventions to challenge the current understanding of the space. For example, a small collective vegetables' garden has been established by the author with other participants in the spring 2011 to challenge the common understanding of what kind of production can be carried out in a maker-space.

Last, the *making* of Fabriken can be looked upon as a series of small-scale interventions where the space has been growing organically through prototyping. Through iterations of initiatives and experimentations with new activities, the space has been shaped with an

approach where project-time and use-time are merged. In this perspective Fabriken is designed through the *making*.

However, prototyping presents two issues when confronted with *making together*. The first one is related to the fact that prototyping is usually a temporally limited phase of a project which comes to a closure when a final solution is identified. The second issue is related to how in supporting *togetherness* prototyping can be carried on as a collective action.

Prototyping for *infrastructuring*

As mentioned, prototyping usually represents a temporally limited phase of the design process that aims at identifying and implementing a final solution. In designing for design-after-design, however, it is obvious how this approach can limit the possibility to support design activities during use-time. Even if Fabriken has been built through the *making*, which means that activities have shaped the space, the problem resides in keeping this process on going so that new initiatives coming into the space have also the possibility to reshape the space according to their needs and requirements. This dilemma highlights the difference between building an infrastructure from *infrastructuring* (Binder et al. 2011). While the former is the activity of designing (and making) a defined structure addressing specific uses and communities of practice (Lave et al. 1998), the latter entails the creation of under-defined structures that can be continuously restructured at use-time for supporting emerging activities (Binder et al. 2011). *Infrastructuring* is aimed at generating:

“a socio material thing (which) is relational and becomes infrastructure in relation to design (...) in use. Hence this infrastructure is shaped over extended time-frames (...) by users as mediators and designers “infrastructuring” in ways never envisioned at project time” (Binder et al. 2011, p172).

In *making* Fabriken, this has meant to shift to an approach where the space is considered as a permanent prototype that can be transformed and shaped by the activities entering and developing in the space. In this way, not only the three initial stakeholders but also the participants are involved *together* in continuously designing and re-designing Fabriken, trying out new possibilities and activities. This approach allows for *infrastructuring* to emerge and continue, making the space living in a continuous evolution.

Prototyping for *thinging*

The second limit of prototyping relies in accounting for *togetherness*. Usually the designer develops the prototype and participation is limited to the use and experience of the prototype. For example in the initial phases of designing Fabriken some workshops

around diverse forms of production were organized by the three stakeholders in order to test possibilities and opportunities. However, we soon realized that these kinds of events were keeping the participants in a role of passive users while we were looking for their active participation in exploring how production could be *opened*.

For this reason, we shifted to other approaches, which were aimed at supporting possible participants activities more than our ideas about what the space should be. Fabriken has been set up as an open platform for people looking for a space and support to test new activities, and when initiatives are in the space we explore how to nourish and support them. Moreover, right before and after the official opening, a number of events were organized which worked as empty structures where participants were encouraged to suggest and drive their own initiatives. Another important element has been to establish a co-working facility in the space, which works as a permanent attractor for new initiatives, and generally, involving participants by handing out responsibilities and control of the space.

What we have tried to do with Fabriken is to *make a thing* (Latour 2004, Binder et al. 2011, Björgvisson et al 2012). In the ancient Nordic societies, *things* were community gatherings where issues and matters of concern were publicly discussed. *Thinging* entails the creation of "socio-material 'collectives of humans and non-humans' through whom matters of concern or controversies are handled" (Björgvisson et al 2012).

In the case of Fabriken this has meant a radical shift in the role of initial stakeholders: instead of trying to define what Fabriken was in advance, even through a participatory process, we have tried to come to the public with an underdefined space and encourage other actors to appropriate and design it according to contingencies and aspirations. Instead of aiming at having a fully functioning maker-space, which could be easily done by taking formats, which have been already developed around the globe, we tried to ask questions about what a maker-space could be, and specifically how it could *open* production in the city of Malmö. Following Latour's perspective on *thinging* we tried to move from a matter of fact, "*FFF is a maker-space*" to a matter of concern, "*what is a maker-space? How it could work in the city of MMM? Who can be involved in it?*"; involving participants in exploring the *thing* by prototyping diverse versions and functions of the space.

Treating Fabriken as a thing, that is a matter of fact (a physical space for opening production) but also a matter of concern (what does opening production imply?), means that there are multiple, and sometimes conflicting, understandings and agendas populating the space. From being a space for leisure time to experiment with electronics, to a facility for small companies, from having somebody actually owning Fabriken, the NGO, to the need, as a participant, to shape the space for your initiatives. This situation can be quite confusing, especially when entering the space the first times; it can, and actually it has generated conflicts and tensions between diverse views. However, at the

A3

same time, it has been extremely rewarding in terms of making together: the regular participants do feel ownership over the space and the right of changing it to better suit their needs, and at the same time they feel comfortable enough to make space for new activities coming into Fabriken, sometimes looking for possible collaborations.



Image 3 Activities at Tantverket

Prototyping as a compositionist tactic

The above section argued, through the case of Fabriken, how prototyping can be used to support *making together* and how prototyping needs to work towards *infrastructuring* and *thinging*.

As a consequence prototyping can be looked upon as compositionist tactic. Compositionist (Latour 2010) in the sense that it represents a way of working with a local perspective and *making* prospects *together* with others. In the case of Fabriken, this means rather than strictly try to apply or experiment with existing scenarios and theories about *opening production*, to slowly build *together* with the participants new practices and ideas about how production could be *opened* in the context of the city of Malmö.

Fabriken can be understood as a space where participants are prototyping alternative and diverse ways of organizing production, composing practices that represent diverse prospects on production. The space is a *thing* where production becomes a matter of concern, which is explored by composing initiatives, represents a pragmatic approach to discuss how goods and services are produced and how to improve the way in which they are created and consumed.

This ongoing effort towards composing is not driven only by the designer but increasingly participants initiate prototypes in the space. In this way prototyping can be understood as a tactic (Di Salvo 2009) since it allows to broaden the participation to Fabriken composition. Design tactics distinguish themselves from design activities since the users can appropriate them and manipulate them beyond the common purpose of design (Di Salvo 2009), becoming, like in Fabriken, an approach that diverse participants can adopt to drive their own activities.

A new role for the designer?

In the previous section it has been discussed how prototyping can be used to support *making together*, both in its traditional form and as way for *infrastructuring* and *thinging*. This can imply that designers involved in processes of *making together* have the possibility to explore new roles. In the case of Fabriken, being a designer has meant to work with mainly three tasks. The first one has been about introducing the practice of prototyping to the participants. For example, a long-term collaboration has been established with Återskapa, the scrap material atelier, in order to explore through events and meetings with diverse stakeholders how to structure her project. Events in particular have represented iterations through which diverse approaches and formats have been tried out. Each event has become an occasion to explore business models, new offers and services and possible partnerships. Also when setting up Tantverket, the textile atelier, a similar approach has been used even if the results have not been that positive (Seravalli 2012 a). Transferring a prototyping approach to non-designers can be quite difficult since it means to accept that failures are positive occasions from which one can learn: if failure is related to a project where a lot of resources are invested and expectations come into play, it is difficult to consider it as something that should be welcomed.

Another role for the designer is related to keeping the *infrastructuring* ongoing. Time passing, a risk at Fabriken is related to the progressive reduction of possibilities in the space since similar activities tend to reinforce one another, moving from *infrastructuring* to having an infrastructure. The role of the designer is therefore to keep the process ongoing by trying out new activities, attracting new participants to the space and, particularly, fostering alliances between existing activities in the space.

The most challenging role is related to *thinging*, since it puts demand on the designer to lose control over the project. The designer in particular has to be able to leave space to others and to transfer ownership to the participants even if this implies that her role in the project becomes marginal. The most difficult aspect in being a designer in Fabriken has been to resist the temptation of "correcting" some participants, by explaining them "what Fabriken is really about" and how they should behave. In working towards *thinging*

A3

and *infrastructuring* it is particularly important to let multiple visions and agendas coexist in the space even when they differ from the initial purpose. This is extremely difficult from a designer perspective since it means to voluntarily renounce from driving the design, leaving to participants that opportunity. In *thinging*, the designer has to learn to do nothing, to become a passive observer of what is going in the design process and eventually support it when the right moment occurs. However at the same time it is important that the designer is part of the space to keep the *infrastructuring* ongoing but also to find mediations between conflicting agendas, if needed.

The designer has to become able to continuously mediate and respond to the evolving situation and to restructure its activities according to the emerging opportunities.



Image 4 Prototyping with Återskapa

Challenges of prototyping for *making together*

In the previous section some challenges of prototyping for *making together* have been highlighted in relation to the role of the designer. However, this approach also presents other issues.

In relation to the participants, *infrastructuring* and *thinging* appear quite challenging and demanding. One of the most recurrent critiques that Fabriken gets is related to how the space works: nobody is really responsible for it, it is unclear how to access the equipment and what is allowed to do. Moreover, a great demand is put on the participants in terms of having an active role in designing and shaping the space. This can discourage participation by people with few resources or not so skilled who can feel that initiating an activity in the space is too difficult.

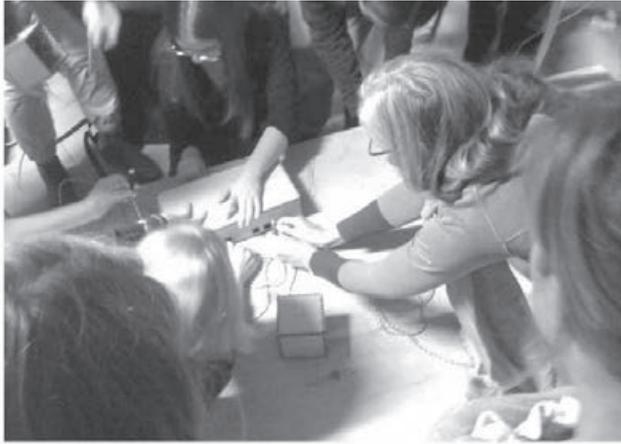


Image 5 Making together at Fabriken

Another risk is related to managing expectations towards the space and the people working there. For example, in the collaboration with Återskapa (the scrap-material atelier), it has sometimes been difficult to understand exactly what my role in the project was. Some months after we started collaborate she got a start-up financing which was covering her salary and providing the resources for employing another person and she offered me to join on a permanent basis her project. A similar situation has emerged in Tantverket where, since I have been the one who invited the founder to join Fabriken and to establish the atelier supporting her activities, it has always been problematic to understand which responsibility I had over the initiative.

The risk with prototyping in *making together* is that activities are not happening in a protected environment (as, for example, it happens traditionally in design) and if on one side this is more giving in terms of learning and opportunities on the other it is much more risky since more resources and effort are demanded. Fabriken is playing a quite important role because it partially represents a safe net for the initiatives developing in the space, lowering the threshold and risks related to prototyping activities. For example, for the small companies who do not have to buy equipment to experiment around products and services, but also for the temporal projects that use the space as a test bed for their ideas.

From *designing for* to *designing in* the making together?

A3

This article reflects on an experience of *making together* to understand how design can support the emergences of production processes based on *openness* and *collaboration*. In developing and running Fabriken, a specific understanding of prototyping emerges as a tactic that can support *collaboration* and *openness* when *making things*, or, as in this case, maker-spaces.

From the Fabriken experience, it is also emerging a more general understanding of design for *making together*. The way in which prototyping is discussed in this article is tightly connected with the specific happenings and the evolution that went on in Fabriken. Specifically it appears that prototyping for and in *making together* is a situated practice (Suchman 1987), which entails that is inevitably connected with the specificity of the context and with whom and what is involved in the process.

From this perspective, *design for making together* becomes a matter of situated and embodied practices, which entails that it makes no sense to separate the discussion about design approaches from the specific context in which *making together* is happening. This also entails that the designer involved in the process should consider herself not as neutral and un-located professional and her methods as disembodied from the actual *making* (Light et al. 2012), but she should account for her agendas in the process as well as being able to shape approaches and methods according to the specific situation.

In supporting *making together*, the design action is not positioned somewhere outside, or sometime before, the *making together* but it becomes necessary part of the process. Moreover design becomes a collaborative practice since it is not just driven by the designer and it is continuously reshaped according to *things* emerging in the process.

Connecting back to the general discourse on *opening production*, this entails that *open* processes of value production, where diverse stakeholders are actively involved should consider the possibility for the actors to (re)design while the process is ongoing in order to adapt to the emerging issues and opportunities. The possibility for stakeholders to shape the process facilitates their ownership over it and it fosters the opportunity for stronger collaborations to emerge. However, it also creates the space for disruptive conflicts and issues to emerge.

In this understanding, designers looking for ways to support and being part of *opening production* should not be so concerned with strategies and approaches of *design for making together*, but rather with understanding how to *design in the making together*.

Acknowledgments

Special thanks to Pelle Ehn, Fabriken/STPLN people, Carin Hemqvist, Richard Topgaard

References

- Agger Erikksen M. 2012. *Materials matter in co-designing, formatting and staging with participating materials in co-design projects, events and situation*. PhD dissertation. Malmö: Malmö University Press.
- Benkler Y. 2006. *The Wealth of Networks*. New Haven and London: Yale University Press.
- Binder T., De Michelis G., Ehn P., Jacucci G., Linde P., Wagner L. 2011 *Design things*. Cambridge, MA: The MIT Press.
- Björgvinsson E., Ehn P., Hillgren P.-A. 2012. Agonistic participatory design: working with marginalised social movements. *CoDesign: International Journal of CoCreation in Design and the Arts* 8(2-3): 127-144.
- Botsman R., and Rogers R. 2010. *What's mine is yours, the rise of collaborative consumption*. New York: HarperCollins.
- Brown T. 2009. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. New York: Harper and Collins.
- Burns C., Cottam H., Leadbeater C., Winhall J. 2006. Transformation Design [online]. Available from: www.designcouncil.info/.../transformationdesign/TransformationDesignFinalDraft.pdf [Accessed 25/09/2012].
- Castells, M. 1996. *The Rise of the Network Society*. Oxford: Blackwell.
- Chesbrough, H. 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Di Salvo, C. 2009. Design and the Construction of Publics. *Design Issues* 25(1): 48-63.
- Ehn P. 1988. *Work-Oriented Design of Computer Artifacts*. Stockholm: Arbetslivscentrum
- Gershenfeld N. A. 2005. *Fab: the coming revolution on your desktop—from personal computers to personal fabrication*. New York: Basic Books.
- Gregory J. 2003. Scandinavian Approaches to Participatory Design. *Int. J. Engng Ed.* 19(1):62-74.
- Hamdi, N. 2004. *Small change. About the Art of Practice and the Limits of Planning in Cities*. London: Earthscan.
- Holmid S. 2009. Participative, co-operative, emancipatory: From participatory design to service design. *Nordic Design Research Conference, NorDes 2007*, Stockholm Sweden
- Jégou F., Manzini E., (eds), 2008. *Collaborative services: Social innovation and design for sustainability*. Milano: Edizioni POLI.design.
- Lave, J., Wenger, E. 1998. *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.
- Latour B. 2004. Why critique as run out of Steam? From matters of facts to matters of concern. *Critical Inquiry - Special issue on the Future of Critique*. 30 (2):25-248,
- Latour B. 2010. An Attempt at a "Compositionist Manifesto". Reception of the Kulturpreis presented by the University of Munich on February 9, 2010

A3

- Light A, Akama Y 2012 The human touch: participatory practice and the role of facilitation in designing with communities. *Proceedings of the 12th Participatory Design Conference (1)*: 61-70
- Lipson, H, Kurman, M. 2010. *Factory@Home: The Emerging Economy of Personal Fabrication*. USA: Whitehouse Office of Science and Technology Policy.
- Lusch R.F., Vargo S.L., Tanniru M. 2010. Service, value networks and learning. *J. of the Acad. Mark. Sci.* 38:19-31
- Michel S., Brown S.W., Gallan A.S. 2008. An Expanded and Strategic View of Discontinuous Innovations: Deploying a Service-Dominant Logic. *J. of the Acad. Mark. Sci.* 36 (1): 54-66.
- Mogensen P. 1994. Towards a Prototyping Approach in Systems Development. *Scandinavian Journal of Information Systems.* 4(1):31-53.
- Murray, R., Caulier-Grice, J., Mulgan, G. 2010. *The Open Book of Social Innovation*. London: The Young Foundation, Nesta.
- Normann, R. and Ramirez, R.1993. From Value Chain to Value Constellation: Designing Interactive Strategy. *Harvard Business Review* 71: 65-77.
- Open Source Ecology 2012. Open Source Ecology [online]. Available from <http://opensourceecology.org/wiki/> [Accessed 25/09/2012].
- Open Structures 2012. Open structures [online]. Available from <http://www.openstructures.net/> [Accessed 25/09/2012].
- Suchman, L. 1987. *Plans and situated actions: The Problem of Human-Machine Communication*. New York: Cambridge University Press.
- Vargo S.L. and Lusch R.L. 2004. Evolving to a new dominant logic for marketing. *Journal of Marketing* 68 (1):1-17.
- Van Abel B., Klaassen R., Evers L., Troxler P. 2011 *Open Design Now*. Amsterdam: Bis Publisher.
- Von Hippel, E. 2005. *Democratizing Innovation*. Cambridge, MA: The MIT Press.
- Wikimedia 2011. Wikipedia Statistics [online]. Available from <http://stats.wikimedia.org/EN/Sitemap.htm> Accessed 25/09/2012].

Seravalli

While Waiting for the Third Industrial Revolution

While Waiting for the Third Industrial Revolution: Attempts at Commoning Production

Anna Seravalli

It is Thursday evening at STPLN, a makerspace located in an industrial building in Malmö. Davey is helping some newcomers with the milling machine. Chris and Frank are working on an old vending machine, trying to make it suitable for selling hardware boards. Someone else is mending a flat bike tire. In the textile corner, Luisa is teaching one of the hackers how to crochet. Quinn is in the kitchen, preparing food for tomorrow's catering. Some of the regulars are sitting on the sofa testing a robot they recently built. Jonathan is playing a cello he built from scrap material. In another room, a new group is experimenting with screen-printing.

The makerspace STPLN is a public workshop that provides access to machines and tools for production. Participants explore fabrication possibilities by sharing space, means, and sometimes knowledge and skills. The space is a platform for several activities, among them building robots, experimenting with new educational formats for sustainability, band rehearsals, and investigating how a café for families with small children could work. The facility is owned by the City of Malmö and is managed by an NGO. The activities are driven by citizens, small companies, groups of friends, and other NGOs.

STPLN, together with similar venues around the globe, is part of a growing network of what could be described as spaces for opening production. Through shared facilities, means of production, and knowledge, these spaces are providing citizens with the possibility to engage in production processes and to re-appropriate knowledge and practices having to do with making things. These open workshops may have different names and come in different formats (such as fablabs, hacker-spaces, and makerspaces). What they have in common is the hope that they would be the venues from which the democratization of manufacturing (Mota 2011) could boost grassroots innovation and entrepreneurship (Gershenfeld 2005; Troxler 2010) that would lead to a "third industrial revolution" (Anderson 2012; Rifkin 2011; Troxler 2013). If textile companies—with steam engines—were the scene of the first industrial revolution, and automotive industries—with mass production and assembly lines—became the symbol for the second one, these spaces, with shared equipment and collaborative production processes driven by individuals outside traditional companies, may become the venue for the third one. Specifically, sharing means of production and knowledge about processes and collaboration

seem to entail two possible scenarios. On one side they are looked upon as the seeds for the establishment of a new mode of production in which resources and means are treated as commons, allowing for individuals to collaborate and perform production outside traditional structures (through peer-to-peer relationships). Commons-based peer-to-peer production, which originated in the software field, is advocated as a more socially and environmentally sustainable way of performing production that could overcome the limits and problems of mass- and capitalist production (Carson 2010; P2P Foundation 2013). On the other hand, these practices could also be just the latest evolution of capitalist production (Bauwens 2006, 2009; Thrift 2006), with companies harvesting the commons and tapping into the creativity of open and collaborative processes.

By reflecting on the practices emerging in the everyday running of STPLN, and the way the space is organized, this chapter provides some insights into spaces for opening production by trying to enter the detail of commons-based practices, describing patterns and revealing some of the possibilities and the problems that may emerge when sharing and collaborating for making things.

Welcome to STPLN!

The STPLN building is a former workers' diner in the center of what until the 1980s was one of the largest shipbuilding sites in Europe. The building, owned by the city of Malmö, is run by STPLN, an NGO that has a history of supporting grassroots cultural initiatives. The venue can be described as a space for opening production, since it enables individuals and small organizations to engage in diverse forms of making by sharing means, knowledge, and resources. Fabriken, the actual workshop, is located in the basement of the building and is equipped with a laser cutter and a CNC mill. The workshop has also some hand tools, a saw, a sander, and equipment for working with electronics.

The basement also houses a bicycle repair workshop (the Bicycle Kitchen), a textile corner (the Textile Department), a screen-printing workshop, and a library of cast-off materials (ReCreate) that organizes activities for children and adults to foster creativity and environmental awareness. On the ground floor there is a venue for concerts, a semi-professional kitchen, and a co-working facility (HUBn).

The idea of setting up a makerspace emerged in 2006 when STPLN bought a 3D printer and started to do some workshops with kids around the city. In 2010, with the involvement of the research center Medea, financial resources to begin designing and implementing the workshop became available. The agreement was that Medea would provide resources to buy some


 A4

equipment, and would supply a design researcher (the author) who would work with Fabriken, while the NGO would take care of the general management of the space.

I was involved in the venue for nearly three years, taking part in setting up and running the space. During that time, I took on diverse roles and carried out diverse activities, including organizing the first co-design workshops, being actively involved in setting up some initiatives, collaborating with some of the projects hosted in the space, taking part in organizing and participating in events and other initiatives, and participating in the everyday life of the space itself. (For a more detailed account of how the space was set up and of the designer's role, see Seravalli 2013.)

This chapter wishes to articulate some insights in relation to spaces for opening production and the so-called third industrial revolution. It does so by reflecting on the experiences emerging from STPLN and Fabriken, looking at how it might be possible to *infrastructure* for production practices based on sharing and collaboration.

Toward the future?

The phenomenon of opening production has had a major effect on intangible, information-based forms of production. The success of FOSS (free and open source software), in terms of long-term sustainability and quality of production output, had a huge influence on the way in which the software sector operates (Benkler 2006). It massively introduced production practices based on shared resources, in which the processes are carried out by self-organized distributed communities not relying on market or managerial inputs to organize and perform production processes, that is, commons-based peer-to-peer production (Bauwens 2009).

A commons has been defined as a “pool of resources or facilities as well as property institutions that involve some aspects of joint ownership or access” (Ostrom et al. 2002, 18), where ‘commons’ can refer both to an intrinsic characteristic of the resource, in which case it is defined as a common-pool resource, or to a specific kind of management arrangement created by humans (commons as an institution) in which a specific resource is owned, managed, accessed, and used by a collective through the development of a system of shared rules and practices (Ostrom 1990). In commons-based peer-to-peer production, commons are of the second kind: a way of managing resources and outputs of the production processes (Benkler 2006). Specifically, in intangible processes, resources and outputs of production processes are usually made available to anyone through the Internet, according to an open-access model. Anybody can use them, but also can contribute to them and enhance them. Thus, they can be defined as open-access commons (Benkler 2013).

This mode of production is characterized by voluntary aggregations of individuals who are entangled in production processes in which resources and outputs are shared. In terms of organization, peer-to-peer processes are characterized by equipotentiality (Bauwens 2006), which means that there is *no a priori* selection of who gets to participate; processes are open to anybody, and skills and capacities are verified during production. This entails that organizational structures and hierarchies are merit-based and are modified according to the kind of production activities that need to be performed (*ibid.*).

Benkler (2006) defines commons-based peer-to-peer production as a form of social production, since its sustainability relies on social relations rather than on market or proprietary stands, and discusses how commons-based peer-to-peer production builds on individuals' intrinsic motivations of being part of a social entity and feeling related to other human beings. Being a form of social production means that, beside generating more or less tangible outputs, commons-based peer-to-peer production is also increasing participants' social capital, which consists of the connections between individuals and the norms of reciprocity and trustworthiness that arise from them (Putnam 1995). Moreover, human capital is often generated, since, by being involved in these processes, participants have the opportunity to develop skills and competencies (Gauntlett 2011).

If we look at the feasibility of intangible commons-based peer-to-peer production, two elements are central: the infrastructure (the Internet) and the means of production (personal computers). The Internet plays a central role in enabling commons-based intangible production processes because it lowers the costs of accessing, processing, and sharing information (the key resource in intangible production processes). Moreover, the distributed nature of the Internet eases participation, facilitating the spreading of production processes. The actual processes of production are carried out through a personal computer, which, like the Internet, allow multiple uses at the same time—for example, sending work e-mail messages, playing online games, chatting with a friend, and participating in commons-based peer-to-peer production. Thus, the cost of purchasing and maintaining a personal computer is spread across diverse uses, and this dramatically lowers the threshold of participation to commons-based production processes. The feasibility of commons-based peer-to-peer production in intangible forms is related to the fact that few resources are required to participate, since such processes can be performed through infrastructures and means of production that are acquired for and sustained through other uses. This is crucial to understanding the challenges of transferring commons-based peer-to-peer production to tangible processes. The FOSS movement has demonstrated the possibility of having commons-based production processes, but how this possibility could be transferred to other forms of production is still to be established. There are several scenarios for a commons-

A4

based provisional system (see, for example, Siefkes 2012; Helfrich 2013); some of them envisage a radical reorganization of society and of production systems. Meanwhile, commons-based peer-to-peer production may also end up being yet another transformation of production-as-usual. There have been only few successful instances in which, in establishing relationships with commercial players, open-source software projects have been able to develop ad hoc solutions to preserve the commons, avoiding allowing companies to tap into and free-ride the shared resources (Bauwens 2009; O'Mahony and Bechky 2008). Moreover, in open-source hardware, there have been a number of projects that, having thrived thanks to the contribution of a vast community, have patented and "closed" products once business possibilities have arisen. (See chapter 7.) Another issue relates to crowdsourcing initiatives in which corporate structures support users' peer-to-peer production and open up their innovation and production processes to users. Here no proper commons are generated, as ownership of and responsibility for production aren't shared. These initiatives have been celebrated as a way to support new forms of micro-entrepreneurship and self-entrepreneurship (Anderson 2010) and user-driven innovation (von Hippel 2005). However, they are also revealing another face of the so-called third industrial revolution, with companies outsourcing production tasks (but also risks) to the users (Bauwens 2009) and benefiting from free labor generated by crowdsourcing and by commons-based activities (Thrift 2006).

It isn't yet clear whether and in which terms the third industrial revolution is going to be a revolution, although it is already possible to see the emergence of some challenges associated with moving commons-based production from the intangible to the tangible realm and with infrastructures supporting collaboration and sharing in making things.

Going tangible: Beyond openness

The success of commons-based peer-to-peer production in information-based production processes, that is, production of intangible goods, has fostered the emergence of a number of open-source projects for the production of tangible goods and the articulation of a scenario for commons-based peer-to-peer production in the tangible realm (Siefkes 2012). As Bauwens pointed out (2009, 129), going tangible requires the creation of "mechanisms that combine the non-reciprocal peer production of designs for immaterial production with a separate system for physical production that relies on, cooperates and supports open design communities." In moving toward commons-based tangible production, beside the need to treat information and knowledge as open-access commons, there is also the need to develop an infrastructure in which tangible means of production and resources are treated as commons.

When it comes to sharing information about tangible production processes, there are several initiatives relying on the same mechanisms used in intangible commons-based peer-to-

peer production. Proponents of open hardware and open design (van Abel et al. 2011) aim at creating and sharing files and knowledge about how artifacts work and how they can be manufactured, generating open-access commons very similar to the ones at play in FOSS. This approach seems particularly promising when it comes to production processes employing personal fabrication machines (such as 3D printers, laser-cutters, small-scale CNC mills). These machines are based on CAD-CAM systems, meaning that production processes are stirred through code and, therefore, entailing the possibility of treating atoms as bits (Anderson 2010). One of the most significant examples is the Open-Source Ecology project, which is developing open-source drawings, files, and instructions to create basic machinery for cultivation and construction.

A more challenging task is to treat tangible assets as commons, since machines and materials present the possibility that problems of rivalry and durability will emerge.

Rivalry and durability

Information and knowledge represent non-rivalrous goods, which means that they can be involved in diverse uses at the same time (Ostrom 1990). If a programmer uses a piece of code found on the Web for generating a program, she doesn't subtract the possibility that another individual will utilize the same piece of code at the same time in another production process. Knowledge and information are also durable goods, which means that they do not degrade by going through processes of production: a piece of code doesn't get worn by being used again and again, so in principle there is no cost of maintenance of the good itself. I write "in principle" because access to and provision of these goods demand an infrastructure that requires resources for its construction and maintenance. This clearly emerges in cases of intangible commons-based production in which access to code requires an Internet connection and working online platforms and repositories.

In shifting toward production processes in which tangibility has a prominent role, things get even more complex since tangible goods are rivalrous and present diverse degrees of durability (Ostrom 1990). For example, a 3D printer is a rivalrous good since it can only print one object at a time and, consequently, can be involved in only one production process at a time. As time passes, its components will wear out and eventually break down. Durability is even more critical if raw materials are considered: the plastic thread used by 3D printers can be used only once. In order for it to be re-used, the previous printed objects have to be melted down and the filament has to be regenerated through a process that is costly in energy, time, and means. Moreover, every time a plastic is recycled, it loses some of its physical characteristics, and after a number of cycles it is useless.

A4

Rivalry and durability, thus, represent a challenge to the establishment of commons-based peer-to-peer production. In working with information, it is necessary to find resources to maintain open-access commons, that is, to maintain the infrastructure and provide access to it. When it comes to tangible forms of production, beside the infrastructure challenge, there are also challenges about how to organize tangible commons assets, for example, by establishing practices for their maintenance, by finding resources to invest in these activities and, even, by introducing sanctioning mechanisms to avoid misusing of the commons and free-riding (Ostrom 1990, 1999). This implies that openness is not enough: there is a need to focus beyond the issue of access, also considering ownership, use, and maintenance of shared resources.

Infrastructures: Not only distributed but also scope-based

Another reflection that can be made about infrastructures “for going tangible” is related to the role that the Internet plays in ensuring the feasibility of intangible commons-based peer-to-peer production. Even if the Internet plays a fundamental role in collaborative and sharing practices, it often ends up being invisible. According to Star and Ruhleder (1995), this is a key characteristic of infrastructures, which become visible only when they break down. Internet invisibility seems to be amplified by the fact that, since the Net is enabling a number of diverse activities in diverse contexts (from sending emails for work to playing online with friends), its costs are spread broadly.

A major factor ensuring the sustainability of intangible commons-based peer-to-peer production is the fact that the Internet allows for so-called economies of scope. The costs of production can be written off either by reaching scale (that is, increasing the quantity of one type of production) or by increasing the scope (that is, using the same equipment for different purposes). Economies of scope look for possibilities of involving the same means of production in diverse processes, spreading the costs of acquiring and maintaining the equipment over a range of activities (Panzar and Willig 1981).

In discussing how to establish tangible commons-based peer-to-peer production, when it comes to infrastructures, the economies of scope pattern is often forgotten. Here, the discussion (and the examples) focus on how to replicate the distributed nature of the Internet through the creation of a network of physical spaces for opening production through which users could access shared technology and collaborate beyond location constraints (Gershenfeld 2005; Carson 2010). There is little discussion of the actual self-sustainability of these hubs, how to manage and maintain them as commons (Troxler 2013) and, to an extent, how economies of scopes, as supporting a variety of uses and holding diverse interests together, could play a role in the viability of tangible commons-based production.

Infrastructures for commons-based peer-to-peer production supporting tangible processes therefore have to face two challenges to maintain themselves over time. The first is to deal with rivalrous and non-durable commons. The second is related to how to establish economies of scope. The next section illustrates how these challenges require us to focus not so much on the technological aspects of the infrastructure as on how it is able to support practices and uses—that is, on infrastructuring.

Spaces for opening production: A matter of infrastructuring?

The first examples of physical spaces for opening production emerged in the 1970s, with Karl Hess' shared machines shops initiative. They were neighborhood-based workshops, in which people living in the surroundings could access tools and knowledge for making things and claim back production processes:

The machine shop should have enough basic tools, both hand and power, to make the building of demonstration models or test facilities a practical and everyday activity. ... For inner-city residents the shared machine shop might be a sensible and practical doorway to the neglected world of productivity as well as being a base for community experimentation and demonstration. (2005, 96)

A similar underlying idea can be found in hacker-spaces, community-operated physical places in which hackers meet and work on projects. In these spaces, tools and machines—as well as knowledge and skills—are usually shared between participants and treated as commons (Wikipedia 2011). Access to these spaces, however, usually remains restricted to so-called lead users, as emerges in the Illutron case (see chapter 5) and from an ongoing discussion inside the hacker community about the role of hacker-spaces in enlarging access to the use of technology (Grenzforthner and Schneider 2009).

A much more inclusive concept is that of the FabLab, which was developed by the Massachusetts Institute of Technology during the first mass diffusion of personal fabrication machines (Gershenfeld 2005). FabLabs build on the concept of hacker-spaces as facilities for production based on shared knowledge and skills, but with a more formal structure, which makes them more accessible. FabLabs have provided legitimacy and visibility to a counterculture niche phenomenon, transforming spaces in which knowledge and tools are shared for collective exploration of production processes into a network of platforms promoting the diffusion of the open and collaborative production in the tangible realm. According to the official MIT database,



there were 80 FabLabs in 2012 and 135 in 2013 (FabLab 2013); to these a undefined number of non-registered FabLabs should be added.

FabLabs have inspired the emergence of TechShops—commercial facilities where users, by paying a membership fee, gain access to advanced equipment for prototyping and small-scale manufacturing.

Another format is that of makerspaces. These do not have a specific definition, as FabLabs do, nor do they address specific communities, as hacker-spaces do; they assume a variety of forms, usually trying to be more inclusive than hacker-spaces by bringing together diverse forms of making and, consequently, diverse communities (Cavalcanti 2013). A very interesting example is the Artisan's Asylum in the United States focusing on craft production, offering access to professional equipment for small-scale production and organizing diverse kinds of courses.

In addition, a number of spaces for opening production are backed and financed by industry. Here, commons are seen as providing freedom of experimentation that eventually could lead to new ideas and products for the markets (Benkler 2013).

Spaces for opening production are all characterized by the centrality of sharing (machines, knowledge, skills) and collaboration (between the participants), although what is shared and in what ways may differ according to their formats and aims, leading to diverse forms of commons-based production. Some such spaces are characterized by proper commons and peer-to-peer patterns, with users being directly involved in the managing and running of the hub. In others, an actor may be engaged in looking after the space and facilitating sharing and collaboration.

There are diverse expectations about these spaces. As has already been pointed out, they are looked upon as the premises that will support the development of commons-based peer-to-peer production (van Abel et al. 2011; Carson 2010). They are also considered incubators from which a new wave of small-scale production start-ups at the intersection between crafts and the so-called Internet of Things will develop (Anderson 2012) as a result of democratizing access to production technologies and fostering collaboration between diverse expertises. Although, aside from a few remarkable examples (Baichtal 2011) these expectations are often far from being met. A survey on FabLabs concluded that they “were primarily offering infrastructures to students,” that they “were relatively passive in reaching out to potential other users,” and that they “had so far created a limited innovation ecosystem, which got used rather rarely” (Troxler 2010, 9). More recently FabLabs have even been declared dead (Zijlstra 2013) because of their failures in developing meaningful relationships with local actors and in promoting the sharing of knowledge and information about production on a global scale.

These critical voices seem to point to another issue that needs to be considered when thinking about how to establish an infrastructure for commons-based peer-to-peer production in the tangible realm: that more than the technical aspects of the infrastructure should be considered. As Star and Ruhleder (1995) pointed out, an infrastructure is not a *what*; it is, rather, a *when*, since it becomes an infrastructure in relation to its ability of supporting a specific practice. Therefore, in trying to build an infrastructure, it is important to focus not only on the technological aspects but also on the uses, practices, and behaviors that it is able to support—that is, to think in terms of infrastructuring (Björgvinsson et al. 2010) rather than in terms of infrastructure. It is thus important to explore and understand to what extent spaces for opening production support or fail to support sharing and collaboration, what kinds of practices and behaviors emerge, who is participating, and what hindrances and challenges are present. The shift from infrastructure to infrastructuring can trigger a parallel shift from commons to commoning (Linebaugh 2009)—that is, a shift from understanding collective ownership institutions as a *what* to understanding them as a *when*, and from something that once implemented is given and defined in time to an ongoing process of negotiation between participants, both human and non-human, in which rules and relationships are redefined according to emerging contingencies. This shift emphasizes the evolutionary and context-related nature of commons and the fact that they are not just a matter of organizing ownership but also a matter of access to and use of a resource (Hess and Ostrom 2007), and how such organization necessarily emerges in the interaction between the involved human and non-human actors. It also entails considering how rules, roles, and practices are at play in use, and how participation unfolds (Ostrom 1990, Ostrom 2011).

It is with a commoning perspective that the chapter now turns again to Fabriken and STPLN, looking at the practices, patterns, challenges, and possibilities emerging there, trying to unpack both how commons develop in time and how infrastructuring was carried out.

STPLN and Fabriken: Participants, practices, and rules in use

Fabriken is accessible when the STPLN premises are open, five days a week between 10 a.m. and 5 p.m., and this is when people can work autonomously on their projects. On Thursday evenings, Fabriken is open until late, and this is normally when diverse groups of participants are active in the space. Normally, between 10 and 30 people are engaged with the machines and equipment to work with electronics, and Thursday evenings is also when the members of the textile group, the Textile Department, meet to sew, stitch, knit, drink tea, and eat biscuits. Initially the Bicycle Kitchen was open on the very same evening, but since it was quite successful in attracting people a decision was made to move openings there to other days in order to keep the space from getting crowded. The screen-printing workshop operates mainly on

A4

Wednesday evenings; a group of volunteers, in addition to using the equipment for their own activities, organize courses and workshops for the public.

In Fabriken tools and machines are available to everybody, with the exception of the laser cutter and the CNC mill; their keys are placed in a “secret” drawer in a storage room. To be able to use them, one must come on a Thursday evening and learn from the more experienced participants. Learning and transfer of skills were, initially, not regulated through a formal system. The more experienced participants did not mind having to spend time to teach the few newcomers how the machines worked. As time went by, the number of new people coming to the space increased, and a need emerged to organize proper courses about the machines, as it was important to establish what people should be taught in order to don’t ruin the equipment and to keep track of who attended the courses. The most experienced participants formally took on the tasks of education and machine maintenance. In exchange they were given a special status: beside social recognition, they were also involved in deciding what machines should be bought. However, later on, also this solution presented some problems, leading to the decision of hiring someone to take care of the space.

Diverse activities are taking place in Fabriken: repairing bikes, sewing clothes, experimenting with electronics, laser-cutting pieces for architecture models, and others. These activities are carried out by individuals or by small groups. Some are aimed at creating finished products, some at experimenting and playing around with tools, machines, and materials. Beside the private individuals who come to the space in their spare time, Fabriken has also been hosting two fashion-design ateliers and a catering company. The ateliers have been based in the Textile Department; one of them focuses on textile design in a broad sense and the other on “up-cycling” old garments. The catering company used for some time the kitchen for food workshops. These three initiatives are driven by people who have regular jobs and who, in their spare time, are trying to build professions out of their passions.

Fabriken attracts also long-term projects. One of them is ReCreate, which uses cast-off materials from industrial production to build new things and to stimulate creativity and environmental awareness in children and adults. The driving force behind ReCreate was a former teacher who wanted to experiment with new ways to teach sustainability. She came to Fabriken looking for space and support for developing her idea. She began by collecting materials, prototyping formats, and holding workshops for adults and children. Moreover, she established a network in the space by getting to know the other projects and the people who gathered in the space on Thursdays evenings. Some events in collaboration with the Bicycle Kitchen were organized, and also some workshops with Fabriken regular participants to explore new ways of

using her materials. After some months, the former teacher got three years' worth of financing for developing her project.

Among the other participants in Fabriken are local hackers, programmers, and electronic musicians. The space is also frequently used by representatives of Malmö's cultural and art scene. A few students from the program in Interaction Design at Malmö University also hang around in the space. It is difficult to categorize the rest of the participants. All of them are interested in various forms of making and self-production. Most of them are well educated and have fairly well-paying jobs; however, there are also some unemployed people and some knowledge workers struggling to make a living. A few people on long-term sick leave come to the space almost every day, mainly for tinkering around and chatting, and three retirees (two engineers and a teacher) are regular visitors.

The ground floor of STPLN's premises is regularly used by small companies and freelancers working in Malmö's cultural and creative scene. The space also hosts short-term projects such as a café for families with small children, a tailor service for fixing clothes, and exhibitions of emerging local artists. These initiatives are driven by people who are looking for space and resources for testing activities and ideas and check if and how they might work before making large investments.

Production at Fabriken: Commons-based crafts and do-it-yourself activities

The production processes and the activities carried out at Fabriken can be defined as commons-based in the sense that they are carried out through sharing both facilities and the means of production. Generally, initiatives at Fabriken resemble craftsmanship (Sennet 2008) since activities are often about doing something concretely by developing a direct involvement with materials through working, often becoming an opportunity to learn and to acquire new skills. At the same time, activities are often characterized by mutual learning and collaboration, generating social connections and resembling the idea of "making is connecting" (Gauntlett 2011).

Fabriken activities are generating outputs of three kinds of value: (1) goods or services with use value, (2) human capital (that is, skills and competence), and (3) social capital (social connections and trust). Here use value is understood as the concrete way in which a thing meets human need, or its being functional in satisfying a specific need (Harvey 2010). In Fabriken, use value can address a private need, or it can be exchanged with others for money or for other values such as social recognition or friendship. Moreover, having access to machines and meeting skilled people contribute to the development of human capital: personal knowledge, competence, and attributes of each participant. Sharing of spaces, machines, and knowledge supports a do-it-together approach (Gauntlett 2011) by which new connections between

A4

participants are established, generating social capital that entails connections among individuals and the norms of reciprocity and trustworthiness that arise from them (Putnam 1995).

When it comes to the activities going on in the space it is possible to distinguish between do-it-yourself practices (Shove et al. 2007; von Busch 2008) and craft practices (Greenhalgh 2002).

The “DIY movement” began in the middle of the twentieth century, promoted by manufacturers of hand tools who saw in amateurs a potential market (Shove et al. 2007). In the 1970s, DIY practices were embraced as a form of resistance against the industrial production system (Leadbeater and Miller 2004), starting from the assumption that everyone could build and repair things (Gauntlett 2011), as opposed to buying new things, and that such activities are rewarding not only in terms of saving and/or producing use value but also in terms of personal satisfaction and self-esteem (Shove et al. 2007). The idea of DIY as a critical practice was developed within punk sub-cultures, in which it was considered a way to reclaim music and information production through home-recorded music tapes and zines (home-made magazines) (Gauntlett 2011). Recently, DIY has also become a central practice in the sustainability discourse, since repairing and recycling are viewed as alternatives to mass consumption (ibid.). DIY as an approach to hack mass production and consumption (von Busch 2008) is also emerging in Fabriken; however, it is also possible to see the space as embedded in and heavily dependent on the current economic system, since most of the production is done as a leisure-time activity.

At the same time, some of the activities seem to have the potential to represent an alternative way of producing and acquiring things, and in that they more resemble crafts. Crafts aren't defined specifically, since they represent an assortment of genres that makes sense together for artistic, economic, and institutional reasons. They have no intrinsic cohesion, no *a priori* relationship that makes them a permanent peculiar or special gathering (Greenhalgh 2002). Crafts, though, present several distinct threads. This is evident in Fabriken, in which craft practices do not necessarily fall in the category of decorative arts, but they more generally include all the activities requiring “applied” forms of creativity in a broad sense, from embroidery to soldering circuits.

Nonetheless, crafts present some common traits, especially when it comes to quality, morality, and technology (Greenhalgh 2002). Whereas DIY focuses on the actual making as an appropriation of production processes and generation of human capital, the focus in crafts is more on making as a way to generate use value; therefore, crafts entail a distinctive notion of quality that brings together functionality, aesthetics, and skills.

Since the eighteenth century, with the rise of the Arts and Crafts movement based on the ideas of John Ruskin and William Morris, crafts have also been considered a more human way of organizing production processes in opposition to the alienation of industrial processes (Harvey 2010), bringing in the aspect of morality. This aspect is shared with DIY practices and the idea of production as a tool for self-expression (Gauntlett 2011). The technology aspect is also quite central. On several occasions crafts have been looked upon in opposition to technology as an expression of industrial society (Ruskin 1985). However, in Fabriken, crafts activities do actually rely on technologies as tools for improving quality, efficiency, and accessibility to practice.

DIY and crafts are not new inventions; these models of production have been around for a long time, and crafts represented a mainstream mode of production until the first two industrial revolutions. What is different in Fabriken, and at other spaces for opening production, is how DIY and crafts practices are performed through shared means of production and collaboration, which, sometimes, but not necessary, can lead to the generation of commons.

Trying to overcome scarcity of materials

A major difference between intangible commons-based peer-to-peer production and the activities at Fabriken is that in the latter materials and outputs are rarely treated as commons, largely because problems with durability and rivalry make it more difficult to share materials—once used, they aren't available for others, and, unlike information, they are difficult to produce. How to get hold of materials for production is a major challenge in spaces for opening production, since the possibility of gaining access to machines, equipment, and even knowledge doesn't generate anything if materials aren't available. Finding ways to gain access to materials has always been a main concern in Fabriken, and has led to the development of a number of strategies having to do with waste. Beside basic approaches such as disassembling electronic products in order to get parts and collecting old clothes that can then be remade or reused, more complex strategies have also been developed. The Bicycle Kitchen, for example, had an agreement with the company that handles waste in Malmö to get bikes that people no longer want. The company put a container dedicated to bicycles in one of its facilities in which citizens bring their garbage. Users bringing bicycles to that facility could then decide whether to throw them away or to donate them to the Bicycle Kitchen. Initially the same strategy was to be used to get other things for Fabriken, but that turned out to be too complicated. The practices in Fabriken were so diverse that many containers would have been needed. Moreover, some extra work would have been necessary to sort materials, since, for example, certain activities performed in the space do not require just wood in general; they require plywood, or boards, or other specific kinds of wood.

A4

And even if we could get hold of the materials, we would not know where to store them. Recently the Bicycle Kitchen decided to stop its collaboration with the waste-management company because it was getting more bikes than it had space for.

An interesting opportunity seemed to arise when ReCreate entered the space, since, besides getting interesting materials, ReCreate was also sorting them out. A series of collaborative experiments ensued—for example, between ReCreate and the Textile Department in order to explore possible uses of a high-quality waterproof textile that ReCreate got from a sailmaking company. However, this was an exception rather than the rule. Most of the materials ReCreate gets are semi-finished products, already shaped and therefore not easy to reuse. Moreover, it is sometimes difficult to know the exact constituents of the things ReCreate collects, so it isn't easy to decide whether, for example, the laser cutter should be used on them.

Working with scrap and waste is a common practice in Fabriken to overcome material scarcity, although this approach is unable to fulfill the needs of most of the activities. Materials scarcity makes it difficult to apply commons-based peer-to-peer production to tangible forms of production. Thus, there is a need to develop new strategies and tactics to acquire resources for tangible forms of social production.

Fabriken and STPLN as attempts at commoning

Despite the materials challenges, Fabriken has succeeded in attracting and supporting a range of production practices by lowering the barriers for performing DIY and crafts activities through shared means of production and collaboration. The machines and the space attract participants and activities, but treating them as commons has not always been easy. Commoning, it became apparent, is not just a matter of establishing shared ownership; it is also a matter of managing collective access to, use of, and maintenance of resources (Ostrom 1990). This implies that commoning is an ongoing activity that needs to continuously evolve and adapt to changes in the context (*ibid.*).

Since the opening of the space, the idea was to involve participants in its management and reward the most active participants with special status—for instance, keys to the space, social recognition, or the opportunity to be involved in deciding what equipment to purchase. This led to a model of managing the premises: the NGO takes care of the general functioning of the space, and the participants focus on specific tasks directly connected to their own interests. The hacker community is managing and taking care of the machines in Fabriken, a small group of designers is running the textile-printing workshop, and an old lady is in charge of the textile corner. An important role is also played by the founders of ReCreate and the Bicycle Kitchen,

who besides running their own projects are often involved in the general management of the space.

The functioning of the space relies on both economic standing and social standing. The NGO people and those running ReCreate and the Bicycle Kitchen are salaried. The fabrication machines, the textile atelier, and the screen-printing workshop, however, are managed by volunteers who are rewarded mainly with social standing. They usually don't get involved in general organizational issues; instead they manage access to and functioning of specific features. These highly engaged participants seem to be more interested in specific and even quite complex activities (such as fixing the laser cutter) than in the general management of the space (which is, as said, mainly a task for the NGO people and the ones driving the in-house projects). However, not all the participants are actively engaged in the space. The layers and possibilities of participation range from simply having access to and using the shared resources to taking part in their maintenance.

The NGO as a partner in commoning

The NGO plays an important role in the complex interweaving of diverse modes of participation, overseeing the management of the premises, coordinating sharing and access, and providing financial resources for the purchase of machines parts and tools. Participants mainly contribute with time, skills, and some material resources (such as equipment and materials). The NGO can be seen as a kind of partner in the participants' production activities. Cosma Orsi (2009) used the notion of partner to describe the possible role of the state in a commons-based regime as a structure supporting and enabling citizens' initiatives. In STPLN, the NGO doesn't run or lead specific activities; rather, it provides support for the diverse projects and ensures the preservation of the commons by intervening in disputes having to do with the sharing of equipment, the space, and access to the premises.

Because the NGO is financed by the municipality of Malmö on the basis of how many activities and people it is able to mobilize, participants can exert power through their sheer presence (or, rather, absence). There is a mutual dependency between the participants and the NGO. The participants depend on the NGO for access to the space and for its basic management. The NGO is aware that without participants the premises are endangered. The NGO's role is particularly important because in Fabriken and STPLN a lot of the projects are short in duration and people easily move in and out of the space. While the NGO ensures the continuity of the commons, the participants in the space may change. The role of the NGO is ambivalent: it certainly enables commoning by facilitating sharing and collaborating between participants; on

A4

the other hand, it could also be said that the organization running STPLN hinders commoning by retaining a central role in the management of the space.

Challenges with transient commoning: Legitimate participants and non-participants

Commoning at Fabriken seems to run quite well, though there are occasional tensions related to how the NGO is distributing financial resources. Specifically, the non-durability of the resources in the space implies the need for constantly investing money to maintain and fix the machines. As said, the NGO has some financial resources that, however, are never enough to cover all the material needs of the initiatives in the space, thus, discontent between participants may emerge about how these resources are allocated.

Other challenges emerged as the number of participants grew. The increasing number of newcomers to Fabriken meant that the regulars had to spend more time providing education in how to use the machines, at the expenses of their own experiments and projects. Moreover, the regulars' increased effort could not be properly rewarded: beyond full and free access to the space and social recognition, there was nothing more that could be offered them. In addition, it is difficult for newcomers to understand and accept how Fabriken and STPLN work. The idea of a commons, in which all concerned take care of the space, seems difficult to grasp because people often look for "someone in charge." The trickiest issue has to do with the sporadic users. Being in a space day after day helps a person to be aware of the importance of cleaning up and putting tools back where they belong. The regulars often have to spend time cleaning up messes made by others, and they often find that tools or materials seem to have disappeared. Moreover, because the space hosts a number of short-term projects, some participants may become very engaged for a while and then disappear from the space.

The problems emerging in the Fabriken and STPLN can be partially explained in terms of Elinor Ostrom's general design principles¹ for sustainable commons (1990, 1999). Among regulars, sporadic users, and newcomers, there is an issue of fairness: newcomers and sporadic users get a proportionately bigger benefit for the effort they invest than the regulars. This suggests that there may be deficiencies in how the rules of use and access are communicated to newcomers. Moreover, Fabriken lacks a system for verifying and sanctioning misuse of the shared resources (Ostrom 1990, 1999)—a lack that raises the question of how to allow consistently for control over the common without investing too many resources when the number of participants gets too big for simple peer control.

In Fabriken and STPLN there is clearly tension between embracing new participants, openness, and the intrinsic necessity for the commons to have defined boundaries (Ostrom 1990, 159

1999), specifically boundaries between legitimate participants and non-participants (Cox et al. 2010). However, it is important to note that Ostrom's principles are based on commons to which participants have a long-term commitment. As has already been pointed out, at STPLN participation is transient, which makes difficult to define a clear boundary between legitimate and non-legitimate participants. From this perspective, the role of the NGO as a partner appears to be fundamental in ensuring continuity to the commons, even though its way of operating could be improved (particularly in regard to informing newcomers and in regard to fairness).

A central challenge in spaces for opening production seems to be how to discourage free-riding and misuse by transient participants. It is also important to understand which approaches can be used to facilitate the inclusion of new participants in the commons, as doing so appears to be a fundamental step towards economies of scope.

Sustainability, scope, and located production

By attracting diverse practices, Fabriken and STPLN show how economies of scope can be at play in spaces for opening production. Economies of scope also figure in the financial sustainability of the entire premises. As has already been mentioned, most of the funding comes from the city of Malmö, which covers basic expenses such as electricity and heating. The municipality is also paying the salaries of the three people from the NGO. Other forms of financing come from the foundation subsidizing ReCreate and the Bicycle Kitchen and from the research center Medea, which invested in some of the machines and which pays the author's salary. Financial resources are also obtained by renting out the space for events or conferences. Some material resources are contributed by participants who share private machines and materials in the space.

However, sustainability is not just a matter of financial or material resources. Voluntary work—a great asset—is often repaid by social standing, but also in more tangible ways, such as the opportunity for the most engaged participants to hold parties and events in the space for no charge. From this perspective, STPLN is using economies of scope when it comes to rewarding participants' work.

The importance of participants' involvement in spaces for opening production is increasingly recognized—for example, a number of FabLabs have implemented internal currency systems so that working hours can be exchanged for access to equipment or other privileges in a similar but more formal manner than is done in Fabriken. However, such a practice requires good calibration and continuous re-adaptation, as Fabriken's problem of participants' not being properly rewarded showed. The latter problem, in fact, led to a decision to

A4

hire someone to take care of the machines and of basic training, and to ask participants for a membership fee that could be paid either in money (which would be used to pay the technician's salary) or by working in the space.

In trying to work toward economies of scope, Fabriken and STPLN have made a major effort to focus on located production rather than local production. Instead of starting out from a defined set of machines and practices, STPLN has tried to adapt progressively to the practices emerging from and coming to the space and to see the space as supporting production practices that make sense in and work in the context of Malmö, rather than developing the space according to a more standardized format (for example, that of the FabLab).

Infrastructuring for co-ownership and multiple understandings

In setting up and running Fabriken and STPLN, a main concern has been how to develop meaningful relationships within the local context. The space has been built up starting from practices, rather than machines and technology. At the official opening, the premises were basically empty. Then, by engaging possible participants and hosting diverse initiatives, the premises were progressively equipped and developed.

In infrastructuring Fabriken, a number of diverse approaches have been taken. In the beginning, events were used to reach out to diverse audiences and to invite them to join the space. These events all had a similar loose format: people were invited to run their own activities. As time went by, we understood how these events worked well in attracting specific communities of makers, and that it was more difficult to create occasions to bring together diverse groups of participants. At the first Hackathon,² in February 2011, we assumed that it was enough to include a few craft workshops to reach crafters. Some people interested in crafts did show up, but the majority of participants were still hackers. We also saw how, in reaching out to a wider public, more structured events (with planned activities and workshops) worked better than loose formats, as people less skilled in making seemed not so comfortable with an open format.

Other ways of involving people have been to organize courses and workshops. These public and planned activities have been very useful in involving people who already knew the space but had not yet found an opportunity to enter it.

Another important aspect in the infrastructuring of Fabriken has been working with a long-term perspective to establish co-ownership over the space, and to support the coexistence of diverse activities and interests.

Organizing events and workshops and setting up small-scale experiments have been important ways of inviting people to participate, but to get them to stay it has been important to provide them with ownership of the facilities and to involve them in the running of the space. It has also been important to find a way to keep many different initiatives with divergent interests under the same roof. Instead of trying to come to an univocal and shared definition of what the premises are about, the approach has been to allow for diverse understandings of Fabriken and STPLN. We have encouraged participants to develop their own understandings of the space. This has been facilitated by the large size of the premises and by the opportunity to have diverse activities happening at the same time in diverse spaces, or in the same space at different times, so as to minimize the risk of friction. Allowing a multiplicity of understandings has been helpful in constructing co-ownership and working toward economies of scope; however, it may have played a negative role in matters of communication concerning rules and behavior.

New producers and old producers: Alliances in the margins?

The participants at Fabriken and STPLN, aside from their differences, can be described as “new producers”: prosumers, amateurs, lead users, and, generally speaking, end users. There is a lack of more traditional producers such as artisans or small producers. Relationships with more traditional producers might help in gaining access to competences and to materials.

Through ReCreate, when looking for material suppliers, a number of contacts with small producers were made. The collaboration with them rarely went beyond getting production leftovers, but when it did, interesting alliances seemed to emerge, as it happened with Bertil and his small die-board workshop that produces molds for punching cardboard and other materials. ReCreate founder, Carin, got in contact with him, as we wanted to experiment with the possibilities of creating building blocks out from various kinds of plastic and cardboard foils that ReCreate got from a packaging company. These initial contacts developed in an ongoing collaboration between Bertil and ReCreate, which entails not only punching foils, but also skills exchange.

Meeting and working with Bertil helped me to understand the situation of local small producers, revealing how promising but also how difficult it could be to involve them in a space for opening production.

In his collaboration with ReCreate, Bertil is working for free. When Carin, the founder of ReCreate, tried to discuss paying for his work and the die-boards, he just smiled and pointed out how expensive developing a die-board is. However, Bertil, who is in his seventies and ready to retire, seems to appreciate the fact that his skills and knowledge can be applied in new areas and, somehow, be passed on. Bertil not only has knowledge of traditional techniques of die-cutting;

162

A4

he is also an expert on laser-cutting, which makes him, potentially, a great resource for Fabriken. Through Bertil it has also been possible to get in contact with a big supplier of plastic materials and looking for possibilities to get some materials from them. Moreover, working with Bertil has led to a better understanding of the situation of small producers around Malmö, which is quite discouraging. The die-board company has very few clients left, since, as Bertil once said, die-cutting, together with many other production activities, is now a Chinese business.

From this perspective, the third industrial revolution could also be about finding alliances that would enable new and old producers to exchange skills, knowledge, and material resources, but it could also be a way to support other practices defining new forms of local production. However, the collaboration with Bertil has been an exception. A number of attempts have been made to infrastructure with small producers in Fabriken, but none of them have succeeded. Once, for example, Fabriken hosted a workshop with a professional woodworker. When discussing the possibilities of collaborating with the space, he stated how the space could work well for teaching the basics of carving wood, but that he could never use it for his professional practice, since that would require the purchase of expensive machines that would be difficult to share because he would have to use them for long periods of time.

However, further exploration of how to infrastructure possible alliances between new and old producers may be worthwhile—collaborations between these two groups may turn out to be fruitful attempts at commoning production, as in the case of Carin and Bertil.

Conclusions

The experiences emerging from Fabriken and STPLN can be considered as examples of what it might mean (and take) to infrastructure and to common for tangible production practices based on sharing and collaboration. The insights coming from the Malmö makerspace reveal the challenges posed by commons with transient participation, as well as, how, working towards economies of scope, demands a located and ongoing approach in exploring possible alliances and practices.

Fabriken and STPLN seem to play a role also in relation to what kind of forms the third industrial revolution may take, at least, in Malmö. Inspired by the practices and activities emerging in this makerspace, the city of Malmö has commissioned us (the researchers) to do a pre-study for another similar facility in another neighborhood, where unemployment and integration are burning issues. The aim of this pre-study is to explore how a makerspace, by supporting the development of human capital and social capital, could improve well-being and living conditions in this area. Another interesting development is related to the national agency

that financed our (the researchers) participation to Fabriken and STPLN. The financing of Fabriken and the other two Living Labs (see chapters 3 and 11) was part of an EU structural funds program aiming for economic growth. During the running of the Living Labs, a number of discussions and tensions have emerged in relation to the fact that the Labs were not delivering enough jobs and companies, which were two of the main indicators of the program. However, it is interesting to notice, one year after the official ending of the project, how the national agency has granted funding for the establishment of a number of makerspaces around the country (Tillväxtverket 2014).

In this perspective, it seems possible to say that a located and explorative engagement with practices, people and spaces could be a way, at least on a local scale, to influence forms and aims of the third industrial revolution.

Acknowledgments

This chapter is a result of ongoing and located commons-based reflections with Pelle Ehn, Richard Topgaard, Luisa Carbonelli, Carin Hernqvist, Caroline Lundholm, Oyuki Matsumoto, Ola Persson, Bertil Björk, David Cuartielles, and the people who have been and are producing and commoning at STPLN.

References

- Anderson, Chris. 2010. *In the Next Industrial Revolution, Atoms Are the New Bits* (http://www.wired.com/magazine/2010/01/ff_newrevolution/).
- Anderson, Chris. 2012. *Makers: The New Industrial Revolution*. Crown Business.
- Baichtal, John. 2011. *Hack This: 24 Incredible Hackerspace Projects from the DIY Movement*. QUE.

- Bauwens, Michel. 2006. *The Political Economy of Peer Production*. *Post-Autistic Economics Review* 37 (3): 33–44.
- Bauwens, Michel. 2009. Class and Capital in Peer Production. *Capital and Class* 33: 121–141.
- Benkler, Yochai. 2006. *The Wealth of Networks*. Yale University Press.
- Benkler, Yochai. 2013. Commons and Growth: The Essential Role of Open Commons in Market Economies. *University of Chicago Law Review* 80: 1499–1555.
- Björgvinsson, Erling, Pelle Ehn, and Per-Anders Hillgren. 2010. Participatory design and democratizing innovation. In Proceedings of the 11th Biennial Participatory Design Conference, Sydney.
- Carson, Kevin. 2010. *The Homebrew Industrial Revolution*. Book Surge.
- Cavalcanti, Guy. 2013. Is it a Hackerspace, Makerspace, TechShop, or FabLab? (<http://makezine.com/2013/05/22/the-difference-between-hackerspaces-makerspaces-techshops-and-fablabs/>)
- Cox, Michael, Owen Arnold, and Tomás Sergio Villamayor. 2010. A Review of Design Principles for Community-Based Natural Resource Management. *Ecology and Society* 15 (4): 38.
- FabLab. 2013. FabLabs list (<http://fab.cba.mit.edu/about/labs/>).
- Gauntlett, David. 2011. *Making Is Connecting*. Polity.
- Gershenfeld, Neil A. 2005. *Fab: The Coming Revolution on Your Desktop*. Basic Books.
- Greenhalgh, Paul, ed. 2002. *The Persistence of Craft*. Rutgers University Press.
- Grenzfürthner, Johannes, and Frank Apunkt Schneider. 2009. Hacking the Space (<http://www.monochrom.at/english/2009/05/hacking-spaces-critical-acclaim-of-what.htm>).
- Harvey, David. 2010. *A Companion to Marx's Capital*. Verso.
- Helfrich, Silke. 2013. Economics and Commons?! Towards a Commons-creating Peer Economy. Keynote speech at conference on Economics and the Common(s): From Seed Form to Core Paradigm, Berlin.
- Hess, Charlotte, and Elinor Ostrom, eds. 2007. *Understanding Knowledge as a Commons: From Theory to Practice*. MIT Press.
- Hess, Karl. 2005. *Community Technology*. Loompanics.
- Leadbeater, Charles, and Paul Miller. 2004. *The Pro-Am Revolution*. Demos.
- Linebaugh, Peter. 2009. *The Magna Carta Manifesto*. University of California Press.
- Mota, Catarina. 2011. The Rise of Personal Fabrication. In Proceedings of the Eighth ACM Conference on Creativity and Cognition, Atlanta.
- O'Mahony, S., and B. A. Bechky. 2008. Boundary Organizations: Enabling Collaboration among Unexpected Allies. *Administrative Science Quarterly* 53: 422–459.
- Orsi, Cosma. 2009. Knowledge-Based Society, Peer Production and the Common Good. *Capital and Class* 33 (31): 31–51.
- Ostrom, Elinor. 1990. *Governing the Commons*. Cambridge University Press.
- Ostrom, Elinor, Dietz Thomas, Dolzak Nives, Stern C. Paul, Stonich Susan, and Weber U. Elke, eds. 2002. *The Drama of the Commons*. National Research Council.
- Ostrom, Elinor. 1999. Design Principles and Threats to Sustainable Organizations That Manage Commons. Workshop in Political Theory and Policy Analysis, and the Center for the Study of Institutions, Population and Environmental Change, Indiana University.
- Ostrom, Elinor. 2011. Background on the Institutional Analysis and Development Framework. *Policy Studies Journal* 39 (1): 7–27.
- P2P Foundation. 2013. Peer Production (http://p2pfoundation.net/Peer_Production#Discussion_2:_Is_Peer_Production_Beyond_Capitalism.3F).
- Panzar, C. John, and D. Robert Willig. 1981. The Economics of Scope. *American Economic Review* 71 (2): 268–272.
- Putnam, Robert. 1995. Bowling Alone: America's Declining Social Capital. *Journal of Democracy* 6 (1): 65–78.
- Rifkin, Jeremy. 2011. *The Third Industrial Revolution: How Lateral Power Is Transforming Energy, the Economy, and the World*. Palgrave Macmillan.
- Ruskin, John. 1985. *Unto This Last and Other Writings*. Penguin.
- Sennett, Richard. 2008. *The Craftsman*. Yale University Press.
- Seravalli, Anna. 2013. Prototyping for Opening Production: From Designing for to Designing in the Making Together. Presented at European Academy of Design Conference on Crafting the Future, Gothenburg.
- Shove, Elizabeth, Matthew Watson, and Martin Hand. 2007. *The Design of Everyday Life*. Berg.
- Siefkes, Christian. 2012. Beyond Digital Plenty: Building Blocks for Physical Peer Production. *Journal of Peer Production* (<http://peerproduction.net/issues/issue-1/invited-comments/beyond-digital-plenty/>).
- Star, Susan Leigh, and Karin Ruhleder. 1995. Steps toward an Ecology of Infrastructure: Design and Access for Large Information Spaces. *Information Systems Research* 7: 111–134.
- Thrift, Nigel. 2006. *Re-Inventing Invention: New Tendencies in Capitalist Commodification*. *Economy and Society* 35 (2): 279–306.
- Tillväxverket. 2014. Pressmeddelande (http://www.tillvaxtverket.se/download/18.48a604441429f3886202ca2/1387447430244/Bilaga+pressmeddelande_om+projekten.pdf).
- Troxler, Peter. 2010. Commons-based Peer-Production of Physical Goods Is there Room for a Hybrid Innovation Ecology? Presented at Free Culture Research Conference, Berlin.
- Troxler, Peter. 2013. Making the 3rd Industrial Revolution. The Struggle for Polycentric Structures and a New Peer-Production Commons in the Fab Lab Community. In *FabLabs: Of Machines, Makers and Inventors*, ed. J. Walter-Herrmann and C. Büchling. Transcript.
- van Abel, Bas, Luca Evers, Roel Klaassen, and Peter Troxler. 2011. *Open Design Now*. BIS.

- von Busch, Otto. 2008. *Fashion(able): Hacktivism and engaged fashion design*. Art Monitor.
- von Hippel, Erik. 2005. *Democratizing Innovation*. MIT Press.
- Wikipedia. 2011. Hackerspace (<http://en.wikipedia.org/wiki/Hackerspace>).
- Zijlstra, Ton. 2013. The Failings of FabLabs (<http://fablab.nl/2013/09/29/the-failings-of-fablabs/>).

Notes

1. These principles are not to be understood as design approaches for the establishment of successful commons. They represent recurring characteristics that have been found in successful commons. (See Hess and Ostrom 2007.)
2. The Hackathon is a format that emerged within hacker communities. Hackathons are 24–48-hour events in which participants gather to program and build things together.

CAN DESIGN GO BEYOND CRITIQUE? (TRYING TO COMPOSE TOGETHER IN OPENING PRODUCTION)

ANNA SERAVALLI
MEDEA K3 MALMÖ UNIVERSITY
ANNA.SERAVALLI@MAH.SE

ABSTRACT

This paper aims at contributing to the emerging field of design for social innovation (D4SI) discussing the insights from the author's long-term involvement as a design researcher in a social innovation project. In order to discuss this experience a particular perspective is introduced, according to which D4SI can be considered an attempt of design to go beyond critique, and, specifically, of *composing together* (Latour 2010). In this understanding D4SI can be considered as a collective effort towards the construction and exploration of alternative ways of living and working.

In deepening how D4SI can be understood as *composing together*, some reflections are made on the author's involvement in the maker-space STPLN, a platform where production processes are opened and attempts of composing new ways of making things and delivering services are carried out.

By highlighting some of the challenges emerged from being a designer in STPLN, the paper develops two reflections. The first one is related to *togetherness* and it argues that, in dealing with collective compositionist processes, designers need

to acquire skills and look for a possible role that is different from the one of the enabler. The second reflection deals with how to assess *composing together*. From the experience with STPLN, it emerges how compositions need to be accountable in diverse discourses in order to travel further and, hopefully, generate future *prospects*.

INTRODUCTION

I belong to a generation of designers fully aware that "There are professions more harmful than industrial design, but only a few of them." (Papenek 1971). Climate change and environmental problems may have lost their priority on the political agenda, but this does not mean that pollution levels have reduced or global temperature stopped to rise.

We are also aware that "there is no alternative" (Tatcher 1980) to neoliberalism, but we are increasingly realizing that in the irresistible march of progress, fewer and fewer are invited to participate.

As designers it seems that we have two possibilities: either hold it strong to progress (Latour 2010), embracing the conviction that "We have designed systems, cities, and commodities. We have addressed the world's problems. Now design is not about solving problems, but about a rigorous beautification" (Rashid 2012); or try to address the challenges that our times are posing to design.

Facing these challenges is not an easy task. If taken seriously, they are basically questioning the scope of design itself as the creative engine of mass-consumption and progress. Is it possible to be a designer and embrace environmental and social issues beyond developing environmentally efficient dishwashers?

A provisional possibility to respond to these dilemmas is coming from design for social innovation (D4SI) that is suggesting how design could contribute to the

development of environmentally and socially sustainable ways of living, working and producing things; giving the chance to stop designing for *progress* and rather cautiously experiment with *progression*, by engaging in the tentatively *composition* of possible future *prospects* (Latour 2010).

This paper aims at contributing to the understanding of the possibilities and limits of D4SI by reflecting on a three year involvement as a design researcher in a social innovation experiment, the setting up and running of the maker-space STPLN. The paper builds on an analogy between D4SI and the idea of Compositionism as presented by Latour (2010). By looking at D4SI as an attempt of *composing together*, two contributions are made: the first one is how D4SI can be considered as a way for design to move beyond critique; the second contribution highlights issues and criticalities that can emerge when trying to design as *composing together*.

The paper develops in three parts: first, D4SI is related to Compositionism and how it can be considered to be an attempt of going beyond critique. In the second part, the design experiment is presented: the ongoing participation in the setting up and running of STPLN, a maker-space in Malmö, Sweden. This experience has given the author the opportunity to work with D4SI focusing on production processes. Finally, by reflecting on the involvement in STPLN, the paper reflects on challenges in working with D4SI as *composing together*. The focus is on how to deal with togetherness and on how to assess compositions, that is trying to understand if alternative *prospects* are generated, or if the composition is rather *tinkering* with future-as-usual.

DESIGN FOR SOCIAL INNOVATION AS COMPOSING TOGETHER: IS IT POSSIBLE FOR DESIGN TO GO BEYOND CRITIQUE?

D4SI represents a growing and heterogeneous field with diverse approaches. This paper accounts for a specific development of D4SI that originated in Europe and that entails the possibility for design to play a central role in tackling both environmental and social issues, specifically, by engaging and fostering collaborative processes for the development of new practices and ways of living.

In 2003, Jegou et al. presented a collection of everyday sustainable scenarios, showing how design could help in the transition towards more sustainable lifestyles besides developing energy- and material efficient products. Few years later, the work with creative communities (Meroni 2007) and collaborative services (Jegou et al. 2008) contributed to further develop the idea of design as a key player for the development of a more sustainable society and as an enabler of grass-root initiatives.

In the same years (2004-2006), the work of the RED group in UK represented one of the first attempts of

using design to tackle complex social and economic issues (Design Council 2008, 2010). Focusing on diverse themes (health, ageing, democracy), the work of RED proved how design could be used for developing new services and solutions to respond to complex issues. From these experiences, the idea of *transformative design* (Burns et al. 2006) emerged, defining some key features of D4SI: the centrality of participatory processes involving stakeholders from diverse sectors, the importance of prototyping, and the need of transferring design skills to process participants. Counting on a strong political support, transformative design has been further developed with the DOTT programs (Design Council 2012), a project where entire communities are involved in prototyping solutions for sustainable local living, and Public Service by Design (Design Council 2010), a program where designers have been involved in redesigning services in the public sector.

The vision provided by Manzini and his group in Italy and the practical work promoted by Design Council in UK had a strong impact, fostering the idea that design can shape not only products but also lifestyles and systems for more sustainable societies. In this sense, D4SI differs from previous experiences of "social and politically engaged design" since it aims to *change* rather than *critique*. Moreover, it addresses and involves a wider public than the design community itself.

In his book on design activism, Fuad-Luke (2008) offers a compendium of diverse design experiences, which have aimed at "*generating (...) positive social, institutional, environmental and/or economic change*" (Fuad-Luke 2008: 28). From Bauhaus to Critical Design, Fuad-Luke maps design practices involved in and with change. He also notices how "*the target audience for many of the design movements, groups and individuals were predominantly aimed at designers, with a view to change the way they think, approach their work and deliver their form-giving, rather than at specific targets external to the world of design.*" (Fuad-Luke 2008: 48). D4SI distinguishes itself from these experiences in its ambitious goal of involving not only the design community, but also other stakeholders: from civil servants to NGOs, from citizens to companies.

This focus on collective processes has brought D4SI close to Participatory Design (PD) (Björgvinsson et al. 2010, 2012; Hillgren et al. 2011; Manzini et al. 2011) and its long-standing experience with collaborative processes (Simonsen et al. 2012). Starting from the belief that users should have a say in the development of technology (Kyng and Ehn 1987), PD strived (and strives) for establishing collaborative design processes involving diverse stakeholders, developing tools, techniques and theories to support users cooperation with professional designers (Kyng 1998). More recently, the PD community started to address social issues by getting involved in public arenas (Björgvinsson et al. 2010; Halse et al. 2010); and D4SI has recognized how PD knowledge about collaborative

processes could be valuable in fostering social innovation (Manzini et al. 2010).

Involving diverse stakeholders can play a role when it comes to the impact of the design process. As underlined by Fuad-Luke (2008), design activism has historically had a significant influence on the design world, but a negligible influence on a broader social level. In this sense, D4SI, similarly to PD, sees in participation in design processes the possibility of moving beyond traditional critique towards a notion of critique based on the construction of possible alternatives. Involving diverse stakeholders in collective design processes and empowering grass-root initiatives are looked upon as possibilities to scale and diffuse promising initiatives promoting change on a large scale (Jegou et al. 2008, Meroni 2007).

D4SI is also opening the possibility to redefine the role of design and to emancipate it from mass production and consumption. Historically, design activism practices (Fuad-Luke 2008) represented isolated and fortuitous occasions where individuals or small groups of practitioners had the chance of being a designer outside the mass-production realm, often, retiring themselves in academia or arts from where they have done a great job in revealing issues and controversies in the design field. The program of D4SI is more ambitious: it proposes to establish a new role for the designer as a catalyst of collective design actions aimed at exploring alternative futures, opening for a new way of practising and understanding the profession of being a designer.

In order to discuss what this practice could be about, the paper introduces an analogy between D4SI and Compositionism (Latour 2010), arguing that D4SI can be considered an attempt of *composing together*.

Latour's (2010) *An Attempt at a "Compositionist Manifesto"* was written after the 2009 climate meeting in Copenhagen when, once again, the limits of traditional politics in facing climate change emerged. In suggesting how to deal with environmental issues, Latour (2010) proposes to move beyond traditional critique through Compositionism. Particularly, he is formulating an approach that is not too much concerned with revealing cracks and limits, but rather it focuses on the construction of alternative practices and discourses.

Latour recognizes how, historically, "*critique did a wonderful job of debunking prejudices, enlightening nations, and prodding minds, (...) generating an immense source of productive energy that in a few centuries reshaped the face of the Earth*" (Latour 2010: 474). However, eventually, *critique ran out of steam* (Latour 2004) because in distancing itself from the world to get an objective perspective on facts, it missed to notice that "*Reality is not defined by matters of fact. Matters of fact are not all that is given in experience. Matters of fact are only very partial and, I would argue, very polemical, very political renderings of matters of concern*" (Latour 2004:232).

In the present situation, in the light of an environmental, economic and political crisis (Castells et al. 2012), to exert critique could sound as a call to nihilism (Latour 2010). In being at the end of history with no alternatives, the emerging malfunctions of neoliberalism are dramatically revealing that we might have no future. In this scenario, critique is unable to generate the necessary energy to provoke change, and it ends up *poking holes in delusion* (Latour 2010).

The *An Attempt at a "Compositionist Manifesto"* refers explicitly to Marx' work. Particularly, it seems to build on the conviction that "*the philosophers have only interpreted the world, in various ways; the point is to change it.*" (Marx 1848). Latour's argument is that reaching change implies involvement in the construction of alternatives. Compositionism is a way of tentatively explore and prototype diverse activities, practices and discourses and understand how they could become *prospects*, challenging future-as-usual and open for new possibilities.

What Latour proposes is to shift from *progress* to *progression*: from an inexorable unidirectional march towards future-as-usual to an exploratory and suggestive progression where different future *prospects* are tried out: "*While critics still believe that there is too much belief and too many things standing in the way of reality, compositionists believe that there are enough ruins and that everything has to be reassembled piece by piece*" (Latour 2010: 475).

Instead of explaining away the world, Latour calls for engagement with humans, objects and technologies (actants) to compose, construct, compromise and even compost future *prospects*. An engagement that acknowledges how each actant, being human or non-human, carries its own agendas and has an active role in shaping the present situation but also possible future *prospects*. *Composing together* aims at generating *things* (Latour 2004), socio-materials gatherings where human and non-human actors are brought together. "*A thing is, in one sense, an object out there and, in another sense, an issue very much in there, at any rate, a gathering. To use the term I introduced earlier now more precisely, the same word thing designates matters of fact and matters of concern*" (Latour 2004:233).

Compositionism should not be mistaken for being acritical, but is an attempt of moving beyond critique that still requires the ability of having a critical mind and carefully understand how *things* are composed and how they flick between being facts and being issues. Working with *things* requires you to recognize and be aware of the connections and tensions that hold reality together, trying to understand how they could be effected. In composing, the focus is not on the construction per se, but on how the process does or does not affect actants' relationships and agendas. On the contrary, if the focus is more on having a functional composition, the risk is to end up in *tinkering*;

assembling not towards alternative *prospects* but rather towards future-as-usual.

What Compositionism is proposing for critique resembles what D4SI is trying to do with socially and politically engaged design: an attempt of moving beyond exert critique to rather work collectively towards the experimentation of alternative practices of living and working. As mentioned above, D4SI is exploring how design approaches could support collective efforts to compose future *prospects* for sustainable living, involving diverse stakeholders in the society. It is moving from raising awareness about specific issues to rather support collective prototypes about possible sustainable futures.

Latour underlines how composing is a matter of togetherness "*it is time to compose—in all the meanings of the word, including to compose with, that is to compromise, to care, to move slowly, with caution and precaution*" (Latour 2010:478). Togetherness plays a central role in D4SI: it often requires the creation of new alliances and relationships between stakeholders from diverse sectors (Jegou et al 2008), but it is also a matter of empowering bottom-up initiatives, developing ways to support other stakeholders' design activities (Björgvinsson et al. 2012, Jegou et al. 2008, Meroni 2007).

Considering D4SI as a way of *composing together* sheds new light on this emerging field. It values prototyping as a key approach to explore alternative possibilities; it underlines how making things (together) – being artefacts, services, scenarios – allows to experiment with new alliances that can move us away from future-as-usual. However, some shades are also emerging from being practically engaged in *composing together*, such as designers' inability of dealing with togetherness, as well as their lack of implementation and management skills. Another issue is related to the role of designer in *composing together*. Finally, the dilemma of understanding if we are *composing* or *tinkering*: are we really building *things*, or are we just playing safe with future-as-usual? These issues are further discussed using some insights from the author's involvement as a design researcher in the setting up and running of STPLN, a maker-space for opening production.

STPLN, A SPACE FOR OPENING PRODUCTION

It is a usual Thursday evening in the STPLN basement: the laser-cutter is running at full speed, cutting out a wood shell for the arcade game that Marcus and Niklas are building. Sitting at the table, Davey is building a wood wristwatch and discussing with a guy who needs help to develop a software. On the sofa, some guys are coding, or maybe they are drawing something to cut out with the laser-cutter? In the Textile Department, two women are knitting, having biscuits and tea. A lot of bicycles are stacked in one corner of the room; they are projects from the Bicycle Kitchen, an open workshop

where people can fix their bikes with the help of volunteers. In the room beside, Carin is fixing the last things before tomorrow's workshop with a primary school: she is the founder of Återskapa, an atelier where cast-over materials from industrial production are used to explore with children their creativity and teach them about sustainability. In the opposite corner of the same room, behind a curtain, some guys are setting up the textile printing workshop, bringing in materials and paints, checking out the frames for screen printing. Upstairs everything is quiet now, but few hours ago the co-working facility was busy as usual and in the kitchen a catering company was cleaning after the conference in the concert room.

STPLN is a 2000 sqm venue owned by the city of Malmö. It was opened in April 2011, becoming an arena where people can experiment with diverse kinds of production: from repairing bikes to staging new formats for music concerts, from building robots to trying out new educational formats.

The space is managed by the NGO STPLN that has a long experience in working with culture production in a broad sense. The role of the research centre I belong to was to set up and manage the workshop in the basement in collaboration with the NGO. When it comes to my role, I have been involved in diverse activities: from setting up events and workshops about making to experimenting with urban gardening, from using prototyping as a tool for coaching to being actively involved in the development of the cast-over materials bank. These activities have been often carried out as a collaborative effort between several stakeholders and with a long-term perspective.

STPLN is a maker-space, a platform where people and individuals can access tools and share resources to engage in production processes, trying out how to move from being a consumer to becoming a producer. In STPLN, diverse practices and activities are interweaving: from amateur do-it-yourself, to professional educational services; from small-scale production with commercial aims, to artistic explorations of materials and technologies.

Maker-spaces, together with other physical infrastructures such as FabLabs and Hacker-spaces, represent a growing phenomenon that is offering to small companies, freelancers, students, artists and amateurs the possibility of opening physical production processes.

The expression "opening production" accounts for all emerging practices that are experimenting with the way in which production is understood and organized, blurring the distinction between producers and consumers, focusing on social values rather than economical ones, reconstructing local supply chains. These practices are cutting across diverse realms: from software and ICT sector, with open-source and commons-based P2P production (Benkler 2006, Bauwens 2009), to the food sector, with civic

agriculture (Lyson 2004), from manufacturing, with the rise of crafts and do-it-yourself practices (Anderson 2012), to the media field, with platforms supporting collaborative production between users (Löwgren et al. forthcoming).

The opening of production is not a coherent movement. Nevertheless, there are shared traits that characterize these *opening production* practices, e.g., the challenging of the distinction between producer and consumer in creating new models in which the two roles overlap and sometimes merge. Moreover, if compared with capitalist and mass-production processes, these practices are often aiming at the generation of multiple values: use value, but also social and human capital. When it comes to social innovation, these practices are looked upon as promising attempts for the establishment of a local-based and on-demand production systems that, by valuing small-scale and artisan production, could become a more social and environmentally sustainable way of generating goods and services (Anderson 2012). Opening production gathers diverse practices that are experimenting with the possibility to compose processes outside (or on the side of) the capitalist and mass-production model.

STPLN represents a space to explore how production could be opened in the specific context of the city of Malmö. What practices can emerge? Which needs are fulfilled? Who is participating? Above all, how is it possible to *compose together prospects* about production, and how can design contribute?



Figure 1: Activities in STPLN basement workshop

REFLECTING ON COMPOSING TOGETHER STPLN

THE CHALLENGE OF TOGETHERNESS: FROM COMPOSITION TO COMPOSING

The expression *composing together* stresses the role of collective actions in generating *prospects*. Togetherness is considered a central element in social innovation, which often emerges from encounters between established organizations and grass-root initiatives (Murray et al. 2010) and entails the creation of new alliances and relationships between diverse sectors (Phills et al. 2008). D4SI has developed the idea of

designing networks, collectives where diverse stakeholders are brought together and entangled in co-design activities (Manzini et al. 2008). Similarly, *transformation design* underlines the importance of participatory approaches for developing social innovation (Burns et al. 2006). Togetherness also implies a shift in the role of the designer: from being the driver of the design action to becoming the enabler and supporter of others' composing activities (Burns et al. 2006, Manzini et al. 2008, Meroni 2007).

However, D4SI lacks hands-on insights discussing the difficulties and challenges of togetherness. What does it take to bring actors together? How is it possible to *compose together*? The work with STPLN has been rewarding, providing insights about how complex (but also surprising) togetherness can be (Seravalli 2012b, 2013). The experience with STPLN has generated two outcomes in terms of togetherness: the first one related to a particular understanding of the collective action in D4SI; the second one regarding the role of the designer in *composing together*.

In framing togetherness (and its difficulties), a great contribution comes from PD, which offers a wide range of approaches and frameworks to understand and deal with collective processes (Simonsen et al. 2012). This knowledge has been extremely helpful in making sense of and navigating what happened at STPLN (Seravalli 2012b, 2013). One of the main learnings that D4SI could embrace from PD is the one of design as a situated practice (Suchman 1987), where human specificities play a central role in shaping practices and results. In dealing with togetherness, it is important to remember that to support the collective design action, the focus should be neither *"the method (nor the designer but the designer using the method...)"* (Light, Akama 2012: 61). In this perspective the outcome of a design action depends on the interaction between the designer, the method and the specific actants involved (being both human or non-human). In *composing together*, a particular emphasis should be put in understanding the specificities of the collective that is brought together. Designers willing to work with social innovation should be able to embrace the specificities of the collective they are involved in (e.g. agendas, possible conflicts, personalities) and develop a particular sensibility in deciding which approaches can be used to foster and navigate togetherness. For example, in the initial phases of STPLN, traditional design strategies for togetherness (such as workshops) have been unable to foster a collective design action, while working on a tactical mode with prototyping, small-scale interventions, and long-term engagement encouraged the emergence of a specific form of togetherness based on making (Seravalli 2012a, 2012b, 2013).

When it comes to the designer's role in making together, D4SI proposes the idea of the designer as a facilitator or enabler of social innovation initiatives. The involvement in STPLN opens for a different

understanding, where the designer brings its competences in the composing but does not necessary lead it.

As a designer, embracing the idea that STPLN was collectively built has meant to leave the ownership of the design agenda, moving from a strategic to a tactical design mode. Rather than starting from specific ideas about which activities should happen in the space, I tried to be more open to support what was emerging: navigating the diverse initiatives and hooking up with the ones close to my agenda. This has been difficult but it has also revealed how *composing together* is often about compromising (Latour 2010) and how, as a designer, you have to stop designing and understand how to support others' design activities.

This requires gaining a different role. PD has developed knowledge about how to support others' design processes, but there is little discussion about what it takes to gain that role. In STPLN, it has been a matter of building trust and understanding what exactly I could offer to the other participants. In establishing a long-term collaboration with the cast-off material bank, it has been important to use my industrial design skills and knowledge about sustainability to make evident how I could contribute to the project. Time passing, mutual trust has grown, creating the possibility to extend the collaboration to other aspects of the project (such as possible business strategies, formats and content for the workshops).

However, trust is not enough, as it emerges from the collaboration with the NGO running STPLN. I always wanted to work with service design aspects of the maker-space, such as how to organize access to the space and how to engage users in its everyday management. I had the chance to give suggestions about possible strategies and solutions regarding these topics; however, it has not been possible to get the same space for experimentation that I gained in Återskapa, the cast-off material bank. A possible reason is, that, while with Återskapa the collaboration is built on offering competences that are missing (e.g. industrial design), with the NGO what I would like to offer overlaps with competences that are already in place. Moreover, my involvement in the management of the space could lead to issues when it comes to defining ownership and roles.



Figure 2: Workshops with Återskapa

These experiences have also highlighted how being a facilitator could not be the most appropriate role for a designer involved in social innovation. In these three years, I had to face the frustration of lacking skills and competences for having that role: one thing is to facilitate a design workshop about visions and scenarios, a totally different one is to cope with issues related to implementation and everyday management of a maker-space. On the other hand, I could see how my skills related to making and "*not being afraid to try out things*" (as Carin from Återskapa framed once prototyping) are considered much more valuable. It is difficult to define exactly which role I have in the *composing together* at STPLN. It is not the one of the facilitator or enabler, but rather it seems to be more related to the ability of navigating the diverse agendas looking for possible connections and having the skills (and some material resources) for trying out activities together with others.

The experience of STPLN shows the need in D4SI to move the discourse from *compositions* to *composing*, from visions and hopes to actual insights from being involved in social innovation activities, to understand how composing is performed and what kind of competencies are needed to work with it. Similar issues have already been brought up in the field of D4SI. The former director of Young Foundation (a leading organization for social innovation) highlighted how designers are often lacking skills in the implementation phase, when it comes to organizing resources and people (Mulgan 2009). A similar critique has been raised by the design studio *Inwithfor* that has worked with D4SI for a long time. They underline the need to move from concepts and prototypes to developing and spreading robust theories of change (Schulman 2009).

COMPOSING OR TINKERING?

In understanding D4SI as *composing together*, a fundamental question relates to how to assess what we are doing, this to understand if we are *composing* or just *tinkering*, i.e., if we are creating *prospects* or just playing safe towards future-as-usual. This is a central issue in both conceptual and practical terms.

In conceptual terms, it is important to embrace how, going beyond critique does not imply to suspend critical mind, quite the contrary. D4SI has been criticised for not considering the political aspects of its actions (Tonkinwise 2010). This risk has emerged in a quite evident way in the discussion about designers' engagement in the implementation of Big Society policy in England, where the development of community-based public services seems to be not an attempt of composing but rather a progressive withdrawal of the State from delivering public services (Tonkinwise 2010). Similar discussions can also be found in the opening of production, for example, in open software and hardware fields, where it is discussed if open-source approaches represent a possible seed for alternative

production, or if they have already been totally co-opted by market forces (Bauwens 2009).

When it comes to practical terms, the line between *composing* and *tinkering* may be blurred. A possible way to navigate this is to consider how *things* travel, i.e., who and what is involved in the composition, as suggested by Latour (2010). *Composing together* aims at generating *things*, which are both matters of facts and matters of concern. In trying to understand if we are generating alternative *prospects*, or if we are just *tinkering* with future-as-usual, it is important to consider how *things* may or may not travel. This idea can be explained by looking at how STPLN worked both as matter of fact and a matter of concern in relation to economic growth.

My participation in STPLN was made possible through a research project financed by EU structural funds aimed at fostering economic growth and innovation. The project involved a consortium of diverse actors: a research centre (to which I belong to), a media cluster, and regional departments. In this constellation, the role of my organization was to set up three Living Labs that were supposed to work as pre-incubators from which new entrepreneurial activities, products and services should emerge (more information on format and aims of the Malmö Living Labs can be found in Björgvinsson et al. 2010).

One of these labs was the workshop in STPLN basement. Since its opening, the lab has been criticized from other project partners due to the fact that it was not delivering enough companies and jobs, which were two of the project evaluation parameters. This led to the decision, a few months after its opening, to re-allocate the remaining resources for the creation of a new prototyping lab that could contribute more directly to economic growth and innovation by engaging big players in the region.

This unfolding can be used to argue why it is difficult to judge if we are *composing* or *tinkering*, since *things* flick between *facts* and *concerns*.



Figure 3: Fixing bikes at STPLN

One of the reasons why the STPLN lab is considered a failure resides in its inability of delivering companies and jobs. At the same time, it is possible to see how the space is contributing to economic growth. Beside the fact that some companies have been actually developing in the space, other interesting *facts* emerged. Such as the participant that by starting tinkering around with electronics decided to take courses at university to improve his education; or the number of long-term unemployed people that is regularly coming to the space and eventually being enrolled for internships there. Other facts are related to the practices of repairing and reusing, which, besides reducing costs and saving materials (like the ones going on in the Bicycle Kitchen), sometimes are even leading to new entrepreneurial activities (like it happened with the material bank). It is also a matter of socializing and getting to know new people that, for example, are attracting in the space a number of creative workers looking for possibilities to enlarge their professional networks. These facts may lie at the margins of the economic growth discourse but it is easy to argue how they contribute to it. At the same time they are issues questioning and enlarging the understanding of production: is it necessary just carried out only by companies? What if it allows unemployed people to “get back on tracks”? What if it becomes a way to create social bonds and improve people skills? What if it results in recycling and repairing rather than consumption?

These questions are showing how STPLN is generating *things* that are opening for a wider understanding of what production is good for and that could lead to *prospects*. However, at the same time, STPLN is failing

in terms of composing, since “the facts” emerging in the space have not been recognized as such by the local actors working within the economic growth discourse. The decision to invest in the new prototyping lab is not bad per se, but it partially shuts down the possibility for STPLN of being a composition, since, the withdrawal of the media cluster and the economic development agency from the composition, might relegate the space in a position (being a facility for leisure activities and cultural artistic explorations) which puts it back in the prospective of future-as-usual.

This story exemplifies how difficult it is to keep compositions ongoing and make *things* travel. If the *things* emerging from STPLN are not accountable in an economic growth discourse, they cannot involve actors related with that issues and this limits their possibility of becoming *prospects*.



Figure 4: One of STPLN companies

However this is a complex point, since even too much travelling can lead to *tinkering*. A meaningful example can be found in the opening of production, where free-software was renamed as open-source software, in order to make this model acceptable by the business community (Benkler 2006). This shift implied that some of the political agendas were left behind, but on the other side it opened the possibility for the open-source models to travel further. Peer-to-peer and sharing-based models are spreading in diverse realms, inspiring new ways of organizing production. Of course, it can be argued how giving up “free” for “open-source” was a way to make these models appealing to the market, but it has also created the opportunity for them to travel and inspire, for example, new models for delivering public services (Botero et al 2012). Making STPLN accountable in an economic growth prospective would allow the maker-space to travel further and create the possibility of opening for *prospects* in the future-as-usual of production. This certainly would imply that some ideas and ways of working in STPLN could be used to keep progress ongoing, but at the same time they would hopefully spread and support the generation of new *prospects*.

Trying to understand if we are *composing* or *tinkering* implies to be aware of how *prospects* can become futures. What emerges from the STPLN experience is that, for travelling further, compositions need to become

accountable in diverse discourses and this requires to care about who and what is involved in the composition.



Figure 5: Making curtains at STPLN

CONCLUSIONS

The paper tries to contribute to D4SI by introducing the idea of *composing together* to reflect on the long-term involvement in a social innovation experiment.

D4SI can be understood as a way of *composing together*, as an attempt of moving beyond being critical and rather engaging directly in the collective creation of possible alternative future *prospects*. *Composing together* aims at generating *things*, gatherings of human and non-human actors where practices and relationships can be explored.

This perspective reinforces a possible role for design in the generation of alternative practices for sustainable living and working, however, it also highlights criticalities as it emerges from the author’s involvement with STPLN, a maker-space in the city of Malmö. Particularly from this experience two issues are brought up.

The first one relates to the need of moving the attention from compositions to composing, from visions and hopes to a better understanding of the practice of D4SI. From STPLN it emerges how *composing together* is a situated practice that depends on the context specific situation. As a consequence, designers need to develop not only approaches to deal with togetherness, but also the ability to understand the specific setting they are involved in. Moreover, some reflections on the role of the designer in *composing together* are made, discussing how the task of enabler may not be the most appropriate one.

The second issue is related to the difference between *composing* and *tinkering*, or how to assess D4SI work. Particularly, from the STPLN experience, it emerges how, in *composing together*, it is important to reflect about how *things* travel further, that entails to consider how *things* flicks between *facts* and *concerns* and who and what is involved in the composing.

Considering D4SI as a way of moving beyond critique towards *composing together* represents a bold statement that is far from being proved. However, introducing this perspective gives the opportunity to discuss more in detail the actual practice and challenges of D4SI.

ACKNOWLEDGMENTS

Thanks to Pelle Ehn, Richard Topgaard all the people involved in STPLN

REFERENCES

- Anderson C. 2012. *Makers: The new industrial revolution*. New York: Crown Business
- Bauwens, M. 2009. Class and capital in peer production. *Capital & Class* 33: 121-141
- Benkler Y. 2006. *The Wealth of Networks*. New Haven and London: Yale University Press.
- Björgvinsson E., Ehn P., Hillgren P.-A. 2012. Design Things and Design Thinking: Contemporary Participatory Design Challenges. *Design Issues* 28(3):101-116
- Björgvinsson, E., Ehn, P., Hillgren, P.-A. 2010. Participatory design and "democratizing innovation". Proceedings of the 11th Conference on Participatory Design, PDC 2010.
- Botero A., Gryf Paterson A., Saad-Sulonen J. (eds.) 2012. *Towards peer production in public services: cases from Finland*. Helsinki: Aalto University.
- Burns, C., Cottam, H., Leadbeater, C., Winhall, J. 2006. *Transformation Design* [online]. Available from: www.designcouncil.info/.../transformationdesign/transformationDesignFinalDraft.pdf [Accessed 25 January 2010].
- Castells M. et al. (eds) 2012. *Aftermath: the cultures of economic crisis*. Oxford: Oxford University Press.
- Design Council 2008. *Design Council Briefing 02: The Role of Design in public services*. [online]. Available from: <http://www.designcouncil.org.uk/our-work/Support/Public-Services-by-Design/The-role-of-design-in-public-services-briefing/> [Accessed 28 January 2011]
- Design Council 2010. *Public Services by Design* [online]. Available from: <http://www.designcouncil.org.uk/our-work/Support/Public-Services-by-Design/> [Accessed 25 January 2011].
- Design Council 2012. *Communities designing more sustainable lives: Dott 07* [online]. Available from: <http://www.designcouncil.org.uk/our-work/challenges/Communities/Dott-07/> [Accessed 08 January 2013].
- Fuad-Luke A. 2008. *Design Activism. Beautiful strangeness for a sustainable world*. London: Earthscan
- Ehn P., Kyng M. The Collective Resource Approach to Systems Design. In G. Bjerknes, P. Ehn and Kyng, M. (Eds.) 1987. *Computers and Democracy – A Scandinavian Challenge*. (pp. 17–58). Aldershot, UK: Avebury
- Hillgren P.-A., Seravalli A., Emilson A. 2011. Prototyping and infrastructuring in design for socialinnovation. *Co-Design International Journal of CoCreation in Design and Art*
- Kyng M. 1998. Users and computers: A contextual approach to design of computer artifacts. *Scandinavian Journal of Information Systems*. 1:7-44.
- Jégou, F., Manzini, E., (eds), 2003. *Sustainable Everyday: Scenarios of Urban Life*. Milano: Edizioni Ambiente
- Jégou, F., Manzini, E., (eds), 2008. *Collaborative services: Social innovation and design for sustainability*. Milano: Edizioni POLI.design.
- Latour B. 2004. Why critique as run out of Steam? From matters of facts to matters of concern. *Critical Inquiry - Special issue on the Future of Critique*. 30 (2):25-248
- Latour B. 2010. *An attempt at a Compositionist Manifesto*. Reception of the Kulturpreis presented by the University of Munich on the 9th February 2010
- Light A, Akama Y. 2012. The human touch: participatory practice and the role of facilitation in designing with communities. *Proceedings of the 12th Participatory Design Conference* (1): 61-70
- Lyson T. 2004. *Civic agriculture, reconnecting Farm, Food and Community*. Massachusetts: Tufts University Press.
- Löwgren, J., Reimer, B. forth. *Collaborative media*. To be published by MIT Press.
- Manzini, E., Rizzo F. 2011. Small projects/large changes: Participatory design as an open participated process. *CoDesign: International Journal of CoCreation in Design and the Arts*. 7(3-4): 199-215.
- Marx, K. (1888) *These on Feurbach* [online]. Available from: <http://www.marxists.org/archive/marx/works/1845/theses/theses.htm> [Accessed 25 March 2013].
- Meroni, A. (eds) 2007. *Creative communities: People inventing sustainable ways of living*. Milano: Edizioni POLI.design.
- Mulgan, G. 2009. *Strengths, weaknesses and a way forward?* [online]. Available from: <http://www.socialinnovationexchange.org/designforrsi/blog?page=1> [Accessed 26 January 2011].

- Murray, R., Cauher-Grice, J., Mulgan, G. 2010. *The Open Book of Social Innovation*. London. The Young Foundation, Nesta.
- Papanek, V. 1971. *Design for the Real World: Human Ecology and Social Change*. New York. Pantheon Books.
- Phills, J. A. Jr., Deiglmeier, K., Miller, D.T. 2008. *Rediscovering Social Innovation*. Stanford Social Innovation Review, 6(4):34–43.
- Rashid K. 2012 Karimmanifesto [online]. Available from: http://www.karimrashid.com/manifesto_fr.html [Accessed 03 January 2013].
- Schulman S. 2010. Design thinking is not enough [online]. Available from: <http://www.inwithfor.org/2010/01/designthinking-is-not-enough/> [Accessed 27 January 2011].
- Seravalli A. 2012a Building Fabriken: Design for socially shaped innovation. DRS 2012 Conference proceedings
- Seravalli A. 2012b From participatory design to participatory making? 12th Participatory Design Conference proceedings
- Seravalli A 2013 Prototyping for opening production: from designing for to designing in the making together
- 10th European Academy of Design Conference proceedings
- Simonsen J., Robertson T. 2012. Routledge international handbook of participatory design. New York: Routledge
- Tatcher M.1980. Speech at the Conservative Party Conference [online]. Available from: <http://www.youtube.com/watch?v=HJAHDXG0jQ> [Accessed 03 January 2013].
- Tonkinwise, C. 2010. Politics please, we're social designers [online]. Available from: http://www.core77.com/blog/featureditems/politics_please_were_social_designers_by_cameron_tonkinwise_17284.asp [Accessed 27 January 2011].

Emilson, Hillgren, and Seravalli

Designing in the Neighborhood

Designing in the Neighborhood: Beyond (and in the Shadow of) Creative Communities

Anders Emilson, Per-Anders Hillgren, and Anna Seravalli

Living Lab the Neighborhood was initiated to explore how a platform that could facilitate social innovation and collaborative services could be set up in the city of Malmö. Although a few strategic decisions were made (for example, to adopt a long-term perspective that could go beyond single projects, to take a very inclusive approach to participation, and to build the platform from the needs, capabilities, and assets of local communities), the intention was that the platform should be designed and redesigned continuously in relation to what it encountered.

The platform is labeled as a *living lab*, a concept that originated at the Massachusetts Institute of Technology (Eriksson, Nittamo, Kulkki, and Hribernik 2005) and has been spreading rapidly around the world for about ten years. Today more than 400 labs are members of the European Network of Living Labs (ENOLL). There is no consensus on how to define a living lab (Folstad 2008; Stålbörst 2008), but usually such a lab is described as a long-term environment for open innovation that supports experimentation with real users in real contexts (Folstad 2008). This fits very well with what we see as essential in a platform that could facilitate social innovation. However, most living labs are strongly driven by industry and commercial interests, and that has consequences for how open “open innovation” can be (Kommonen and Botero 2013) and for what is regarded as innovation (Björgvinsson, Ehn, and Hillgren 2010, 2012). More than many other living labs, our platform is design-driven. According to some researchers, it is also one of few living labs driven by the interests of users’ or citizen communities (e.g., NGOs) (Nystrom and Leminen 2011).

Living labs resonate with the idea of enabling platforms as formulated by designers in the field of *design for social innovation*. These platforms are looked upon as structures that should respond to the meta-technological demands of grassroots social innovations (Jégou and Manzini 2008). Manzini and Rizzo (2011) call these supporting structures “framework projects” and discuss what implications they might have for designers. According to Manzini and Rizzo, designers can act as facilitators and support ongoing initiatives, or they can act as triggers and start new initiatives. They can also be either design activists or members of co-design teams. We did not define any explicit roles the designer should take when exploring how the Living Lab the Neighborhood could contribute to social innovation, but we would argue that we have been

working in all the roles described by Manzini and Rizzo. We have also taken an active role in matchmaking heterogeneous and complementary stakeholders to generate creative encounters. Focusing on different levels of design engagement has been important to our way of operating—we have sometimes zoomed in and paid attention to the details of concrete experiments together with grassroots communities, but when we have encountered obstacles to realizing the potential results of the concrete experiments we have sometimes zoomed out again to elaborate a possible change in the bigger picture by inquiring into more systemic levels by trying to modify regulations, work procedures and cultures, public policy, and indicators of project success.

We are not, however, the only ones who pay attention to these more systemic levels. Recently, several actors have started to explore how design potentially could have an impact on larger systems and, especially, how design could reach into the public sector and into municipal offices (Bason 2010; Christansen and Bunt 2012; Jégou et al. 2013; Staszowski et al. 2013). One inspiring example is La 27e Région, an independent innovation organization that explores how design approaches can influence policy development within the public sector in France. La 27e Région's strategy, which they have characterized as *friendly hacking*, builds on embedding multidisciplinary teams, including designers, who—for shorter or longer periods—can empower civil servants within diverse public organizations. They use the term 'hacking' because it "signifies the intent to challenge the robustness of public policy instruments" (Jégou et al. 2013, 6). "The hacking," they add, "is friendly, not destructive." Although most of our design interventions are based on concrete interventions at the community level, the concept of friendly hacking resonates well with how Living Lab the Neighborhood, as a meta-design platform, has focused more and more on building alliances within the public sector with the aim of having an impact on a systemic level. Our starting point has been quite different from that of La 27e Région. Since the beginning, they had several politicians sitting on their board, and their friendly hacking is commissioned by the public sector and supported by formal agreements that give them a mandate to work inside these organizations. We, by contrast, started far from power centers and rooted our initial work within local communities.

Apart from the more systemic recent engagements, the lab activities have focused on a variety of topics, on community needs, and on potential designs that include technology that increases grassroots organizations' visibility and mobile games for urban exploring (see chapters 11 and 14). During these processes, the concepts of *infrastructuring*, *design things*, and *agonistic spaces* have emerged and have helped us to better understand our activities. These concepts are discussed elsewhere in the present volume (e.g., chapters 2, 10, 11 on infrastructuring, chapters 2 and 14 on design things, and chapters 11 and 13 on agonism) and in recently published research papers by Björgvinsson, Ehn, and Hillgren (2010, 2012) and by Hillgren, Seravalli, and Emilson

(2011). In this chapter we will focus on long-term infrastructuring, because the story we tell here is probably one of our most significant examples of such a process.

Surprising findings from the city of Malmö

To better understand our focus and what we try to aim for, consider the two quite different perspectives on Malmö that are described in the introduction to this book (see chapter 1). One highlights how the city has gone through an extensive transformation, from an industrial city to a “knowledge city” and a regional growth engine. The other perspective depicts it as a segregated city with a high number of immigrants who live primarily in the southeastern part, which has some of the highest rates of child poverty and unemployment in Sweden. In 2008, when we were engaged in research activities in Malmö’s Rosengård district (famous for its social problems), riots were occurring and young people were attacking firefighters and police officers. The riots attracted international media attention.

According to the Kommissionen för ett socialt hållbart Malmö (Commission for a Socially Sustainable Malmö), these riots weren’t surprising if one considered the huge differences in health and living conditions between Rosengård and other districts of Malmö. According to Stigendal and Östergren (2013), it is surprising that the tensions and troubles aren’t worse.

We will come back to this later, but now we will start to describe the journey of designing Living Lab the Neighborhood. First, we will discuss whom we could collaborate with and how. We will then present a series of design interventions performed on different scales, stretching over several years, and financed by diverse funding schemes. Finally, we will discuss what this means as a design practice.

Beyond (and in the shadow of) creative communities

At the beginning of Living Lab the Neighborhood, two important questions were whom to collaborate with and which actors could have relevant capacity and skills to work creatively with social innovation. Concepts such as *the creative class* (Florida 2004) and *lead users* (von Hippel 2005) mainly bring forward privileged groups, such as engineers, poets, artists, researchers, or designers. These groups are well established and make up a significant percentage of the citizens in the western part of Malmö, where new-media clusters are emerging and where Malmö University is located. However, the starting point for our lab was to try to work with stakeholders and citizens that are living and operating in the southeastern part of the city. Although there are engineers, poets, and artists in these areas, we were particularly interested in locating people and groups that were not on Florida’s or von Hippel’s list. One promising alternative to the

privileged groups—an alternative that inspired us at the time—was the concept of creative communities made up of “professionals of the everyday” (Meroni 2007)—people who have organized themselves to solve a local problem, often focusing on achieving local sustainable solutions.

Whereas the creative class is driven by highly individualistic norms (Florida 2004), the creative communities are driven by a sense of community spirit and by the pleasure of collaborating and building relationships (Meroni 2007).

Most of the examples that Meroni brings up are tied to specific categories (for example, commuting, eating, and housing) and are aiming for a specific solution, such as a “walking school bus” (an arrangement by which children walk to school together). Creative communities are also quite visible in the urban landscape. Even if you might find examples in Malmö that more explicitly resemble these cases, we were curious if we could find other resourceful actors that were less visible. As we argued in the introduction to the present chapter, we aim for an inclusive approach that will allow marginalized actors to participate.

What kind of groups could be found “under the radar”? Every time we have asked civil servants about prominent creative groups or stakeholders in these areas, and every time we sent students out to do research, the same answers recurred: the most prominent actors were *Drömmarnas Hus* (an independent organization focusing on cultural activities such as theater and film, often in collaboration with schools) and *Yalla trappan* (a cooperative association of formerly unemployed immigrant women who provide catering and housekeeping services). *Drömmarnas Hus* and *Yalla trappan* are supported by the municipality, highly visible, and fairly well established.

How can those “under the radar” be reached? We had an infrastructuring process (Björgvinsson, Ehn, and Hillgren 2010, 2012; Hillgren et al. 2011) going on some years before the Neighborhood Lab started. Infrastructuring basically means that we cultivate long-term working relationships with diverse actors and slowly build a designing network. In this process, some stakeholders have been using their social capital to help us approach and enter other networks that are “under the radar” and marginalized. For example, *Rörelsen Gatans Röst och Ansikte* (RGRA), an organization with which we had been working for a long time, connected us to a marginalized but also highly innovative and skillful group, the *Herrgård’s Women’s Association* (HWA).

The Herrgård's Women's Association

HWA was founded in 2002 by five women in the Rosengård district of Malmö as a response to the feeling of being excluded from Swedish society. The organization counts approximately 400 members (200 of them children) with backgrounds in Iran, Iraq, Bosnia, and Afghanistan. Most of the women live on social security, have limited skills in Swedish, are illiterate, and generally lack higher education. HWA fulfills most of the characteristics of a creative community: the members' emotional involvement is tightly connected to a collective approach, and they have organized themselves to develop solutions for challenging problems in their neighborhoods. These problems are, however, slightly different than the ones that have been described by Meroni (2007). They include complex social problems that seldom are visible in the physical environment or outside their community. One issue is social integration, since many immigrants have a hard time being accepted in the Swedish society. Then there are gender issues in patriarchal cultures where the group slowly, but forcefully, has pushed the borders for what a woman is allowed to do. Moreover, through the trust that the women have developed within their networks during many years, they can mediate between family members to prevent honor-related violence and they organize educational events in collaboration with the city around health issues (e.g., sexual health). Here, we would like to connect back to the Commission for a Socially Sustainable Malmö (Stigendal and Östergren 2013) and argue that HWA and similar organizations probably are one of the reasons why riots and social problems aren't worse than they are. Their invisible everyday work mitigates many of the tensions.

In parallel to being engaged in these complex social and societal issues, the women's activities also include cooking, designing textiles, and making carpets and clothing. The core group of five women meets regularly, and, depending of what kinds of activities are carried out, other members sometimes participate.

If we would bring forward some more of the distinguishing qualities that these women possess, it would be the extensive social network and trust they have built in the area. They have the insider's perspective on what problems and opportunities are embedded within their communities. This gives them the ability to be very creative and to devise situated solutions to local problems in ways that outsiders (e.g., civil servants) cannot.

Another distinctive feature that Meroni (2007) assigns to creative communities is a feature that, we argue, applies well to HWA: their aesthetic qualities. Meroni states that creative communities "are not only interesting because they are innovative, but they are also aesthetically 'beautiful': there is something in the way they appear that invokes positive emotions and recalls the straightforward aesthetics of the useful. They are beautiful because they are colorful and they

are authentically and surprisingly creative. They express vitality and spirit of initiative: they are the unthinkable made possible.” (2007, 9) HWA is certainly colorful, authentic, and vital in the way that Meroni brings forward.

An emerging framework project: Living Lab the Neighborhood

Once we had identified HWA as a promising and challenging partner with a resemblance to a creative community, though much more in the margins, the next question was how we could work together. As Manzini (2007) argues, when you approach creative communities as a designer, you often do not need to design something new. The good ideas are already there, embedded in the practice, and you have to facilitate, support, and scale up what these groups already are doing. To be able to do that, Manzini and Rizzo (2011) argue, you need a *framework project*, a larger supporting structure that could move these local cases out of isolation and increase their capacity to contribute to society. The purpose is to see if these creative communities could inspire others, be replicated, and eventually have a large impact (ibid.). We explored how Living Lab the Neighborhood could become a framework project. However, it wasn't clear to us what should be scaled up or replicated, or if scaling and replication would be the right strategy at all. Rather, we wanted to collaboratively explore what the women wanted to do and, if possible, build relationships and connect them to diverse stakeholders. If strategic design and scenario building has been the central approaches for Manzini and Rizzo (ibid.) to construct framework projects, we have rather started from the local projects and having a framework project emerging bottom up. In line with Nabeel Hamdi's (2004) argument that overdesign often inhibits progress and development, we have tried to create a balance between defining a possible direction and allowing for emergence. Particularly through our processes of *infrastructuring*, we have been building relations with diverse actors through an ongoing matchmaking process, with flexible allocation of time and resources. This more organic approach tries to make use of the creative potential in a heterogeneous city by facilitating opportunities that emerge along the way. Infrastructuring allows the unexpected to emerge by working toward the creation of framework projects, which strive for being open-ended when it comes to constellations of actors (that is, who will participate) and issues (that is, what to explore and how to do it).

Co-designing with HWA—no method, but artful inquiries

Different methods that could spark creativity and organize discussions during workshops are often highlighted as cornerstones within co-design (Brandt 2006). The designer's role within co-design is to provide “tools for ideation and expression” (Sanders and Stappers 2008, 12). One of the arguments behind this focus is that people with different backgrounds and professional

languages need tools to mediate and articulate the discussions during the design process. One might think that this would be especially relevant when approaching a multi-ethnic NGO with diverse cultural backgrounds. However, our experience turned out to be contrary to such expectations. Instead, we started our collaboration slowly with informal meetings, sitting down, drinking tea, and discussing one another's practices and everyday activities. They were not rushed and well-structured meetings, nor smart workshop formats, but very casual and open-ended appointments. Our design approach was rooted in the reflective practice of Donald Schön (1983, 1987) rather than in particular methods. During these encounters, we navigated among opportunities through a process of reflection-in-action and reached an understanding of the women's situation by continuously re-framing it. The process can be viewed, according to Schön, as consisting of "artful inquiries" that represent reflective conversations with unique and uncertain situations where standard theories or techniques cannot be applied. Because of language differences and cultural differences, the approach was to take it slow and let understanding develop. Many meetings between the women and representatives of the municipality have broken down, and our understanding is that the breakdowns have been attributable in part to difficulties in communicating and to the fact that civil servants don't have (or take) enough time to sit down and talk to the women and to the fact that they often set the agendas and the protocols for the meetings.

During the very fruitful discussions that took place during our meetings, the women expressed their desire to be more integrated in the Swedish society by finding opportunities for their abilities and skills to be valued. According to them, their activities were most often considered to be "leisure" by the authorities. This spurred our curiosity as to whether we, together with the women, could demonstrate that their activities could be viewed as "professional," and that an immigrant NGO could become a socioeconomic resource for the Swedish society. During this phase, we could have developed scenarios to highlight this possibility, but there were too many questions and potential issues that had to be resolved, and we needed a more explorative approach. The notion of reflective practice is seldom highlighted in the areas of design and social innovation. However, another concept from design, *prototyping*, has spread quite extensively (Burns et al. 2006; Brown and Wyatt 2010). According to Murray, Caulier-Grice, and Mulgan (2010, 12), refining and testing ideas is important in social innovation because "it is through iteration, and trial and error, that coalitions gather strength (for example, linking users to professionals) and conflicts are resolved (including battles with entrenched interests)." Prototyping has played a central role in the work with HWA (Hillgren, Seravalli, and Emilson 2011), and it often turned out to be a quite demanding and complex activity. All HWA interventions required mobilizing a number of stakeholders and asking them to invest time and

resources. This had the implication that the expectations were often quite high, leading to a number of issues related to the actual results of each prototype, with failures being difficult to accept and manage.

In the subsections that follow, we discuss our long-term engagement with HWA and how artful inquiry with the women developed through the use of prototypes and through friendly hacking.

Prototype 1: The catering company

After a suggestion from HWA, our artful inquiry started by developing prototypes around their cooking activities. Initially, we tried to understand how their cooking skills could be developed into a service that besides the food also could include knowledge about the food ingredients and the original cultural context. We also explored if the women could play a more active role when delivering the food than just handing it over. Facilitated by us, the women produced leaflets about the food to be distributed to the clients, and we supported them in getting a few catering orders. For example, we put them in contact with an architectural firm, and we accompanied them to an event at which they provided some tastes of Afghan and Iraqi food to employees at the architectural firm.

The architects clearly expressed their enthusiasm about the additional cultural experience and quickly adopted the Afghan terminology—for example, “Could you please bring me one more Kobbe?” It seemed that both HWA and the architectural firm were satisfied and that the studio would place the order, so we stepped back, leaving the women doing their business. Unfortunately, a few days later HWA informed us that the architects had turned down their offer, apparently because they thought that HWA was too expensive. We phoned the studio and discovered that communication problems had arisen: the company was asking the women to provide a formal offer, stating the menu and the quantity of food they would deliver. The women were not used to these kind of requests, and something went wrong in the communication between the actors: the architects thought that the quantity of food HWA would deliver would not be fair in relation to the price.

In hindsight, it is clear that we should have helped the women to structure and communicate their offer. However, during prototyping with HWA, it has always been problematic to find a balance between the support we should provide them while avoiding making the women feel weak, fragile, and too dependent on us. Nevertheless, the catering activity has developed further and it has become one of the central activities of HWA, even

though the women lack access to a professional kitchen and thus have to do the cooking in their homes.

Prototype 2: The cultural intermediation

Early on, the women told us that they would like to try to do something for refugee children in Malmö. These kids, mainly between 13 and 17, are in Sweden without their families. Malmö has welcomed a lot of Afghan and Iraqi orphans in recent years, and, since they share the same cultural background, the women felt they could offer something to them. However, working with refugee children is a sensitive matter, and we wanted to facilitate the creation of trust between HWA and the responsible department of Malmö's municipal government. Together with us, the women proposed to the city that meetings with the refugee children be held to explore whether HWA might be able to provide some kind of valuable service for them in the future.

The municipality was positive but didn't want to play an active role. It suggested that we contact the health-care company Attendo, which provides accommodation for refugee children in Malmö. Attendo was positive and we set up some experiments. We were particularly concerned about the possibility that the prototyping activities might evoke some undesirable memories in the women and the children. We decided to proceed carefully. The first step was simply to invite the kids to HWA's premises for an Afghan meal. They came accompanied by an Attendo employee. It turned out that most of them had not been eating home-made Afghan food since leaving their families, sometimes several years before. It became clear that food could play an important role, and the kids wished that there would be other occasions for meeting the women and eating together. According to the women, several of the children were quite depressed, and to some degree the women were emotionally stirred, but the emotional experience was compensated by the joy of feeling helpful.

The next step was to offer a cooking class to the children. That was done in collaboration with a media company called Nice Planet, which provided access to its kitchen. During this encounter, the children could alternate between cooking with the women and using Nice Planet's computers to explore social media together with some of the company's employees. The experience was quite positive for all involved (the CEO of Nice Planet said "I feel extremely inspired by meeting the women"). A chance to establish a more solid connection between HWA and Nice Planet emerged, which opened up the possibility for the next step in the artful inquiry with HWA: a possible collaboration between the women and the Mike Network, a Swedish network of businesswomen. (Nice Planet's CEO was a member of the Mike Network.) Making the necessary arrangement with the Mike Network took some time. Meanwhile, we tried to get civil servants from the city of Malmö involved in the effort.

Friendly hacking trial 1: A design workshop with civil servants

A role for designers that often is mentioned in relation to social innovation is to support capacity building, in which communities get empowered with new skills that can facilitate their everyday efforts. When the designer leaves the scene, this capacity will remain within the communities (Burns et al. 2006; Sangiorgi 2011). However, it became more and more clear that the members of HWA, although they might need some support in doing business, were extremely capable and skillful. The reason why they still were regarded as a societal cost and as acting in the margins must thus be found elsewhere. From our perspective, it would rather be the municipality that needed capacity building and new skills for how to be able to support organizations like HWA. Consequently, from this moment, our attention to where to locate our design interventions shifted from the women toward the municipality, and our first opportunity for friendly hacking emerged. While we were slowly strengthening the women's relations with some civil servants, one of us was asked to participate in an internal municipal development group in the neighborhood in which the HWA members lived and operated. This position was then used to introduce, in the development group, the notion that municipal support for local communities could be valuable, which was received positively by a few civil servants. From this, we got a commission from the municipal government to hold a workshop on design and social innovation. The civil servants prepared the invitation list for the workshop, and HWA's members were not on it, but we sneaked them in by setting up a workshop assignment that was tailored to HWA's needs. The workshop seemed successful and provided many valuable findings for us. First of all, many of the civil servants questioned the vocabulary and practice of both design and social innovation, although some of them had had good experiences with grassroots initiatives. It also became clear that the municipality would have to rethink its practices for how to support NGOs and how to work with social innovation. Some prominent civil servants stated that there was a tension between formal structures and creativity, and that social innovation required them to work across departments. They also argued that there was a need for a more permissive culture, so that civil servants would be allowed to experiment and even to fail. They also discussed how regulations could be stretched, and what could be done without breaking any regulations or laws. Finally, specific scenarios were developed that described how community initiatives (similar to HWA) could be supported by the municipality through an iterative process. Several civil servants seemed very interested in exploring this further, and we expected the process to continue. However, nothing happened, and all our attempts to try to understand why nothing had happened failed. Some civil servants insinuated that the reason nothing had happened was cultural: that civil servants didn't want outsiders to interfere with their business. Although this could be seen as a failure, we learned some valuable things and acquired more allies.

Friendly hacking trial 2: Project Women Mike

While working with the municipality, we continued our conversation with the CEO of Nice Planet. She had been impressed by the women of HWA, and she wanted to find ways to work further with them. We wanted to foster collaborations between HWA and other extraordinary businesswomen, with the aim of strengthening HWA's business competence and, at the same time, challenging established notions of what could be regarded as a company or an entrepreneurial activity.

This new attempt involved the Mike Network (a Swedish organization that promotes peer-to-peer support between career women) and Make It Real (a side project of Nice Planet's CEO—a digital platform for connecting people with diverse competences for the purpose of developing projects). The idea was that Make It Real could facilitate encounters between HWA and the Mike Network with the aim of encouraging peer-to-peer support between the women of the two groups.

We offered to help the founders of Make It Real, since we thought that our long experience with HWA could help. However, they clearly stated that they did not want us to intervene in the project. For Make It Real, the project was a fundamental step in proving that they were able to act as matchmakers; thus, in order to establish their role and state their ownership of the process, they did not want to collaborate with us in structuring the encounters.

The Make It Real founders set up the process as a series of meetings between members of the two organizations. These meetings, mediated by a business coach, were aiming at developing a number of projects from "dreams and aspirations" of the participants.

The first meeting went rather well. The women got to know one another, then organized themselves into five groups focusing on activities that HWA was already carrying out, such as cooking and gardening. After the first day, each group had a series of meetings with the business coach to develop a project plan. In these encounters, it became apparent that it was difficult for HWA members to be able to attend all the planned meetings, because they were involved in several groups at the same time. Another issue was Make It Real's process structure, which was very traditionally business-focused and—already at the early stages—brought up questions such as "Who is your potential client?" and "What is your value proposition?" This approach turned out to be problematic for two reasons. First, it presumed a high commitment from the participants, while they barely knew one another. Second, although these question may sound quite standard and easy to answer, they were completely new to the HWA members, and far from how they were accustomed to framing their everyday activities.

One encounter that went quite well was a day trip organized by one of Make It Real's founders at her house in the middle of a forest. The women spent the day picking herbs and cooking together, getting a chance to get to know one another better. Unfortunately, only a few women of the Mike Network were able to participate in that encounter, since it took place on a working day.

The process continued for a couple of months; then there was a meeting at which the groups were asked to present their proposals. During this meeting, Make It Real stated that each group should develop its projects independently. Consequently, the coach asked the HWA women, who were participating in several groups, to choose one group over the others. This raised concerns among the HWA women, but in the end every participant was on board. Another series of encounters for each group were planned.

A few days after this meeting, someone had forced the door of the small building where HWA met, stolen a binder with the names and addresses of the members in it, and started a fire. This was the third time HWA's meeting place had been burned down, and this time the women were quite scared by the theft of the information about them. HWA asked that the Make It Real project be put on hold.

This break allowed some doubts about the project to emerge. Specifically, HWA members felt that splitting up in separate groups was endangering their NGO, since they were not working as a unit. At the same time, some of the members of the Mike Network complained about the HWA members' lack of commitment of in the process—they were not present at all the meetings, they were often late, and they were not very active in formulating and developing the proposals. Through discussions with the participants, we came to understand that there were two main issues: that the process was too fast and that the HWA women considered themselves a collective.

With Make It Real, we discussed the possibility of modifying the process by slowing down its pace. However, the founders of Make It Real found that unacceptable. According to them, the idea of a collective was keeping the women from expressing their full potential. They were also quite frustrated—they had found a potential source of financing for one of the projects, and the break was spoiling their efforts to secure it. In addition, the members of Make It Real were eager to find economical resources that could help them establish their initiative. These tensions, accompanied by the difficulties that HWA had in coping with the consequences of the fire, brought the project to an end.

This experience revealed the challenges and difficulties of "friendly hacking the business", since, when it comes to ideas and formats related to entrepreneurship, there seemed to

be very few alternatives to the model of the independent and self-reliant woman. Even worse, there seemed to be no opportunity to experiment with alternative ideas as to what an entrepreneur is and what an enterprise can be. (What if an enterprise is driven by a collective? What if its aim is to generate social values and skills rather than profits?) The possibility of experimenting with alternative notions of enterprise and entrepreneurship was not just a matter of cultural or mental modes (collective vs. individual identity); it was also very much a matter of getting resources for and space within the business sector for experimenting with alternative models of entrepreneurship.

Friendly hacking trial 3: The incubator

The next attempt at friendly hacking was, once more, done within and with the municipality. (It is described in more detail in chapter 4.) Through establishing good relations with a civil servant that were inspired by design approaches through his previous work in the UK, we got the commission to explore how an incubator for social innovation could be structured and how its main features and support functions should be designed. We thought this incubator might make a difference for many invisible but resourceful stakeholders in the city. It was a very promising opportunity to build capacity within the municipality and establish a platform that could collaborate with stakeholders such as HWA. The process, bringing together civil servants, researchers, and grassroots initiatives (including HWA), developed a number of insights that were summed up for the municipality in a policy-briefing note. However, this process was then taken over by other actors. The final result was the establishment of a traditional incubator to support fairly traditional “close to market” business ideas. None of the grassroots initiatives that had been involved in the incubator process could fit into this structure. Although this intervention could also be seen as a severe failure, several civil servants were very disappointed with how the process had unfolded and wanted to continue to fight together with us to see if a structure that could collaborate with and support NGOs such as HWA could be established.

Friendly hacking trial 4: The Innovation Forum

After the incubator process, one of us got the opportunity to be embedded in a team of civil servants that was exploring the establishment of an Innovation Forum in which actors with complementary skills and knowledge could apply design-inspired methods to social challenges. The main task of the Innovation Forum was to develop a municipal structure that could respond to local challenges and initiatives from citizens. The process involved studying local, national, and international examples as well as investigating local grassroots organizations and ongoing municipal initiatives. Practitioners, researchers, and civil servants participated in workshops and seminars. Implementing design approaches within the municipality was regarded as promising;

however, it also turned out to pose several challenges, one of which had to do with how some civil servants perceived the vocabulary of design. Insofar as the word 'design' itself connotes such things as product design and fashion design, using the word as we used it didn't make sense for many civil servants. A serious effort was therefore undertaken to use phrases more appropriate to their language and their culture: "The empathic perspective!" "Collaborative problem formulation!" "Test early and test again!" Finally, a report was produced with concrete suggestions on how to proceed. Once the report had been produced and the municipality owned the process, we believed, the process would lead to the creation of a structure that could finally collaborate with initiatives such as HWA. Again, however, nothing happened.

Friendly hacking trial 5: Hacking financing bodies and indicators

A substantial part of the funding that supported our collaboration with HWA came from Tillväxtverket (the Swedish Agency for Economic and Regional Growth, henceforth abbreviated SAERG), which channels money from EU Structural Funds to regional development projects. Our team was part of a larger project, Malmö Nya Medier, that had very distinct project goals (such as supporting regional growth) and indicators (such as creating a specified number of jobs and companies). During our interventions with HWA, it became obvious that these indicators weren't appropriate. The work with HWA wouldn't easily yield an indicator such as "a new company." At the same time, we could see that HWA had the potential to become a valuable resource for society.

While our project was unfolding, some external evaluators hired by SAERG criticized it severely and argued that our efforts should be more directly targeted toward activities likely to develop commercial businesses. Luckily, we found an ally in a group of researchers that had been assigned by the same financing body to do a meta-study on various projects financed by them. During their study, they could connect the rationale behind our work to a larger context of European policies regarding social cohesion and the connection between social integration and economic growth. According to the researchers, we had succeeded in establishing new forms of collaboration, had utilized unused competences, had empowered people, and had connected stakeholders in ways that had the potential to be models for future efforts: "Here, they have succeeded in something many regard as impossible, but it has not been considered to be valuable." (Stigendal 2012, 49, authors' translation) They concluded that the problem wasn't with how we operated, but with the fact that our activities were measured and evaluated over too short a time span and with indicators that were too limited. We still do not know how much of an impact this report will have, but we hope it will open up more opportunities for similar efforts.

Further developments

We have continued to collaborate with HWA on different projects and funding schemes, though perhaps not as intensively. For example, we did a “tele-crafting” session in which HWA members and some Swedish textile craft groups were connected through Skype to similar groups of women in Paris. HWA is also connected to two new larger projects in which we are extensively involved. One of these larger projects focuses on new ways of caring for the elderly; the other one takes a systemic perspective on physical and social investments in suburbs. We didn’t have to invite HWA to take part in these projects. That group’s visibility has increased, at least partly (we would argue) as a result of our stubborn engagement.

When it comes to friendly hacking, the most promising future paths seem to be related to the Commission for a Socially Sustainable Malmö (Stigendal and Östergren 2013), whose final report clearly states that one of the important strategies would be to continue the work that had been done toward establishing an Innovation Forum. The report also argued strongly for the importance of working with NGOs and the civic society. Other promising paths may also emerge from the alliances that we have built with fellow researchers at Malmö University. Thanks to this work, we are now engaged in exploring the possibility of an Institute for Participatory Citizenship, which could become a strong platform for addressing all the issues emerging from the work done with HWA.

HWA and the bigger picture

In this chapter, we have described infrastructuring and prototyping activities aimed at supporting the creative community HWA. The larger framework for this inquiry is how Living Lab the Neighborhood, by setting up collaborative design processes, can contribute to addressing different social challenges and can increase society’s capacity to act. Within this framework, we have departed from grassroots efforts in the margins by collaborating with HWA. In this section we will connect the experiences from our collaboration with HWA to the findings of the Commission for a Socially Sustainable Malmö and discuss how HWA creates value and contributes to society and what kind of opportunities our work with them has generated.

First, as was stated above, the work HWA does has a very positive impact on its members and the area in which they live, but unfortunately the establishment doesn’t acknowledge their activities. We don’t think the prospects of a group such as HWA depend entirely on the members’ own capabilities; we think they depend on how society is organized, how the economic system works, what cultural values are held, and what is considered normal. Therefore, in this section we will discuss the bigger picture in relation to HWA—what is

considered to be work, what roles culture and civic society play, and what it means to be “integrated in the society.”

One of the researchers involved in the Commission for a Socially Sustainable Malmö, the sociologist Mikael Stigendal, asserts the importance of problematizing how the parameters for urban development projects are set—for example, how and by whom a problem is defined, what the objectives are, what counts as results, what is considered normal, what actors are involved, and what is taken for granted:

It has become an established perspective that problems are taken for granted. Unemployed seem not to work, while they in reality work in different forms (taking care of the home, family and relatives). Youngsters without grades seem to be without knowledge, when they rather have a lot of knowledge that we do not count or measure.

The population in some parts of Malmö that are characterized by high unemployment, poverty, and low grades seems to lack everything—while they rather might have and do very much, but things that do not fit into the exclusive community that the Swedish society has developed into. What is the problem?

The answer to this question will be essential for the solutions. (Stigendal 2011, 8; translated from Swedish).

Stigendal (2012) argues that achieving social sustainability in Malmö will require questioning the notion of knowledge, the notion of work, and what “to be integrated” entails. He points to the need to take a holistic approach. Rather than working with one isolated problem, or just viewing a problem as rooted in individuals or communities, he argues, we should also consider the systemic and structural factors. He quotes the EU report *Cities of Tomorrow*:

The challenge of moving toward shared visions of holistic, sustainable development models is to a certain extent the challenge of reaching a better and shared understanding of urban realities. Overall objectives need to be understood in wider terms of final objectives—e.g. sustainable quality of life and liveability—and not only in the more narrow terms of the means to get there (e.g. economic growth, employment rate, income levels). (Hermant-de-Callataÿ and Svanfeldt 2011, 61)

The objectives that have been dominant drivers for society at large in the last 30 years, such as economic growth and employment, are more and more put into question. The growth paradigm has been criticized by Jackson (2009) and by Stiglitz, Sen, and Fitoussi (2009), and new objectives such as happiness (Abdallah et al. 2012) and equality (Wilkinson and Pickett

2009) have been proposed as more in line with the ideas of sustainability and quality of life. A major contribution to this field has been made by Amartya Sen (1986), who points out that material well-being is only one of the factors determining a person's quality of life. Specifically, Sen states, the standards of living are based on the possibilities of *being* and *becoming* that someone has. These so-called functionings depend on a person's internal capabilities, such as skills, but also on external things, such as social networks and access to services. In Sen's view, therefore, material well-being is only one of the factors that determine quality of life. Among the others are access to education, opportunity to have a social life, and having a role in one's community.

Stigendal (2012, 8; translated from Swedish) claims that the large-scale urban development programs that have been carried out in Malmö in the last ten years haven't been successful according to objectives like "sustainable growth" and reducing "social, ethnic and discriminating segregation." But, he asks, "what if the objectives were wrong?" (ibid., 28). He means that there has been a lot of innovative work carried out, but that, because it has been concerned with "happiness, meaning of life, community and belonging" (ibid., 30), it has only to a minor degree been taken into account. However, Stigendal views this work as a rich inspirational resource for "developing new forms of work, knowledge, democracy and participation" (ibid.).

We think that it is within this context that the activities of HWA should be considered, along with our collaboration with HWA in exploring "new forms" for contributing to society and for being considered as part of it. Looked at through this lens, HWA seems less problematic, less marginal, and more like a promising initiative with resources and potentials yet to be explored, developed, and acknowledged.

Below we will develop this new perspective by following Stigendal's reasoning regarding work, which is very close to the feminist tradition in economics (Waring 1988; Gibson-Graham 1996; Gibson-Graham et al. 2013). Some feminist economists have argued that wage labor and the market economy represent work and production only in part (Waring 1988; Gibson-Graham 1996; Gibson-Graham et al. 2013). They have argued that capitalism focuses only on profit-generating activities and that it ignores non-wage forms of work and production and the fact that these forms of work are essential for wage labor and market labor to exist. According to Gottschlich (2013), household work, caring for family members, and voluntary work within civil society are fundamental for the (re)production of society and for its functioning.

Stigendal (2012, 34) argues that work has been limited to gainful employment and that “other kinds of work,” including voluntary work within civil society, studying, household work, and care work, aren’t acknowledged. He again cites the *Cities of Tomorrow* report, which claims that “collective goods, i.e. public goods or goods that are not exchanged in the market but are self-produced and exchanged within small groups such as a family, club or social network or association, are of great importance, and are always underplayed in economic analyses that focus on GDP alone,” and that “these play a crucial role in quality of life and are often significant in economic development” (Hermant-de-Callatay and Svanfeldt 2011, 50).

It is in this sphere that HWA operates, but their work doesn’t count today. Stigendal (2012, 34) argues that this “other kind of work” could be developed into gainful employment, and that is the kind of exploration we have done with the women, responding to their wishes of becoming more integrated and contributing to society. We would, however, argue that they are already contributing, but their work is neither visible nor properly rewarded and recognized. Stigendal makes an interesting turn when he claims that the kind of work that civil society produces perhaps should not be developed into conventional employment. He means that it may be an “other kind of work” that can contribute to social welfare and cohesion.

But how to make a decent living? Could there be other ways to get acknowledged and paid for the work one does? Is there something in between living on welfare and being employed or running a business? Maybe it is here that our prototypes can make sense. We have failed in developing a conventional business, but we have explored and demonstrated new and alternative forms of work. But this also points to the need for new economic models for this kind of value creation.

We will now discuss how our infrastructuring and prototyping activities have affected HWA in relation to the findings of the Commission for a Socially Sustainable Malmö. First, we will relate infrastructuring to the concept of social capital.

In their discussion paper for the Malmö Commission, Maria Emmelin and Malin Eriksson claim that social capital includes “our social networks, our social support, possibilities to participate in society and degree of social kinship in our neighborhood” (2012, 11; translated from Swedish). Social capital can be an individual resource, but it also can be a collective resource consisting of people’s participation in social networks, reciprocity, and trust between people: “When this exists,” Emmelin and Eriksson write, “collaboration and mutual efforts between people is easier and leads to a well functioning society.” The members of HWA could be said to have a rich “bonding” social capital, being well connected within their 400-member group and in their neighborhood, but they lack “bridging” social capital that might connect them

with other groups and networks, institutions, and actors that could provide them with the resources, skills, and knowledge they lack. Here, we claim that our infrastructuring activities—such as connecting HWA with new and complementary actors, and the prototypes that made the women’s capabilities visible—increased HWA’s bridging social capital. Will Norman (2012) argues that bridging social capital helps an organization to reach beyond its immediate neighborhood, something that is very important if a community is to develop and become innovative.

As was mentioned above, our prototyping activities helped reveal potential in the women’s activities and helped to connect them with new actors. Although the prototype with the refugee children and Attendo didn’t achieve much, it created a rumor that the women had interesting qualities and had potential for performing such work, and that led the Migrationsverket (the Migration Board) to ask HWA whether it could perform a similar service for single immigrant women. Although that request didn’t yield any real results, it shows that prototyping can reveal possibilities and spread them to a wider network of possible stakeholders.

HWA has new facilities and is occasionally doing some catering, but it hasn’t yet become a cooperative business. However, doing catering more regularly than in the past, and thus getting a reputation and access to more potential customers, is a good start. Catering is also the most conventional of HWA’s activities and perhaps the easiest activity to exploit. Even so, HWA will have to face competition from stronger and better-established actors.

We think that HWA’s less conventional qualities and activities, such as the work with refugee children, still has a huge potential and could be developed further. In our view, this represents the real challenge, but also a unique possibility to generate value for the women, the children, and society.

Designing Living Lab the Neighborhood

The design trajectory, our journey, has shown that we couldn’t have known from the beginning what kind of lab or *framework project* we would need when we initiated the first explorations. Even though we made a few strategic design decisions, such as explicitly taking an inclusive approach, most of our work has been spent on patchwork efforts to enable initiatives to grow from the bottom up, and on allowing for serendipity. Instead of following pre-defined plans, we navigated step by step among the opportunities and the obstacles we encountered. The whole process of building the lab could be seen as long-term reflective practice in which we have continuously matched different stakeholders and their respective agendas.

At times we were able to invite stakeholders to structured design workshops, but many of the encounters with stakeholders had to take other formats, often as iterative informal appointments. Still, we would argue that these encounters have been very designerly and that they could be seen as “artful inquiries” into the uncertain in which we continuously had to re-frame how situations could be understood and how these re-framings affected our opportunities. The importance of these informal appointments also emerged in the matchmaking between HWA and the Mike Network; for example, the informal herb-picking trip to the woods turned out to be more successful than the structured workshops.

During the process of infrastructuring and building Living Lab the Neighborhood, we have been exploring the boundaries of a *framework project*. This has brought our attention not only to community-based interventions, but also to other levels of design engagements. We have been influenced by La 27e Région’s concept of “friendly hacking” aimed at influencing and possibly change the systemic levels of society. Even though more and more opportunities emerged for HWA to become a visible and acknowledged resource for society, the concept of friendly hacking became especially relevant when we could see that those opportunities didn’t work within established societal structures.

We and La 27e Région aren’t the only ones who argue that designers should take a more transformative role. Several design researchers have recently argued for challenging established structures instead of focusing on productivity, efficiency, experience, or improving services within existing societal structures (Botero and Saad-Sulonen 2013; DiSalvo 2012; Manzini and Staszowski 2013). However, when our design trajectory has reached these systemic levels, practical limitations emerged—for example, the fact that we have no mandate (or funding) to work with systemic change. Rather, we have to work with tactics, on in-between projects, and in informal alliances with civil servants and researchers who share our norms and interests.

Thinking about design and social innovation as long-term collaborations that could stretch between different sub-projects and different funding schemes has been important. Thanks to this long-term perspective, we have been able to build trust between diverse stakeholders, support mutual learning and dared to pick “tough” cases (i.e., cases that do not fit into existing structures and where you might end up without an immediate success story). This has also made it possible to slowly gain authority to work on more systemic levels (as exemplified by the above-mentioned project on physical and social investing in suburbs, in which we have been invited to work in alliances with researchers and civil servants who share an interest in systemic change).

What would be different if we had had a mandate to work on a systemic level from the beginning, as La 27e Région did? Or what if we had been embedded within and owned by the municipal structure, as Mindlab (an innovation unit in Denmark that are owned by and work with three ministries and one municipality) was? We believe that we probably wouldn't have been able to make the choices we made. Now that we are slowly reaching the systemic level, we are still rooted in the communities with which we have been working.

This design trajectory also says something about how we, as design researchers located at a university, can position ourselves. As other design researchers have begun to argue, when you are approaching societal challenges you have to go beyond the traditional design project set-up, with its clear client-consultant relationship, and explore opportunities that may emerge among a variety of stakeholders with diverse agendas and needs (Botero and Saad-Sulonen 2013; Staszowski et al. 2013). This makes the designer role more complex than the role of a traditional innovation lab, such as a corporate lab that is steered and guided by private interests, or an embedded public-sector lab owned and controlled by a public administration (e.g., Mindlab). If a design lab doesn't have a clear client-consultant role, who will decide where and what processes to initiate, with whom, and from what perspective?

Our guiding principles were to be inclusive and to address diverse and conflicting agendas. However, we believe it was important to start with the embedded practices of particular communities. We paid considerable attention to whom we should start our collaboration with, and we tried to find stakeholders who were marginalized but also resourceful and who had extensive social capital within their networks. Although we started from the agendas, needs, and opportunities that we could see in HWA, which always was a point of reference for where we should navigate with our design interventions, we tried to balance their agendas with the interests of other stakeholders, such as the Mike Network or the municipality. This balancing act made the aspect of ownership central. In our work with HWA, we saw the importance of establishing stakeholders' ownership over the processes not only as a way to gain their temporal participation but also as a way to ensure a long-term commitment to the implementation of a new service or solution.

While working with Make It Real and the Mike Network, we stepped back to allow the members of Make It Real to take ownership (because they had an extensive network in the business field). We tried to argue that we could take a more active role because we knew that our experience with HWA could have been very useful in the process. Make It Real turned down our offer and we decided to respect that, although we could see some likelihood that their quite structured and business-focused process would be problematic.

Because different funding opportunities also affect what a lab can focus on, and because research labs depend on external funding, we had to respect the objectives and goals of different research calls from funding bodies. Still, as we saw in friendly hacking trial 5, we also need to challenge these goals and work on our own guidelines. SAERG, the agency that funded our work with HWA, hired external evaluators who during most of the project were quite critical and argued that we were too far from established models of business support. However, in their final report, they surprisingly stated that one of the strengths of the Living Labs was their broad definition of innovation and their strong focus on societal challenges. Their recommendation was that this focus should be developed further and be used to profile the region.

Given what we have learned, can we still work within the frame of traditional innovation projects dealing only with growth? Engaging in a traditional innovation project would mean accepting a vision that we know may limit our ability to consider what is regarded as legitimate value production within society and what is regarded as work. On the other hand, we know that traditional innovation projects provide a great opportunity to engage with and influence powerful actors such as funding bodies and policy makers. Then should we support pre-defined goals, or should we challenge them? Should we develop solutions that work within existing structures, or should we continue exploring alternatives? Should we continue the “friendly hacking” from within the existing structures?

When, during this long design trajectory, we encountered HWA and explored their capacities not from an existing template but much more freely, they could prove their skillfulness both to us, to refugee children, to other researchers and to (some) civil servants. Since then, HWA has been a point of reference for where we should navigate with our artful inquiries. As long as HWA cannot connect to the rest of society and become a more acknowledged resource, we have to continue the journey.

References

- Abdallah, Saamah, Juliet Michaelson, Sagur Shah, Laura Stoll, and Nic Marks. 2012. *The Happy Planet Index: 2012 Report*. New Economics Foundation.
- Bason, Christian. 2010. *Leading Public Sector Innovation: Co-creating for a Better Society*. Policy Press.
- Björgvinsson, Erling, Pelle Ehn, and Per-Anders Hillgren. 2010. Participatory Design and “Democratizing Innovation.” In Proceedings of the Eleventh Participatory Design Conference, Sydney.
- Björgvinsson, Erling, Pelle Ehn, and Per-Anders Hillgren. 2012. Agonistic Participatory Design: Working with Marginalised Social Movements. *CoDesign* 8 (2-3): 127-144.
- Botero, Andrea, and Joanna Saad-Sulonen. 2013. Peer-Production in Public Services: Emerging Themes for Design Research and Action. In *Public and Collaborative: Exploring the Intersection Of Design, Social Innovation and Public Policy*, ed. E. Manzini and E. Staszowski. DESIS Network.
- Brandt, Eva. 2006. Designing Exploratory Design Games—Can They Be the Guiding Framework for the Designer? In Proceedings of the Participatory Design Conference 2006, Trento.
- Brown, Tim, and Jocelyn Wyatt. 2010. Design Thinking for Social Innovation. *Stanford Social Innovation Review* (<http://www.ssireview.org>).
- Burns, Colin, Hilary Cottam, Chris Vanstone, and Jennie Winhall. 2006. Transformation Design (<http://www.designcouncil.info/mt/RED/transformationdesign/TransformationDesignFinalDraft.pdf>).

- Christiansen, Jesper, and Laura Bunt. 2012. *Innovation in Policy: Allowing for Creativity, Social Complexity and Uncertainty in Public Governance* (http://www.nesta.org.uk/publications/assets/features/innovation_in_policy).
- DiSalvo, Carl. 2012. *Adversarial Design*. MIT Press.
- Emmelin, Maria, and Malin Eriksson. 2012. Kan socialt kapital "byggas in" i våra bostadsområden och därmed förbättra invånarnas upplevelse och mentala hälsa? Kommission för ett socialt hållbart Malmö.
- Eriksson, Mats, Veli-Pekka Nittamo, Seija Kulki, and Karl A. Hribemik. 2005. *State-of-the-Art in Utilizing Living Labs Approach to User-Centric ICT Innovation—A European approach*. Centre for Knowledge and Innovation Research, Helsinki School of Economics.
- Florida, Richard. 2004. *The Rise of the Creative Class*. Basic Books.
- Folstad, Asbjørn. 2008. Living Labs for Innovation and Development of Information and Communication Technology: A Literature Review. *Electronic Journal for Virtual Organizations and Networks* 10 (7): 99–131.
- Gibson-Graham, J. K. 1996. *The End of Capitalism (As We Knew It): A Feminist Critique of Political Economy*. Blackwell.
- Gibson-Graham, J. K., Jenny Cameron, and Stephen Healy. 2013. *Take Back the Economy: An Ethical Guide for Transforming Our Communities*. University of Minnesota Press.
- Gottschlich, Daniela. 2013. Doing Away with "Labour": Working and Caring in a World of Commons. Keynote speech at Economics of the Commons Conference, Berlin.
- Hamdi, Nabeel. 2004. *Small Change: About the Art of Practice and the Limits of Planning in Cities*. Earthscan.
- Hermant-de-Callatay, Corinne, and Christian Svanfeldt. 2011. *Cities of Tomorrow: Challenges, Visions, Ways Forward* (http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_final.pdf).
- Hillgren, Per-Anders, Anna Seravalli, and Anders Emilson. 2011. Prototyping and Infrastructuring in Design for Social Innovation. *CoDesign* 7 (3–4): 169–183.
- Jackson, Tim. 2009. Prosperity without Growth? The Transition to a Sustainable Economy (<http://www.sd-commission.org.uk/publications.php?id=914>).
- Jégou, François, and Ezio Manzini, eds. 2008. *Collaborative Services: Social Innovation and Design for Sustainability*. POLI.design.
- Jégou, François, Stéphane Vincent, Romain Thévenet, and Anna Locharé. 2013. Friendly Hacking into the Public Sector: Co-Creating Public Policies within Regional Governments. Presented at Boundary-Crossing Conference on Co-Design in Innovation, Aalto University (<http://www.slideshare.net/27region/friendly-hacking-into-public-sector>).
- Kommonen, Kari-Hans, and Andrea Botero. 2013. Are the Users Driving, and How Open Is Open? Experiences from Living Lab and User Driven Innovation Projects. *Journal of Community Informatics* 9 (3).
- Manzini, Ezio. 2007. A Laboratory of Ideas: Diffuse Creativity and New Ways of Doing. In *Creative Communities*, ed. A. Meroni. POLI.design.
- Manzini, Ezio, and Francesca Rizzo. 2011. Small Projects/Large Changes: Participatory Design as an Open Participated Process. *CoDesign* 7 (3–4): 199–215.
- Manzini, Ezio, and Eduardo Staszowski. 2013. Introduction. In *Public and Collaborative: Exploring the Intersection of Design, Social Innovation and Public Policy*, ed. E. Manzini and E. Staszowski. DESIS Network.
- Meroni, Anna. 2007. *Creative Communities: People Inventing Sustainable Ways of Living*. Polidesign.
- Murray, Robin, Julie Caulier-Grice, and Geoff Mulgan. 2010. *The Open Book of Social Innovation*. Young Foundation and Nesta.
- Norman, Will. 2012. *Adapting to Change: The Role of Community Resilience*. Young Foundation.
- Nystrom, Anna-Greta, and Seppo Leminen. 2011. Living Lab—A New Form of Business Network. In Proceedings of the 17th International Conference on Concurrent Enterprising.
- Sanders, Elisabeth, and Pieter Jan Stappers. 2008. Co-creation and the New Landscapes for Design. *CoDesign* 4 (1): 5–18.
- Sangioorgi, Daniela. 2011. Transformative Services and Transformation Design. *International Journal of Design* 5 (2): 29–40.
- Schön, Donald. 1983. *The Reflective Practitioner: How Professionals Think in Action*. Basic Books.
- Schön, Donald. 1987. *Educating the Reflective Practitioner*. Jossey-Bass.
- Sen, Amartya. 1986. *The Standard of Living: Tanner Lecture on Human Values*. Cambridge University, 1985.
- Stålbrot, Anna. 2008. *Forming Future IT: The Living Lab Way of User Involvement*. Doctoral thesis, Luleå University of Technology.
- Staszowski, Eduardo, Scott Brown, and Benjamin Winter. 2013. Reflections on Designing for Social Innovation in the Public Sector: A Case Study in New York City. In *Public and Collaborative: Exploring the Intersection of Design, Social Innovation and Public Policy*, ed. E. Manzini and E. Staszowski. DESIS Network.
- Stigendal, Mikael. 2011. Malmö—de två kunskapsstäderna. Kommission för ett socialt hållbart Malmö.
- Stigendal, Mikael. 2012. Malmö—från kvantitets- till kvalitetskunskapsstad. Kommission för ett socialt hållbart Malmö.
- Stigendal, Mikael, and Per-Olof Östergren. 2013. Malmöns väg mot en hållbar framtid. Hälsa, välfärd och rättvisa. Kommission för ett socialt hållbart Malmö.
- Stiglitz, Joseph, Amartya Sen, and Jean-Paul Fitoussi. 2009. Report of the Commission on the Measurement of Economic Performance and Social Progress.
- von Hippel, Eric. 2005. *Democratizing Innovation*. MIT Press.
- Waring, Marilyn. 1988. *If Women Counted: A New Feminist Economics*. Harper & Row.
- Wilkinson, Richard G., and Kate Pickett. 2009. *The Spirit Level: Why More Equal Societies Almost Always Do Better*. Allen Lane.

Dissertation series in

New Media, Public Spaces and Forms of Expression

Faculty of Culture and Society
Malmö University

1. Denward, Marie. *Pretend that it is Real! Convergence Culture in Practice*, 2011.
2. Memmott, Talan. *Digital Rhetoric and Poetics: Signifying Strategies in Electronic Literature*, 2012.
3. Eriksen, Mette Agger. *Material Matters in Co-Designing: Formatting & Staging with Participating Materials in Co-Design Projects, Events & Situations*, 2012.
4. Gansing, Kristoffer. *Transversal Media Practices. Media Archaeology, Art and Technological Development*, 2013.
5. Lindström, Kristina & Ståhl, Åsa. *Patchworking Publics-in-the-Making. Design, Media and Public Engagement*, 2014.
6. Hoby, Mads. *Designing for Homo Explorens. Open Social Play in Performative Frames*, 2014.
7. Seravalli, Anna. *Making Commons (attempts at composing prospects in the opening of production)*, 2014.

This thesis accounts for a designerly inquiry in *the opening of production*. *The opening of production* refers to the rising of *openness*, *collaboration* and *sharing* in processes through which things are made and service delivered.

The interest in exploring such a swamp stems from two concerns. The first is understanding the nature of open, collaborative, sharing production practices and to what extent they can lead to more environmentally and socially sustainable ways of producing things and delivering services. The second concern is how, as a designer, it might be possible to engage in not only envisioning and prototyping, but also in constructing *open, collaborative, sharing-based* production practices.



ISBN 978-91-7104-583-6

MALMÖ UNIVERSITY
205 06 MALMÖ, SWEDEN
WWW.MAH.SE