

Expanding design space(s)

Design in communal endeavours

Andrea Botero

Aalto University publication series
DOCTORAL DISSERTATIONS 85/2013

Aalto University
School of Arts, Design and Architecture
Department of Media

Aalto ARTS Books
Helsinki
books.aalto.fi

© Andrea Botero

Graphic design: Nina Kajavo
Language editing: Hilal Jamal
Photographs: by members of the research group

Paper: Munken Pure 120g and Munken Pure 300g
Typeface: Arnhem

ISBN 978-952-60-5173-4
ISBN 978-952-60-5174-1 (pdf)
ISSN-L 1799-4934
ISSN 1799-4934
ISSN 1799-4942 (pdf)

Thesis supervisors:
Professor Pelle Ehn
Professor Sampsa Hyysalo
Preliminary examiners:
Dr. Mark Hartswood, University of Edinburgh, UK
Dr. Per-Anders Hillgren, Malmö University, Sweden
Opponent:
Dr. Monika Büscher, Lancaster University, UK



Printed in Unigrafia
Helsinki 2013

Acknowledgements

My understanding of the joys and perils of design through a communal endeavours lens comes from insights gained in a variety of communal endeavours I have engaged in with the complicity, passion, and love of Teemu, Luna, and Stella. I cannot begin to express how much I have learned from them. The intellectual interest in the themes I elaborated in this work is rooted in the learning possibilities with which two women have provided me. Anita Weisman's course on Industrial Sociology at the National University of Colombia, and Lucy Suchman's seminar on Work Practice and Technology at the University of Oslo. I am very grateful to these women.

My supervisors Pelle Ehn and Sampsa Hyysalo have been generous both with their time and knowledge. Pelle's approach to design has been a constant source of inspiration to me. I am grateful to him for agreeing to be my supervisor without quite understanding where I wanted to go. He posed important and timely questions and forced me to think through my choices. I am indebted to Sampsa for the best academic writing learning experience I have had and for taking on the feat of teaching me how to turn my work into a dissertation. He also gets the prize for providing the most detailed and constructive feedback ever. All doctoral students should be so lucky.

My academic home for the past years has been the disparate and enthusiastic community of Arki research group at Media Lab Helsinki. There, my third mentor Kari-Hans Kommonen, our research group director, has been a key piece in my journey. He provided funding, books and ideas plenty. I am grateful to all past and current members of the group. I could not have done this without the brains, muscles, and warm hearts of Joanna

Saad-Sulonen, Sanna Marttila, and Mariana Salgado. They have worked on projects with me and shared in my struggle as we wrote proposals and articles, and grappled with much more. Aside from reading and commenting on every aspect of this manuscript, they have fed my children and me, and they have embraced me at times when I needed it the most. I was fortunate to collaborate with Roman Suzi, Mika Myller, and Eirik Fatland in the design and production of the prototypes used in this research. It was a pleasure and intellectual challenge. I am very grateful to Maria Koskijoki, Taina Rajanti, and Iina Oilinki, who, through joint work, assisted me by shedding some light on the workings of the anthropological and the sociological imagination.

My Thesis pre-examiners Mark Hartswood and Per-Anders Hillgren deserve recognition for their very careful readings of the manuscript, for pointing out to me the many ways in which it could be interpreted, and for the important suggestions they gave me to move my work forward beyond the dissertation. I am extremely happy that Monika Büscher has agreed to act as the opponent. I very much look forward to hearing her comments.

I want to express my deepest gratitude to those whose day-to-day input gave meaning to this journey. The Active Seniors association believed in the project and was willing to experiment with us. Eila, Sirkka, Marja-Liisa, Riita, Tuula, Jorma, Paavo, and all other active seniors and residents of Loppukiri endured our fiddling with their endeavours and honoured my many requests. Many residents and activists of the Arabianranta neighbourhood, as well as some open-minded officials in different departments of Helsinki City, contributed their time and ideas to my work.

For someone who was raised and educated in the periphery of the majority world (Colombia) and ended up designing and doing research in the periphery of the hyper-developed world (Finland), it has been essential to confront and test ideas widely. I am grateful for the opportunities to discuss my work and spend some time with: Merryl Ford at Meraka Institute in South Africa, Lawrence Lessig at Stanford University in California, and Shin Mizukoshi at Tokyo University in Japan. Cesar Peña, Aydee Ospina, and Jaime Franky trusted me and helped open doors for me so that I could speak at the Andes University and at the National University in Bogota *¡Gracias mil!* Towards the end of this journey, Maria Fernanda Olarte and Tania Bustos invited me to their reading circle on thinking with care; I can't thank them enough for that opportunity.

Penny Hagen's re-reading of my work has helped me understand it better. Even though I don't know her personally, Lucy Kimbel's work has had

a very similar effect. Bo Westerlund's research has been a good stepping-stone. Without Aaron Schartz's python wizardry and general cleverness, many things would have been out of place. I have also benefited from receiving thoughtful comments on the manuscript from my dear friends Tuukka Tammi, Pauliina Seppälä, Olga Goriunova, Katja Battarbee, Hans Poldoja and David de Los Reyes. I owe them tons of chocolate for their clever thoughts, suggestions for improvements, and the afternoons of good laughs. My peers and colleagues at the doctoral program in Media Lab have provided interesting challenges. Andrew Patterson, especially, kept me company in the metaphorical delivery room of this book, our shared office on the 3rd floor. In our department, Lily Diaz, Mauri Kaipainen, and Timo Honkela all had their turns providing me with guidance. Phillip Dean, the "big boss", has made many things possible, and Pekka Salonen has kept things running. Hilal Jamal, Nina Kajavo and Sanna Tyyri-Pohjonen worked with me to turn a flat dissertation into what to me looks like a proper book. Thank you!

Nothing gets very far without a good start or long term commitments. This research has had just that thanks to Hector, Maria Eugenia, Carolina and Sandra Botero Cabrera. They have not only been there for me always, but also they have concretely contributed ideas, words, and criticism to all aspects of my work. In particular, Sandra has disentangled my broken English arguments so many times that she deserves a bit of heaven. To my extended family in Bogotá and in Tampere, my friends here (Carolina, Paola, Eliana) and there and my lovely neighbours (Raquel and Andrea), thanks for the hugs, the spiritual support, and the occasional child care. Thanks to Pippuri for companionship. I am almost done; I cannot believe it. GRACIAS!

Andrea, Kallio, May 3rd 2013

Abstract

The present research inquires into the contemporary shapes and strategies of situated and participatory perspectives on design. It proposes a re-conception of the notion of design space to capture the wider interplay of possibilities, practices, and partly assembled technologies, as well as developing competencies and social arrangements that are the basis for ongoing design choices.

In so doing, this work looks at the arrangements that evolved at the intersection of two design research engagements. The first engagement deals with the life project of an association of seniors developing an alternative housing arrangement with its related growing-old-together practices. In particular, the first case study draws on a mutual journey to design and develop what the community refers to as their everyday life management system or *Miina*, which helps them coordinate their daily joint practices. The second engagement looks at forms of active citizenship in the interactions of citizens both with each other and with officials in the city administration as these interactions are enacted through locative technologies. In this case, the research takes advantage of the collaborative design process for an online platform service, namely *Urban Mediator*, for sharing locative media content about the urban environment.

The research highlights aspects that are relevant to the development of design approaches which do not only deal with designers and their design processes, but which can also deal with how both the things undergoing design and the design process itself are simultaneously embedded in existing everyday life arrangements. Drawing on work from different fields, especially Design Research and Science and Technology Studies, the design space framework introduced herein elaborates nuanced navigational aids for long term design engagement. The main purpose of this framework is to help recognize the inescapability of confronting collective design spaces and the relevance and potential that their explicit construction as collaborative endeavours can have in particular settings.

Original Articles

- I Botero, A., Kommonen, K.-H., Oilinki, I., & Koskijoki, M. (2003). Co-Designing Visions, Uses, and Applications. In *Electronic Proceedings of the 5th International Conference of the European Academy of Design. Techno-Designing Wisdom, Barcelona, Spain: European Academy of Design / Universidad de Barcelona.*
- II Botero, A., & Saad-Sulonen, J. (2008). Co-designing for New City-citizen Interaction Possibilities: Weaving Prototypes and Interventions in the Design and Development of Urban Mediator. In J. Simonsen, T. Robertson, & D. Hakken (Eds.), *Proceedings of the 10th Participatory Design Conference PDC08* (pp. 266–269). Bloomington, Indiana, USA: CPSR/ACM.
- III Botero, A., & Kommonen, K.-H. (2009). Coordinating Everyday Life: the Design of Practices and Tools in the Life Project of a Group of Active Seniors. In *Proceedings of the COST 298 Conference: The Good, the Bad and the Challenging* (Vol. II, pp. 736 – 745). Slovenia: ABS-Center and COST 298 Action.
- IV Botero, A., & Saad-Sulonen, J. (2010). Enhancing Citizenship: the Role of In-between Infrastructures. In T. Robertson, K. Bødker, T. Bratteiq, & D. Loi (Eds.), *Proceedings of the 11th Biennial Participatory Design Conference PDC10* (pp. 81–90). Sydney, Australia: ACM.
- V Botero, A., & Hyysalo, S. (2013). Ageing Together: Steps Towards Evolutionary Co-design in Everyday Practices. *CoDesign*, 9(1), 37–54.
- VI Botero, A., Kommonen, K.-H., & Marttila, S. (2010). Expanding Design Space: Design-In-Use Activities and Strategies. In D. Durling, R. Bousbaci, L.-L. Chen, P. Gauthier, T. Poldma, S. Roworth-Stokes, & E. Stolterman (Eds.), *Design & Complexity: Design Research Society International Conference* (p. 18). Montreal, Canada: DRS.

Table of Contents

Abstract	6
Original Articles	7
1. Introduction	10
1.1. Design-in-use, progress made	15
1.2. From workplaces to communal endeavours	18
1.3. Focus of the research	24
<i>Presenting the articles</i>	28
<i>Outline of main contributions</i>	33
2. Situating design	36
2.1. Use before use	38
<i>Using (UCD)</i>	40
<i>Participating (PD)</i>	43
2.2. Design after design	46
<i>Evolving</i>	50
2.3. Understanding a Design Space	54
3. Research design, cases, and methods	62
3.1. Research design	63
3.1. Cases: activities and materials	66
<i>Loppukiri co-housing community and Miina</i>	66
<i>Citizens, city officials and Urban Mediator</i>	70
3.2. Methods and analysis	73
4. Expanding design space(s)	78
4.1. Design space	84
4.2. Design time-space	96
4.3. Design things-space	103
Conclusions	106
References	112
Articles	122

1

Introduction

“... Design is not creation of discrete, intrinsically meaningful objects, but the cultural production of new forms of practice.”

SUCHMAN ET AL.1999, P: 404

Historically, design methods and models of design processes assume that designers or design teams just come along and develop elegant solutions based on briefings given by customers or invented by the designers themselves. In this scenario, the design can then be developed further for production and finally taken to the market. Based on this model, it is expected that people will either sense the elegance and truthfulness of the solution and embrace it forever or simply ignore it. The naivety of this view has been broadly questioned (Cross 1981, Margolin 2002).

Nevertheless, the image of design as a one-shot activity based largely on the insight of peculiar individuals who produce ready-made solutions continues to be a common reference in popular culture and is actively maintained by many producers, designers, curators, and the media, as well as by customers and users of products and services. To counterbalance some of these misplaced assumptions and build a more transformative practice, some sectors of design research and practice have begun to elaborate a more encompassing perspective on design over the course of the last decades. The most generative of the strategies taken has been to place design activities and design knowledge on more explicit collaborative grounds.

Seeds of these developments could already be seen in the design methods movement of the 60s, which initiated a discussion on the need to go beyond drawing and introspection as the main design techniques. The

design methods movement contributed to identifying new forms of practice by collecting and adapting tools and techniques with the aim of supporting multidisciplinary design knowledge and facilitating the collaboration between multidisciplinary team members (Jones 1992, Mitchell 1992). This was partly inspired by “The Sciences of the Artificial” (Simon 1996) and the general project of searching for scientifically robust models of design (Margolin 2002). With the disillusionment suffered by many early proponents of the movement when it brought about an over-rationalization of design activities and unhelpfully abstract models, the agenda for building a more encompassing design practice was largely abandoned (Cross 1981).

Nevertheless, during the 70s, various experiments across different design areas revived interest in new forms of multidisciplinary collaboration, in particular in the rediscovery of neglected sources of design knowledge in use situations and in new ways of relating to those situations (see e.g., Cross 1971, Papanek 1973, Ehn 1988, Greenbaum & Kyng 1991, Norman 1988). In this context, at least two movements are particularly prominent when searching for a relevant and coherent body of knowledge to elaborate further on new models of design practice. The first one is commonly known as User Centred Design (UCD). The UCD movement has left its imprint by helping designers and organizations incorporate knowledge from use situations into design processes in systematic and efficient ways and by considering mainstream product and service design and development processes and needs. The second movement, often referred to as Participatory Design (PD), has been instrumental in re-structuring design processes more broadly by articulating the social and political implications of this re-structuring. The PD movement outlined an agenda for initiating collaborative design projects that recognize the role of tacit knowledge and work practice as legitimate and inescapable resources for design. It can be claimed that, as a result of the contributions of these two movements, multidisciplinary collaboration has been greatly expanded and aligned in design research and practice, and also our understanding of the ways in which design activities articulate other aspects of human existence and how they are situated¹ has increased significantly.

Design research that supports the unfolding of collaborative design activities has certainly moved areas of design disciplines beyond the ro-

1 Chapter 2 situates UCD and PD movements and literature more precisely.

mantic stance of the lonely designer or the design movement's over-rational design team². Today, successful experiences that link design to the work of a diverse group of people that expands to include users as well as other relevant stakeholders indicate that there is much to gain from that objective³. In many situations, collaborative design is seen as a viable – if not the only possible – model of practice. Despite these advancements, our understanding of how to go about setting up, carrying on, and more broadly, sustaining collaborative and open-ended design processes in explicit ways is still limited (see, e.g., Harstwood et al. 2002, Voss et al. 2009, Fischer 2003, Björgvinsson et al. 2012b). From a design research point of view, the current situation presents at least the following gaps⁴:

- 1 **Around and beyond innovation “fuzzy front end”**. Current research mostly focuses efforts on developing collaborative techniques and interventions in those stages of innovation process in which the design concept is evolving and being defined. Following common typologies of research and development stages in innovation literature, this happens at what is often referred to as the “fuzzy” front end⁵. However, articulating a more *temporarily extended and evolving understanding of collaborative design*, beyond bounded projects, could allow us to seize and scrutinize more explicitly the opportunities and limitations for participatory and co-design activities. This is

-
- 2 In recent years, the body of research exemplifying the possibilities, limitations, and conditions for carrying out multidisciplinary and collaborative design and research in diverse settings has grown. My work follows a series of doctoral dissertations in our department that deal with these interconnected issues (see: Diaz-Kommonen 2002, Salgado 2009, Leinonen 2010).
 - 3 State of the Art discussion on the current debates on collaborative design research can be found for example in the CoDesign and Design Issues Journals, the Participatory Design Conference, the NordiCHI conference, some streams of DIS-Designing Interactive Systems Conference and in the Design Research Society Conference to mention but a few.
 - 4 I will elaborate further on these gaps in Chapter 2 after having duly anchored them in research literature.
 - 5 Innovation management literature describes the front end of innovation as the stage where the generation of an idea and concept design takes place (e.g., Khurana & Rosenthal 1998, Murphy & Kumar 1997). The stage roughly ends around the concept's approval for development or its termination as a viable project to continue. It is considered to be “fuzzy” because information is usually scarce, costs associated with change low, and ability to influence results high. These depictions of innovation are made based on r&d process from the point of view of producer/manufacturing organizations (Godin 2006).

particularly relevant for processes that do not match strict research and development (R&D) project forms.

- 2 Away from only role-based accounts and prescriptions.** Current research into the implications of collaborative design strategies tends to assume that new roles for designers (change of attitude coupled with new methods) will be sufficient. This type of research tends to give normative prescriptions of what all the actors should be doing by proposing alternative roles for them. For example, designers and design researchers need to act as facilitators, gardeners, and initiators in a manner that allows users to act as designers, researchers, and so on. While these type of propositions are certainly relevant and needed, there have been fewer efforts to develop a more precise understanding of what it is that everybody is actually doing, with what resources, when, and how these activities evolve in time. Elaborating a better understanding of the role of diverse design activities in actual use could allow us to inquire further into the consequences of particular arrangements.
- 3 Lack of frameworks to guide interventions that are not constrained to a specific focus of attention.** The shift from the role of the product or the brief as the loci of the design process to a focus on users, their experience, and their context has been a welcomed development. Today, however, it is also possible to find design (research) processes whose sole focus ends up being the right conditions to conduct user studies or on how user centred or participatory events should be configured, with little or no mention of an actual *shared thing* being developed (*a design*, not necessarily a *product*). In reality, from a design perspective, briefs, products, users, designers, and their contexts as well as processes should be kept in sight and none can be particularly neglected.
- 4 Towards a nuanced understanding of the distributed nature of design agency.** In overcoming some of the limitations of understanding design processes as the prerogative of particular individuals, current design research carries the implicit assumption that collaborative design work is carried out largely by teams (small or extended) and is best organized around a project. We lack ways to look at, describe, and engage collectively in processes distributed more radically in space and time and within more complex socio-material assemblies.

I propose to look closely into the developments that have identified design-in-use as a critical component and into the ways they contribute to fill some of the above-mentioned gaps and point the way forward. In particular, the notion I am referring to here as design-in-use is inspired by a proposition articulated by Henderson and Kyng (1991) who referred to design-in-use as a key component in achieving truly collaborative design practices. Back then they identified issues such as *tailorability* and *adaptation* as supporting strategies to build upon when seeking to facilitate people's efforts to continue to design "at home". I take their call to be one of explicitly taking into consideration the creative work everyone does (and must do) to achieve appropriate and sustainable solutions in their everyday life. In contrast to this, the tendency in design practice and theory has been to overemphasize the implications of design activities *at project time* as opposed to *design at use time* (Fischer & Scharff 2000) or *design after design* (Redström 2008). To better understand what is still needed I will provide a short overview on the state of affairs, before expanding on it later in Chapter 2.

1.1. Design-in-use, progress made

It is worth noting that the idea that a variety of use situations display design-like characteristics, although not mainstream, is not particularly new in design theory. It was present in discussions around un-self conscious design (Alexander 1964) and implicit in some dimensions of the idea of vernacular design (see, e.g., Brand 1994). In an earlier era, when manufacturing and development was tied to the industrial mass production process, the idea that design-in-use is a reality was mostly of philosophical interest for designers. In practice, though, it had very little significance in defining or stirring the professional side of design practices (Clement 1993, Nardi 1993, Shove et al. 2007, Suchman 1994). During the last decades there has been a growing interest in that matter around professional design circles, as new social and technological developments have made the issue more pragmatically relevant. As a result, more conversations around the topic have started to appear. For example: Fulton Suri (2005), Brandes et al. (2008), and Wakkary & Maestri (2007, 2008) have provided empirical illustrations of some of the resourceful, adaptable, and emergent qualities of creative design related activities in contemporary every day contexts and their implications for various design practices. In the realm of software design and the production of interactive systems, Moran has also introduced the idea of adaptive design while discussing its similitude

and differences with professional design (2002). Büscher et al. (2001) have argued for the importance of foregrounding bricolage activities (ad-hoc and creative combination of materials and technologies) in use. Similarly Hyysalo & Lehenkari (2001a) and Diettrich et al. (2002) have documented how design “in the wild” might also display spaces for explicit collaboration. Extending some of these insights towards sustainability, Meroni (2007) and Jegou and Manzini (2008) have explored how creative communities exercise design and drive social innovation through their ongoing activities and have called for engagement with the ways in which professional design can amplify those practices.

In relation to supporting interaction design work in particular, the last decades have seen the development of a series of evolutionary oriented frameworks for carrying on collaborative design that explicitly identify the need to recognize and support end users’ design activities as part of the design engagement. Among them are Meta-design (Fischer & Scharf 2000, Fischer & Giaccardi 2004), Co-realization arrangements (Hartswood et al. 2002, Voss et al. 2009), and, most recently, Infrastructuring (Björgvinsson et al. 2010, 2012a, Ehn 2008, Pipek & Wulf 2009) and Thing Design (Binder et al. 2011, Ehn 2008). All of these approaches seek to articulate good practices to account for and support ongoing design processes. Despite these advances, in many ways design-in-use activities continue to be unarticulated in professional design practices and the need to explicitly link them to collaborative, open ended design processes in everyday life contexts remains (e.g., Brandes et al. 2008, Büscher & Cruickshank 2009, Hyysalo 2010, Kanstrup 2012, Shove et al. 2007).

From a design research point of view, elaborating and expanding our understanding of the nuanced dynamics of temporarily extended collective design activities is particularly important at this point in time. On one side, user centred and participatory approaches to design (and innovation in general) are being positioned as potential key elements in addressing the growing crisis in collective well being around the world (see, e.g., Büscher & Cruickshank 2009, IDEO 2001, Manzini & Rizzo 2011, Mulgan et al. 2010, Sanders & Stappers 2008, Thackara 2006). In this context, methods of collaborative design as well as skills for stakeholder involvement – with or without design twist – are being developed, applied and rediscovered in many areas, including marketing, as well as business and innovation management. A considerable amount of discussions in those disciplines revolve around concepts like co-creation and the associated new sources of value creation to be found in customer activities (Normann

& Ramirez 1993; Prahalad & Ramaswamy 2004). Such discussions also include new insights into the ways users are sources of innovations (von Hippel 1988), how innovation can be shifted to users via toolkits (von Hippel & Katz 2002) or online platforms (Jeppesen & Frederiksen 2006, Sawhney et al. 2005), and the types of contributions to be made by undefined crowds (Surowiecki 2005, Howe 2006), as well as the value of more distributed and “open” ways of organizing innovation processes (Chesbrough 2003).

Some of the developments in these directions imply the risk of turning collaboration and participation into a mere issue of streamlining and commodification of stakeholder involvement and collaborative activities, in the service of business as usual⁶. In the worst-case scenario, given simplistic understandings of everyone as a potential designer, broader expectations that in the long run design work could be cheaply and effectively outsourced to a “crowd” are being created⁷. In such circumstances, the progress made so far in relation to new models of design practice might seem irrelevant.

Furthermore, contemporary research into innovation processes and its claims on democratization and openness are also a challenge for collaborative design approaches. User driven innovation activities (von Hippel 2005), the emergent rhetoric of crowdsourcing (Brabham 2008, Brabham 2012, Howe 2008), and open design (Abel et al. 2011), as well as the Do-it-yourself culture (Gauntlett 2011, Levine & Heimerl 2008) – participatory culture (Jenkins 2006) and new insights into the dynamics of social

6 By commodification of user involvement I mean to suggest that the main focus of inquiry is limited to the development of user involvement techniques and methods that are streamlined, efficient, modular, easy to use, and organizationally “friendly” in contexts dominated by narrow views on corporate benefits (including traditional views on how R&D should be organized). In a similar vein, human geographer Nigel Thrift discusses the ways in which new understandings of customers as the centre-piece of the value creation processes of an organization are today using design as a core. He argues that these understandings often result in a mere interest in “harvesting” and “tapping on” users creative activities. This mostly means that consumers’ ingenuity is played upon and activated under highly unbalanced circumstances (Thrift 2006).

7 This argument is also asserted by other commentators who see this interest in user and customer participation as a mere private capture of community-created value (Kleine & Wyrick 2007) and a problematic reworking of consumption’s creative potential (Goriunova 2007) and perhaps as an easy way to blame the user for failures in the design and deny responsibility (von Bush 2012). There is also need to discuss issues of invisible and immaterial labour (including no compensation) involved in these type of developments (e.g., Biggar 2010, Brabham 2012, Kleemann et al. 2008, Lazzarato 1996)

and peer production contexts (Benkler 2006, Bauwens 2006) push collaborative design perspectives toward finding ways to better specify what it is that their exact contribution entails⁸.

Rather than a naïve celebration of everybody's capabilities to do things on their own or an overreaction to the co-optation option, I am interested in elaborating a repertoire of strategies and tactics as well as nuanced navigational aids for long-term design engagement that recognize the inescapability of confronting collective design spaces, and the relevance and potential that their explicit construction as *collaborative* ones can have in particular settings.

1.2. From workplaces to communal endeavours

The present research inquires and probes into some of the contemporary shapes and strategies of situated and participatory perspectives on design, following recent developments that aim to understand them in more mundane contexts that stretch from workplaces and organizations into everyday life (e.g., Bødker 2009, Hagen & Robertson 2010, Simonsen & Robertson 2012) and public spheres (Bieling et al. 2010, Björgvinsson et al. 2012b). Concretely, this means that I have carried out my research through personal involvement and analysis of two cases where design engagements support the development of practices in these broader settings.

The first engagement articulates with the life project of an association of seniors developing an alternative housing arrangement called Loppukiri⁹, with its related growing-old-together practices (case A). This part of my research draws particularly on our mutual journey (Figure 1) in the design and development of what the community calls Miina, an *Everyday Life Management System*¹⁰. Miina can be generally described as an intranet type of media for their co-housing arrangement (Figure 2).

-
- 8 From the perspective of the contribution from professional design practice, the "participative turn" has also raised concerns in regard to the transformation of designers into mere managers of post-it notes (Manzini 2012) and, in the worst case, managers of expropriation disguised as work focused on the community (Yudice 2008, de Los Reyes & Botero 2012)
 - 9 Loppukiri is the name the association gave to the building; the word translates into English as "last spurt".
 - 10 The core of the practical design work in this engagement was partly funded by Emerging Digital Practices of Communities ADIK, TEKES project (2004-2007) and 4G Design, TEKES project (2002-2003).



Figure 1 Snapshots from the seniors' case (A): Workshops and activities with Active Seniors

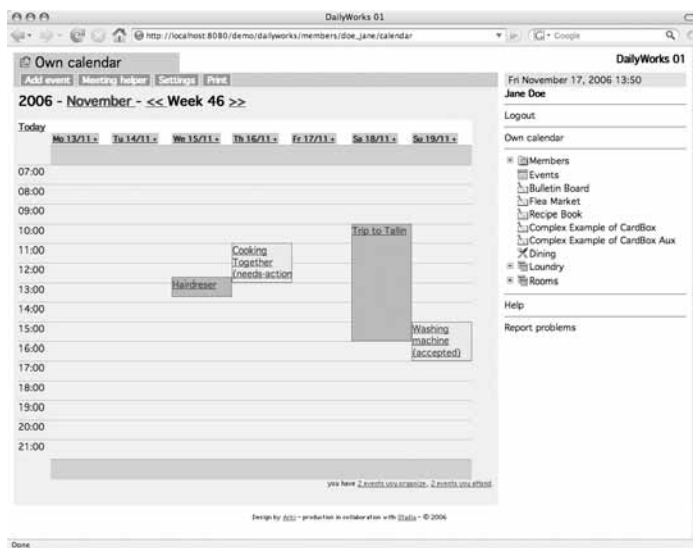


Figure 2 User Interface of Miina – Calendar view
(Based on the demo version of DailyWorks)

The second engagement looks at forms of active citizenship in the interactions of citizens with each other and with officials in the city administration, as they are enacted in everyday practices for “issue reporting”¹¹ and “issue sharing” through locative technologies and media (case B). In this case, I take into consideration my involvement in the design process for an online platform service for *sharing locative media content* about the *urban environment*, which we called Urban Mediator (UM)¹².

In both cases, I focus on the collective design spaces emerging in between what, to pre-empt one of the core conceptual results of the study, can be called the “*communal endeavours*” of these settings. Characterizing these settings in terms of communal endeavours helps to capture their shifting and drifting nature. They are *endeavours* in the sense that,

-
- 11 Basically meaning the unidirectional reporting of mundane fixes, bugs, and suggestions related to city infrastructure and life (usually in the form of reports about potholes, broken streetlights, graffiti, illegal dumping of refuse, etc.), which might become a more ambitious “issue” formation. The second meaning refers to the more specific sense of a controversy (contested views on traffic planning, security, etc.) around which publics might come into being (Marres 2007).
 - 12 Core of the initial design and development work was partly funded by the Innovative Cities for the Next Generation ICING, EU project (2006-2008).

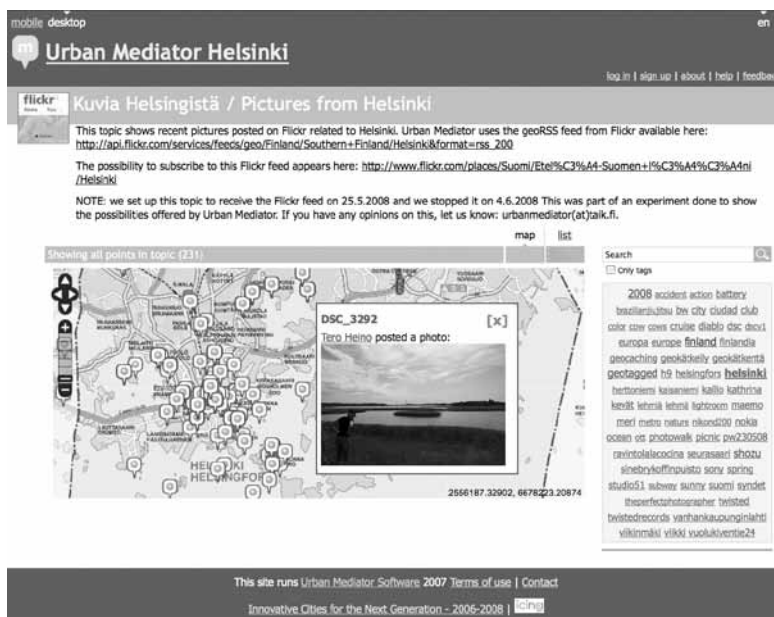


Figure 4 User Interface of UM – Map view

for the people involved, certain practices can be small-scale enterprises whose commitments stretch over time (cooking together as a strategy for growing old actively). However, they can also be rather temporary engagements of high intensity that evolve – or not – into more stable configurations (active citizens joining to influence a particular city planning process). In this capacity, communal endeavours stand midway between being the project of a recognized community of practice¹³ (all the senior residents of the same cohousing arrangement) or teams¹⁴ and being simply the coordinated actions of unidentifiable collectives or ad-hoc groups (citizens documenting graffiti spots in the city).

-
- 13** In the sense developed by Wenger (1998), the term communities of practice (CoP) refers to groups of individuals participating in a communal activity who are continuously creating their shared identity by engaging in and contributing to those practices. In this sense a communal endeavour is much more loose and might be at times less dependant on issues of identity.
- 14** For a review on the historical development of the concept of teams see the work of Engeström (2008), who also identifies other collaborative work formations like “knotworking”.



Figure 5 Communal endeavours embrace issues shared by different types of collective arrangements

This means that sometimes actions and concrete tasks are organized through the coordination of a specific team (like senior residents in charge of a particular cooking turn or particular team of city officers in charge of developing a plan). Other times, organization comes via the short-lived initiatives of an ad-hoc group (seniors organizing a theatre outing or citizens interested in raising discussion around trash in the city).

A communal endeavour tends to drift between issues that are relevant to a collective or a community, or between a loosely tied group and a well-defined team and everything in-between (Figure 5). A common facet is that to achieve a communal endeavour people come together, most likely through a shared platform (an association, a cohousing arrangement, or a citizen initiative), to negotiate a set of objectives and eventually coordinate some of their practices in ways they find practical, meaningful, and rewarding. While doing that, parts of these platforms can be temporarily “solidified” and mediated by various institutional arrangements and diverse artefacts such as those made by contemporary new media technologies¹⁵.

¹⁵ New media technologies are key components in the growing feasibility of these types of endeavours due to the kind of flexibility that a computational foundation affords. This is resulting on scaling up and bringing new visibility to communal endeavours in contemporary everyday life (e.g., Botero et al. 2012, Gauntlet 2011)

Thus, focusing on communal endeavours allows one to use similar entry points for the interventions, change the scale of analysis and develop a common framework, despite the fact that the cases might appear dissimilar at a first glance.

The sites, tools, media, and practices that relate to communal endeavours are also perfect places to study the dynamics of collaborative design, not because they will be representative of all design situations, but because collaboration in these settings cannot be avoided either in design nor in use. They offer ample opportunities to scrutinize closely some of the issues at hand, in the hope that they could offer insights that could be generalized to other collaborative design settings. Consequently, the empirical body of the work consists of materials collected during my participation in these two different design research projects, both of which had important research, design, and development components. Thus, the themes and concerns of the study have evolved through engagement in practical design and production work. This draws on a research strategy already established in design whose central tenet is as Nelson and Stolterman put it: “*making meaning by causing things to happen*” (2002 p. 49). In this strategy, design practice and, in particular the artefacts that are generated through it, take a central place in the conducting of the research (Koskinen et al. 2011). In addition to that strategy, at times I also borrow elements from action research (Lewin 1946, Reason & Bradbury, 2001) to help structure the interventions. When looking at the materials and carrying out some of the analysis, I rely on elements closer to a case study approach (Yin 2002).

I discuss more specific details about the research design, the empirical data collected, and the analytical approach in Chapter 3. To provide an overview, Table 1 introduces the settings, entry points, design devices, themes, and the main intervention frameworks used in both engagements.

1.3. Focus of the research

In this section, I introduce the main focus of the study via the research questions and the themes with which each article in the compilation deals. As my inquiry is structured through both practical engagements in design projects and analysis of them aided by theoretical reflection, both the projects and the research directions have evolved as the activities unfolded. Thus, the questions that I now present have not existed in this shape from the beginning.

	A SENIORS CASE – GROWING OLD TOGETHER	B UM CASE – SHARING URBAN KNOWLEDGE
SETTING	<i>A collective project that experiments and develops an alternative social arrangement for growing old with its associated practices and infrastructures</i>	<i>A design research initiative exploring possibilities for new interaction mechanisms between citizens and city officials to be supported by locative technologies</i>
ENTRY POINTS	<p>An existing initiative by a senior citizens association to which our design research contributed.</p> <p>What is the role of new media in supporting the communal endeavours of a co-housing arrangement for senior citizens?</p> <p>How to design and develop it together with the relevant stakeholders?</p>	<p>Our design research proposal for which we sought contributors and allies in different contexts.</p> <p>What type of new media might support the emergence of communal endeavours in the parallel everyday practices of citizens and city officials?</p> <p>Which are relevant stakeholders? How can they be brought temporally together?</p>
DESIGN THEMES	<ul style="list-style-type: none"> • Negotiating, coordinating and evolving everyday life. • Practices for growing old actively and together. • Elderly care (public services) • Resource sharing and peer production 	<ul style="list-style-type: none"> • Practices of reporting and sharing urban issues and knowledge (e.g. citizen activism and urban planning) through locative information. • Active forms of citizenship (public services) • User created content, peer production and open access/data
FRAMEWORKS OF REFERENCE FOR THE DESIGN INTERVENTIONS	<p>Participatory Design (PD) including designing for practices</p> <p>Co-realization (CR)</p>	<p>Participatory Design (PD), including designing for practices and Infrastructuring</p> <p>Meta-Design/ End-User Development (EUD)</p>
MY OWN POSITION AND ROLE	Contributing designer and researcher. In addition I was project manager for 2 of the externally funded projects that supported the collaboration reported here	Contributing designer and researcher. In addition between 2007 and 2008 I coordinated the contribution of our university to the broader EU project that funded the development efforts.
ARTICLES	I, III & V (+VI)	II & IV (+VI)
MAIN DESIGN DEVICES	<p>Miina: A web-based intranet providing everyday life management support for the activities and agreements of a shared housing community.</p> <p>(DW – DailyWorks Open Source Software)</p>	<p>Urban Mediator Helsinki: A web-based platform where different stakeholders create, share and process location-based information about the urban environment.</p> <p>(UM – Urban Mediator Open Source Software)</p>

Table 1 Entry points, setting and frameworks for each engagement

The starting point of the inquiry was framed within the interest of our research group¹⁶ to probe the feasibility of long-term design engagements with more open-ended goals. This brought a first general question: In which ways does extending collaborative design engagements matter? As the design interventions in the cases became more concrete and shared objects (prototype systems and media) emerged which were brought to various contexts of use and evolved, it became relevant to understand more specifically: What modes of engagement can participants have when their contributions are seen in the long-term? However, to avoid the trap of getting stuck with the not so helpful message of messiness (collaboration is messy, people are difficult, just embrace it and use some methods), it was clear that some navigational aids with strategic value would be needed. I found a relevant way to articulate many insights through the notion of *design space*. To this end, it became important to frame the research through the following main questions:

How does the notion of design space help (or not) in the management and understanding of temporarily extended collaborative design activities?

How does this notion need to be refined in light of the realities of extended collaborative design engagements?

The research articles that are part of this dissertation can be grouped into three themes related to these questions. These are: (1) Setting the stage: defining the boundaries of the research program; (2) Refining the questions and empirical analysis; (3) Contextualizing: framework and implications of the research inquiry (see Table 2).

Accordingly, the design projects can be considered constructions that explore various aspects related to these research questions. The research articles discuss these questions from various standpoints and document and analyse the observations made, as well as the actions taken during the engagements. To wrap things up, this introductory essay draws a comparison between the different articles and offers conclusions across them, to be able to answer the main research questions.

16 Arki is a multidisciplinary research group that is part of the Media Lab Helsinki at the Aalto University School of Arts, Design, and Architecture. The focus of the group is the co-evolution of digital technology and the practices of everyday life from a design perspective. Arki means “everyday” in Finnish (for more, see <http://arki.mlog.taik.fi>)

<p>1 SETTING THE STAGE: DEFINING THE BOUNDARIES OF THE RESEARCH PROGRAM</p>	<p>I) Botero, A., Kommonen, K.-H., Oilinki, I., & Koskijoki, M. (2003) Codesigning Visions, Uses, and Applications. In Proceedings of 5th European Academy of Design Conference: "TechnE Design Wisdom". EAD, Barcelona, Spain</p>
	<p>III) Botero, A., & Kommonen, K.-H. (2009). Coordinating everyday life: the design of practices and tools in the life project of a group of active seniors. Proceedings of the COST 298 Conference: The Good, the Bad and the Challenging (Vol. II, pp. 736-745). Slovenia: ABS-Center and COST 298 Action.</p>
<p>2 REFINING QUESTIONS AND EMPIRICAL ANALYSIS</p>	<p>II) Botero, A., & Saad-Sulonen, J. (2008). Co-designing for new city-citizen interaction possibilities: weaving prototypes and interventions in the design and development of Urban Mediator. In J. Simonsen, T. Robertson, & D. Hakken (Eds.), Proceedings of the 10th Participatory Design Conference PDC 08 (pp. 266-269). CPSSR/ACM. New York, NY, USA.</p>
	<p>III) Botero, A., & Kommonen, K.-H. (2009). Coordinating everyday life: the design of practices and tools in the life project of a group of active seniors. Proceedings of the COST 298 Conference: The Good, the Bad and the Challenging (Vol. II, pp. 736-745). Slovenia: ABS-Center and COST 298 Action.</p>
	<p>IV) Botero, A., & Saad-Sulonen, J. (2010). Enhancing Citizenship: the Role of In-between Infrastructures. In T. Robertson, K. B. dker, T. Bratteiq, & D. Loi (Eds.), Proceedings of the 11th Biennial Participatory Design Conference PDC10 (pp. 81-90). ACM. New York, NY, USA.</p>
	<p>V) Botero, A., & Hyysalo S (2013) Aging Together: Steps Towards Evolutionary Co-design in Everyday Practices. Co-Design International Journal of Co-Creation in Design and the Arts, 9(1), 1-18.</p>
<p>3 CONTEXTUALIZING: FRAME- WORK AND IMPLICATIONS OF THE RESEARCH INQUIRY</p>	<p>VI) Botero, A., Kommonen, K., & Marttila, S. (2010). Expanding Design Space: Design-In-Use Activities and Strategies. In Proceedings of the Design Research Society Conference: Design & Complexity. DRS. Montreal, Canada.</p>
	<p>V) Botero, A., & Hyysalo S (2013) Aging Together: Steps Towards Evolutionary Co-design in Everyday Practices. Co-Design International Journal of Co-Creation in Design and the Arts, 9(1), 1-18.</p>

Table 2 Articles and their grouping

PRESENTING THE ARTICLES

The first article introduces a kind of “research program” charter and draws together the main concerns that guided setting up interventions in our research group (Article I – Botero et al. 2003). The article brings forth a distinction between strategic and tactical modes of technology assimilation, already suggesting that collaborative design practices should enable communities to adopt a more strategic stance and avoid the need to respond mostly ‘reactively’ in the face of technological pressures. At that time, I was especially intrigued by the possible implications of design research activities whose point of departure was a collective project and its associated practices, instead of locating it in some individual user and her static needs or a particular technology. In this article, design-in-use is discussed briefly in terms of social innovation and is already identified as a key component. An interest in a more holistic scope for design is articulated through the concept of “applications” -instead of just *needs* or *products* or *users*. In the following articles, I abandoned the notion of applications in favour of *practices*. The article uses as one case the starting point of our collaboration with an association of senior citizens building a communal house (Active Seniors). The preliminary results of our interactions back then already contain some *design seeds* that grew later into concrete interventions and prototypes that we realized in close collaboration. The piece thus shows how we already hypothesised that for planning long term engagements, design seeds can be planted through small contributions that later can generate new venues for collaboration and help participants begin exploring a relevant design space. At this point in time, the main activities reported centred only on early engagements and concept designs rather than in analysing any actual design-in-use since the senior’s own project was only starting to take form. However, including it in this compilation nicely conveys the persistence and also the evolution of the ideas that these design engagements have pursued. For this article I was responsible for the framing, reporting on the work done, and drafting the implications for future work. My other co-authors, who were all involved in one way or another in carrying out the work, commented on and shared their feedback and ideas for the content.

As the research advanced, I was interested in pointing out more precisely how from early design seeds more full-fledged designs (concrete propositions) co-evolve in use. By this time, we had done a lot of prototyping efforts, in particular an everyday life management system for the seniors who were already living in their co-housing arrangement (called

Miina). More importantly, at this point it became possible to apply similar ideas to a new context dealing with citizen participation in urban issues. The latter would go on to become my second case study¹⁷.

A guiding inquiry for this next stage was looking through which types of design interventions and experiments we could trace back the opportunities to explore design-in-use (Article II – Botero & Saad Sulonen 2008). In this second article, Joanna Saad-Sulonen and I reflect on the need to weave together new processes and spaces for experimentation within design-in-use. We point out how these are particularly needed to create sustainable innovation opportunities within participatory processes in urban issues. From the point of view of the design strategies that the project took advantage of, we analyse how during the early development of Urban Mediator (UM), design seeds were planted, together with different stakeholders, and how prototypes were weaved together as a strategy to help “emerge” shared explorative spaces (later referred to as design spaces) among stakeholders. In this case, no particular community (or associated practices) existed a priori like it did in the case of the seniors. In this article, I was responsible for the idea, selecting the focus, and making the final edition. My co-author, who had lead the participatory design activities described in it, contributed throughout the paper, which represents the first time that we tried to articulate our thoughts together.

The third article outlines in more detail the collaboration with the active senior citizens who were building their communal house (Article III – Botero & Kommonen 2009). In the article, Kari-Hans Kommonen and I look closely at the Active Seniors’ envisioned and realized practices for shared meals, neighbourhood help, and promotion of an active social life. In particular, we asked what resources and skills did the Active Seniors need to design their own housing/life? The article elaborates a more refined understanding of social practices as a locus for the design interventions and presents a reflection on the relationship of the themes in the broader project of the seniors to the design of Miina, the everyday life management system for the cohousing project. This concept was only in an envisioning stage during the writing of the first article. At this point in

17 I share this second case with my colleague Joanna Saad-Sulonen who is also using the project as empirical material for her dissertation. Her focus is on the specific relationship of design processes such as the one carried out with UM to participatory and collaborative urban planning strategies (Saad-Sulonen Forthcoming 2013). Article II will be included in both of our compilations.

time, it had been actually built and was in use. The main responsibility of the work for this third article fell on me; I wrote the empirical part and selected the framework. My co-author commented throughout the text and contributed with ideas for the discussion and conclusion sections.

After my practical involvement in both projects and being able to follow the deployment of UM in a number of real pilots and projects, I wanted to look more closely at the conditions under which multiple actors imagined new relationships through the possibilities that prototypes created and made visible (Article IV – Botero & Saad Sulonen 2010). Written in collaboration with Joanna Saad-Sulonen, the fourth article looked at a bigger set of the empirical material accumulated in the second case and asked: where and how did the required innovations take place in design-in-use? We used examples from several pilots in which UM was used both by citizens and city administrations to experiment with the collection and processing of locative data and media. With the help of those examples, we went through some of the ways the platform was reinterpreted and weaved together with existed and the kinds of issues the interventions raised and how they become visible to the different stakeholders. The main responsibility of the work for this article was mine; I chose the focus and direction and did most of the writing. My co-author helped in selecting and writing up the examples chosen for the empirical part of it; she also contributed with data from trials I was not directly involved in, helped frame the conclusions, and wrote parts of the introduction.

After delving deeper into the materials of the second case, it became evident that I needed to return to the experience with the Active Seniors' case. The intention of the fifth article is thus to try to open up, in more general ways, how collaborative design activities in design-in use can be rendered explicit, organized and kept alive taking into consideration all we knew by then (Article IV Botero & Hyysalo 2013). In this article, written together with Sampsa Hyysalo, we outlined a proposal for developing long-term co-design engagements by distilling a set of design strategies for "aging together". The set of strategies builds directly on what was learned from the experience with the seniors case and indirectly touches upon aspects that were already more elaborated in the UM case but that had not yet been outlined. We present the design strategies using empirical details from the collaborative engagement with the seniors. The analysis of the case shows how many important co-design opportunities only become evident in use and what types of strategies we devise to work with this fact. The article proposes that there is a need to elaborate a more

nanced repertoire of resources to guide reflexive co-design work. Designing with the *aging together* type of strategies thus calls for extending collaborative design beyond and around the traditional research and development (R&D) projects form in important ways, and our reflections in this piece aim towards that goal. For this article I took responsibility for writing the empirical part, my co-author contributed by framing the direction of the article and helped in placing it in the research context and in distilling the main strategies.

Parallel to the work on analysing the cases, I started to further contextualize and construct a framework by which to discuss some of the activities and insights gained through practical work.¹⁸ For this purpose, *design space* became a fruitful notion to build upon and discuss some of these ideas (Article VI: Botero, Kommonen & Marttila 2010). In the sixth article, together with Kari-Hans Kommonen and Sanna Marttila, we sought to reposition what is a fairly normal assumption in design practice: the existence of an abstract “design space” that designers usually explore in the concept design stage, which helps constitute the “problem” and from where they work out alternatives. This space tends to be treated as an abstract, Euclidean, and temporarily limited construction. In contrast, we develop an idea of the design space as an emergent and expanding set of possibilities that are also explored – at different times – by a collective as practices and their supporting technologies co-evolve. Based on a literature review and reflecting indirectly on our experiences in different projects (including the cases presented here), we offered an analytical and practical framework for understanding and locating design research interventions and a tool for mapping design activities over time (developed further in this introductory essay in Chapter 4) that continuously reflects in the structure and openness of such spaces.

This sixth article makes the case for paying attention to design-in-use in particular. The specific conception of the design space that is elaborated in the article attempts to deal with two things: First, it locates and maps a variety of design activities, as different stakeholders perform them, regardless of whether or not they perceive their role as designers or what they do as design or use. This offers a simple and clear way to illustrate

18 This became particularly acute when we participated in a larger national project aimed at developing tools for user driven open innovation called: Flexible Services – User Driven Open Innovation (TEKES 2009-2010)

the inescapable extension of design activities into design-in-use, as we saw them unfold throughout our projects. Second, the framework qualifies stakeholders' design-related activities in terms of possibilities that are accessible to participants on a continuum from *design* towards *use* (later I specify more the *design-in-use* part), which helps understand implication of different collaborative design strategies and associated resources (materials, designs, etc.) through time. The proposal helps to discuss the ongoing, and social nature of a design endeavour in terms that are attuned to contemporary discussions (and critique) on the nature of innovation. It also reflects in an elegant way many of the observations made during the unfolding of the cases. For this article, the responsibility of organizing and editing the paper was mine. I made the contextualization in terms of the design space notion and elaborated the examples that illustrate it. The visual composition of the framework evolved through iterations between all of us, aided by the fact that we all were familiar with the materials of the cases and where using this as a tool to communicate insights in other projects. My co-authors contributed in opening up and describing the elements of the framework, provided explanation of the cases and in identifying the strategies suggested.

On the basis of the articles and concerns listed above, in this introductory essay I aim to present a more general narrative in order to link and compare the insights gained in the cases in more systematic way, and with a view to drawing more general conclusions. Two main themes will be elaborated: First, the preoccupation with **situating design** in current design practice and research is presented and analysed. Second, a proposal for recognizing **design space(s)** and their expanded composition is introduced as a way to understand, organize, and reflect upon design interventions in a situated and strategic manner, one that would also be flexible and open to ad-hocking. Aided by this framework, I compare and clarify the insights each case brings in to support the main arguments. The two themes thus weave together concerns and issues that arose throughout the development of the actual projects, as well as exemplify our practical attempts to reflectively deal with them.

Accordingly, this essay is structured as follows: in the remainder of this section I will present a summary of my main findings and contributions. In Chapter 2, I provide a general depiction of the development of situated design perspectives. I trace the current preoccupations of most of the design research carried around this area. The chapter ends by introducing the need for an updated version the notion of design space. I propose

this as a way to move beyond salient gaps I identified in extant research. This chapter thus maps the territory to which my research contributes in particular. In Chapter 3, I look in detail at the research approach employed and present the cases and the materials I collected. In other words, I will explain how I claim to know the things I discuss along the study. In Chapter 4, I compare the experiences from the cases. This time, I look at them more thoroughly in terms of the constitution and unfolding of their respective design spaces and what they can tell us about the configuration of new productive collaborative design relationships. The chapter draws together the experiences to point out a proposition for how design space, design time, and design things articulate the results of the work. I summarize the design strategies deployed in the cases, the resources at hand and what was learned from them. In Chapter 5, I close by bringing together the main themes and reflecting upon the opportunities and limitations of the research.

OUTLINE OF MAIN CONTRIBUTIONS

Before proceeding, I will briefly summarize the key findings and contributions of my work:

- 1 The design engagements reported here confirm that collaborative design can be organized in fruitful ways on an ongoing, open-ended time frame. It shows that doing so has important implications: on the one hand, for the ways in which endogenous production of technologies by communities can be made possible (and supported); on the other hand, on how the collective's emerging norms, values, and regulatory principles interact within the supporting technological forms. These themes are of increasing importance in the light of framing and approaching contemporary social problems.

Implication: the current situation in design research of mostly focusing efforts on activities and interventions at the concept design stage (fuzzy front end) is important, but limited. Collaborative design when explicitly addressed before, after, and to the sides of the concept design stage is pertinent and has implications for the final outcomes, the scope of design possibilities, and the future horizon of communal endeavours.

- 2 The notion of 'design space' is re-conceptualized to capture the wider interplay of possibilities, practices, and partly assembled technologies, as well as to develop competencies and social arrangements that are the basis for

ongoing design choices. This helped to identify a variety of crucial activities with design related implications (e.g. compose, aggregate, remix, extend) whose acknowledgement supports collective endeavours in aligning design interventions and activities in their temporal and social fabric.

Implication: Design research and practice needs to engage more seriously in identifying and benefiting from multiple and poly-centric interventions in time and space. It also needs to understand the ways in which those interventions close or open relevant design spaces and what the resulting consequences are.

- 3 The work introduces some resources and strategies for organizing extended collaborative design engagements in practice, in particular when it comes to new media for supporting and carrying out communal endeavours. It illustrates the importance of setting the context (grounding the collaboration setting) and cultivating new forms of design work (identification of design seeds, following of indigenous spin-offs, facilitating forking) and some of the required learning strategies (partial failures, reflective practices) to pay attention to. The repertoire of practices and strategies documented offer guidance to the sorts of activities and venues needed to allow ongoing collective design processes room to breath and grow (e.g. infrastructuring and midwifing).

Implication: Besides developing new techniques and methods for collaborative design and proposing new roles for participants, long-term design engagement requires from both the “communal endeavour” and the “professional” designers a broader and reflective repertoire of strategies and resources and the collective articulation of shared principles.

2

Situating design

From an earlier exclusive focus on the role of the “object” and “the design brief” as the focal points of the design process, it is more common today that designers and researchers feel compelled or are obliged to situate design activities in a wider and more complex socio-technological context. Here, how a project is approached and the roles are played by the participants also matters, beyond only accounting for results (Findeli & Bobaci 2005, Krippendorff 2006). Efforts to situate design practice and knowledge¹⁹ – and to a certain extent problematize them – from within the design fields can be found from a variety of starting points. However, I propose they can be recognized more clearly in those discourses where efforts to understand *use* and *user involvement* have been more systematically articulated.

While use or user involvement concerns are certainly not the only things at stake when “situating design”, the issues raised when interested in dealing seriously with the messiness of current and future use situations, as they relate to a design process, have made practitioners aware of a wider spectrum of issues. Those include the depth and breath of networks and configurations at play in technology production, both in the brief and around it (Voss et al. 2009, Suchman 2007, Williams et al. 2005), sources of design knowledge present in contexts of use (Bannon 1992, Ehn 1988,

19 There is an intentional reference here to “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective” (Haraway 1988) and “Located Accountabilities in Technology Production” (Suchman 2002).

Hyysalo 2009b) and the role of tactics and strategies at play in a variety of processes (Svanæs & Gulliksen 2008) among many others.

Figure 6 summarises some of the elements present in various design practices and how in design research steps have been made to characterize design as a matter not only of *form giving* issues (mostly concerned with the brief and a product) but also one that concerns with *using* (concerned also with context of use and user representations) and *participating* (concerned further with structuring the process and reflecting on roles and contributions of participants).

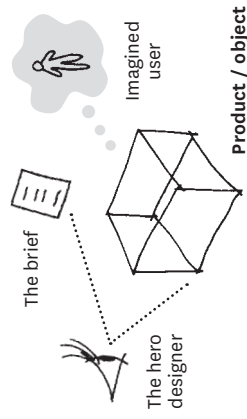
Because of the interplay of issues emerging, I discuss, in particular, User Centred Design (UCD) and Participatory Design (PD), as distinctive movements that have been at the forefront of bringing together a coherent body of knowledge and research around these issues to the awareness of practitioners²⁰. I do not discuss co-design as a separate movement or even as a domain per-se, since I see it more as a label to demark a concern, a contemporary opportunity, that draws on both the traditions of UCD and PD explicitly or implicitly. In my overview of UCD and PD, I will make a distinction between three things: a “label” (a name tag in common use that identifies an issue to deal with), a “movement” (a recognized community with an agenda condensed in foundational texts, activists trying to make a case, researchers, practitioners and followers), and “factions” (specific applications and adaptations of a general movement’s agenda done by group of practitioners and followers that stress certain aspects of the agenda differently, depending on local conditions and their own interpretations).

2.1. Use before use

While discussing the variety of ideas and ideals that can be encountered when problematizing use, Redström (2008) proposed a spectrum that includes: at one end, concerns for ‘**use**’ **before use**, starting from the now classic ambition to test and try out ‘use’ in advance of actual use during

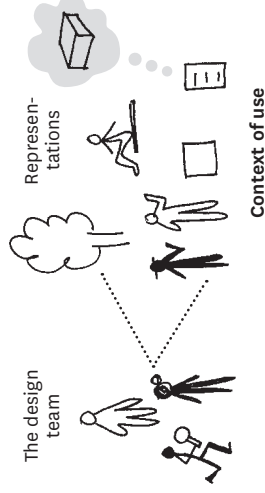
²⁰ The so-called critical design movement (Dunne, 2005, Dunne & Raby, 2001) is also a relevant development worth mentioning in contemporary attempts to situate design. However, I will not elaborate on it, because I consider my cases and my research approach as embedded in a more pragmatic interventionist practice that does not exactly relate to staged controversies about design achieved through objects, which are typical of critical design strategies. On a complementary direction, *adversarial design* can become another interesting movement to follow (see DiSalvo 2012).

[FORM GIVING]



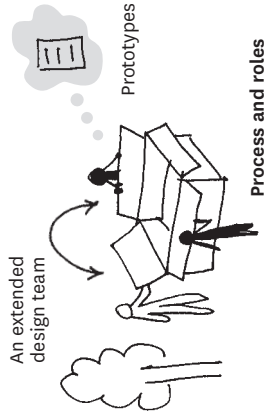
1 CLASSICAL DESIGN PRACTICE

[+ USING]



2 USER CENTERED DESIGN PRACTICE

[+ PARTICIPATING]



3 PARTICIPATORY DESIGN PRACTICE

Figure 6 Situating design practice and knowledge, a few steps

the design process; on the other end, concerns for supporting **design after design**, or efforts to create a larger space of possibilities for defining use through use itself (Redström 2008 p: 421). In the following sections I will make use of this spectrum to provide an overview of the broader project I refer to as *situating design knowledge* while at the same time identifying some of its limitations.

USING (UCD)

User Centred Design as a recognizable label has its origins in the early 80s in the United States of America. Back then, the acronym User Centred Systems Design (UCSD) was coined to group a series of specific practices developed and put in place to ensure that product and system development would take into account human factors early enough in the process (Norman & Draper 1986, Norman 1988). These early days were heavily influenced by cognitive psychology and ergonomics, which meant that most of the practices and research discussed specific methods for testing the behaviour of systems and products and ensuring they met specific user requirements (Gould & Lewis 1985, Nielsen 1994). In the early days, a lot of effort was placed on developing practices for iterative evaluation and assessment of products with the hope that this information could eventually drive design. This was specifically evident in the Human Computer Interaction (HCI) field and a big driver of the usability movement; however, its discourse has also permeated other design fields as well. This specific faction continues to be active today in many circles, although it has been criticized for, among other things, not accounting for the broader social context of use and for treating the human aspect as one more factor (Bannon 1991). Another common concern raised has been that this faction of UCD deals much more with evaluating the nitty gritty of designs than with doing actual design work (Bannon & Ehn 2012, Constantine 2004).

Today User Centred Design (UCD) is in reality more nuanced. Other factions have built upon cognitive psychology and ergonomics research but also upon concerns from traditional design practices²¹ and from areas

21 Several iconic designers have been a reference point for the broader UCD movement, in particular Dreyfuss and his classic “Designing for people” (1974). Similarly, professional design consultancies like IDEO have been developing arguments that cross beyond those of cognitive and psychological ones, even touching upon aspects of business results (Kelley & Littmann 2001) and innovation capability building (Brown 2009, IDEO 2011).

such as information systems design. In doing this, UCD practitioners have incorporated tools and approaches from e.g. social sciences to complement earlier reliance on mainstream market research thus highlighting the importance of other dimensions beyond mere usability. Today discussions in UCD around concepts like interaction (Preece et al. 2002), empathy (Koskinen et al. 2003), experience (Shedroff 2001, Kuti 2009, Hassenzahl 2010, Buxton 2007), co-experience (Battarbee 2003), emotions (Norman 2004), pleasure (Jordan 2006), and meaning making (Krippendorff 2006) bring to the foreground the importance of the many generative aspects needed to articulate design knowledge when there is a humanist focus. Related to this, some advocates of UCD prefer Human Centred Design, as opposed to the simple UCD label (e.g. Krippendorff 2006, Steen 2011), to stress the need for focusing not only in the narrow role of the user, but instead pay attention to wider conceptions of the human existence.

In terms of the movement as a whole, I condense the UCD's main contributions around two things. The first one has been to position a set of standards targeted at product development activities like ISO 13407 (ISO 1999)²². These standards have contributed to achieving legitimization, in organizational contexts, for UCD related practices and knowledge (Philip & Rourke 2006). This has been key; as in these contexts, certain type of design work has been hard to sell or make visible over development resources. In this sense, UCD has provided clear tools to structure a design team's work and to integrate its multidisciplinary knowledge, into critical business stages, particularly at the fuzzy front end of product development (Gulliksen et al. 2005, Svanæs & Gulliksen 2008).

The second critical contribution is to have streamlined and popularized the observation of users in natural settings²³, linking these to empirically oriented design methods and ways of working. The focus of the UCD movement has been bringing knowledge of a use situation early on to the process and making a case for it by illustrating how acceptance and fit in the market can be affected by such processes. Such user-oriented strategies have become relevant once differentiation, niche markets, and

22 These standards are closely related to usability work, and while some discuss design processes, their guidelines are still very ambiguous from a design stance.

23 The UCD movement has been key in the adaption and diffusing process of ethnographically inspired approaches from traditional anthropology circles into corporate settings and product development. For a view into the story of the relationship between ethnography and design see (Wasson 2000).

customization have become much more critical to business practices as technology matures (Leonard 1998), and when industrialization and mass production are not the only games in town. In this way, the UCD movement has also given more legitimacy to one persistent knowledge claim made by designers, namely that they have the role of “representing” the user by acquiring a certain type of design knowledge expertise. That is, designers that master UCD processes are prepared to translate – in actionable terms – concerns regarding delight, aesthetics, engagement, comfort, utility, and experience, as much as style, and do it in a “designerly way” (e.g., Mattelmäki 2006, Vaajakallio 2012). This would appear, vis-à-vis other types of concerns that come from an engineering perspective: technical efficiency, productive considerations, and quality control. The reach of this second contribution is clearly visible in the popularity of tools such as use scenarios (Carrol 1995), techniques such as Contextual Design (Beyer & Holtzblatt 1997), and the popularized activity toolkit for Human Centred Design packaged by IDEO (IDEO 2011).

There is no doubt that concerns regarding user orientation have brought a wave of fresh air and new insights to professional design practice. There is now increased awareness and interest in practitioner’s circles to look at broader sets of issues when designing and organizations are now much more receptive to these types of issues. However, it has been questioned whether UCD is able to recognize all the complexities of what is at stake. On the one hand, its relationship with actual making and development work is still unclear (Iivari & Iivari 2006, Stewart & Williams 2005). On the other hand, researchers have also commented on the need to question how “users” or “experiences” are phenomena that do not exist a priori or in isolation; they are only evident when there is something there to use or experience, and in relation to broader constellations of things (Shove & Pantzar 2005, Shove et al. 2007) and networks of working relationships (Suchman et al. 1999, 2002). People’s everyday activities evolve and the dynamic process of learning, creative appropriation, domestication, and shaping of technology that unfolds (Shove et al. 2007, Haddon et al. 2006) and takes place even under adverse circumstances (see e.g. Eglash et al. 2004). More than often, it represents a long process of mutual adaptation of technology and practices (Leonard 1998, Bowker & Star 1999, Hyysalo 2010) and even non-use (Oudshoorn & Pinch 2003). On that account the UCD movement still has little to offer when design practice needs to relate to longer timeframes beyond the traditional development lifecycle and R&D frameworks. Moreover, there is a need to recognize that identities

such as designer or user are not stable or separate; rather, as Suchman argues, they function as categories that describe people positioned “*differently in terms of their histories and future investment in projects of technology development*” (Suchman 2007 p: 279).

PARTICIPATING (PD)

Unlike the mainstream factions of the UCD movement (whose main interest has been to insert UCD practices as a routine in product development processes) Participatory Design (PD), as a movement, has placed greater emphasis on probing and experimenting broadly with the ways relationships of use, design, and production are normally conceived (Greenbaum & Loi 2012. Suchman 2007, Törpel et al. 2009). The vehicle to achieve this has been mostly to interrogate the designer- use dichotomy by focusing on ways to include users as creative partners. From my perspective, the agenda can be interpreted as being broader²⁴.

As is the case with UCD, diverse factions of the movement have placed efforts on different aspects. The Scandinavian Participatory Design approach (SPD)²⁵ is commonly known as the movement’s original agenda setting faction. The story starts around the 70’s, when through action research, several research projects created alliances between labour unions and technology designers/researchers to propose new workplace practices and technologies that could strengthen democracy at work (see Floyd et al. 1989, for an overview of the early experiences). An aim was that, through a participatory process, new practices and technologies would question taken-for-granted configurations of technology production and innovation processes. However, more broadly speaking labour unions, who had been very successful in bringing wages into collective bargaining with high success in Scandinavia, lacked means to tackle employer driven reforms done by the means of introducing new technology that undermined worker skills. For them PD type of process where interesting as a way to bring technological change into the bargaining process as well. In that

24 Even though most of the foundational PD texts never refer to or use the word innovation, many of the issues that PD has been tackling, pioneering, and experimenting with deal with re-configuring production and innovation processes, in deeper levels than UCD for example. In later years, this connection has been made more explicit (e.g., Bødker et al. 2004, Buur & Matthews, 2008b)

25 Sometimes also referred to as the Collective Resource approach (CRA) (See: Greenbaum & Kyng 1991)

aim, SPD was not successful. Nonetheless, it did introduce more localized means for workplace democracy and collaborative technology development by offering alternatives to assumptions such as those of considering firms or management as the only proactive agents in bringing new technologies and in defining work practice or of users not having knowledge or competence relevant for design work (Ehn 1988). SPD projects in the 70s pioneered a series of approaches to creating conditions for mutual learning between participants through an ethnographically inspired inquiry for design. These projects also experimented with the creation of spaces for dealing with conflicts and the emergence of shared innovation. Through these and many other subsequent projects, tacit knowledge and skills were reclaimed to be important sources of design knowledge. The experiences showed the importance of hands-on-work and evolving prototypes as relevant ways of replacing abstract requirements and briefs (Ehn & Kyng 1991, Gregory 2003). More importantly, ways to understand and use these resources were experimented with collectively (see Bjercknes et al. 1987, Ehn 1988, and Greenbaum & Kyng 1991 for foundational texts). In the process, the many practical, social, and political implications of these approaches have been charted (Simonsen & Robertson 2012 provides an updated view of some of the current developments).

The specific label of Participatory Design (PD) has its origin when certain concepts and methods from those Scandinavian experiences in the 70s travelled to North America and other parts of the world and confronted new circumstances (Schuler & Namioka 1993, Kraft & Bansler 1994). As a result of new conditions, a lot of interest started to concentrate more on the practicalities of achieving informed and meaningful participation with non-expert designers and other stakeholders, giving rise to a more pragmatic faction that, to the opinion of some, is what tends to dominate the agenda lately (Blomberg et al. 1997; Iversen et al. 2004). PD features a large body of knowledge around tools, techniques, and methods, ranging from the possible collaborative inferential dimensions of self-reporting research methods, like probes (Mattelmäki 2006), all the way to more comprehensive frameworks, like *MUST* (Bødker et al. 2004). This is complemented by current efforts to organize and classify PD activities and tools (Sanders et al. 2010, Brandt et al. 2012) to help those interested in trying out meaningful stakeholder involvement.

Recent developments in related fields such as marketing and innovation management have been very successful in positioning new concepts such as co-creation and customer centricity (Prahalad & Ramaswamy

2004), co-configuration (Victor & Boynton 1998), and user driven innovation (von Hippel 2005), among others at the forefront of business practices and policy. These developments seem to be configuring the emergence of new factions within PD. In a widely cited article on the CoDesign journal, Sanders and Stappers (2008) link developments from the PD movements, and other early design traditions to what they identify as an emerging landscape of design they term “co-design”. They suggest that the “best known proponents” for collaborative approaches to design are to be found today in innovation and marketing approaches (Sanders & Stappers 2008 p:8), making the time ripe for a new type of participatory practice that can extend to all types of pressing issues. This practice should be committed to supporting everyday people’s creativity and their value to design processes, in particular at the fuzzy front end. Although they distance it from the marketing and innovation management propositions, they stress less the experimentation with re-configuring relationships. Similar arguments are also advanced in a newly developed blend of participatory design, user innovation, and anthropological studies referred to as Participatory Innovation (Buur & Mathews 2008a, 2008b).

Taken as a whole, PD has been instrumental in opening up design work to new types of knowledge, by proposing the role of radically extended design teams, sometimes acknowledging the social consequences of this move. In doing so, the movement has revealed both processes by which different types of design knowledge can be productively linked to change processes and how it is possible to de-centre design authorship without losing expertise. Moreover, in seeking alliances with other (often under-represented or marginalized) stakeholders outside of the typical producers’ realm, PD has also shown that innovation activities can be effectively started, bootstrapped, and sustained in many unconventional configurations, often with interesting and even emancipatory results for those involved.

Another key contribution has been to identify the importance that concrete activities have in producing and performing design-related knowledge collectively. PDs insistence on prototyping as a way of anchoring tacit knowledge in a collective way (e.g. Bødker & Grønbæk 1991) and its critical engagements to extend drive and stage design process through events, such as workshops (e.g. Kensing & Madsen, 1991), have provided tools to manage stakeholder participation in early design phases (e.g. Agger-Eriksen 2012, Binder & Brandt 2008, Bødker et al. 2004), especially along the concept design stage and fuzzy front end (Buur & Matthews 2008a, Sanders & Stappers 2008). This has led to the emergence of an understanding of

various new possible roles for professional designers, going beyond representative, and including those of facilitators, triggers of change, activists, capacity builders, and so on (see e.g. Manzini & Rizzo 2011, Lee 2008, Tan 2012 for more thorough elaboration on a variety of emerging roles ascribed to designers).

The PD movement's approach also has limitations. A commonly mentioned drawback is that despite its ambition to design future practice before technology and regardless of its insistence on the emergent qualities of design, in practice, most of the developments of the different PD factions have been unable to overcome engagements beyond early deployment of prototypes (for a review and critique, see Hartswood et al., 2002; Voss et al. 2009). Some even have argued that at present PD does not offer many resources through which to tackle evolutionary aspects (Giaccardi 2004). This is so perhaps because it has not connected its agenda well with other ad-hoc collaborative practices in the wild (Dittrich et al. 2002, Hyysalo & Lehenkari 2002b, Hyysalo 2010) or that it lacks a more clear position towards its relationship with end-users' designs and their status (e.g. Johnson & Hyysalo 2012, Kanstrup 2012). Another issue that has been pointed out is how under the current landscape of design, it is hard to locate, from the onset, all possible future users, not to mention how to guarantee their participation (Bødker 2006, Clement et al. 2008). For some, it is obvious that sometimes people are not necessarily waiting to be taken into consideration by a participatory process and that there is an unproductive stance that needs to be challenged, specifically when some factions of the movement tend to portray designers as heroes that fix situations, leaving users to be portrayed as some sort of victims in need of salvation (Spinuzzi 2003, Stewart & Williams 2005). Another increasingly visible concern is manifested in the need to specify more accurately and interestingly expert design competences and contributions, which tend to be eclipsed by facilitating skills inherent in most of the activities that PD processes advocate (Findeli & Bobaci 2005, Manzini 2012).

2.2. Design after design

Having surveyed the territory and the aims of two relevant movements attempting to advance the project of situating design project, I now will summarize some of their key components by locating salient gaps in extant research.

Gap 1: Around and beyond the fuzzy front end: Current research, both around UCD and PD mostly focuses its efforts on developing collaborative techniques and interventions at the fuzzy-front end of innovation, where concept design is mostly performed (Sanders & Stappers 2008, Buur & Matthews 2008). While this work has been important in finding a voice for a design approach and demonstrating the relevance of the practices of these movements, without extending the reach and connections around and beyond the fuzzy front end, our understanding of the complexities at stake is ultimately limited. Research in related fields suggest that crucial encounters in the designer-user relationship can only manifest themselves when social practices develop (Jenkins 2006, Hyysalo 2010, Voss et al. 2009). From a design perspective that means design-in-use needs to be more critically scrutinized as a site for collaboration. Articulating a temporally extended and evolving understanding of collaborative design, could allow us to seize more explicitly, and – critically elaborate – opportunities for collaborative design activities beyond the concept design stage, something particularly acute in settings that do not fit current fixed R&D project forms.

Gap 2: Away from strictly role-based accounts and prescriptions: Besides the attention devoted to influencing at the fuzzy front end, design research has had a keen interest in untangling the implications of collaborative design strategies for the role participants in such process have: e.g. who the designers are, where should the users be, how to enrol producers, when not to forget the intermediaries. The tendency in both UCD and PD, and more generally in design research, has been to give normative prescriptions of what all these actors should be doing by ascribing to them roles²⁶ (e.g. facilitators or gardeners). While these kinds of propositions are certainly relevant and needed, there have been fewer efforts to understand, more precisely, what it is that everybody is actually doing (Redström 2008), with what (Agger-Eriksen 2012, Kimbell 2012) and when they are doing it – independent of their perceived identity. We also lack an understanding of how these activities evolve in time (Büscher & Cruickshank 2009). As a result, it becomes relevant to ask not only what role people play or should

26 Tan (2012) provides an illuminating literature review of the status of *roles* in design research. While she asserts that there is lack of research on the specifics of designers' roles and that therefore more research on new roles should be made, the amount of interest she found on the issue of new roles in general, attests to the importance given to this matter at the expense of almost any other concern.

play, but also *what role do the different design-related activities play?* This could allow us to inquire further into the consequences of particular arrangements, roles, materials, and resources when it comes to both design and design-in-use as well (Kimbell 2012).

Gap 3: Lack of frameworks to guide interventions not constrained by a specific centre of attention: A call for attention and focus on users (UCD) and on structuring a more inclusive process (PD) has been a welcomed development for disciplines often too centred on concerns around the right shapes and colours or peculiar technological capabilities for their own sake. It has taken some time to realize that, without attention to and awareness of practices, one could ask: design for what? However, today it is also possible to find design (research) processes whose sole focus ends up being finding out what is the “right” user study or what type of process or roles will yield a more human approach (user centred or participatory) with little mention of an actual shared *thing* being developed (*a design*, not necessarily as a product, though). Without a shared *thing* should we not ask: collaboration for what? In reality, all aspects (brief, objects, and things and contexts of use and production, as well as users and designers’ histories and trajectories) should be kept always in sight, and none can be particularly neglected (see e.g. Coxton 2009, Findeli & Bousbaci 2005, Hyysalo 2010, Manzini 2012). The brief is rethought in active exchange with the understanding of use and of the development context; users and context of use are shaped and shape previous objects, products, and things; an understanding of what can be done needs to be coupled with what could be changed, what needs to be maintained, and how that might be achieved (Büscher et al. 2009)

Gap 4: Towards a nuanced understanding of the distributed nature of design agency: In overcoming some of the limitations to understanding design processes as the prerogative of particular individuals, current design research carries the implicit assumption that collaborative design work is carried out largely by teams (small or extended), and it is best organized around a project. We lack ways to look at, describe, and engage collectively in processes distributed more radically in space and time and in “socio-material assemblies” (Björngivsson et al. 2012, Ehn 2008, Kimbell 2012).

This state of affairs is summarized in Table 3, which also introduces themes currently under development to partly address the above-mentioned gaps.

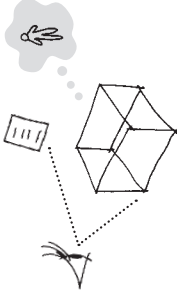
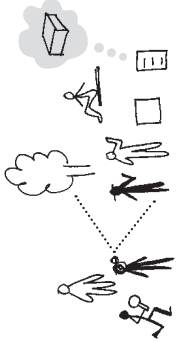
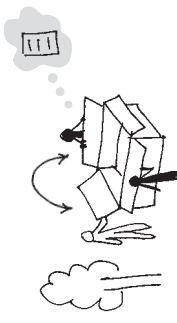
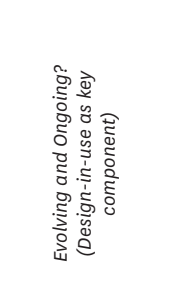
	[FORM GIVING]	[USING]	[PARTICIPATING]	[?]
				
DESIGN PROCESS	Design process as an ideal model.	Design process as conquering the fuzzy front end of product R&D and filling it with use concerns.	Design process as opening the fuzzy front end of R&D for other stakeholders (struggle and negotiation).	1 Around and beyond the fuzzy front end: acknowledgment of continuous, conflicting and parallel contributions.
DESIGNER'S ROLE	The designer is the hero (designer = demiurge role).	The design team articulates the work (designer = user representative role).	Design stakeholders should be recognized and reinvented (designer = facilitator and gardener roles should also be exercised).	2 Away from only role based accounts and prescriptions: Collectives / networks and their trajectories, evolving roles and activities.
LOCUS OF DESIGN	The brief and the object are the locus.	Context of use should be the locus	Process and roles can be the locus	3 Frameworks that do not require a specific centre to focus attention on: Polycentric locus as both more realistic and likely to yield results

Table 3 Situating design practices and knowledge, current gaps and emerging themes

In the developments of these emerging themes, a salient strategy has been to take “time” into account as a more fundamental component for design. We see this both in terms of raising it as a key variable when doing interaction design (see e.g. Mazé 2007, Redström 2001) and in generally identifying it as a neglected dimension when structuring design practices (Kyng & Henderson 1991, Fischer 2011).

EVOLVING

In what follows, I will present three developments that have sought to articulate good practices to account for and support extended design processes and designs that engage with the increasing predominance of design-in-use instances. In the context of my work, they introduce the rationale behind some of the work carried out in the cases and provide a frame to better understand the strategies suggested in this thesis.

The first one is referred to as **Co-realization**. Co-realization (Hartswood et al. 2002) deals with a principled synthesis of ethnomethodology and Participatory Design developed to address what Dourish and Button (1998) called the “paradox of ethnomethodologically informed design”. This means that the implications of a new system for work practices do not become evident by studying the work as it is now; they will only be graspable during the system’s subsequent use, as Dourish and Button so vividly illustrated. Co-realization thus proposes that there is a need for more radical and shared practice between users and IT professionals than proposed by PD. These practices should be grounded in the lived experience of users in-situ, beyond the deployment of prototypes in important dimensions. From a co-realization point of view, designers should continue to be present at the workplace for extended periods of time, allowing both the workers as well as designers to *jointly realize* where the system and work practice could be taken and then iteratively realize these development directions as they emerge (Hartswood et al. 2002).

Co-realization, co-location, and emergence are important and unavoidable dimensions that end up clarifying and opening up possibilities for further development (Voss et al. 2000, Voss et al. 2009). Co-realization engagements are concrete in the sense that a shared object is not only envisioned but also continuously *realized* and followed-up on for longer periods of time and via mutual commitments and alliances between various stakeholders (Hartswood et al. 2007, Büscher et al. 2009). Co-realization has been successfully deployed in research projects around various medical IT applications and manufacturing IS systems.

Along parallel lines, the second development is located in between **Meta-design** and **End User Development (EUD)**. On the one hand, Meta-design has been proposed as an alternative system design practice that bridges participatory activities towards those of evolving working life contexts (Fischer & Scharff 2002, Fischer & Giaccardi 2004). This should be embedded in current “cultures of participation” (Fischer 2011, Jenkins 2006) framework. A central tenet of Meta-design is to develop during ‘design time’ systems that are under-designed, yet complete. The resulting Meta-design environments are then made available to “owners of problems,” who participate directly in the evolution of the systems. Having said that, it is important to clarify that for proponents of Meta-design strategies this is not about open-ended design; rather, Meta-design is about taking into account a concrete domain and a particular system. Meta-design discusses the centrality of creating a framework for seeding both technical and social components (Fischer & Ostwald 2002) to allow for periods of intense participatory activities and more slow-paced interventions, and then closing up with an enhancement and re-structuring period during which the system is sharpened and fine-tuned.

As co-realization, Meta-design is also based in concrete outcomes (e.g. systems), but, in contrast to it, its strategies include developing sufficient flexible functionality to allow users to make re-designs during ‘use time’ without or with minimal developer involvement. It also identifies the need to develop ways to help users share those changes and adaptations with others in order to support further design-in-use. Some of the concrete techniques and tools for achieving this are referred to as “End User Development (EUD). The EUD proposition builds directly on the discussion initiated by Henderson and Kyng (1991) to ‘continue design in use’ in order to enable users to influence the information systems of their work (Lieberman et al. 2006). It merges it with parallel strands of research on end-user computing and programming (Nardi 1993). EUD thus seeks to understand adaptation and the ‘tailoring’ of technology to changing requirements at use-time by developing highly flexible tools and systems that are within reach of non-professional software developers.

The third and last development is more conceptual in nature. I locate it along two lines of discussion: on the one hand, a call for serious engagement in **Infrastructuring** (Björgvinsson et al. 2012a, Björgvinsson et al. 2012b, Ehn 2008, Pipek & Wulf 2009); on the other hand, propositions for engaging in **Thing Design** (Ehn 2008, Binder et al. 2011). Infrastructuring propositions take as a starting point previous work around the growing

importance of information infrastructures as an integral part of contemporary life (Star & Ruhleder 1996, Star & Bowker 2002). Star and Bowker suggested that, when interested in the *how to infrastructure*, what should be taken into consideration is more ‘when’ something is being perceived as infrastructure by its users than it is ‘what is’ an infrastructure that should be taken into account. While most design approaches tend to focus on particular artefacts, neglecting – more or less – the surroundings in which the artefacts are placed into, it is precisely these surroundings, which become a concern for Infrastructuring (Pipek & Wulf 2009). Accordingly, when doing infrastructuring a lot of design work should turn towards a continuous alignment between contexts and the ways in which this is socially achieved (Björgvinsson et al. 2012). From this point of view, **infrastructuring** becomes an engagement in experimenting with ways of achieving this alignment (Hillgren et al. 2011, Pipek & Wulf 2009) while accounting for the creative ‘design’ activities of professional designers and users across the divide and beyond technology (Karasti & Syrjänen 2004, Pipek & Syrjänen 2006) without necessarily privileging either view.

Thing Design, on the other hand takes infrastructuring work to the realm of what Science and Technology Studies (STS) scholar Latour has called *Dingpolitik*²⁷ or ThingPolitics (Latour 2005). In this move, the interest for infrastructuring as a central concern in design activities expands. Put another way, it relocates to exploring milieus where socio-technical configurations around public controversial things emerge; usually including design oriented interventions around social issues, alternative media production, public services and space, and related governance implications. This interest becomes Thing Design where these configurations bring into being not only “matters of fact” but instead bring into being “matters of concern”²⁸ through design activities, as a way of “Thinging”.

27 *DingPolitik* is a neologism introduced by Latour and his collaborators among other places in the exhibition *Making Things Public* (Latour & Wiebel 2005). The term is a provocative contraposition to the concept of *RealPolitik*, a German term used to describe modest, no non-sense (realistic) politics based on “matters of fact”, which is the usual way of dealing with naked power relationships. For Latour and his collaborators, DingPolitics in contrast should be preoccupied with “matters of concern” and those that gather and should gather around them carrying with it connotations of trouble, worrying, and respect (Puig de la Bella Casa 2011).

28 “Thinging” represents a modern take on the ancient Nordic and Germanic assemblies (a Ting) for which “matter of concerns” for a community were discussed and made public (see: Binder et al. 2011, Ehn 2008, Latour & Wiebel 2005).

That is, we are dealing not with “Design things” but *Things to design with*. An aim for engaging in these types of public controversial things is to contrast claims of democratizing innovation, stemming from innovation studies focused mostly on value creation for businesses, with other alternative practices, including grassroots or subculture approaches. For Thing Design, the constellation of relationships and resources that need to be realigned to reimagining innovation in these settings are – for designers – much more a matter of supporting future appropriation (Büscher & Cruickshank 2009), continuous matchmaking activities between collaborators that are unaware of each other, and even facilitating the prototyping of alternative futures (Hillgren et al. 2011, Moll 2012).

Co-realization and Metadesign approaches have been mostly applied in the workplace domain, often in technology-intensive and high value settings where a good fit between technology and work justifies high designer presence and costs and where the constellation of actors, even though large, is relatively stable (as they relate to the same domain or application area). The third approach, Thinging and Infrastructuring, presents the contours of a series of practices that are not as such formalized, but rather introduced as challenges for collaborative design practice to confront and build upon. In addressing matters of concern, this challenge appears as a timely reminder of relevance to the communal endeavours that I have presented as settings for this work. While many of the principles of these three propositions hold beyond the workplace and the public sphere and can certainly apply beyond technology development, some are in need of adjustment for settings with more undefined participants and less stable concerns or mundane settings. None of them – on their own – fully addresses the gaps in extant research that I have summarized.

When thinking of design as a set of practices spread over time and performed in multiple sites including use, then, not only does *design-in-use* need to be acknowledged and understood better, but also we could ask – as was proposed by Dietrich, et al. – how can those different and coexisting practices be understood in dynamic relation to each other? (2002). To help us account for the dynamic relationship between such coexisting and ongoing design practices we need to rethink concepts. I propose that one such concept should be an expanded notion of *design space*. In terms of communal endeavours, the existence of multidimensional design spaces is an unavoidable feature. Thus, in this type of settings, a better grasp of the evolving qualities of this notion is needed, one that could avoid the proposition of simply “ad-hocking” one’s way through it.

In Table 4, I use the example of a simple button to illustrate possible expansion of concerns in different directions, when situating design at large. From design spaces dealing with the button's shapes all the way to those dealing with the communal endeavours associated with a button. In the next section I will elaborate the background thinking for proposing the notion of design space as a potential framework to approach some of the gaps identified in the projects of situating design, in particular, as it refers to communal endeavours settings.

2.3. Understanding a Design Space

In this section, I update and clarify the parts of Article VI that explain why a reconceptualization of the notion of design space is needed, where the framework comes from, and the particular stance of the concept in my work.

As a starting point it is fair to say that the word pair *design space* is evocative enough to have been found relevant both in design research projects and in practice. It is not an uncommon concept in design research literature²⁹; it is part of the standard jargon of professional practice and it has also made appearances in more general innovation literature, as we will see later.

Even though the term is fairly common, seldom is it defined what space actually is or consists of. A short detour to some common uses of the word in design discourse helps to clarify some of the assumptions it presently carries and to identify its current limitations and potential. In general terms, we can say that the concept of design space is used to highlight the fact that, during the initial stages of a process, there is freedom to choose from many options and to explore alternatives (e.g.: Fischer & Giaccardi 2004, Gaver 2011, McKerlie & MacLean 1994, Sanders 2001, Westerlund 2005). Sometimes the term also seems to refer to all design relevant information that is available for designers in a design process (e.g.: Hassenzahl & Wessler 2000, Sharrock and Anderson 1994). Another use is to describe it as a territory that expands and contracts; for example as the brief or

²⁹ See (Sanders & Westerlund 2011) for an overview of current uses in relationship to their proposal for developing *co-design space* as a concept. Moreover, there are few recent doctoral dissertations that deal centrally with the concept (Giaccardi 2004, Heap 2007, Leerberg 2004, Westerlund 2009) and several references to it in current design research (see, e.g., Binder et al. 2011, Gaver 2012, Höök & Löwgren 2012).

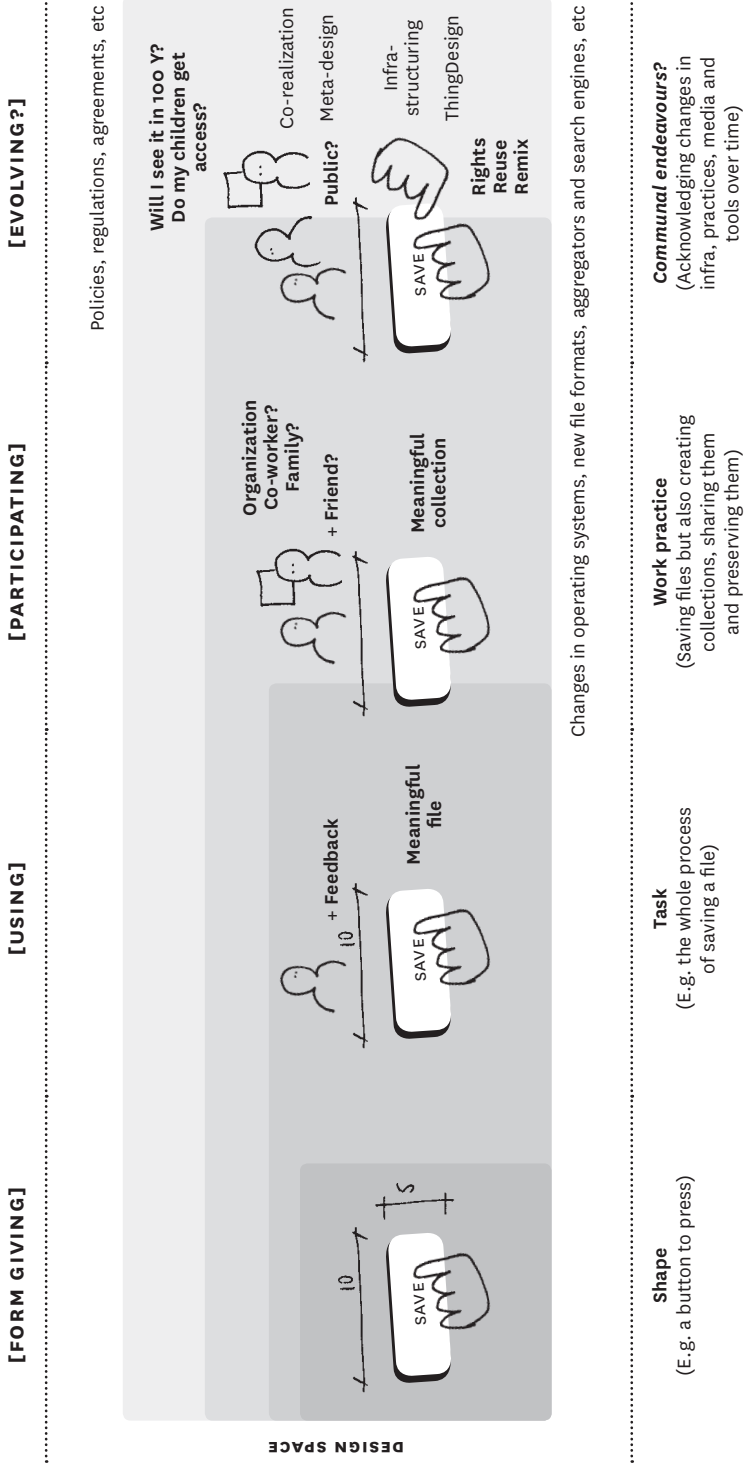


Table 4 Situating design practices and knowledge, possible design spaces of a simple save button

challenge for the project changes during the process (e.g.: Gero & Kumar 1993) or as the conceptual space that relates to a project is clarified (Heap 2007). It has also been used in relation to the increased scale and complexity in human interactions made tangible by technology, which presents different, and sometimes new spaces for design action (Giaccardi 2004). Recently the term has also been linked to the wider discussion regarding the role of place, space (Binder & Hellström 2005, Sanders & Westerlund 2011), and materials (Agger-Erikssen 2012) in present day design practices.

In terms of potentials, the metaphor of a territory seems to help those engaged in design activities deal with contingency, as exploring a territory calls for flexible strategies (Heap 2007, Binder et al. 2011). Making explorations and carrying out experiments around a territory is not the same as following a rigid linear process and being in total control of it, as design sometimes has been presented. Moreover, the concept also works well to develop an understanding of design process not from the point of view of problems, but rather from the vantage point of view of propositions and action. In particular when we conceptualize it as a "*territory of possible solutions*" (Westerlund 2009 p: 35, see also Gaver 2011).

In terms of limitations, there are two common threads emerging in this design research literature. First, a *design space* is usually described from the point of view of a typical design actor – a designer or an organization involved in the creation of a product or solution. It is as if professionals are those who explore the design space and define it. Sometimes, of course, this exploration can be done in collaboration, as advised by UCD or PD traditions. However, in such cases, it is almost implicit that it is a designer initiating the explorations or inviting people to do so. Second, the design space tends to be treated, if not as an abstract space, as a territory that is open or visible at the initial steps of a process or in concept design. In fact, the assumption seems to be that the design space is a feature of the early stages of the design process (as understood from a maker/producer's angle only) and that there is no need to return to it or perhaps no possibilities of inhabiting it for long.

This stands in contrast to other takes on the matter in more recent design research that characterises design space as emerging landscapes of design co-constructed over time and space (Binder et al. 2011). It appears even more limited when looking at other uses made visible by empirical investigations in several strands of research located in-between User Innovation (UI) literature and the science and technology studies (STS) literature. Their discussions point out other relevant dimensions of a design space

that have not been fully acknowledged in design practice and research. To start with, the UI literature offers clear evidence that illustrates how, besides producers and designers, at least the so-called lead users (von Hippel 2005) have capabilities and actually engage in envisioning and constructing a design space by themselves. These studies show how this user activity has led to the creation of completely new product genres (e.g., Baldwin et al. 2006, Flowers & Henwood 2010) and contributed in important ways to the emergence of new fields and industries. Such arguments empirically challenge the tendency to treat the point of view of the designer (or producer) as a given. When looked at broadly, distributed accounts of innovation, like the ones provided by UI literature, show particular ways in which a design space is collectively explored and how it can be constructed by a network of peculiar stakeholders – like users – motivated by logics other than that of mere product development (von Hippel 2007). However, these conceptualizations still convey an idea of the design space as a somehow predetermined or predefined area, which is then “mined” (e.g., Baldwin et al. 2006 p:8) by particular stakeholders, including users.

The second strand comprises a range of research contributions in STS that argue for expanding even more radically the scope of what counts as innovation. Insights from these works suggest an even richer and ongoing view of the design space that is being explored as innovations (practices and technologies) emerge and develop. These accounts, for example, have pointed out the ways in which individual user customizations of technology reframe the design space of such technologies (Eglash et al. 2004). They have also shown how the social practices that users engage in and extend form a big part of the design space that is ultimately collectively charted and created. In these accounts, the sceneries of everyday life (Shove & Pantzar 2005, Shove et al. 2007), the development of particular practices, and user interests (Hyysalo 2007, Tuomi 2003), including the horizon of actual skills and the bounded imaginations of different stakeholders, all determine the potential for both future practices and technologies (Hyysalo 2009, Hyysalo 2010). Finally, they also contribute to a new understanding of the ways in which agencies and boundaries between people and technology might be imaginatively and materially reconfigured (Suchman 2007) and provide a means to map the trajectories, histories, and resources beyond the front end of innovation (Pollock & Williams 2008; Hyysalo, 2010).

Such understandings of the design space go beyond the abstract and limited fuzzy front-end design space usually acknowledged by producers

and designers. The two important and most immediate implications of these insights for reconceptualising the meaning and significance of developing new notions of design space are: first, exploration and construction of a design space – in line with the idea of a collective endeavour – is done by a variety of actors (not only producers or designers, or designers inviting users into some user centred process) at different points in time and always in relation to certain resources. Secondly, an understanding of a particular design space should be expanded to include other things, social practices, protocols, and agreements and not only the immediate surroundings of particular technological artefacts and choices.

In his PhD dissertation, Bo Westerlund has elaborated an understanding of design space in terms of a conceptual tool to design and understand design processes (2009) that offers a good starting point to elaborate upon. Through his research, Westerlund found that design space explorations, in practice, are not only done from the point of view of problems or briefs, but rather from the vantage point of view of possible solutions. Those solutions, he claims, are what actually constitute the design space. When done in collaboration and in an open-ended manner with different stakeholders, the explorations seem to be more thorough and meaningful for those involved. From this perspective, the design space is turned into a useful concept to reframe and develop more up-to-date design process by focusing on possibilities rather than dwelling on problems alone, which is the common stance in many current design models. While his conceptualization identifies the co-operative nature of this exploration and moves the focus from problems to possibilities, it could be refined further to include:

- 1 A way to map trajectories, histories, and resources around and beyond the fuzzy front end.** The design space could be a *performative tool* to communicate *where we have been* and *where we are now*, or even “*where we could be*”, to all those with a stake in the process. This could certainly aid in communication between those involved in a joint venture and help bridge tactical and strategic conditions.
- 2 A view that accounts for the activities everybody is engaged in (not only their roles), regardless of whether they consider them as design (or use).** This can complement role-based accounts of particular events (e.g. facilitator in workshop, designers in a co-design session) with a more situated view of how, e.g., the roles evolve over time. So that collabora-

tive design strategies could be recognized at multiple levels and more critically explored.

- 3 A wider definition that includes not only well-formed solutions and the presence of users, but includes collectives, practices, materials and resources** that are present in a design endeavour at particular moments; *insofar as they could be potentially rendered as design-able* or not. This also opens the possibility of polycentric strategies to be acknowledged, instead of centring inquiries and actions around a particular focus (the object, the user, and her context or the process and the roles).

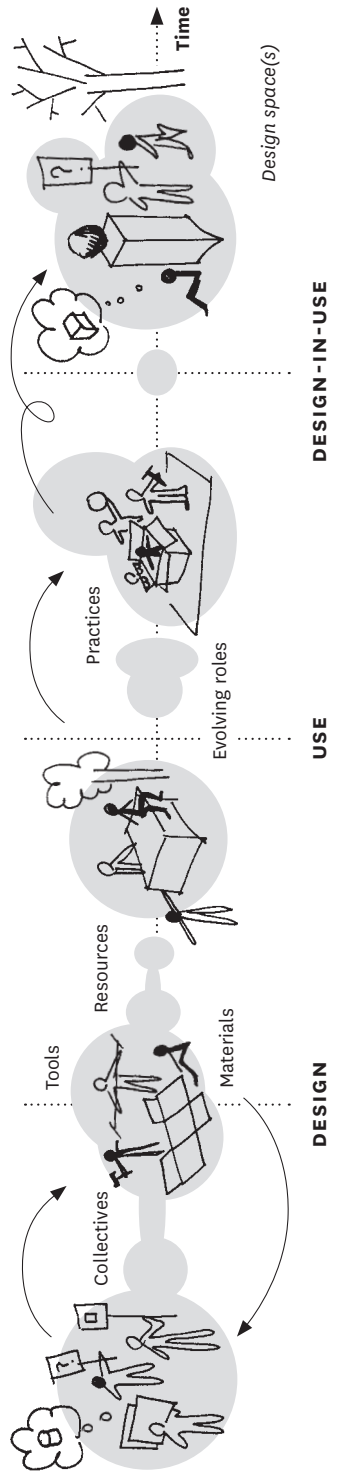
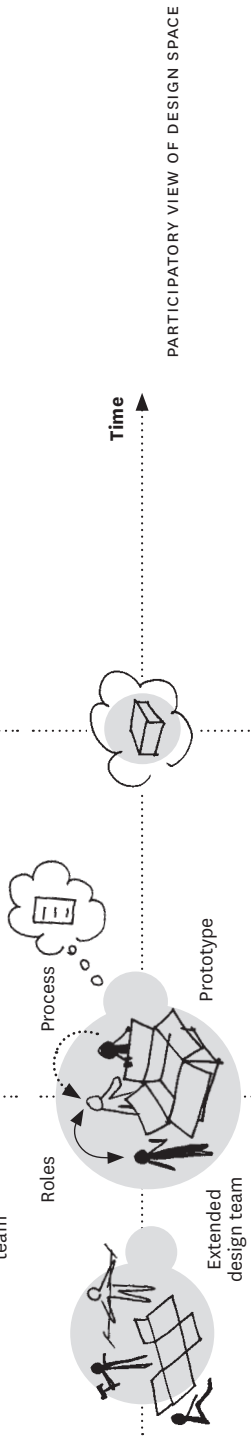
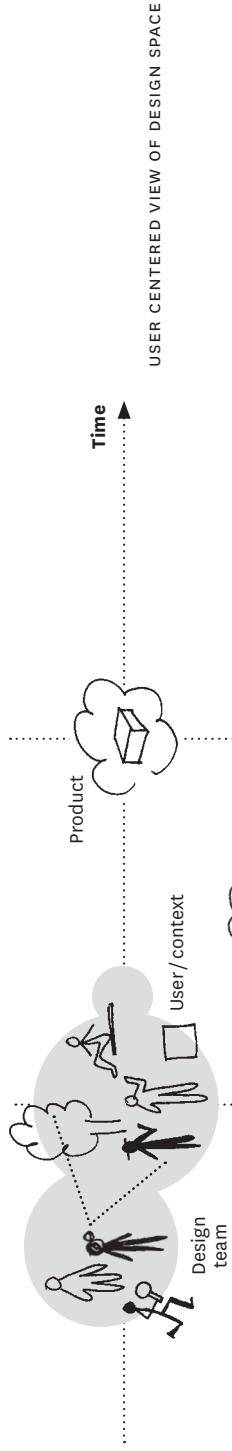
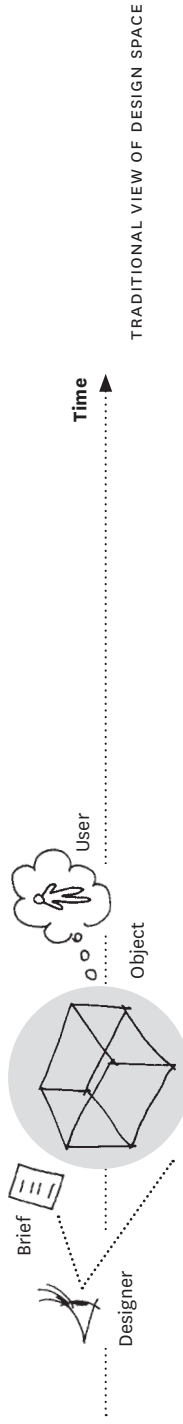
In most design research, the identities of those involved: designers, users, and producers are usually considered stable, despite the interest in exploring new roles (Redström 2008, Suchman 2007). Thus, in Article VI, we followed Redström's invitation to develop ways to explore "*what it is that we do rather than who we are*" (2008 p:410) with respect to a design process in order to avoid unproductive user-designer dichotomies. Based on our experiences and in line with the accounts of Binder et al. (2011), we argued that a design space is neither pre-existent nor static; rather, it emerges as the presence of different designs, stakeholders, tools, technologies, and materials, as well as social processes and agreements evolve. In this piece, we introduced a preliminary definition of design space as "*the space of potentials that the available circumstances afford for the emergence of new designs at multiple levels*". Put differently, this means that a design space is not an abstract feature, but rather *a relational quality among people, things, and activities* at particular times. Within such space, all those who are "designing" make choices and eventually, instantiations of *a design* come to being, transform, or even disappear. These are ongoing relationships that precede and extend beyond any given design stage, and, as such, intentional design interventions need a more nuanced framework to locate, manage, and critically reflect on their collaborative nature on an ongoing basis.

Figure 7 illustrates a set of different versions of the design space and suggests the contours for an expanded version of the design spaces available. The illustration aims at summarising central elements of the classical version of the design space, delimited by what surrounds an object as understood by the detached work of a disembodied designer. The design space in this view is only there to be grasped or affected in an ideal concept design stage. The second version of the design space, typical of user centred design practice, seems to concentrate on the ways in which observing

use situations and contexts – via the work of a more embodied but still distant design team – is made possible. The third version relates to current co-design and participatory design practices, whose design space version focuses more on what is possible by the joint exploration in the process, via the shared work of multiple co-designers who all have new roles. A design space also visible at limited encounters that are staged by some particular actors. A reframed notion of design space should recognize more explicitly that there are multiple design spaces, and that such spaces come together through time, in the interactions of collectives, tools and resources at hand. Through this recognition, design-in-use becomes an important site for multiple actors, their social interactions with and through technologies and processes to converge or be mobilized by different stakeholders, in an ongoing basis (Floyd & Twidale 2008).

What I am after is to elaborate in more detail, a nuanced conception of design space(s) that is temporally expanded, situated, and attuned to current insights of how design and innovation process actually unfold and how we might imagine them anew. In order to update and elaborate the proposal for such a conception of the design space, I will first turn to my empirical cases to introduce the research design, the settings, the materials, and the analytical approach that form the basis of the insights presented in Chapter 4.

Figure 7 A glance at different versions of a design space



3

**Research design,
cases, and methods**

This section presents the research design strategy followed and the empirical materials gathered accordingly. First, I explain my general research design, which weaves together design engagements as part of the research strategy. Then, I provide an overview of the cases, the type of materials, and the data accumulated through engagement with the participants in both projects, and I describe briefly the main design devices we built. To close, I recount my choice of analytical strategy.

3.1. Research design

My basic strategy draws on several methodological choices founded on a pragmatic philosophy that is common to design research, although there are varied flavours to it. A central tenet of this strategy can be formulated, in Nelson and Stolterman's words, as: "*making meaning by causing things to happen*" (2002 p: 49). Some have placed the accent in the design "project" as the variable that should drive the inquiry (Diaz-Kommonen 2002, Findeli 1998, Findeli 2008), while others concentrate on highlighting, in a different manner, the relationship between the activities of design and of research (e.g. see discussions on Fallman 2008, Jonas 2007, Leinonen 2010), giving different priorities to each, depending on the type of engagement or objectives. A more pragmatic proposition reframes these discussions by proposing the existence of a general constructive design research strategy (Koskinen et al. 2011). This means research projects are framed in ways such that planning and doing are not separate and a central place is

given in the inquiry process to a *construction*³⁰. This construction is usually in the form of a prototype, even a concept of a product, a system, a space or media (Koskinen 2008, Koskinen et al. 2011) that helps channelling activities, questions. Because the construction is intentional, the product of iterative reflection-in-action, it helps at the same time to articulate hypotheses (Leinonen 2010).

Since my interest has been in examining ‘doings’, specifically the ways in which designing can be enacted collectively in a comprehensive sense, my main course of action has been engagement in practical design and production work during my participation in two different design research projects. Each design engagement was planned and conducted so that it could generate opportunities for contributing to the design and development of concrete constructions (e.g., concepts, scenarios, prototypes) and their associated practices, in collaboration with others. I have carefully documented those processes and the results (e.g., design devices, artefacts, scenarios, etc.). In doing that I been attentive to the particular design practices that generate those results and to the everyday practices those results aim to contribute to, as they pertain to the idea of *communal endeavours* that I introduced in Chapter 1.

In using the term “practices,” I refer to those embodied, materially mediated arrangements of human activities that are continually reproduced and that are shared and evolve in a variety of social settings (Schatzki 2001). I follow the assumption that practices are organized through practical understanding (Suchman et al. 1999) and constitute a kind of silent and ubiquitous “consumer production” (De Certeau 1984). This has been suggested as a useful entry point to understand interactions between design and use, beyond traditional designer-user dichotomies (see e.g., Suchman et al. 1999, Kimbell 2012) in line with similar propositions regarding the reconfiguration of dynamics of consumption and production (Shove & Pantzar 2005) and new conceptualizations of the on-going processes of innovation, which also happens in ‘what people do’ (see e.g., Hyysalo 2010, Shove et al. 2007).

30 Similar methodological concerns are presented in related fields, such as information systems, where there are research methods under the rubric of constructive design research approach and design science research (see e.g., Hevner et al. 2004). The concerns in this tradition focus more on how to scientifically validate the design steps involved in making the construction (e.g., system).

At the same time, the constructions and the engagements in general have provided insights into how to think about collaborative design, and provided resources to try that out in practice. The insights I have gained in these processes are structured and presented with the notion of the design space framework. Therefore, in addition to the constructive design research strategy, I also borrow elements from action research tradition (Lewin 1946) that are evident in the ways the broader projects were framed. Both design cases have a background in the Participatory Design approach, which has given a set of starting premises and tools for conducting the projects (see Table 1: Entry points, setting and frameworks for each engagement). On the one hand, PD has a history of Action research oriented strategies (see Bannon & Ehn 2012, Spinuzzi 2005). With an Action research approach the engagements are usually relying on a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the results of the action aimed at “...*the pursuit of practical solutions to issues of pressing concern to people*” (Reason & Bradbury, 2001, p: 1). This is very compatible with the constructive design strategy, as the research is at the same time providing some useful results (in this case not only very concrete tools and media, but also ideas, scenarios and other resources for action) for those engaged in the processes. On the other hand, for the PD tradition, participants are actively influencing the agendas and results of the engagement, since they are seen as “co-designers” there is an inbuilt sensitivity to pay attention to, follow, and document their design related activities (Spinuzzi 2005).

In taking a step back and comparing the engagements and carrying out the analysis, at times I draw on elements that are closer to a case study approach (Yin 2002, Stake 1994). I chose different cases to complement my picture on the subject. By contrasting and probing these partly similar and partly different interventions, I wanted to shed light on a wider phenomenon by illuminating some of its central parts. In other words, by describing unique and specific events (instances of change), a whole is explained by triangulating data from multiple sources and settings (Yin 2002). Concretely, it means that I have followed the development of these interventions and uptake of the “designs” through a long-term commitment to the sites of deployment (measured in years in both cases). I have then reflected upon these engagements with the help of my peers and collaborators through several interconnected activities: joint analysis sessions (via co-design workshops and project meetings), literature review in current design research, and writing peer-reviewed articles and their fur-

ther discussion in conferences and seminars. This second activity weaves together more clearly the theoretical reflections with the various design choices made, making the comparison possible.

3.1. Cases: activities and materials

LOPPUKIRI CO-HOUSING COMMUNITY AND MIINA

Loppukiri (in English: last spurt) is an alternative arrangement for senior housing initiated and developed by the Active Seniors association³¹ in Helsinki, Finland. For the activists involved the main motivation was to propose and try out ways of growing old that would be more communal, safe, and appealing than a lonely flat yet more personal, intimate, and active than the current senior service housing solutions in Finland³². The project of the association was largely inspired by the Scandinavian co-housing movement (e.g., McCamant et al. 1994) and in concrete by several Swedish senior community housing experiments that became familiar to some of the founding members of the association.

During the planning and construction years of Loppukiri, the Active Senior association had to adapt general co-housing principles to the realities of the Finnish context and in the process propose and experiment with new service arrangements for elderly care. For this, they designed and developed unique solutions ranging from ownership schemas for the flats, organizational rules for the community of inhabitants, and ways of cooperation with different parties and organizations that made it possible to realize their vision in a feasible way³³. Even though the project is far from being perfect, it has nonetheless proven to be an important experience.

-
- 31 The Loppukiri house is located in the Arabianranta neighbourhood in Helsinki, a relatively new regeneration district, which is also home to Aalto University School of Arts, Design, and Architecture. More information about the Association, its goals, and its current activities can be found on their website at www.aktiivisetsejorit.fi. Unfortunately, not much information is available in English.
 - 32 At the moment these are the basic, default arrangements that Finnish society seems to provide (see e.g., Sonkin et al. 1999).
 - 33 Dahlström & Minkkinen (2009) offer (in Finnish) a detailed account of the experience from the point of view of two active members of the association who are current residents. The book documents the many processes and challenges that the association faced, parts of the history of the project, and some of the collaborations they sought. The book also gives practical advice and a navigational chart intended for others interested in following their steps. Of related interest are the details of the collaborative work developed with the architecture office in charge of the design of the building.

Loppukiri in a nutshell

Currently, the house is home to 70 people living in 58 compact apartments with an average age of 60 years. The individual flats are smaller than normal, but the house has large common areas that include a library, a kitchen, dining room, guestroom, a multipurpose activity room, laundry room, and two saunas.

“We built at the same time a house and a community” (SM)

In order to keep an active life and continue building a strong community, the inhabitants of Loppukiri have agreed on a series of principles for their community: neighbourliness, self-help, community spirit, and open decision making processes. This is actualized in a series of practises aimed at coordinating everyday life. They take care of the maintenance tasks of the house themselves, prepare a shared daily meal that is enjoyed by all those that registered for it, everyone is encouraged to nurture other social activities like reading circles, yoga sessions, trips, and so on, and the house and their common areas are used as a resource for community life and interactions with the surrounding locality. At the logistical level, the teams rotate responsibilities such as cooking, cleaning and maintaining the house, and shopping. In addition, there are also several working groups to take care and develop certain specific aspects like: communications, cooperation partners, parties, and information systems. These groups guarantee the operations of the house and try to ensure everybody’s participation. Decision-making is organized through an association (created based on the experiences of the Active Seniors Association but which includes only the residents of the house).

The project of the Active Seniors to explore an alternative arrangement for growing old together in Finnish society served as basis for a long-term design engagement between members of the association and our research group. The collaboration started in an open manner early on when plans for the house were being sketched in 2000. The collaboration continued – in different shapes and funding instruments – throughout the construction of the house and has been active on and off since the seniors moved into the house in 2006. Table 5 gives an overview of the materials and data I rely on and indicates the activities that generated them.

A salient entry point to this case is the design and implementation of an intranet type of solution for Loppukiri, which the seniors named

ACTIVITY/	METHOD	DATA/MATERIALS	STAKEHOLDERS	YEAR
Participating in meetings of the association, visiting the house, taking part in events organized, following the use of prototypes in context and gathering contextual materials	<ul style="list-style-type: none"> Participant observations Semi-structured interviews 	<ul style="list-style-type: none"> Field notes and observations Audio recordings Miina use logs and feedback Screen-shots AS communication materials (newsletters and presentations) A book written by two of the AS members 	<ul style="list-style-type: none"> Active seniors association (AS) and Loppukiri inhabitants Designers /developers 	2000–2009
Self-documentation probe samples of media sharing practices, networks and a day in the life activities (3)	<ul style="list-style-type: none"> Group discussions Design exercises (e.g. building a collage, making a poster) Affinity diagrams and collages 	<ul style="list-style-type: none"> Probe contents (pictures, texts, photos) Analysis posters Field notes and observations 	AS (~6-10)	2002
Workshops on shared resources, spaces, coordination practices, safe and security, calendar, remembering and reminding (6)	<ul style="list-style-type: none"> Group discussion Design Exercises (e.g. card sorting) 	<ul style="list-style-type: none"> Pre task materials, summary posters, Pictures, Audio/video recording Field notes and observations 	<ul style="list-style-type: none"> AS Volunteers (~6-10) Designers /developers 	2002, 2004, 2005
Various experimental trials using prototypes for sharing information, cooking and gardening knowledge (4)	<ul style="list-style-type: none"> Field trials (creating content with protos) 	<ul style="list-style-type: none"> Repurposed software protos Presentation materials Use logs and feedback 	<ul style="list-style-type: none"> AS Volunteers (~8) IT AS working group 	2003, 2005
Workshops to look at concrete prototypes and uses -paper or functioning demo (3)	<ul style="list-style-type: none"> Group discussion Episodic interviews 	<ul style="list-style-type: none"> Pre task material Pictures, Audio recording Field notes and observations User created content 	<ul style="list-style-type: none"> IT AS working group (+ other AS volunteers) Designers /developers 	2006, 2007
Following the evolution of the artefacts	<ul style="list-style-type: none"> Tracking and analysing design decisions Documenting evolution of artefacts Concept maps Episodic interviews 	<ul style="list-style-type: none"> Issue tracker content and bug collector Excel documents produced by AS Screenshots User created content 	<ul style="list-style-type: none"> Designers /developers IT AS working group 	2005–2009

Table 5 Data sources for Case A

*Miina*³⁴, their Everyday Life Management System, and which in our research group we called *DailyWorks*³⁵. This prototype concretized – in code – some of the organizing principles and social practices of the community and the envisioned communal endeavours that we explored together. Over the years, it has been possible to observe instances of how the platform has been hacked, evolved, or served as inspiration and playground for other developments inside the seniors' project. In the same vein we are also witnessing how it has also been partly abandoned as a result of both its inherent limitations and new circumstances.

Miina in a nutshell

Miina is a collection of web-based tools for the Loppukiri community, which assists in the negotiation, coordination and sharing of everyday life activities and information. Using Miina, residents of the house (and others with special rights) can set up personal and shared calendars to organize communal events and happenings (dinners, theatre trips, etc.), allocate and manage household maintenance tasks (cooking, cleaning etc.) and reserve and manage shared resources (sauna, laundry room, sewing machine, etc.). Furthermore, Miina offers a way to create shared repositories of information and ideas that can be designed and maintained by the community itself (examples of some of the implemented resources include: recipe book, a general bulletin board, a flea market announcement space, a simple log).

The software is available under an Open Source license under the generic term of DailyWorks (DW) at <http://arki.uiah.fi/adik>. However, development is no longer active.

34 This is in honour of Miina Sillanpää (1866 – 1952) who was one of the first nineteen female members of the Parliament of Finland and Finland's first female minister. During her life, she was active in various areas, including journalism and politics. With their choice, they wanted to point at the fact that the system should do almost "as much as Miina did" during her lifetime.

35 Our team decided to give the software a different name in order to abstract it from Miina, the specific implementation and configuration for the seniors. In doing so, we wanted to keep an eye on use cases relevant to groups of friends and clubs, residents associations, extended families, food buying circles, day-care circles, and others that could potentially benefit from a similar platform as the one we were developing with the seniors.

Components:

Core: Operates as framework for other products and takes care of common use cases such as login and navigation. Other products and components are able to be plugged into it.

Personal Calendar: provides each member with a calendar in which they can organize private and public events, register for community activities, follow their reservations, and subscribe to other calendars available.

Group Calendar: a shared calendar for planning, informing and registering for interesting events.

Dining Calendar: a special kind of calendar for planning and registering for shared meals. This calendar provides different reporting options that allow the community to plan shopping and organize billing activities if needed. A dining calendar can be connected to a shared recipe book to create the menus and organize the cooking and shopping.

Resource Calendar: another special kind of calendar that can be created for each shared resource, allowing the community to set rules for their use and for managing their reservation or availability.

Profile: collects the personal information of each member of the community.

Cardbox: a generic tool that can be used to create, group, and organize information into meaningful collections with unique structures. Each CardBox can have its own structure and fields that can be changed and evolve easily without the need of programming.

Technical Implementation:

DW is built using Zope 2.9. It also takes advantage of code from other existing Zope products, namely CalCore, CalZope and CPSSharedCalendar.

CITIZENS, CITY OFFICIALS AND URBAN MEDIATOR

Urban Mediator related engagement has its most concrete origin in a European project we were involved with aimed at exploring solutions rooted in Information and Communication Technologies (ICT) “[to] *help raise productive participation by citizens in how their cities are managed and to help city administrations provide cost effective, location-aware services to citizens*” (Jung, 2008, p. 2). At that point in time, in Helsinki, as was the case in many other places and certainly for the other cities participating in the project, e-government initiatives seemed to carry the inherent assumption that, by providing a sufficiently overarching city system (e.g., a new issue reporting and tracking platform) or a new user-friendly entry point (e.g., one-stop government services shop), an increase in “participation”

would automatically follow or “participation” would be fulfilled. In contrast, our main goal was to facilitate more experimentation around what participation might mean in Helsinki through a prototype online platform for sharing information we called Urban Mediator (UM)³⁶.

Our activities thus centred on the study of practices, technologies, and socio-technical arrangements for creating and sharing location-based information about the urban environment. Table 6 presents an overview of the materials, data, and activities involved in this case.

A springboard for some of the concrete interventions was the search for ways to address a simple observation: conducting any kind of experiments that could connect citizens’ input and knowledge with the knowledge and/or responsibilities of city officials was not very much encouraged neither by the systems nor the practices in place on both sides. Our evolving working hypothesis was that by offering through UM interfaces for the data (in this case locative media) of a variety of actors, we could create conditions for more experimentation. Experimenting with communal endeavours could also allow participants to understand in more precise ways the implications of citizen participation (e.g., citizens locative media creation practices, initiatives, and contributions) and of an eventual collaboration between city officials and citizens.

Urban Mediator (UM) in a nutshell

UM is a web-based framework that provides a way to create, obtain, and share location-based information and tag it. This collected information (**UM Points**) can be organized according to topics of interest (**UM Topics**), which can be set up and maintained by any registered user (citizens or city officials).

UM uses a map-portrayal service as a means for representing the location-based information and complements it with a set of tools to help process, share, and organize the points. UM also provides tools for exporting data from UM and for connecting UM to other sources of data. These tools include **UM Feeds** (e.g.: RSS, Atom/GeORSS, KML) and **UM Widgets**, which allow some of the functionality of UM and the data it contains to be used or embed-

36 The initial concept used in the project proposal for the EU was based on ideas presented in the MA final degree project of my colleague Joanna Saad-Sulonen, as well as on the long standing interest of our research group leader Kari-Hans Kommonen on the idea of an urban “bug tracker”.

ACTIVITY/	METHOD	DATA/MATERIALS	STAKEHOLDERS	YEAR
- Contextual studies and interviews	Semi-structured theme interviews Participant observation	<ul style="list-style-type: none"> Field notes and observations gathered in research group site. Audio recordings 	Arabianranta Residents Arabianranta Parents Associations 5 Arabianranta e-moderators (active citizens that volunteer to moderate digital bulletins of the buildings in the neighbourhood) 10 City officials (different dept.)	2006-2008
Workshops for mapping practices related to location-based information (2)	<ul style="list-style-type: none"> Group discussion Collages 	Sketches and maps made (Paper map, stickers and tasks). Repurposed software protos	3 e-moderators 4 residents • Designers /developers	2007
Experimental trials for gathering and sharing location-based information (3)	<ul style="list-style-type: none"> Group discussion Collages 	<ul style="list-style-type: none"> UM early seed prototype + scenarios User created content 	3 e-moderators 10 teenagers (school class and one teacher) 1 employee of the local development agency in Arabianranta	2007
Workshops charting emerging practices Mixing the use of prototypes and workshops for ideation (4)	<ul style="list-style-type: none"> Group discussion Affinity diagrams Episodic interviews 	UM prototypes and UM online service, other related services (e.g., Arabianranta portal, city department website), and paper prototypes with scenarios of use	3 local development agency employees 2 active residents lobbying for a community house 2 city officials from the planning department and 1 from the city's research unit 2 employees at the local contemporary art museum	2006-2007
Cases with the city of Helsinki: Bunny rabbits in Helsinki (5 months), Malminkartano traffic safety planning (3 months), Skate park design and location	<ul style="list-style-type: none"> Participant observation Episodic interviews 	<ul style="list-style-type: none"> User created content in UM online service (beta) and external online forum Content of websites (inc. Helsinki city CMS) Screen-shots 	1 city official (public works department) 1 city official (city's research unit) 2 city officials (planning department) 2 city officials (youth department) ~ Citizens (in general)	2007-2010
Independent cases and other short experiments		Use logs, screen-shots, feedback feature of UM (alpha and beta)	~ Citizens, planners, city employees	2008-2010
Following the evolution of the artefacts	<ul style="list-style-type: none"> Tracking and analysing design decisions Concept maps 	<ul style="list-style-type: none"> Issue tracker content and bug collector Excel documents produced by officers Screenshots User created content 	• Designers /developers	2006-2009

Table 6 Data sources in Case B

ded in other online places. The user interface is available for PC and mobile browsers. There was also an experimental mobile application developed.

UM is meant to: 1) support the creation of repositories for sharing annotated locations in the spirit of openness and user-created content; 2) permit the aggregation of local and external information sources by means of harvesting and/or syndicating existing data, which in turn allow for the reuse and cross-fertilization of information; 3) provide tools to host both official and public initiatives or “projects” for location-based information collection; 4) facilitate the creation of explicit channels to other systems, such as public authorities back-end systems, in a lightweight manner.

The software is available under an open source license at <http://mlab.taik.fi/urbanmediator/>.

Currently there are two active UM instances on our university servers: the UM Helsinki (uses map data provided by the City of Helsinki), and the UM Helsinki Open (uses a freely available map data from the OpenStreetMap project)

Technical implementation:

UM server side is built using web.py 2.4, a python web framework that uses MySQL database. Additional code for the geodesic calculations and cartographic transformations is based on ElementTree, PIL, and PyProject.

3.2. Methods and analysis

A main pursuit for this research has been to connect design-in-use activities to professional design practices and further link them to collaborative, open-ended design processes in everyday life contexts. This aim entails an iterative and exploratory approach that is at the same time constructive and descriptive. I consider the sites, tools, media, and practices that relate to communal endeavours interesting places to study the dynamics of collaborative design, not because they will be representative of all design situations, but because collaboration in these settings can be avoided neither in design nor in use. Having two differently positioned communal endeavours allows me to compare and offer generalizations that could be of use to other collaborative design settings.

As an active participant in both the management of the design projects and in design and production, I have been able to collect, first hand, a

large body of empirical materials in close collaboration with a variety of stakeholders. These materials have served as a springboard and setting for the development of the themes and concerns, as well as for interventions and further data gathering. As presented in Table 5 and Table 6, the diverse body of empirical and design material which I rely on has been collected through diverse means.

At the onset of each engagement, participant observation and semi-structured interviews allowed us to get an initial entry point to the design cases and thus set the initial framework for the interventions (design ones). The main aim was to get a picture of current practices and provide a common handle for broader discussion on future practices as well. As the projects developed and more concrete interventions and prototypes emerged, workshops, design sessions, and group discussions also became a primary means of driving the design work, and by the same token the main sources for material and data collection. Along the process, I wrote field notes, collecting in them my observations, questions, and sketches. I have also made use of notes and materials created by other members of the research group as we had a practice to share our notes in a common wiki to help us in moving the practical production work forward. In addition to those notes, I have also stored and consulted the e-mail exchanges with key collaborators. During workshops where conversation and discussion was intermingled with actual making (collages, story boards, etc.) and construction (paper prototypes, talk out loud sessions), it was not feasible to write down notes all the time, so I did it as part of our team debriefing session, usually conducted immediately after an event, visit, or trial. Depending on each occasion, the team consisted of designers, software developers, and social scientists, whose presence and insights I have used as resources. While workshops and working sessions were sometimes recorded (audio or video recordings), it would have been unfeasible to include all the hundreds of hours that accumulated after the years. I have used these recordings to update my field notes³⁷, the wiki development environment, and the software issue tracker.

As the engagements proceeded, participant observation in the workshops has been complemented by episodic interviews and a variety of ac-

37 Done in cases where my own role in the events as participant did not allow me to take detailed notes. On some occasions, they have also served as back up documentation in cases where we had dissimilar observations among the team.

tivities linked with collaborative prototyping and deployment of the working prototypes in the actual contexts of each communal endeavour. Thus, I have also taken advantage of materials generated as by-products of the use of actual prototypes. Since many of the interventions and the two main platforms (design devices) are digital, in both cases I had access to the content created by end users and to the logs of the systems. When looking at the evolution of these artefacts, I have recorded how the artefacts changed over time by: 1) documenting the scenarios, the results of the design tasks, and artefacts made in the workshops; 2) Observing the use of the prototype platforms and taking screenshots of them at regular intervals; 3) taking notes and following the issue tracker and the bug collector of the software development environments. Through what has been recorded there, it is possible to partially reconstruct the evolution of the features in the code, as well as track many design conversations and the resulting decisions with a good level of detail. In addition to these, I have also collected examples that illustrate important turning points and illustrative contributions made in the prototypes by taking screenshots of them.

I am (painfully) aware that the amount of materials and data generated by the closely intertwined design projects and research work can be problematic. On the one hand, in the midst of advancing practical production, securing deadlines, and trying to be truthful to commitments done to the partners, it is possible that I have not been so careful and could have compromised the rigor of data collection. On the other hand, as I have been an active participant and interventionist, it might have been difficult to avoid certain issues like taking explanations at face value without questioning the underlying assumptions, especially when some analyses are based not only on “materialized” accounts of what went on, but also on my personal involvement and judgment of what is important to do and follow. This might mean that at times I could adapt the materials to changing theoretical perspectives or interests. I tried to minimise that by following closely instances in which the evolution and change of the artefacts were discussed, keeping consistency in my notes and sharing my observations and insights with my peers and collaborators at different points in time. I have also followed the process from other perspectives (looking at the e-mail exchange archive, the issue tracker, and our shared wiki or by conducting informal interviews about my interpretations).

The general analytical strategy I have followed consists basically of bringing together *emergent themes* as the engagements proceeded and then looking at those themes across the materials and data collected in both

cases. Both for purposes of design work and analysis, I (in collaboration and independently) have found several key themes and critical incidents or turning points in the interviews, observation notes, and changes in the artefacts. I have compared systematically the themes and their recurrences across different materials at different points in time: 1) when planning for new co-design workshops and field trials; 2) every time we planned a new release of the prototypes; 3) while writing the articles. This means that there have been various loops and iterations between the activities, which have offered further possibilities to reflect on them and check their persistence and evolution, as well as to evaluate and develop the types of interventions and “constructions” to realize in close collaboration with different stakeholders (Stake 1994).

The engagement with the seniors’ growing old together project clearly precedes and feeds in many ways – conceptually and practically – the locative media sharing interventions done through UM. By the same token, the experiences and analysis processes of the second case have informed and challenged the analytical insights produced with the materials from the seniors’ case, which had already been carried out for the most part when the second case was at the height of its development. Accordingly, I have done reflection and analysis both at the level of the cases themselves and also across them, triangulating the sources and my insights to the furthest extent possible. This is both a strongpoint of the work and a possible limitation. It does show the persistence of certain themes and the relevance of the collective design spaces – as discussed in this work – in collaborative design from different point of views. However, both cases are also peculiar instances of communal endeavours made possible by particular social, cultural, and economical conditions in Finland.

4

**Expanding
design space(s)**

Having located the territory to which my research contributes, introduced the need for a framework to locate and reflect on co-design interventions over time, and presented the cases and research approach, I will revisit the material more thoroughly in this section, in terms of their design spaces and the supporting co-design strategies implicated. I will start by outlining some of the different configurations of the design space that emerged throughout and the foci they have had at different points in time and at the intersection of other stakeholders' projects and ours. By highlighting some points from the articles, I look at both cases together and present the findings in relation to three aspects: space, time, and things.

Articles I, III, and V introduce the settings, constituency building activities, and access design experiments that lay the common ground for the seniors' case. I have identified how instead of storming in to perform a joint large co-design project, we started with a small joint exercise that could help us all identify the constituency and define targets for design engagement, a sort of *access design*. At that point, the seniors' working group collaborating with us envisioned that a website for their project was a subtle way to encourage members to use computers more. We recommended adding an intranet with different levels of access to build new communication channels for the community, as they were still dispersed and getting to know each other. Trust and knowledge of each other shaped the initial configuration of the design space by having an open-ended design agenda focusing on the current and future practices of the community from the onset.

In the case of UM, no particular community existed a priori like it did in the case of the seniors; rather, UM prefigured certain practices. In other words, its aim was to offer a platform where the practices might come into being later on through the coming together of new communities and collectives via initiatives of teams and groups. Similar to the way that the seniors' Loppukiri project functions, UM can be seen as an attempt to re-research alternative arrangements for carrying out communal endeavours in a specific domain by developing an experimental platform and then cultivating³⁸ micro interventions around it.

Articles II and IV thus offer a parallel account of the UM case in which identifying the emergence of a constituency and defining targets for design engagement were even more relevant and also were achieved in part by early “access design” experiments. Article II concentrates on details of how the process started by building prototypes using repurposed software so that we could quickly start workshops with different stakeholders. With the help of those working prototypes, real location-based information and content was created in an experimental, hands-on, and reflective way with a range of people (through shorter access design experiments with residents and activists' projects). Later on, these design seeds were augmented through conscious interaction design decisions (e.g., giving predominance to the idea of widgets and feeds that could populate other services) to slowly emerge an *in-between* infrastructure where participatory projects could be constructed (UM). The first larger trial of UM made in collaboration with a city officer had a similar role of “access design” in relation to broader processes inside the city administration. In that case, this particular officer was taking part in a project addressing the response the administration should take to the increase in numbers of non-indigenous rabbits in the city, which among other things were linked to damage to the vegetation. The research was intended to feed a report about the matter to be used by the city's policy makers. Officials had some scientific information and data but wanted to get first-hand accounts from people about the areas where they were encountering rabbits and get a better grasp of the attitudes and opinions of the citizens regarding what should be done with the animals, as this was a controversial issue. Via UM we manage to collect in easy and manageable way detailed accounts

38 See (Aanestad 2002) for a discussion on cultivating as a metaphor for infrastructuring work.

of the amount of rabbits seen in the city, their eating habits and behaviour and location information³⁹. The UM board also created a link to the general discussion forum on the Neighbourhood Association of Helsinki, which partly contributed to channel and awaken the public discussion over how the city should deal with the rabbit problem. Thanks to this positive experience, new opportunities appeared for further collaborative development and experimental trials within the administration.

Collaboration strategies in both cases included setting up and carrying out traditional co-design techniques like joint production of scenarios, demos, concepts, and probes through shared workshops and events that, in line with previous research (e.g., Westerlund 2009), provided scaffolds and created conditions for the initial exploration of a common design space, in this case, not so much as iterations but as a way to open up the design space in a deliberative way and keep design moving. This is obvious in the way that some of the ideas for the communal endeavours that Miina was built upon have roots in a variety of *design seeds* emerging from these early collaborations. Articles III and V discussed the ways we collectively mapped and discussed the kinds of practices that could take place in Loppukiri and how certain issues gain focus from practical arrangements and rules all the way to new ideas about what to do and how to relate to others. In aiming for a long term engagement, *design seeds* were planted through concrete access design contributions, as well as with more general ideation activities that later generated new venues for collaboration and helped participants explore and identify relevant design spaces for them and how those could overlap with design spaces relevant for us in terms of e.g., project funding.

Another type of design seeds provided for what can be called *indigenous design*⁴⁰ spin-offs, meaning ideas that take shape and evolve outside of the specific design engagement and are usually implemented with resources within reach, often involving workarounds, social arrangements, and commitments and technology (Article V). In the case of the seniors, early propositions for developing an “on duty porter” video system, ended up evolving into the idea of an “on duty” role for members of the house who

39 UM tools provided import possibilities for the City’s own geographical Information system (GIS) format.

40 I take here the term “indigenous designs” as an extension of the concept presented in (Björgvinsson & Hillgren 2009) and a related discussion on ready-mades by the same authors earlier (Hillgren & Björgvinsson 2002).

could both greet visitors (porter) and, more importantly, be available to any resident in need of help. The seniors implemented this by simply purchasing a dedicated mobile phone line and rotating it among the residents. In later research, we have also identified similar spin offs for the case of UM and participatory urban planning (see also Saad-Sulonen et al. 2012)

Other types of design seeds also grew as scaffolds and triggers for open agenda and as concrete design and prototyping activities later on. Both cases show some of the many interesting and crucial co-design opportunities that emerged in use when a concrete working intervention – Miina or UM – was deployed and how we all took care of it. In both cases, efforts turned toward a type of in-between infrastructuring work deployed to help bridge the role of those concrete interventions in the total horizon of the communal endeavour practices. To that end, Articles III and V detail some of the challenges in the uptake, appropriation, and design-in-use of Miina and Articles II and IV details those challenges that arose the case of UM. In design-in-use, new aspects of communal endeavours are made visible; thus, the design space manifests differently, both in terms of a more nuanced understanding of the practices involved not only in situ, and due to the possibilities and limitations the design interventions create. In this case, both practices and Miina or UM themselves were transformed through the possibilities people found for reinterpretation, adaptation, and reinvention in the design space of their communal endeavours. These transformations included the image of Miina as a calendar towards that of an every day life management system (Article III) and then a sandbox like repository (Article V). At the same time, UM continuously morphed from collections of points or simple requests (Article II) towards more shared and full fledged projects and initiatives (Article IV).

The design-in-use activities included co-optation and hacking of features to collectively build proofs of concepts, e.g., a notice board prototype out of recipe book functionality in the case of Miina. This was done in order to explain their idea to us in a more concrete way and at the same time to try out the solution for themselves. Collaborative design activities also included artful integration⁴¹ and weaving Miina and UM together with other analogue systems (paper calendars, notice boards, and so on) or legacy infrastructures (city GIS system, neighbourhood association website, etc.), developing social agreements to handle things that were

41 In the sense of “artful integrations” used by Suchman (2002)

too cumbersome to change in code (Articles IV and V). In the end, these produced temporarily workable configurations to make certain practices possible by keeping commitments open to new developments. Being in the field, following the deployments of the prototypes in their context of use, at least once in a while, was certainly needed.

Seen over time, as design collectives, in both cases, we were always engaged in explorations and interventions at different levels of a design space, ranging from technical minutia to supporting and facilitating the extension of practices and even their understanding. For example, Article IV links some of the interventions made with UM to a broader understanding of active forms of citizenship instead of only participation. In that article, three instances of design-in-use design space explorations with UM are recalled. The first was the side project/game initiated by two active citizens documenting abandoned cars in the city of Helsinki and their experimentations in documenting graffiti art done in collaboration with a museum exhibition that presented both interesting and conflicting outcomes. Although it was important for many people to be assured that the “city” (or someone) was truly listening and able to act upon feedback from citizens, the ultimate consequences of these moves were difficult to predict and not always necessarily positive. The second was an intervention on the planning of new skateboard parks in Helsinki, which was carried out in conjunction with the youth department of the city and revealed seeds of possible communal endeavour approaches with skateboarders but lacked the support of a larger planning framework that would have made it possible. The third example made use of a citizen led initiative to document garbage in the city. The locative media collected with UM framed the issue of garbage in the city as one that requires questioning relationships and attitudes between citizens and pointing out things that need to be negotiated not only with the responsible city department (that do not pick up the trash), but also with fellow citizens (who are not reasonable and throw trash everywhere). A result achieved by the experiences, albeit in modest terms, was to make visible/accessible new dimensions of the design space of “citizen participation” by making concrete a variety of aspects (e.g., open data, interoperability, sustainable participation, etc.) not recognized by stakeholders in the same way (see also Saad-Sulonen et al. 2012).

Both these communal endeavours and their supporting arrangements are examples of experimentations and propositions for the emergence and relevance of collaborative strategies when framing issues, the necessity to deal with and elaborate more sophisticated ideas about ownership, and

the reusability of data and information systems. They also comment and participate in the discussion on new divisions of labour and responsibilities between citizens and civil servants, mediated by new technological arrangements that have implications for broader issues like governance⁴².

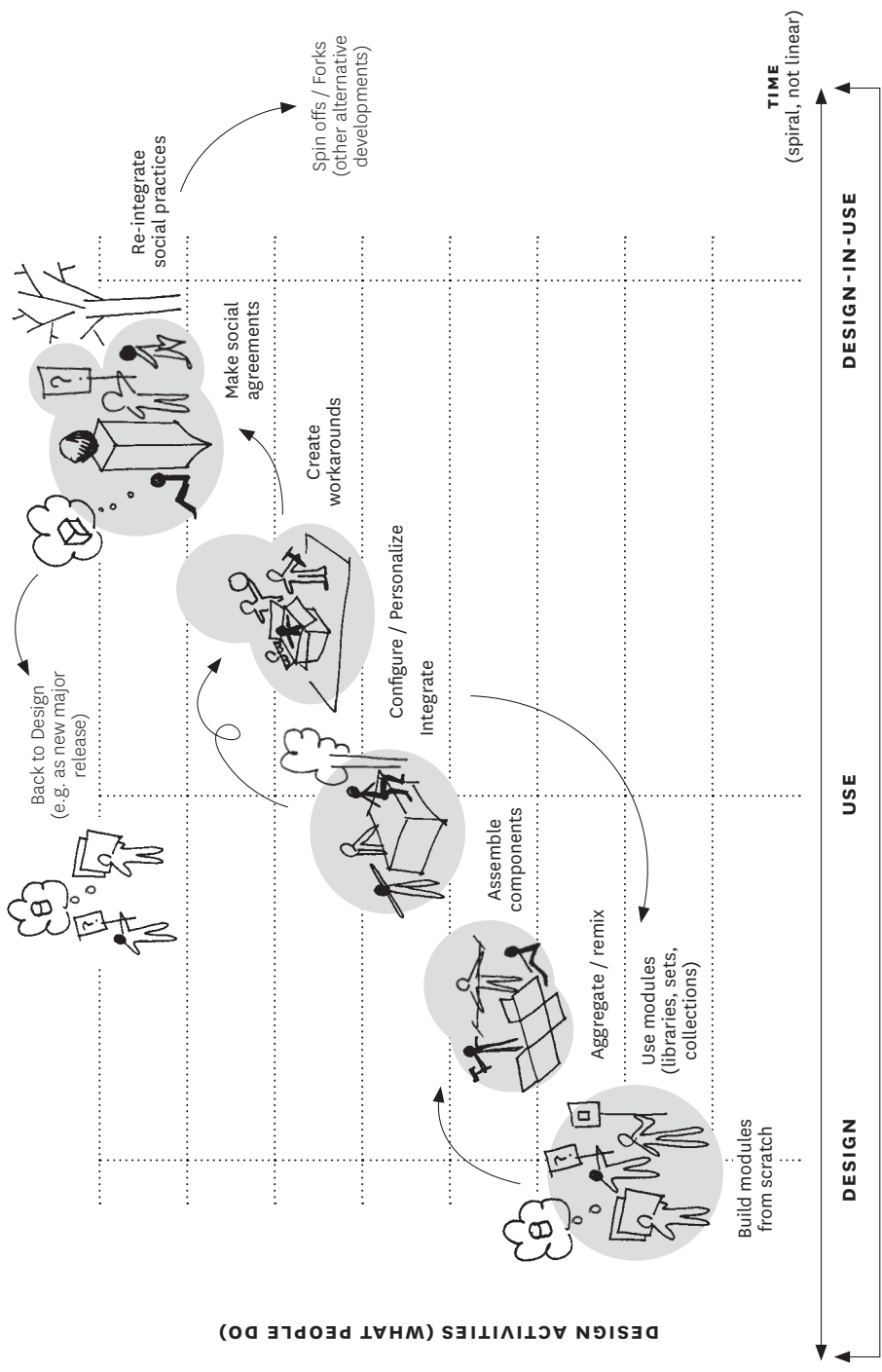
4.1. Design space

As the accounts of the cases testify, over time, the composition, evolution, and unfolding of design spaces change in multiple dimensions. We can see this in the instances of the design processes of both Miina and UM and also, more generally, in the settings of the cases themselves. It is change in the everyday practices that is the targeted outcome of design, and those practices by their nature intertwine systems that are simultaneously affected by other developments aside from design. By the same token, the available space for design is not limited to designed objects. It also includes immaterial designs that affect how social arrangements, norms, timing, and pacing of everyday routines are carried out.

Following the work done in Article VI, the notion of design space represents *the interplay of possibilities, practices, partly assembled technologies, developing competencies, and social arrangements that are the basis for ongoing design choices and experimentation at multiple levels of engagement*. To make the claims concrete, I will now introduce the first elements of a framework for understanding the changing faces of design space(s) and relate it to the experiences in the cases. I will do this first via an illustration (Figure 8) that brings forth some of the main concepts of the framework. This diagram has been iterated further, so it slightly differs from the version introduced in Article VI. However, its main spirit and idea remain the same.

In Figure 8, the horizontal axis is meant to capture **Time**, where a design engagement moves back and forth, not only linearly ahead, but instead in a sort of continuum loop between **design**, **use**, and **design-in-use**. This axis is meant to underscore also the existence of distributed and multiple design spaces (potentials for designs to emerge). The vertical axis presents an account of **design activities** or, to put it simply, the kinds of things that people do which make design take place and which have been identified through the engagements. They are called *design activities* be-

⁴² An interest we delve deeper into later (Botero et al. 2012a). See also Pestoff (2010),



V O.16 Based on (Botero, Kommonen & Marttila 2010)

Figure 8 Scope of design activities and time (timing) affect the shape and visibility of design space(s) in a communal endeavour

cause – and this is my first claim – these activities, I maintain, have design-related implications.

In this diagram, I want to illustrate that the location of a collaborative engagement and the “shape” of a particular design space at a particular moment (represented loosely by the grey bubbles) change as both practices and technologies are *aged together* – Article V. As the conditions that surround a given practice and its related artefacts change over time, this also reflects on how a design space transforms. That is, there are contraction and expansion dynamics at play. The scope and shape can also be affected by the types of *infrastructuring*, *interventions*, and *things* that collaborative design activities create, as presented in Articles II, IV, and V. Thus, my second claim is that design interventions at all levels and at different points of the continuum can make “slices” of the design space more explicitly amenable to collaboration – sometimes making that particular design space more obvious/evident for the people involved. Conversely, design interventions can also close some other slices and might pose constraints in building new relationships. It is at the same time about cut, continuity, and change.

I will now continue by defining precisely what each of the activities along the vertical axis refers to:

- **Build modules:** This refers to design decisions and explorations that affect technology choices, materials, and production tools, sometimes with important consequences resonating all the way to the other activities (Büscher et al. 2009). Here, unprocessed materials or issues such as overall composition are the main focus of the design activities. In interaction design for new media, the actual writing of code and the abstraction process required for this (including understanding of algorithms, data, and information management forms) are at the core of the activities. These types of activities resulted in the various custom codes that actually make DailyWorks and UM what they are (on top of the existing modules provided by Zope or web.py)⁴³.

- **Composing from modules and libraries:** Seasoned designers know that a lot of the practical design work is carried out by carefully choreographing the interactions of diverse elements from a catalogue of predefined mod-

43 More detailed technical discussions about the related design decisions of the cases are condensed in other articles that are not part of this compilation (see Suzi et al. 2009 and Botero et al. 2007).

ules and libraries – that is, materials or ideas that have been processed somehow (e.g., a wood panel instead of just wood). The aim of these types of design activities are thus to produce a coherent and more or less self-standing whole, a composition, that performs a function relevant to some group of people and at the same time makes use of reasonable resources. In new media, this is where different software elements are composed into applications, taking advantage of already existing underlying modular software libraries. Here, the application domain requirements need to be kept closer and building prototypes and mock-ups are important to test ideas and to see which libraries are needed and what modules should be relied on. Having and giving access to open Application Programming Interfaces (APIs) for resulting designs is an emerging line of concern for these types of design activities. In the cases analysed in this work, we relied a lot on *protocols, specifications*, and ready made components that provided streamlined data or services for our designs, namely frameworks like Zope or web.py that form the basis of the platforms prototyped. These modules are available with open source licenses and have active developer communities. In building on top of them we wanted to secure some level of independence and continuity for our efforts, beyond a specific R&D project, trying to stretch (theoretically at least) the possibilities for design-in-use.

- **Assemble components:** These types of design activities customize and expand a design by including components that link it to existing systems, a product platform, or the environment. In the case of new media, design decisions that include bringing plug-ins to add new capabilities and create localized manifestations of a design are located in this layer. Recent developments that relate to new media design include supporting this type of (software) design activities without the need of extensive programming experience (see, e.g., MacLean et. al. 1990, Henderson & Kyng 1991 Nardi 1993, Scheible 2011). In general, the discussion of providing toolkits so that other non-experts can design their own tools, systems, and support mechanisms, or at least customize ready-made systems for more specific purposes, will belong partly to this level. In the two cases presented here, these activities became sites of constant negotiation and active co-design both at design time and, very evidently, during design-in-use. Design choices exemplified in the last data container component for Miina an evolution from a custom system (open to design by coding) to an assemblage system (open to design by assembling components without coding (Article III and V); extensible libraries in UM are examples of this (Article II).

- **Aggregate/remix:** These activities address decisions and choices involved in composing from a mix of different “wholes”, each bringing along certain capabilities, and are not necessarily compatible by default. With regards to new media, recent developments in Internet applications (and a representative feature of the so-called Web 2.0 phenomenon) create new service designs by aggregating selected information from other web services or media content from different sources. This phenomenon is sometimes referred to as a “mash-up”. Today, there is a lot of interest in developing skills for this type of activity (Floyd et al. 2007), whose design rationale has been described as opportunistic (e.g., Hartman et al. 2008) and emergent (Floyd & Twidale 2008). In my cases, it is easy to identify the ways in which these types of design-in-use activities help collectively prototype ideas; Take for example how the various possibilities for combining the widgets and feeds of UM to create a distributed strategy became evident to stakeholders – Article II. Another example of remixing activities are evident in the ways UM and Miina components were used to achieve concept prototyping at use sites, notably the seniors’ hacking the recipe book to build and experiment with a notice board that would support their information sharing practices – Article IV.

- **Integrate:** These activities involve design decisions for selecting, allocating, interfacing, and, above all, weaving together different platforms and systems to achieve some overarching goal. Currently, this is a fairly reactive design practice as the resulting designs are the particular patchworks and quilts (to use other evocative metaphors) that make everyday practices possible. Design activities can involve selecting and shopping (Robertson 1998) and particular ways of linking things (automatically, if one had the know-how and the access to the adequate tools or if it would be allowed by standards or policy. In new media, design activities for integration manifest themselves, on the one hand, in expert patchwork prototyping (Twidale & Floyd 2008) and on the other hand, in lay practices of copy-pasting and linking information by hand from one device or system to another to temporarily tie them together, an alternative for when one lacks skills like programming or adequate tools. An example from my materials is illustrated by the intertwined paper interfaces of the digital calendars in Miina used to reserve resources and register to a dinner event – Article IV. The enabling possibilities that it offers – if adequately supported – is illustrated more through the availability of conversion mechanisms for data feeds in UM that made possible importing citizen gathered data into the city systems in some of the experiments realized that combine it with other systems – Article II and Article IV.

- **Configure/personalize:** Once things are temporally integrated, tweaks and bricolage strategies (Leví-Strauss 1968, Büscher et al. 2001) emerge to appropriate and inhabit emerging configurations and make the necessary adjustments to local settings. In contrast to aggregation and integration, configuration and personalization are more recurrent; they require the patina of time and awareness of the specific surroundings. In the case of new media and software-based systems, these activities include configuring settings, tweaking a particular instance so that it deals with information that is context dependent, often quite personal and whose relevance becomes clear as time passes. This is a typical area where more and more end-users and communities engage in unrecognized design-related activities. In here many of the particular settings and arrangements that differentiate Daily-Works from Miina and the generic UM to the different instances that exist are obvious places to look at.

- **Create workarounds:** Workarounds refer to the shortcuts and bypasses developed to overcome shortcomings of a particular configuration (c.f. Gasser 1986; Pollock 2005). They are design related activities that dynamically attempt to weave particular artefacts – or collections of them – together with existing collective and personal ways of doing things, mostly to transcend what for some reason or another is not supported (technical incompatibility, policies, regulations, etc.). Thus, important design choices result from these activities; however, in most cases this is a reactive practice. Unfortunately, opportunities for reflecting on the implications of these types of decisions are not necessarily present by default (Floyd & Twidale 2008), making this a part of the design space crucial to making it more visible and amenable to more collaborative strategies. An illustrative case is made by the appropriation of features like UM Tags to pre-classify the location information that people could contribute in UM – Article II. It is also illustrated in the many bypasses explored for dealing with access management rights in both cases – Articles V and IV.

- **Make social agreements:** A social agreement is a de-facto consensus around a shared objective that emerges within a certain group or community. The nature of such agreements is usually distilled from a small group initiative that later evolves into a commonly implemented convention. Like other design related activities, it involves some amount of trial and error experimentation, recruiting of allies, and, sometimes, skilful negotiation. The agreement becomes visible in the ways a particular task starts to be accom-

plished and then turns into a de-facto standard among practitioners. These design activities turn certain material or technological features into design material themselves, but the full-fledged design is only actionable through a collective agreement that ties both the “misuse” of a feature and the bounded workarounds and conventions created⁴⁴. The examples on citizen driven documentation of garbage and the collection of abandoned cars created by reinterpretation of certain features of UM that are documented in Article IV exemplify some of the implicated design-in-use decisions involved.

- Re-integrate and extend social practices: Social practices are embodied and materially mediated arrangements of human activities; they describe a particular way of going about an activity with its associated resources (Reckwitz 2002). They are said to be shared and persist because a group of people continuously reproduces them in creative ways (De Certeau 1984) through a combination of skills, material resources, and meanings (Shove and Pantzar 2005). Over time, it is possible that sets of social agreements eventually evolved into full-fledged social practices with specific artefacts and conventions⁴⁵ when people codify their doings (make explicit some rules and share formats and exemplars) and when they actively experiment through them. In a fashion similar to the other activities presented above, through active engagements, a collective can “push forward” the evolution of certain practices by creating new links with other practices (Shove et al. 2007), reinterpreting, appropriating, and re-integrating infrastructures and doings for new purposes, and, therefore, initiating certain collective processes that extend practices. These, again, are all activities that have design related consequences. In the engagements presented here, they are exemplified in the new framings for issue sharing in the design space of urban knowledge sharing (Article II and IV) and the practices for planning, preparing, and eating the meals that the seniors developed together (Articles III and V).

-
- 44 A widespread simple social agreement found in new media is the way hashtagging is used in microblogging services like Twitter. There, the hash symbol (#) is used to precede a term that adds additional context and metadata to the posts/tweets, making the posts easier to follow, organize, and disseminate; the platform as such had no provision or specific features to address this.
- 45 For example, on video sharing sites like YouTube, there are very advanced community-initiated social practices for inviting and sustaining audiovisual conversations. These practices include the use of visual genres, annotation workarounds, revealing of time-coded information, and so forth. These activities certainly expand the design space of online video sharing to areas not charted initially by the providers and designers of the platform.

Continuities in these design activities that close the loop are achieved by identifying opportunities for “new releases” (which brings us back to design). On the other hand, leaps forward or parallel developments can also occur when *spin offs* (indigenous development) and *forks* appear.

The relationship between these activities in the horizontal axis and the continuum of *design*, *use*, and *design-in-use* present in the horizontal axis can be further characterized by further qualifying those design, use, and design-in-use possibilities in terms of *reinterpretation*, *adaptation*, and *reinvention*, to borrow a set of categories introduced by Eglash when referring to technology appropriation (Eglash 2004:xi). This is illustrated further in Figure 9.

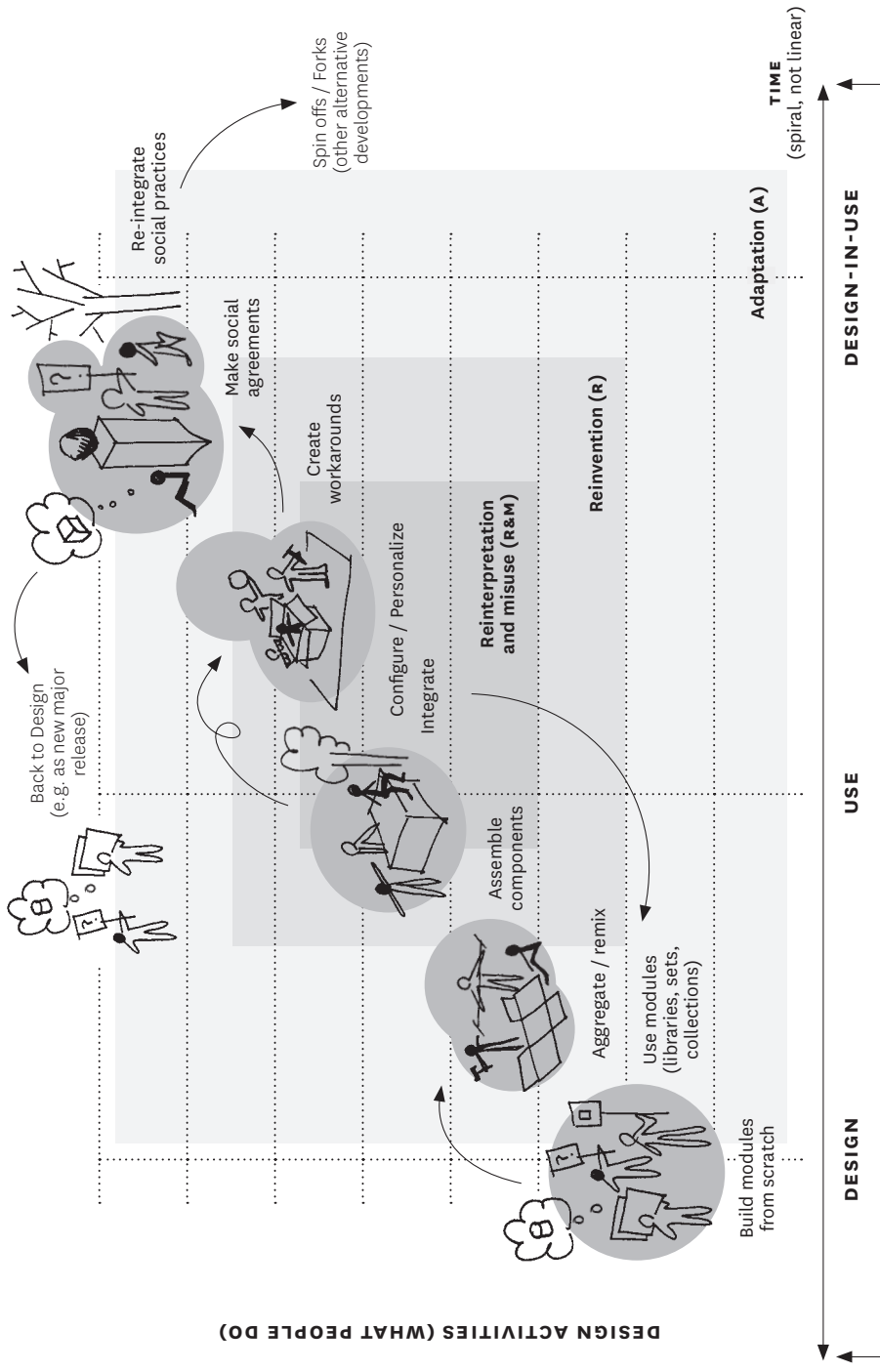
Reinterpretation and mis-use: (R&M) This refers mostly to possibilities that exist for surpassing the semantic associations proposed in relation to a given structure. One example provided by Eglash is that of the graffiti artists’ interventions into the urban space, which provide a reinterpretation of the function of that space as a place for self-expression or political commentary without changing the structural conditions of the space itself. When talking about new media, creative reinterpretations of what certain features of the software are for, coupled with basic shared agreements between groups of users, can create, and open up a new design space, although a niche one. From a design process perspective, the design space is made visible mainly through the possibilities for basic configuration of the product or service⁴⁶. When people make use of reinterpretation strategies, there normally is: 1) No support to share and or extend user practices and agreements – thus, design-in-use activities remain an informal ad hoc proposal, even though workarounds and configurations might be easy to spot and share; 2) Restricted possibilities for altering the basic modules, assemblies, and components, although there are always hacking strategies to rely on – again, this is not something that is explicitly encouraged and could be even illegal to do (e.g., both graffiti and hacking or reverse engineering products are illegal in many countries).

⁴⁶ An example of this relational quality will be the unintended uses of a spreadsheet program (e.g., excel, which is designed to calculate and manipulate numbers) as a graphical layout design tool to create interiors and user interfaces, as documented by Berger (2006).

Adaptation: (A) According to Eglash, implies a certain degree of flexibility in the underlying structure coupled with a sense of violation of intended purpose. By violation of intended purpose, he meant not only a breach of the designers' intentions, but also, equally, of things like marketing strategies and/or gender assumptions embedded in a product. Eglash's classic example includes the "misuses" of early cassette players by Bedouin tribes that saw beyond the playback functions of the machines that marketing sold to them, and uncovered the potential to record their own cultural productions. Adaptation strategies involve creativity to look beyond assumed functions and recognition of new possibilities. These strategies are a result of: 1) limited support to share and or extend user practices and agreements, and workarounds and configurations can be shared and adapted via repositories and user forums. Here design-in-use activities might be acknowledged but they are still limited only to some set of activities. 2) Limited possibilities for altering the basic modules, assemblies, and components via new developments like APIs, toolkits, and linked data that encourage hacking – again, this is not something that could be explicitly supported, and extensive tampering might continue to be considered illegal.

Reinvention: (R) in the category of reinvention, a manipulation of semantics, use, and structure is usually achieved and new functions are created. According to Eglash, a true reinvention usually involves being able to produce changes and alterations to the original structures, like the case in which Latino mechanics have radically appropriated and reinvented automobile *shock absorbers* in order to create *shock producers* for their low-rider cars (because they acquired the knowledge, had means of production and tools to their disposal, and could tamper with the mechanics). In new media, the most common design-in-use strategies for supporting reinvention will be most likely when 1) there is access to the code and/or the permission for altering content (new licensing schemas) is present, visible, and understandable 2) those efforts are complemented strongly by design in use strategies to try out, sustain, and disseminate social practices, which are what ultimately make this type of activities feasible⁴⁷.

⁴⁷ Many peer production ventures that rely on Free/Libre and open source software (FLOSS) have evolved due to the close interconnection of the nature of the software and the way it interacts with sophisticated community agreements that – when well documented – serve as benchmarks, inspiration, and learning devices for other people engaged in related ventures. This is exemplified in, e.g., practices of collective encyclopaedia writing, producing, and editing that have evolved in projects such as Wikipedia (Slattery 2009).



V O.16 Based on (Botero, Kkommen & Marttila 2010)

Figure 9 Reinterpretation, adaptation, and reinvention in design spaces

It should be noted that by arguing for identifying and making the design spaces more visible and explicit, I do not intend to produce judgements as to what are the appropriate openness levels nor the valid or right configuration for a particular design landscape. Rather, I am more interested in the ways that discussing them serves as an avenue for locating interventions and developments and assisting in asking questions, such as: “Where are we at now? Given what we know now, what should we do next?”⁴⁸.

I am aware that the depiction of the notion of design space – as it stands now – is mainly relevant to new media and interaction design types of work. However, I am fairly confident that similar activities and components can be assembled to address other design domains. Obviously, refinements and adjustments should be explored with more empirical examples. To back-up my confidence I rely on insights from two other accounts that explore similar issues from different angles. The first one is informed by the STS tradition and traces health technology development and use across several cycles of designing and using. Looking in detail at the emergence of these technologies from the early technological dreams to the ways in which they ended up being embedded in practices, as well as in the subsequent evolution of their impacts, the study proposes a “configurational” view of technology (Hyysalo 2010). The second one is more general in nature and condenses a series of careful observations on the ways “buildings learn” after they are built and through use (Brand 1994). They both elaborate complementary arguments to the one I am presenting here by showing the ways in which iterative and design spaces emerge just as buildings, elderly-care wristwatches, and diabetics databases are adapted and transformed in use over time. Neither Brand nor Hyysalo use the term “design space”; however, their examples and analyses of the situations are very much in line with the elements I have discussed throughout. In particular, the role of time and the influence of concrete practices of use resonate very well with the argument for developing design-in-use collaborative strategies. In their work, both Brand and Hyysalo imply how more collective ways of acknowledging this could be achieved and how it is of relevance to the practices of the professionals involved in their respective areas (architects, the building industry, medical doctors, and policy makers), as well as of the citizens (dwellers, patients, and other “end” users in particular).

48 Suchman (2002) has referred to this question as particularly important in guiding located and accountable design practices.

For the purposes of this work, I do not see a need to elaborate/speculate on such other applications more thoroughly. I will only point out some contemporary developments, such as the so-called Maker Culture (visible in the emergence of supporting physical spaces such as hacklabs⁴⁹ and fablabs⁵⁰) and the free culture movement, not to mention specific manifestations such as Creative Commons⁵¹ and, in some ways, Living Lab approaches to innovation⁵². All hint to a wider interest in and need for developing supporting strategies for collaborative work and design around and beyond the areas of media and digital technology. These would all benefit from more nuanced conceptualizations of what comprises design, design-in-use, and design spaces.

In so doing, I also recognize that metaphors, such as the one implied in this extended notion of *design space*, are both powerful (Lakoff & Johnson 2003) and potentially harmful. In understanding the design space in terms of an abstract, all encompassing and Euclidean one (Simon 1996), it would be very tempting to assume that design can be used to describe – and approach – every aspect of human existence. I recognize the limits of such an account and wish to emphasize that design spaces, when understood as “landscape” (Binder et al. 2011, Gaver 2011), should point our at-

49 Defined as community-operated physical places that incorporate elements of machine shop, workshop, and/or studio where people from a local community come together to share resources and knowledge and build and make things. Today there are several international networks of semi-organized hacklabs and related events called hackathons. (See e.g., <http://en.wikipedia.org/wiki/Hackerspace> for a general overview.)

50 Fablab is a shortcut to denominate a fabrication laboratory: usually a small-scale and experimental workshop offering (personal) digital fabrication equipment. The specific label has its roots in the MIT Media lab that currently hosts the international network of Fablabs. Fablab activities are closely tied to an alternative mode of production than the current “mass production” of physical goods and are said to aim at empowering consumers. See http://en.wikipedia.org/wiki/Fab_lab for a definition and Bas van et al. 2011 for an overview of the wider phenomena.

51 Based on the work of an international non-profit organization, the CC movement offers copyright licenses that provide a simple, standardized way for creators to give permission to further share and use their creative work. In simple terms, the licenses switch off the default of “all rights reserved” for productions in favour of the more nuanced “some rights reserved”. See <http://creativecommons.org/about> for an overview of the aims and activities of the organization.

52 Feuerstein et al. Define Living labs as: “a systemic innovation approach in which all stakeholders in a product, service or application participate directly in the development process. It refers to a research and development (R&D) methodology in which innovations are created and validated collaboratively in multi-contextual, empirical real-world environments.” (Feuerstein et al, 2008)

tention and attune us to the existence of spots and even complete areas that are just plain uninhabitable or out of reach and thus not amenable to “design”. The all-encompassing option would not only be design imperialism or naïveté, but it would in fact be the least useful advice to designers, as it would burden their explorations of design spaces beyond measure. Design spaces emerge, interact, and evolve in relationship to other ones that include (but are not limited to) the regulatory space, the living routines space, the safety space, and practice space. Those other ones might be best described and approached with other mind-sets, tools, and expectations.

However, it is possible that under certain circumstances people that predominantly describe themselves as designers will be inclined to influence and act in those other spaces in order to render visible and “designable” particular slices in a particular design space⁵³. Thus, it is important to keep in mind that design space explorations are ultimately just one among many “...figures and practices of transformation” with their own set of limitations (Suchman 2011 p: 1). I take this to mean that modest but meaningful and artful transformations constitute better targets for design work that attempts to deal seriously with communal endeavours.

4.2. Design time-space

A commitment to modest transformation that the above outlining of the contours of design space proposes helps me now to reiterate a point: time cannot be underestimated because design is not enough. By now it should be obvious that the extent to which long-term ongoing collaborative design is accounted for affects the attainable outcomes in important ways: both the co-housing arrangements for the seniors’ project and the developing of practices for sharing urban knowledge via locative media in UM exemplify this well. Without hanging around long enough, meaningful explorations cannot be made sustainable. Keeping co-design going throughout concept design, implementations, re-designs, and further iterations calls for well-rehearsed means such as design games, workshops, generative tools, and observational techniques. On their own, however, these means of engagement are not sufficient to achieve the required levels of learning and trust building. Users’ sense of ownership, their coming to

53 Contradictions of this are visible in the figure of the designer-activist and the activist-designer (Fuad-Luke 2009, Julier 2011).

understand their own needs and desires, as well as designing at multiple levels of practice and technology, all require sustained interchange. The designed systems, usages, users, and designers' practices need to become more seasoned, that is, they need to "age together".

To further clarify what this means for reconceptualising design processes involved in communal endeavours, Article V introduces a proposition for portraying extended collaborative design process as slightly messier than prevalent portrayals of co-design that rest on the assumption that design takes place mostly within temporally defined R&D project forms. So far, R&D is a frame easy for funders, producers, design practitioners, and researchers to recognize (Godin 2006). It also feels comfortable, especially for design practitioners, as it assumes that it is the temporally defined design project, which should be the area of concern in organizing collaborative design. However, this familiar frame is increasingly at odds in design contexts where the market launch of an industrially produced design does not structure sensible frames for operation (Björgvinsson et al. 2012b). Communal endeavours are clear examples of these types of settings.

The proposal in Article V builds on a simple squiggle metaphor used as portrayal of co-design processes introduced in a widely quoted article by Sanders and Stappers (2008 p: 8) that discusses the new landscapes of design. Their squiggle portrayal maps the growing relevance of co-design activities mostly to the fuzzy front end and shows collaborative design diminishing and getting narrower by the time a prototype or a concrete solution appears. In contrast, by looking closer at some of the elements observed and introduced throughout the two engagements (e.g., design seeds, indigenous design, spin-offs, and access design), we identified an extension of collaborative design activities to stages before and after the more typical R&D (Figure 10). At least when it comes to communal endeavours, collaborative design activities have different trajectories and are even more active and critical at those stages (see Articles II, IV, and V for the empirical details documenting these stages).

As the analyses of the cases have shown, design activities fluctuate between developers and users (Figure 10 vertical axis), and, even though some designs are closed every now and again, they tend to seed further evolution, iterations, and design directions later in time (Figure 10 horizontal axis) rather than "close" or diminish collaborative design activities. This more complex and less pre-decided temporal structure follows from the fact that, when designing with communal endeavours in mind, design is only one of the lines of development that affect the attainable outcome.

Figure 11 again makes use of the same squiggle metaphor to highlight how the developments in the co-design engagement, in the practice, and in the infrastructure factually affect and pace each other⁵⁴. Another way to say this is: the point of centring (practice or design) and the temporal organization of collaborative design activities are among the key factors to which situated approaches to design must pay attention and develop (in addition to methods, norms, tools, power, participant roles, and so on).

There is another important theme related to the design time aspect. The ecology of information and of artefacts⁵⁵ and the practices surrounding the work on these two cases spread across the home and work, and often in between. They all, as we should expect, evolve over time. Thus, the development of the engagements also exemplifies that ultimately the types of things to attend to when studying, making interventions, and designing in communal endeavour settings depend on the particular entry points in time that are used as reference and that might turn out to be only anecdotal (Hyysalo 2010). Framing the design space as one of communal endeavours helps to account – on an ongoing basis – for change as it unfolds in the everyday practices of those involved. This also means that both cases offered complementary views to very similar phenomena, albeit through different starting points and trajectories (Figure 12).

As we moved along, in both cases many of the different dimensions of communal endeavours were made visible and required design decisions and acknowledgment. For example, in instances where what started as envisioning and designing particular “groupware” functionality for the seniors everyday management ideas ended up displaying over time (through design-in-use) requirements and behaviour of what could be better understood and supported in terms of “social media” (Article V). The same was also happening vice versa, in UM: initial ideas that displayed characteristics of fuzzy collective social media features, required at times a more tight and bounded “groupware” type of support (Article IV) and at other times even more flexible ideas of what constitutes a group (for whom and for what something is made? Who belongs and what sort of “unit” should “own” something?).

54 This argument is also supported by analysing other UM related cases and design processes with another set of considerations (see Saad-Sulonen et al. 2012)

55 Used here in the sense of Nardi and O’Day (1999). See also (Hyysalo 2010)

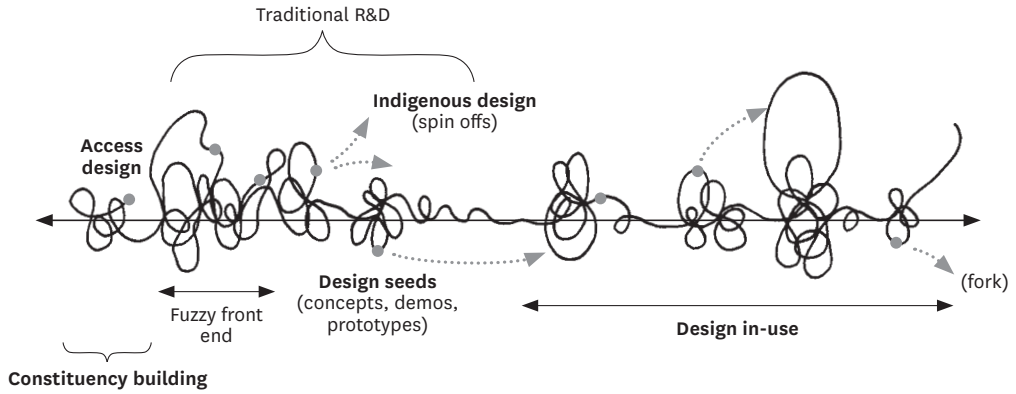


Figure 10 Portraying design engagement with an “Aging Together” point of view (Article V, Botero & Hyysalo 2013)- Adapted and extended from Sanders and Stappers squiggle model for co-design (Sanders & Stappers 2008 p:8)

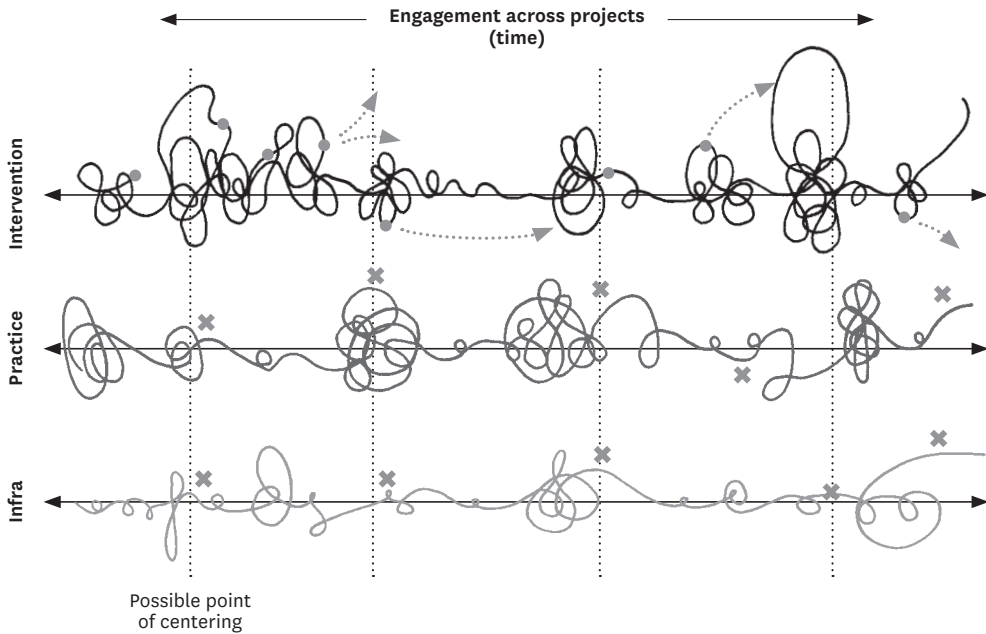


Figure 11 Extending the squiggle metaphor to underscore that long-term collaborative design engagement requires recognizing the trajectories and rhythms of stakeholders’ own projects and devising strategies to work with them (Article V).

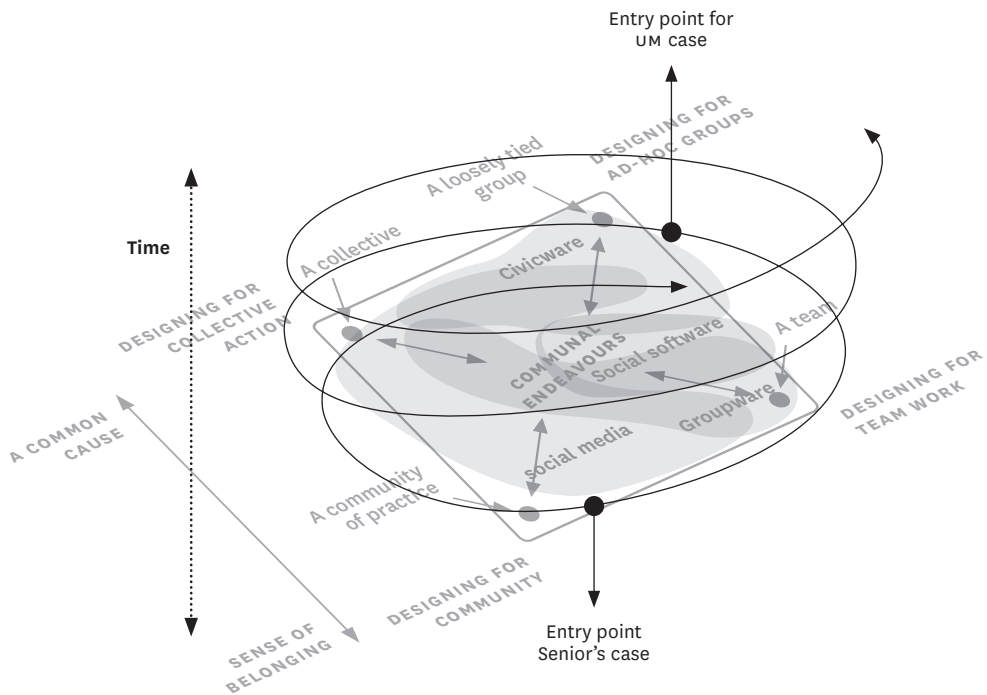


Figure 12 Spiral time journey of designing for communal endeavours in the 2 cases

This has certain implications for understanding collaborative design strategies. An important point to make is that few recipes or stand-alone techniques will hold up to attempts to foster the design capabilities of the stakeholders themselves. Longer-term strategies are also required to ensure that there is a healthy balance in doing it for the people/with the people and leaving people to grapple with it by themselves (given that the latter, which increases hardship, also provides potential for learning and ownership). It also requires finding resources and tools and mobilizing them, as well as creating conditions to support the collective unfolding of a truly collaborative design space. Strategies for explicitly supporting design that “ages together” are thus becoming relevant in many settings where contribution from professional designers can help in charting, outlining, and revealing aspects of the relevant design spaces available and the possibilities for reinvention, adaptation, and reinterpretation that exist or that could be created.

In Article V, a collection of the principles for guiding design work and interventions that aim to foster an open-ended and gradual collective exploration in communal endeavour settings is introduced. They are referred to as “*Aging Together strategies*”, since they seek to gradually uncover and make jointly visible the design spaces available and realize an evolving line of well-suited technologies, media, and practices. I will recapitulate them here. Interested readers can find in Article V a more complete account of the empirical insights supporting them, as well as the position of each strategy in relation to current design research literature.

- 1 **Start with social practices.** Design activities do not occur only at the studio or in exploratory workshops. They are already present in the practices, infrastructures, and development trajectories of people who come together to become the “clients”, “users”, and “designers”.
- 2 **Explore the constituency, build new alliances if needed.** It is key to explore stakeholder configurations to be able to achieve the kind of practice and technology or media change that is being envisioned and to determine if the agendas of each party can be aligned.
- 3 **Start with the relevant small “access design”.** Design engagement is not guaranteed to work. A well-bounded initial teaser can give a sense of what the collaboration feels like – should everyone want to get more serious or not?
- 4 **Manage expectations.** *Set joint goals and do not expect or do not have the participants expect that resources will be there forever.* Clarify and check these constantly. Apply for funding as the project advances and needs arise.
- 5 **Cultivate an open agenda.** The idea is not to focus on realizing a killer application, but, instead, fostering contributions, which is likely to lead to improving the practices in the community.
- 6 **Go there, be there.** Collaborators should get a real feel for each other. If the community is dispersed or only beginning to emerge, people should meet, workshops should be arranged, and similar experiences studied as a starting point.
- 7 **Build scaffolds.** Provoke imagination and cultivate the sense of possibilities by getting a sense of what can be done. Bring concepts, materials, solutions,

and practices from elsewhere. Design avenues can be explored in hands on workshops and with experiments. Tune in by doing it on site if possible.

- 8 Build and release prototypes iteratively, rapidly and from early on.** Follow how things are being used, what ideas for improvement, shortcomings, contradictions, new design directions etc. may have emerged and respond to the evolving needs through collective and cumulative design iterations.
- 9 Alternate close working periods with lighter engagement.** Make the most of the time spent together, people need to find their own ways to use the technology and try things out on their own and avoid spending designer hours unduly. Communications channels should be created towards this end.
- 10 Foster ownership of the process, technology, and media.** Advice, solution help and alternatives are needed to make final decisions. Negotiate and decide jointly which new design directions are pursued further and clarify why.
- 11 Keep attentive to partial failures and what can be learned from them.** An encompassing and stable design is slow to achieve and may easily embody things that are not needed or that end up serving other purposes. Failures can provide serendipity handles.
- 12 Embed design at different levels.** Support multiple access modes and make sure there are parallels from old to new to weave things together. Make possible design activities at different scales.
- 13 Avoid design locking-in with crucial choices (e.g., technology).** Open and/or flexible alternatives for technologies and infrastructures should be preferred whenever possible. An open discussion about things such as intellectual property rights should not be avoided.

Implementing “Aging together strategies” requires an iterative revision of plans and patience to allow processes to unfold over time. In this light, this set of strategies should be seen as both a resource for professional designers interested or called upon to contribute to communal endeavours and as resources and guidelines for communities, groups, teams, or collectives interested in recruiting the help of professional designers in their own communal endeavours. For both users and professional designers, this might mean giving up expectations of total control and predictability in favour of embracing possibilities for sustained caring and longer term involvement that emphasizes the importance of setting the context (collaboration setting), cultivating and acknowledging new forms of design work (design seeds, indigenous spin-offs), and identifying potential learning strategies (partial failures, reflective practices, and contingency). In both of the cases presented, successful temporary alignments and leaps forward occurred when all those involved recognized the strategies at play and built upon them.

4.3. Design things-space

If we are serious about the idea that designing for communal endeavours means designing with the evolving practices involved, then design activities along the continuum *design/use/design-in-use* are by necessity blending all the time. What are then the design things involved in the cases I have just presented? On the one hand, there are these communal endeavours, which can never be fully realized or completely designed as the endeavour always lives on or keeps moving on. The design space partly conflates with the practice space, or so it might appear at times. On the other hand, there are also very concrete things, those partial designs that are temporarily assembled and frozen in order to achieve those communal endeavours.

In this way of thinking about design, those steps towards situating design practices that have included form giving concerns over the development of an understanding of use and contexts of use, as well as issues of participation, apply simultaneously, albeit perhaps in a different order than that of their historical awareness (see: Figure 6 Situating design practice and knowledge, a few steps p: 40). Thus, in Figure 13, I locate those modes of necessary engagement, not as historical or even overlapping layers, but as modes of alignment and articulation: sensible, caring, and creative ways devised to move, align, and perform design things in time and space. Where “design things” can very well make up for such totality.

In practical terms, this means that designing always requires at least three important components. First, caring for and taking the contextual understanding of practices and context of use so that collective *participating* in the joint process of figuring out what ought to be designed and how it relates to particular practices is possible. This includes what processes are involved, which skills are available, and what roles possible, with *prototyping* as a key activity in the articulation of knowledge about using and participating. Second, it is also concretely designing artefacts, devices, and tools and caring for their *forms*, material manifestation, cultural relevance, and modes of production. In this level we need a more updated and sophisticated understanding of what *materializing* entails as a form-giving approach. Third, it is also the continuous alignment between contexts and ongoing paying attention and supporting the ways in which this is socially and materially achieved, where *infrastructuring* becomes a key activity. Thinging here is at the same time *accompanying* these *things* and *practices* and *bridging* them to the future horizons of the communal endeavour.

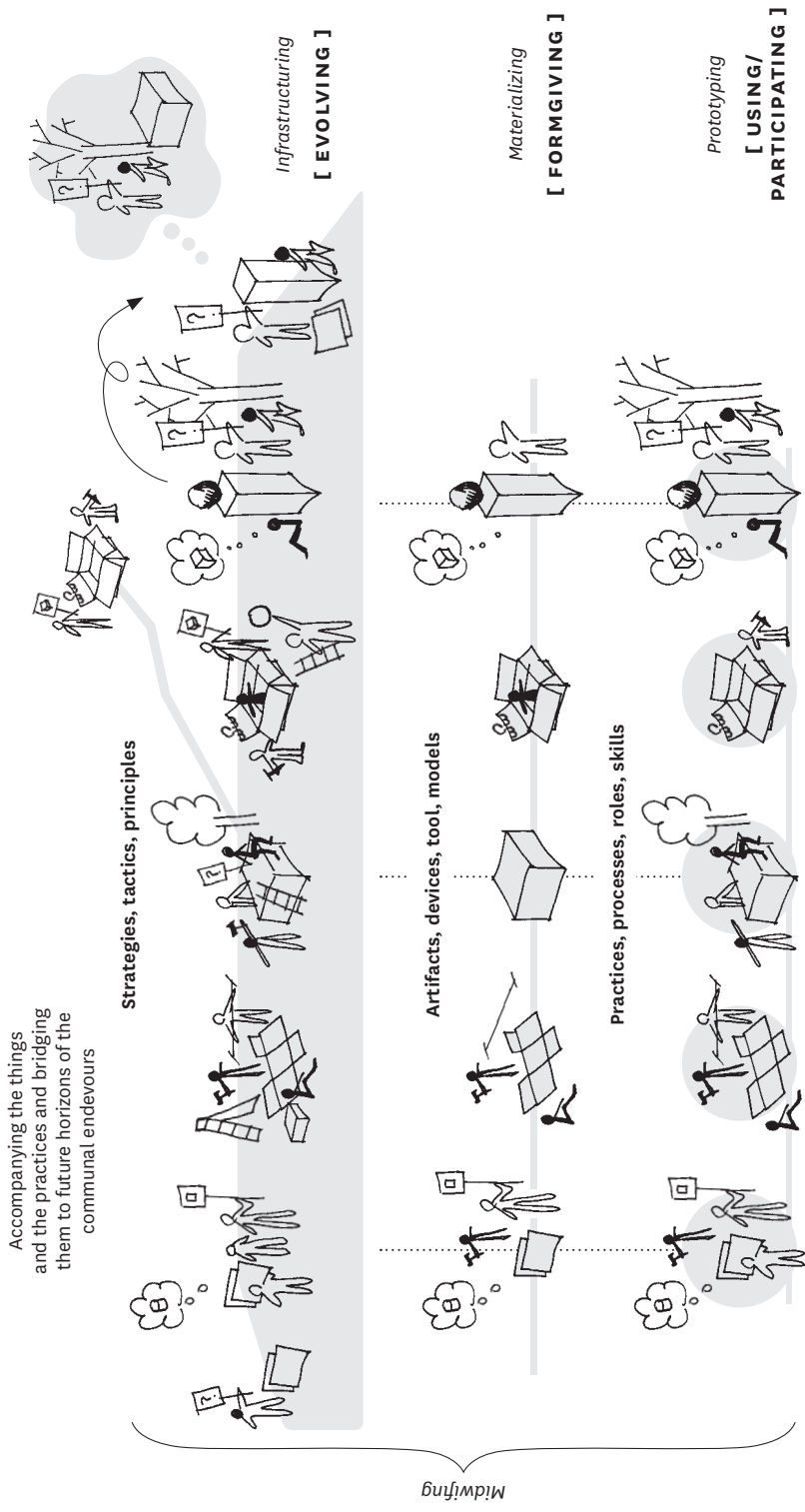


Figure 13 Design things in communal endeavours

C

Conclusions

What is the most significant contribution that collaborative design practices make to the broader project of situating design? Are we talking about collaborative design's contribution to re-inventing innovation via the rhetoric of user involvement promising streamlining profit, increasing market penetration, and more consumption? Or should collaborative design rather contribute to the creation of new cultures of knowledge that are supportive of wider, democratic aims, where the design spaces available emerge in interactions between multiple stakeholders and different socio-material assemblies? Throughout the thesis I have wanted to probe into the feasibility and importance of this second option.

I have explored an updated notion of design space as evolving and expanding collective design spaces. I propose that their collective awareness, construction, and caring could work as a framework to understand, reflect upon, and organize collaborative design activities going beyond and around the concept design stage or fuzzy front end. My approach has been to look carefully at two design interventions carried out to support fledgling communities (seniors aging together) and emergent collectives (citizens and city officials sharing locative media). I have looked at, taken care of, and actively influenced the arrangements that evolved at the intersection of their respective *communal endeavours*. I have used these experiences as experimentation settings and case studies.

My analyses of the cases highlight aspects that are relevant to the development of design approaches that deal not only with *designers* and *their design processes*, but that could also deal with how the *things that are under-*

going design and the *design process itself* are simultaneously embedded in everyday life arrangements. In doing this, the work brings forth the importance of understanding and developing further collaborative “design-in-use” activities and issues. I believe this is a fruitful road to achieving continuity and collaboration between design and life-practices more generally.

I have used the term “design activities” for a variety of things that relate to selection, building, mixing, bricolage, compositions, and other adjustments that extend, challenge, recombine, or affirm things and practices. Some of these activities emerge due to constrain, contingencies, and possibilities that can only be understood once meaningful instances of use are achieved. The term design has perhaps been used rather loosely, not necessarily to redefine what it is meant to be from now on, but to draw attention to two important and complementary aspects. On the one hand, there is the need to look closer at what happens outside the traditional focus of a well-bounded project, which is the usual scope of the professional designer. These are the types of things that competent everyday life-practitioners take care of (and must do) in order to achieve appropriate and sustainable solutions in their everyday life: the *design-in-use* part. On the other hand, there also seems to be the need to surpass the contingent and opportunistic nature of design-in-use. There are instances in which there is a need to rework the details in relation to other wholes and other scales. This includes work that requires resources, caring, and expertise that competent design practitioners acquire across projects: that is the *design* part of the spectrum.

My perspective has been one of making visible useful and realistic ideas for how to deploy interventions – with a collaborative design twist – in different endeavours, particularly in support of everyday life, communal ones. The goal is both tactical and strategic: conditions need to be created and resources mobilized (strategies) so that wider slices of the design space can become explicitly amenable to scrutiny and change on an ongoing basis (tactics). The fact that *design*, *use*, and *design-in-use* must be understood as a continuum is worth underscoring.

Design approaches guided by an awareness of the relevant design spaces involved can have implications for endogenous production of technologies and media by communities. Moreover, it can provide loose support for collectively constituted governance processes that regulate and shape technology and other design choices at multiple levels (Pestof 2012). This is important not only to design, but also to the provision of opportunities to develop forms of “undesign” (Pierce 2012).

Collaboration in User Centred Design (UCD) and Participatory Design (PD) movements can be seen as a series of coping strategies which we have been using to try to fit the realities of design-in-use to the demands of the typical consultancy mode of work and the strict R&D project models that, as professional designers, we have been forced to adhere to most of the time. PD and UCD only attack the symptoms. Out there, many organizations and collectives are already exercising sustained collaborative design, they are doing it with the help of professionally trained designers, and they are doing it without them as well. Parasitic expert presence in all kinds of initiatives is not what I am interested in. I am well aware that many communities do not need designers to design for them. On the other hand, there are also many initiatives, like that of the seniors and countless others produced through urban and public activism, interested in experimenting but finding it difficult to scale or influence. The same goes for other more top-down experimentations. Those tasks might benefit from more than a trial and error approach; collaborators trained at looking and working out multiple alternatives might prove handy.

I am not claiming that caring and sustained design engagement is needed for most of our *culturally mature* artefacts like spoons or chop sticks. However, I do think that collaborative design approaches of the sort advocated in this work are important for many areas in contemporary society. It definitely makes sense in settings where technological possibilities and user practices are evolving and more poignantly needed were societal problems are being framed. There are two important reasons, among others, for this.

First, because new media practices and information and communication technologies are two of the relevant application areas called to address many of those so-called societal problems, we need to recast their design process now more than ever. These processes are usually presented as either “technology led,” or “user centred”. However, these assumptions tend to hide the many important ways in which both technology and users co-constitute themselves (Shove et al 2007, Suchman 2007, Hyysalo 2010). Nevertheless, the implications of co-constitution are not so easily translated into pragmatic design work. It is my hope that some of the notions developed in this work provide us with the vocabulary needed to look at and navigate design engagements with new lenses and new temporalities.

Secondly, addressing many contemporary societal dilemmas seems to require new productive configurations able to challenge prevalent centralized and hierarchical modes of engagement that have prevailed in the

last century. Some of these new configurations have been discussed sometimes in terms such as co-configuration (Engeström 2008), co-production (Parks et al. 1981, Pestoff 2012), peer-production (Bauwens 2006), and social production (Benkler 2006, Engeström 2008). Achieving these will depend on appropriate modes of collaborative design of media, technologies, and services. This is especially true in settings and communities where lay and expert knowledge, confidentiality, sustainability, and so forth are easily trampled over when design approaches do not take collective engagement as foundational. I hope my work contributes in these directions.

As it became clear through the course of these engagements, a strategic position cannot be avoided, particularly one that helps look at the sustainability of the efforts in the long run; simply ad hoc hocking our way through the middle of communal and collaborative endeavours might not be an option today. However, design is at the same time *accompanying things* and *practices* and *bridging* them to the future horizons of a communal endeavour. How can collectives go about doing this? What type of thinging might be needed? I want to suggest that, in addition to current interest in facilitation, in collective forms of prototyping, and in infrastructuring (outlined in Chapter 2), there is also a level of designing and building “in-between” infrastructures (e.g., Article IV) that requires a type of engagement I will tentatively refer to here as ‘midwifing’. This is not necessarily aimed at proposing yet another role for designers. It seems that, in his proposition for second-generation design methods, Rittel already envisioned *recasting* designers in such a role (see Cross 1981 p: 4).

In proposing midwifing as an analogy that lends itself to this context, I am most interested in the ways in which the practices of contemporary professional midwifery can help us rethink the process through which *things* come into being and develop; of course, we should be mindful of the important differences that exist between bearing a child and participating in the making of a thing. To this end, I have found that the way in which midwifery is seen today, as a partnership between members of a community (midwife, mothers, babies, other care givers, families, and other relevant figures) to optimize the well-being of mothers and their developing babies (Avery 2005) is a good inspiration. With that in mind, midwifing for design might relate and draw attention to the caring and accompanying aspects that exist before, during, and after specific projects and which are necessary to bridge communal endeavours with a variety of possible horizons.

Rather than a discrete simple practice, a model of partnership resembles more highly complex and contingent networks of strategic and pro-

ductive relations (Surtees 2003) that can be of help when designing. For communal endeavours, it might not only be “matters of concern” (Latour & Wiebel 2005), but even “matters of care” (Puig de la Bellacasa 2011), which could make the difference⁵⁶. While I have only hinted at it here, I think this is an important matter to pursue in proposing a more evolutionarily oriented view of the development of media and technology. Such a view requires relinquishing expectations of total control and predictability while still leaving room for elaborating possibilities for intervention and influence. In that sense, interventions are carried out in order to better understand what is amenable to design (what is in-between the design space and the other spaces), and where change might require, instead or in parallel, activating other spaces or conforming to the limits at their core. I have come to see DailyWorks information containers and UM as interesting instantiations of *in-between* infrastructures that ought to be *midwifed*, especially if they are intended to succeed in their objectives. How can we *design with care*? I look forward to expanding this line of thought in future work.

56 Feminist scholarship has been fundamental in raising the importance of the concept of care for contemporary social life. E.G. Mol (2008) used examples from practices in healthcare services, to describe the main features of an alternative “logic of care” in contrast to what she terms the “logic of choice” which has been used lately to restructure healthcare services to be more patient centred. In contrast to choice, logics of care include elements of watchfulness, attention, vulnerability and distribution of practices within large collectives that might offer more sustainable development paths. Assuming a similar stance, Puig de la Bellacasa (2011) has challenged the notion of “matters of concern” central to recent debates in STS. She argues for “matters of care” as a way of drawing on the rich strand of feminist theory thinking that uses “care” as a way to think about ethics and ethos in different ways.

References

- Aanestad, M. (2002). *Cultivating networks. Implementing surgical Medicine* (PhD Dissertation). University of Oslo.
- Abel, B. van, Evers, L., Klaassen, R., & Troxler, P. (Eds.). (2011). *Open Design Now: Why Design Cannot Remain Exclusive*. Amsterdam: BIS Publishers.
- Agger Eriksen, M. (2012). *Material Matters in Co-Designing: Formatting & Staging with Participating Materials in Co-Design Projects, Events & Situations* (Doctoral Dissertation). Malmö University.
- Alexander, C. W. (1964). *Notes on the Synthesis of Form*. Harvard University Press.
- Avery, M. D. (2005). The History and Evolution of the Core Competencies for Basic Midwifery Practice. *Journal of midwifery & women's health*, 50(2), 102–107. doi:10.1016/j.jmwh.2004.12.006
- Baldwin, C., Hienert, C., & Von Hippel, E. (2006). How User Innovations Become Commercial Products: A Theoretical Investigation and Case Study. *Research Policy*, 35(9), 1291–1313.
- Bannon, L. (1991). From Human Factors to Human Actors: The Role of Psychology and Human-Computer Interaction Studies in System Design. In J. Greenbaum & M. Kyng (Eds.), *Design at Work: Cooperative Design of Computer Systems* (pp. 25–44). Hillsdale, NJ, USA: L. Erlbaum Associates Inc.
- Bannon, L., & Ehn, P. (2010). Design Matters in Participatory Design. In J. Simonsen & T. Robertson (Eds.), *International Handbook of Participatory Design*. Routledge.
- Battarbee, K. (2003). Defining Co-experience. In *Proceedings of the 2003 international conference on Designing pleasurable products and interfaces* (pp. 109–113). New York, NY, USA: ACM. doi:10.1145/782896.782923
- Bauwens, M. (2006). The Political Economy of Peer Production. *Post-autistic economics review*, (37), 33–44.
- Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press.
- Berger, N. (2006). The Excel Story. *interactions*, 13(1), 14–17. doi:10.1145/1109069.1109084
- Beyer, H., & Holtzblatt, K. (1997). *Contextual Design: Defining Customer-Centered Systems* (1st ed.). Morgan Kaufmann.
- Bieling, T., Joost, G., & Müller, A. (2010). Collaborative Potential: Designing Coexistence in Urban Context. *VIRUS, nomads.usp journal*, (04). Retrieved from <http://www.nomads.usp.br/virus/virus04/?sec=4&item=2&lang=en>
- Biggar, J. (2010). Crowdsourcing for the Environment: The Case of Brighter Planet. *Platform: Journal of Media and Communication*, 2(2), 8–23.
- Binder, T., & Brandt, E. (2008). The Design:Lab as Platform in Participatory Design Research. *CoDesign International Journal of CoCreation in Design and the Arts*, 4(2), 115–129.
- Binder, T., & Hellström, M. (2005). *Design Spaces*. Helsinki, Finland: Edita: IT Press.
- Binder, T., Michelis, G. de D., Ehn, P., Jacucci, G., Linde, P., & Wagner, I. (2011). *Design Things*. The MIT Press.
- Bjerknes, G., Ehn, P., & Kyng, M. (Eds.). (1987). *Computers and Democracy: A Scandinavian Challenge*. England: Avebury: Aldershot.
- 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). New York, NY, USA: ACM. doi:10.1145/1900441.1900448
- Björgvinsson, E., Ehn, P., & Hillgren, P.-A. (2012a). Agonistic participatory design: working with marginalised social movements. *CoDesign*, 8(2-3), 127–144. doi:10.1080/15710882.2012.672577
- Björgvinsson, E., Ehn, P., & Hillgren, P.-A. (2012b). Design Things and Design Thinking: Contemporary Participatory Design Challenges. *Design Issues*, 28(3), 101–116. doi:10.1162/DESI_a_00165
- Björgvinsson, E., & Hillgren, P.-A. (2009). Indigenous Design: Healthcare Professional Using Self-produced Video in Articulating and Developing Work Practices. In *Nordic Design Research Conference*. Presented at the Engaging Artefacts, Oslo, Norway: NORDES. Retrieved from <http://ocs.sfu.ca/nordes/index.php/nordes/2005/paper/view/20>

- Blomberg, J., Suchman, L., & Trigg, R. (1997). Back to Work: Renewing Old Agendas for Cooperative Design. In M. Kyng & L. Mathiassen (Eds.), *Computers and design in context* (pp. 267–287). Cambridge, MA, USA: MIT Press.
- Bødker, K., Kensing, F., & Simonsen, J. (2004). *Participatory IT Design: Designing for Business and Workplace Realities*. Cambridge, MA: The MIT Press.
- Bødker, S. (2006). When Second Wave HCI Meets Third Wave Challenges. In *Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles* (pp. 1–8). New York, NY, USA: ACM. doi:10.1145/1182475.1182476
- Bødker, S. (2009). Past Experiences and Recent Challenges in Participatory Design Research. In A. Sannino, H. Daniels, & K. D. Gutiérrez (Eds.), *Learning and Expanding with Activity Theory* (1st ed., pp. 274–283). Cambridge University Press.
- Bødker, S., & Grønbaek, K. (1991). Design in Action: From Prototyping by Demonstration to Cooperative Prototyping. In J. Greenbaum & M. Kyng (Eds.), *Design at work: cooperative design of computer systems* (pp. 197–218). Hillsdale, NJ, USA: L. Erlbaum Associates Inc.
- Botero, A., Karhu, K., & Vihavainen, S. (2012). Exploring the Ecosystems and Principles of Community Innovation. In A. Lugmayr, H. Franssila, P. Näränen, O. Sotamaa, J. Vanhala, & Z. Yu (Eds.), *Media in the Ubiquitous Era* (pp. 216–234). IGI Global.
- Botero, A., Myller, M., & Suzi, R. (2007). *Daily Works – The Journey from Customizable Towards Co-designable* (No. 1-3) (pp. 32–42). Helsinki: University of Art and Design, Helsinki.
- Botero, A., Paterson, A. G., & Saad-Sulonen, J. (2012). *Towards Peer-production in Public Services: Cases from Finland*. Helsinki, Finland: Aalto University, School of Arts, Design and Architecture.
- Bowker, G. C., & Star, S. L. (1999). *Sorting Things Out: Classification and Its Consequences*. Cambridge, MA: The MIT Press.
- Brabham, D. C. (2008). Crowdsourcing as a Model for Problem Solving. An Introduction and Cases. *Convergence: The International Journal of Research into New Media Technologies*, 14(1), 75–90. doi:10.1177/1354856507084420
- Brabham, D. C. (2012). The Myth of Amateur Crowds. *Information, Communication & Society*, 15(3), 394–410. doi:10.1080/1369118X.2011.641991
- Brand, S. (1994). *How Buildings Learn: What Happens After They're Built*. Penguin Books.
- Brandes, U., Stich, S., & Wender, M. (2008). *Design by Use: The Everyday Metamorphosis of Things*. Springer.
- Brandt, E., Binder, T., & Sanders, E. (2012). Tools and Techniques: Ways to Engage Telling, Making and Enacting. In *International Handbook of Participatory Design*. Routledge.
- Brown, T. (2009). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. HarperBusiness.
- Büscher, M., & Cruickshank, L. (2009). Designing Cultures: Post-Disciplinary Practices. In *Proceedings of the 8th European Academy Of Design Conference*. Presented at the EAD 09, Aberdeen, Scotland: Robert Gordon University.
- Büscher, M., Gill, S., Mogensen, P., & Shapiro, D. (2001). Landscapes of Practice: Bricolage as a Method for Situated Design. *Computer Supported Cooperative Work*, 10(1), 1–28.
- Buur, J., & Matthews, B. (2008a). Participatory Innovation. *International Journal of Innovation Management*, 12(03), 255–273.
- Buur, J., & Matthews, B. (2008b). Participatory Innovation: A Research Agenda. In *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008* (pp. 186–189). Indianapolis, IN, USA: Indiana University.
- Buxton, B. (2007). *Sketching User Experiences: Getting the Design Right and the Right Design* (1st ed.). Morgan Kaufmann.
- Carroll, J. M. (1995). *Scenario-Based Design: Envisioning Work and Technology in System Development* (1st ed.). John Wiley & Sons.
- Chesbrough, Henry W. (2003, April 15). The Era of Open Innovation. *MIT Sloan Management Review*, 44(3), 35–41.
- Chesbrough, Henry William. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press.
- Clement, A. (1993). Looking for the Designers: Transforming the “Invisible” Infrastructure of Computerised Office Work. *AI & Society*, 7(4), 323–344. doi:10.1007/BF01891415
- Clement, A., Costantino, T., Kurtz, D., & Tissenbaum, M. (2008). Participatory Design and Web

- 2.0: the Case of PIPWatch, the Collaborative Privacy Toolbar. In *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008* (pp. 51–60). Indianapolis, IN, USA: Indiana University.
- Cockton, G. (2009). Getting there: Six Meta-principles and Interaction Design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 2223–2232). New York, NY, USA: ACM. doi:10.1145/1518701.1519041
- Constantine, L. (2004). Beyond User-Centered Design and User Experience: Designing for User Performance. *Cutter IT Journal*, 17(2).
- Cross, N. (Ed.). (1972). *Design Participation – Proceedings of the Design Research Society's Conference 1971*. London, England: Academy Editions.
- Cross, N. (1981). The Coming of Post-industrial Design. *Design Studies*, 2(1), 3–8.
- Dahlström, M., & Minkkinen, S. (2009). *Loppukiri. Vaihtoehtoista asumista seniori iässä (Loppukiri Alternative Living for Senior Age)*. Juva, Finland: WSOY.
- De Certeau, M. (1984). *The Practice of Everyday Life*. University of California Press.
- De los Reyes, D., & Botero, A. (2012). Endearing (re) encounters: Participatory Design in a Latin-American Popular Context. In *Proceedings of the 12th Participatory Design Conference: Exploratory Papers, Workshop Descriptions, Industry Cases – Volume 2* (pp. 85–88). New York, NY, USA: ACM. doi:10.1145/2348144.2348171
- Díaz-Kommonen, L. (2002). *Art, Fact, and Artefact Production: Design Research and Multidisciplinary Collaboration* (Doctoral Dissertation). University of Art and Design, Helsinki, Helsinki.
- DiSalvo, C. (2012). *Adversarial Design*. Cambridge, MA: MIT Press.
- Dittrich, Y., Eriksén, S., & Hansson, C. (2002). PD in the Wild; Evolving Practices of Design in Use. In *Proceedings of the Participatory Design Conference* (pp. 124–134). Malmö, Sweden: CPSR; MALMÖ UNIVERSITY, SWEDEN.
- Dourish, P., & Button, G. (1998). On “Technomethodology”: Foundational Relationships between Ethnomethodology and System Design. *Human-Computer Interaction*, 13(4), 395–432.
- Dunne, A. (2005). *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*. MIT Press.
- Dunne, A., & Raby, F. (2001). *Design Noir: The Secret Life of Electronic Objects* (1st ed.). Birkhäuser Basel.
- Eglash, R. (2004). Appropriating Technology. An Introduction. In R. Eglash, J. L. Croissant, G. Di Chiro, & R. Fouché (Eds.), *Appropriating Technology. Vernacular Science and Social Power*. University of Minnesota Press.
- Eglash, R., Croissant, J., & Di Chiro, G. (Eds.). (2004). *Appropriating Technology: Vernacular Science and Social Power*. University of Minnesota Press.
- Ehn, P. (1988). *Work-Oriented Design of Computer Artefacts*. Arbetslivscentrum & Lawrence Erlbaum Associates, Inc.
- Ehn, P. (2008). Participation in Design Things. In *Proceedings of the 8th Participatory Design Conference Experiences and Challenges* (pp. 92–101). Bloomington, Indiana: CPSR/ACM.
- Ehn, P., & Kyng, M. (1991). Cardboard Computers: Mocking-it-up or Hands-on the Future. In *Design at work: cooperative design of computer systems* (pp. 169–196). L. Erlbaum Associates Inc.
- Engeström, Y. (2008). *From Teams to Knots: Studies of Collaboration and Learning at Work* (1st ed.). Cambridge University Press.
- Fallman, D. (2008). The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. *Design Issues*, 24(3), 4–18. doi:10.1162/desi.2008.24.3.4
- Findeli, A. (1998). Will Design Ever Become a Science? Epistemological and Methodological Issues in Design Research, Followed by a proposition. In P. Strandman (Ed.), *No Guru no Method? Discussion in Art and Design Research*. Helsinki: University of Art and Design Helsinki.
- Findeli, A. (2008). *Searching for Design Research Questions*. Keynote lecture presented at the Q & H Conference '08. Retrieved from <https://www.designresearchnetwork.org/drm/content/q-%2526amp%3B-h-conference-%2526%25203039%3B08-keynote-alain-findeli-searching-design-research-questions>
- Findeli, A., & Bousbaci, R. (2005). L'éclipse de L'objet Dans les Théories du Projet en Design. In *Proceedings of the 6th European Academy of Design, EAD Conference*. Presented at the Design-Système-Évolution, Bremen, Germany.
- Fischer, G., Giaccardi, E., Ye, Y., Sutcliffe, A., & Mehandjiev, N. (2004). Meta-design: A Mani-

- festo for End-user Development. *Commun. ACM*, 47(9), 37, 33.
- Fischer, G. (2003). Meta-Design: Beyond User-Centered and Participatory Design. In *Proceedings of HCI International* (pp. 88–92). Lawrence Erlbaum Associates.
- Fischer, G. (2011). Understanding, Fostering, and Supporting Cultures of Participation. *interactions*, 18(3), 42–53. doi:10.1145/1962438.1962450
- Fischer, G. & Giaccardi, E. (2004). 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* (pp. 427–457). The Netherlands: Kuwer Academic Publishers.
- Fischer, G., & Ostwald, J. (2002). Seeding, Evolutionary Growth, and Reseeding: Enriching Participatory Design with Informed Participation. In T. Binder, J. Gregory, & I. Wagner (Eds.), *Proceedings of the Participatory Design Conference (PDC'2002)* (pp. 135–143). Malmö, Sweden: CPSR; MALMÖ UNIVERSITY, SWEDEN.
- Fischer, G., & Scharff, E. (2000). Meta-Design: Design for Designers. In *Proceedings of the Third International Conference on Designing Interactive Systems (DIS 2000)* (pp. 405–396).
- Flowers, S., & Henwood, F. (2010). *Perspectives on User Innovation*. World Scientific.
- Floyd, C., Mehl, W.-M., Reisin, F.-M., Schmidt, G., & Wolf, G. (1989). Out of Scandinavia: Alternative Approaches to Software Design and System Development. *Human Computer Interaction*, 4(4), 253–350. doi:10.1207/s15327051hcio404_1
- Floyd, I. R., Jones, M. C., Rathi, D., & Twidale, M. B. (2007). Web Mash-ups and Patchwork Prototyping: User-driven Technological Innovation with Web 2.0 and Open Source Software. In *Hawaii International Conference on System Sciences* (Vol. 0, p. 86c). Los Alamitos, CA, USA: IEEE Computer Society. doi:http://doi.ieeecomputer-society.org/10.1109/HICSS.2007.612
- Floyd, I., & Twidale, M. B. (2008). Learning Design from Emergent Co-Design: Observed Practices and Future Directions. In *Designing for Code-signers ws*. Retrieved from <http://mlab.taik.fi/co-design-ws/>
- Fuad-Luke, A. (2009). *Design Activism: Beautiful Strangeness for a Sustainable World*. Routledge.
- Fulton Suri, J. (2005). *Thoughtless Acts?: Observations on Intuitive Design*. Chronicle Books.
- Gasser, L. (1986). The Integration of Computing and Routine Work. *ACM Trans. Inf. Syst.*, 4(3), 205–225. doi:10.1145/214427.214429
- Gauntlett, D. (2011). *Making is Connecting* (1st ed.). Polity.
- Gaver, W. (2011). Making Spaces: How Design Workbooks Work. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1551–1560). New York, NY, USA: ACM. doi:10.1145/1978942.1979169
- Gaver, W. (2012). What Should we Expect from Research Through Design? In *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems* (pp. 937–946). New York, NY, USA: ACM. doi:10.1145/2208516.2208538
- Gero, J. S., & Kumar, B. (1993). Expanding Design Spaces Through New Design Variables. *Design Studies*, 14(2), 210–221. doi:10.1016/0142-694X(93)80048-H
- Giaccardi, E. (2004). *Principles of Metadesign: Processes and Levels of Co-Creation in the New Design Space*. School of Computing, Communications, and Electronics / University of Plymouth, UK.
- Godin, B. (2006). The Linear Model of Innovation: The Historical Construction of an Analytical Framework. *Science, Technology & Human Values*, 31(6), 639–667. doi:10.1177/0162243906291865
- Goriunova, Olga. (2007). *Art Platforms. The Constitution of Cultural and Artistic Currents on the Internet* (Doctoral Dissertation). University of Art and Design Helsinki, Helsinki, Finland.
- Gould, J. D., & Lewis, C. (1985). Designing for usability: key principles and what designers think. *Commun. ACM*, 28(3), 300–311. doi:10.1145/3166.3170
- Greenbaum, J., & Loi, D. (2012). Participation, the camel and the elephant of design: an introduction. *CoDesign*, 8(2-3), 81–85. doi:10.1080/15710882.2012.690232
- Greenbaum, J. M., & Kyng, M. (Eds.). (1991). *Design at Work: cooperative design of computer systems* (1st ed.). Lawrence Erlbaum Associates.
- Gregory, J. (2003). Scandinavian Approaches to Participatory Design. *International Journal of Engineering Education*, 19(1), 62–74.
- Gulliksen, J., Göransson, B., Boivie, I., Persson, J., Blomkvist, S., & Cajander, Å. (2005). Key Prin-

- ciples for User-Centred Systems Design. In A. Seffah, J. Gulliksen, & M. C. Desmarais (Eds.), *Human-Centered Software Engineering – Integrating Usability in the Software Development Life-cycle* (Vol. 8, pp. 17–36). Berlin/Heidelberg: Springer-Verlag.
- Haddon, L., Mante, E., Sapio, B., Kommonen, K.-H., Fortunati, L., & Kant, A. (Eds.). (2006). *Everyday Innovators: Researching the Role of Users in Shaping ICTs* (1st ed.). Springer.
- Hagen, P., & Robertson, T. (2010). Social technologies: Challenges and Opportunities for Participation. In *Proceedings of the 11th Biennial Participatory Design Conference* (pp. 31–40). New York, NY, USA: ACM. doi:10.1145/1900441.1900447
- Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14(3), 575. doi:10.2307/3178066
- Hartmann, B., Doorley, S., & Klemmer, S. R. (2008). Hacking, Mashing, Gluing: Understanding Opportunistic Design. *IEEE Pervasive Computing*, 7(3), 46–54.
- Hartwood, M., Procter, R., Slack, R., Vob, A., Buscher, M., Rouncefield, M., & Rouchy, P. (2002). Co-realisation: Towards a principled synthesis of ethnomethodology and participatory design. *Scandinavian Journal of Information Systems*, 14(2), 9–30.
- Hartwood, M., Procter, R., Slack, R., Voß, A., Büscher, M., Rouncefield, M., & Rouchy, P. (2008). Co-Realization: Toward a Principled Synthesis of Ethnomethodology and Participatory Design. In M. S. Ackerman, C. A. Halverson, T. Erickson, & W. A. Kellogg (Eds.), *Resources, Co-Evolution and Artefacts* (pp. 59–94). London, England: Springer-Verlag London.
- Hassenzahl, M. (2010). *Experience Design: Technology for All the Right Reasons*. Morgan & Claypool Publishers.
- Hassenzahl, M., & Wessler, R. (2000). Capturing Design Space From a User Perspective: The Repertory Grid Technique Revisited. *International Journal of Human-Computer Interaction*, 12(3), 441. doi:10.1207/S15327590IJHC1203&4_13
- Heap, C. (2007). *The Design Space, the Design Process as the Construction, Exploration and Expansion of a Conceptual Space* (PhD Dissertation). Mads Clausen Institute, University of Southern Denmark, Sønderborg, Denmark.
- Henderson, A., & Kyng, M. (1991). There's no place like home: Continuing Design in Use. In *Design at Work Cooperative design of computer systems* (pp. 240, 219). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Hillgren, P.-A., & Björgvinsson, E. (2002). Ready-made design at an Intensive Care Unit. *PDC*, 221–225.
- 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*, 7(3-4), 169–183.
- Höök, K., & Löwgren, J. (2012). Strong concepts: Intermediate-level Knowledge in Interaction Design Research. *ACM Trans. Comput.-Hum. Interact.*, 19(3), 23:1–23:18. doi:10.1145/2362364.2362371
- Howe, J. (2006). The Rise of Crowdsourcing. *Wired*, (14.06).
- Howe, J. (2008). *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business* (1st ed.). Crown Business.
- Hyysalo, S. (2007). User innovation, Design Space, and Everyday Practices: Rodeo Kayaking Case Revisited. In *Proceedings of the Nordic Consumer Policy Research Conference* (pp. 1542–1558). Helsinki: Nordic Forum for Consumer Research.
- Hyysalo, S. (2009). User Innovation and Everyday Practices: Micro-innovation in Sports Industry Development. *R&D Management*, 39(3), 247–258.
- Hyysalo, S. (2010). *Health Technology Development and Use: From Practice-Bound Imagination to Evolving Impacts* (1st ed.). New York, NY, USA: Routledge.
- Hyysalo, S., & Lehenkari, J. (2001). An Activity-Theoretical Method for Studying Dynamics of User Participation in IS Design. In *Proc of the 24th IRIS seminar*. Bergen: University of Bergen.
- Hyysalo, S., & Lehenkari, J. (2002). Contextualizing Power in a Collaborative Design. In *PDC 2002 Conference Proceedings* (pp. 93–103). Malmö, Sweden: CPSR; Malmö University.
- IDEO. (2011). *Human Centered Design Toolkit: An Innovation Guide for Social Enterprises and NGOs Worldwide*. Palo Alto, California, United States: IDEO.
- Iivari, J., & Iivari, N. (2006). Varieties of User-Centeredness. In *Proceedings of the 39th Annual Ha-*

- waii International Conference on System Sciences* (Vol. 08, p. 176.1). IEEE Computer Society.
- ISO. (1999). *Human-centred Design Processes for Interactive Systems* (No. ISO 13407:1999). International Organization for Standardization.
- Iversen, O. S., Kanstrup, A. M., & Petersen, M. G. (2004). A Visit to the “New Utopia”: Revitalizing Democracy, Emancipation and Quality in Co-operative Design. In *Proceedings of the third Nordic conference on Human-computer interaction* (pp. 171–179). New York, NY, USA: ACM. doi:10.1145/1028014.1028040
- Jégou, F., & Manzini, E. (Eds.). (2008). *Collaborative Services, Social innovation and Design for Sustainability*. Edizioni POLI.design. Retrieved from http://www.sustainable-everyday.net/main/?page_id=26
- Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide* (illustrated edition.). NYU Press.
- Jeppesen, L. B., & Frederiksen, L. (2006). Why Do Users Contribute to Firm-Hosted User Communities? The Case of Computer-Controlled Music Instruments. *Organization Science*, 17(1), 45–63. doi:10.1287/orsc.1050.0156
- Johnson, M. (2013). *How Social Media Changes User-Centred Design. Cumulative and Strategic User Involvement with Respect to Developer–User Social Distance*. Aalto University, School of Engineering, Helsinki, Finland.
- Johnson, M., & Hyysalo, S. (2012). Lessons for Participatory Designers of Social Media: Long-term User Involvement Strategies in Industry. In *Proceedings of the 12th Participatory Design Conference: Research Papers – Volume 1* (pp. 71–80). New York, NY, USA: ACM. doi:10.1145/2347635.2347646
- Jonas, W. (2007). Design Research and its Meaning to the Methodological Development of the Discipline. In R. Michel (Ed.), *Design Research Now* (pp. 187–206). Birkhäuser Basel.
- Jones, J. C. (1992). *Design Methods*. John Wiley and Sons.
- Julier, G. (2011). Political Economies of Design Activism and the Public Sector (pp. 77–85). Presented at the Nordic Design Research Conference: Making Design Matter, School of Art & Design, Aalto University, Helsinki, Finland: Nordes.
- Jung, E. (Ed.). (2008). *The ICING Cookbook*. Dublin: ICING Project & Dublin Institute of Technology. Retrieved from http://www.fp6-project-icing.eu/icing_cookbook.pdf
- Kanstrup, A. M. (2012). A Small Matter of Design: An Analysis of End Users as Designers. In *Proceedings of the 12th Participatory Design Conference: Research Papers – Volume 1* (pp. 109–118). New York, NY, USA: ACM. doi:10.1145/2347635.2347651
- Kensing, F., & Madsen, K. H. (1991). Generating Visions: Future Workshops and Metaphorical Design. In J. Greenbaum & M. Kyng (Eds.), *Design at work: cooperative design of computer systems* (pp. 155–168). Hillsdale, NJ, USA: L. Erlbaum Associates Inc.
- Khurana, A., & Rosenthal, S. R. (1998). Towards Holistic “Front Ends” in New Product Development. *Journal of Product Innovation Management*, 15(1), 57–74. doi:10.1016/S0737-6782(97)00066-0
- Kimbell, L. (2012). Rethinking Design Thinking: Part II. *Design and Culture*, 4(2), 129–148. doi:10.2752/175470812X13281948975413
- Kleemann, F., Voß, G., & Rieder, K. (2008). Un(der)-paid Innovators: The Commercial Utilization of Consumer Work through Crowdsourcing. *Science, Technology & Innovation Studies*, 4(1), 5–26.
- Kleine, D., & Wyrick, B. (2007). InfoEnclosure 2.0. *Mute*, 2(2). Retrieved from <http://www.mute.org/editorial/articles/infoenclosure-2.0>
- Koskinen, I., Battarbee, K., & Mattelmäki, T. (2003). *Empathic Design: User Experience in Product Design*. IT Press.
- Koskinen, I., Zimmerman, J., Binder, T., Redstrom, J., & Wensveen, S. (2011). *Design Research through Practice: From the Lab, Field, and Showroom*. Elsevier.
- Kraft, P., & Bansler, J. P. (1994). The collective Resource Approach: the Scandinavian Experience. *Scandinavian Journal of Information Systems*, 6(1), 71–84.
- Krippendorff, K. (2006). *The Semantic Turn: A New Foundation for Design*. CRC.
- Kuutti, K. (2009). HCI and Design: Uncomfortable Bedfellows? In T. Binder, J. Löwgren, & L. Malmberg (Eds.), *(Re)Searching the Digital Bauhaus* (pp. 43–59). London: Springer.
- Lakoff, G., & Johnson, M. (2003). *Metaphors We Live By* (2nd ed.). University Of Chicago Press.
- Latour, B. (2005). From Realpolitik to Dingpolitik – An Introduction to Making Things Public. In Latour, Bruno & P. Weibel (Eds.), *Making Things*

- Public – Atmospheres of Democracy* (pp. 4–31). MIT Press.
- Latour, B., & Weibel, P. (2005). *Making Things Public: Atmospheres of Democracy. catalogue of the show at ZKM*. MIT Press.
- Lazzarato, Maurizio. (1996). Immaterial Labour. In P. Virno & M. Hardt (Eds.), *Radical thought in Italy*. Minneapolis, MN: University of Minnesota Press.
- Lee, Y. (2008). Design participation tactics: the challenges and new roles for designers in the co-design process. *CoDesign: International Journal of CoCreation in Design and the Arts*, 4(1), 31–50. doi:10.1080/15710880701875613
- Leerberg, T. (2004). *Embedded Spaces: Ph.d. Af-handling Arkitektskolen* (PhD Dissertation). Danish Center for Integrated Design, Århus.
- Leinonen, T. (2010). *Designing Learning Tools Methodological Insights* (Doctoral Dissertation). Aalto University, School of Art and Design, Helsinki, Finland.
- Leonard, D. (1998). *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*. Harvard Business Press.
- Lévi-Strauss, C. (1968). *The Savage Mind*. University of Chicago Press.
- Levine, F., & Heimerl, C. (2008). *Handmade Nation: The Rise of DIY, Art, Craft, and Design* (1st ed.). Princeton Architectural Press.
- Lewin, K. (1946). Action Research and Minority Problems. *Journal of Social Issues*, 2, 34–46.
- Lieberman, H., Paternò, F., & Wulf, V. (Eds.). (2006). *End User Development* (Vol. 9). Springer.
- Manzini, E. (2012, July 3). Making Things Happen: Participatory Design Beyond the Post-it Revolution. *Design Ethos Blog*. Retrieved December 11, 2012, from <http://www.designethos.org/wp/2012/07/03/making-things-happen-participatory-design-beyond-the-post-it-revolution/>
- Manzini, E., & Rizzo, F. (2011). Small projects/ large changes: Participatory design as an open participated process. *CoDesign*, 7(3-4), 199–215.
- Margolin, V. (2002). *The Politics of the Artificial: Essays on Design and Design Studies* (1st ed.). University of Chicago Press.
- Marres, N. (2007). The Issues Deserve More Credit Pragmatist Contributions to the Study of Public Involvement in Controversy. *Social Studies of Science*, 37(5), 759–780. doi:10.1177/0306312706077367
- Mattelmäki, T. (2006). *Design Probes*. University of Art and Design Helsinki, Helsinki, Finland.
- Mazé, R. (2007). *Occupying Time: Design, Technology and the Form of Interaction*. Axl Books.
- McCamant, K., Durrett, C., & Hertzman, E. (1994). *Cohousing: A Contemporary Approach to Housing Ourselves*. Berkeley, California: Ten Speed Press.
- McKerlie, D., & MacLean, A. (1994). Reasoning with Design Rationale: Practical Experience with Design Space Analysis. *Design Studies*, 15(2), 214–226. doi:10.1016/0142-694X(94)90026-4
- Meroni, A. (Ed.). (2007). *Creative communities | People inventing sustainable ways of living*. Edizioni POLI.design. Retrieved from http://www.sustainable-everyday.net/main/?page_id=26
- Mitchell, T. (1992). Preface to the Second Edition of Design Methods. In *Design Methods* (pp. ix–xvii). New York: John Wiley & Sons.
- Mol, A. (2008). *The Logic of Care: Health and the Problem of Patient Choice* (1st ed.). Routledge.
- Moll, J. (2012). *Prototyping Matters of Concern* (PhD Dissertation). University of Copenhagen,, Copenhagen.
- Moran, T. (2002). Everyday Adaptive Design. In *DIS '02: Proceedings of the 4th conference on Designing interactive systems* (pp. 14, 13). London, England: ACM. doi:<http://dx.doi.org/10.1145/778712.778715>
- Mulgan, G., Caulier-Grice, J., & Murray, R. (2010). *The Open Book of Social Innovation*. United Kingdom: Nesta and The Young Foundation.
- Murphy, S. A., & Kumar, B. (1997). The Front End of New Product Development: a Canadian Survey. *R&D Management*, 27(1), 5–16.
- Nardi, B. A. (1993). *A Small Matter of Programming: Perspectives on End User Computing*. MIT Press.
- Nelson, H. G., & Stolterman, E. (2002). *The Design Way: Intentional Change in an Unpredictable World: Foundations and Fundamentals of Design Competence*. Educational Technology Pubns.
- Nielsen, J. (1994). *Usability Engineering*. Morgan Kaufmann.
- Norman, D. A. (1988). *The Psychology of Everyday Things (Later published as The Design of Everyday Things)*. New York: Basic Books.
- Norman, D. A., & Draper, S. W. (1986). *User Centered System Design; New Perspectives on Human-Computer Interaction*. Hillsdale, NJ, USA: L. Erlbaum Associates Inc.

- Normann, R., & Ramírez, R. (1993, August). From Value Chain to Value Constellation: Designing Interactive Strategy. *Harvard Business Review*, 71(4), 65–77.
- Oudshoorn, N., & Pinch, T. (Eds.). (2003). *How Users Matter: The Co-Construction of Users and Technology*. The MIT Press.
- Papanek, V. (1973). *Design For The Real World: Human ecology and social change*. (2 Revised.). Academy Chicago Publishers.
- Parks, R. B., Baker, P. C., Kiser, L., Oakerson, R., Ostrom, E., Ostrom, V., ... Wilson, R. (1981). Consumers as Coproducers of Public Services: Some Economic and Institutional Considerations. *Policy Studies Journal*, 9(7), 1001–1011. doi:10.1111/j.1541-0072.1981.tb01208.x
- Pestoff, V. A. (2008). *A Democratic Architecture for the Welfare State*. Taylor & Francis.
- Philip, R., & Rourke, C. (2006). *User-centred Design and Organisational Maturity*. Mercurytide. Retrieved from <http://www.mercurytide.co.uk/news/article/beyond-usability-testing/>
- Pipek, V., & Syrjänen, A.-L. (2006). Infrastructuring As Capturing In-Situ Design. In *7th Mediterranean Conference on Information Systems*, Venice, Italy: Association of Information Systems.
- 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). Retrieved from <http://aisel.aisnet.org/jais/vol10/iss5/1>
- Pollock, N. (2005). When Is a Work-Around? Conflict and Negotiation in Computer Systems Development. *Science, Technology & Human Values*, 30(4), 496–514. doi:10.1177/0162243905276501
- Pollock, N., & Williams, R. (2008). *Software and Organisations: The Biography of the Enterprise-Wide System or How SAP Conquered the World* (1st ed.). Routledge.
- Prahalad, C. K., & Ramaswamy, V. (2004). *The Future of Competition: Co-Creating Unique Value with Customers*. Harvard Business School Press.
- Preece, J., Rogers, Y., & Sharp, H. (2002). *Interaction Design* (1st ed.). Wiley.
- Puig de la Bellacasa, M. (2011). Matters of Care in Technoscience: Assembling Neglected Things. *Social Studies of Science*, 41(1), 85–106. doi:10.1177/0306312710380301
- Reason, P., & Bradbury, H. (2001). *Handbook of Action Research: Participative Inquiry and Practice*. SAGE.
- Reckwitz, A. (2002). Toward a Theory of Social Practices: A Development in Culturalist Theorizing. *European Journal of Social Theory*, 5(2), 263, 243.
- Redström, J. (2001). *Designing Everyday Computational Things* (Doctoral Dissertation). Göteborg University.
- Redström, J. (2006). Towards user design? On the Shift From Object to User as the Subject of Design. *Design Studies*, 27(2), 123–139. doi:10.1016/j.destud.2005.06.001
- Redström, J. (2008). RE:Definitions of Use. *Design Studies*, 29(4), 410–423. doi:10.1016/j.destud.2008.05.001
- Robertson, T. (1998). Shoppers and Tailors: Participative Practices in Small Australian Design Companies. *Computer Supported Cooperative Work (CSCW)*, 7(3), 205–221. doi:10.1023/A:1008626803428
- Saad-Sulonen, J. (2013). *Combining Participations: Shifting the Locus of Participatory E-planning* (Doctoral Dissertation). Aalto University, School of Arts, Design and Architecture, Helsinki, Finland.
- Saad-Sulonen, J., Botero, A., & Kuutti, K. (2012). A Long-term Strategy for Designing (in) the Wild: Lessons from the Urban Mediator and Traffic Planning in Helsinki. In *Proceedings of the Designing Interactive Systems Conference* (pp. 166–175). New York, NY, USA: ACM. doi:10.1145/2317956.2317982
- Salgado, Mariana. (2009). *Designing for an Open Museum, an exploration on content creation in the museum* (Doctoral Dissertation). University of Art and Design, Helsinki, Finland.
- Sanders, E. B.-N., Brandt, E., & Binder, T. (2010). A Framework for Organizing the Tools and Techniques of Participatory Design. In *Proceedings of the 11th Biennial Participatory Design Conference* (pp. 195–198). New York, NY, USA: ACM. doi:10.1145/1900441.1900476
- Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the New Landscapes of Design. *CoDesign International Journal of CoCreation in Design and the Arts*, 4(1), 5–18.
- Sanders, E. B.-N., & Westerlund, B. (2011). Experiencing, Exploring and Experimenting in and

- with Co-Design Spaces. In *Nordic Design Research Conference 2011*. Presented at the NORDES, Helsinki, Finland. Retrieved from www.nordes.org
- Sawhney, M., Verona, G., & Prandelli, E. (1995). Collaborating to Create: The Internet as a Platform for Customer Engagement in Product Innovation. *Journal of Interactive Marketing*, 19(4), 1–15.
- Schatzki, T. (2001). Introduction, Practice Theory. In T. Schatzki, K. Knorr-Cetina, & E. von Savigny (Eds.), *The Practice Turn in Contemporary Theory* (pp. 10–22). Routledge.
- Scheible, J. (2011). *Empowering Mobile Art Practice A Recontextualization of Mobile and Ubiquitous Computing*. Aalto University, School of Art and Design, Helsinki, Finland.
- Schuler, D., & Namioka, A. (Eds.). (1993). *Participatory Design: Principles and Practices* (1st ed.). Hillsdale, NJ: CRC / Lawrence Erlbaum Associates.
- Sharrock, W., & Anderson, B. (1994). The User as a Scenic Feature of the Design Space. *Design Studies*, 15(1), 5–18. doi:10.1016/0142-694X(94)90036-1
- Shedroff, N. (2001). *Experience Design*. Waite Group Press.
- Shove, E., & Pantzar, M. (2005). Consumers, Producers and Practices: Understanding the invention and reinvention of Nordic walking. *Journal of Consumer Culture*, 5(1), 64, 43.
- Shove, E., Watson, M., Hand, M., & Ingram, J. (2007). *The Design of Everyday Life*. Berg Publishers.
- Simon, H. A. (1996). *The Sciences of the Artificial - 3rd Edition* (third edition.). The MIT Press.
- Simonsen, J., & Robertson, T. (Eds.). (2012). *Routledge International Handbook of Participatory Design*. Routledge.
- Slattery, S. P. (2009). “Edit this page”: the Sociotechnological Infrastructure of a Wikipedia Article. In *Proceedings of the 27th ACM international conference on Design of communication* (pp. 289–296). Bloomington, Indiana, USA: ACM. doi:10.1145/1621995.1622052
- Sonkin, L., Petäköski-Hult, T., Rönkä, K., & Södergård, H. (1999). *Seniori 2000. Ikääntyvä Suomi uudelle vuosituuhannelle (Seniors 2000. Aging Finland for the next century)* (No. Sitra 233). Helsinki, Finland: Sitra.
- Spinuzzi, C. (2003). *Tracing Genres through Organizations: A Sociocultural Approach to Information Design (Acting with Technology)*. The MIT Press.
- Spinuzzi, C. (2005). The Methodology of Participatory Design. *Technical Communication*, 52(2), 163–174.
- Stake, R. (1994). Case Studies. In N. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 236–247). Sage Publications Ltd.
- Star, S. L., & Bowker, G. (2006). How to Infrastructure. In L. A. Lievrouw & S. Livingstone (Eds.), *The Handbook of New Media – Student edition* (pp. 230–244). Sage Publications, Inc.
- 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.
- Steen, M. (2011). Tensions in Human-centred Design. *CoDesign*, 7(1), 45–60. doi:10.1080/15710882.2011.563314
- Stewart, J., & Williams, R. (2005). The Wrong Trousers? Beyond the Design Fallacy: Social Learning and the User. In *User involvement in innovation processes. Strategies and limitations from a socio-technical perspective*. Munich: Profil-Verlag.
- Suchman, L. (1994). Working Relations of Technology Production and Use. *Computer Supported Cooperative Work (CSCW)*, 2(1), 21–39. doi:10.1007/BF00749282
- Suchman, L. (2002). Located Accountabilities in Technology Production. *Scandinavian Journal of Information Systems*, 14(2), 91–105.
- Suchman, L. (2007). *Human-Machine Reconfigurations: Plans and Situated Actions* (2nd ed.). Cambridge University Press.
- Suchman, L. (2011). Anthropological Relocations and the Limits of Design. *Annual Review of Anthropology*, 40, 1–18.
- Suchman, L., Blomberg, J., Orr, J., & Trigg, R. (1999). Reconstructing Technologies as Social Practice. *American Behavioral Scientist*, 43(3), 392–408.
- Surowiecki, J. (2005). *The Wisdom of Crowds* (Reprint.). Anchor.
- Surtees, R. (2003). *Midwifery as Feminist Praxis* (PhD Dissertation). University of Canterbury.
- Suzi, R., Saad-Sulonen, J., & Botero, A. (2009, February). Co-designing with web.py: Urban Mediator. *Python Magazine*, (2), 27–34.

- Svanæs, D., & Gulliksen, J. (2008). Understanding the context of design: towards tactical user centered design. In *NordicCHI '08: Proceedings of the 5th Nordic conference on Human-computer interaction* (pp. 362, 353). Lund, Sweden: ACM. doi:<http://dx.doi.org/10.1145/1463160.1463199>
- Tan, L. (2012). *Understanding the different roles of the designer in design for social good. A study of design methodology in the Dott 07 (Designs of the Time 2007) projects*. Northumbria University.
- Thackara, J. (2006). *In the Bubble: Designing in a Complex World*. The MIT Press.
- Thrift, N. (2006). Re-inventing Invention: New Tendencies in Capitalist Commodification. *Economy and Society*, 35(2), 279–306.
- Törpel, B., Voss, A., Hartswood, M., & Procter, R. (2009). Participatory Design: Issues and Approaches in Dynamic Constellations of Use, Design, and Research. In *Configuring User-Designer Relations: Interdisciplinary Perspectives*. London, England: Springer-Verlag London.
- Tuomi, I. (2003). *Networks of Innovation: Change and Meaning in the Age of the Internet*. Oxford University Press, USA.
- Vaajakallio, K. (2012). *Design Games as a Tool, a Mindset and a Structure*. Aalto University, School of Arts, Design and Architecture, Helsinki.
- Victor, B., & Boynton, A. C. (1998). *Invented Here: Maximizing Your Organization's Internal Growth and Profitability*. Harvard Business Review Press.
- Von Busch, O. (2012). Generation Open: Contested Creativity and Capabilities. *The Design Journal*, 15(4), 443–459. doi:10.2752/175630612X13437472804295
- Von Hippel, E. (1988). *The Sources of Innovation*. Oxford University Press, USA.
- Von Hippel, E. (2005). *Democratizing Innovation*. The MIT Press.
- Von Hippel, E. (2007). Horizontal innovation networks-by and for users. *Industrial and Corporate Change*, 16(2), 293–315. doi:10.1093/icc/dtm005
- Von Hippel, E., & Katz, R. (2002). Shifting Innovation to Users via Toolkits. *Management Science*, 48(7), 821–833. doi:10.1287/mnsc.48.7.821.2817
- Voss, A., Hartswood, M., Procter, R., Rouncefield, M., & Slack, R. (Eds.). (2009). *Configuring User-Designer Relations: Interdisciplinary Perspectives*. London, England: Springer-Verlag London.
- Voss, A., Procter, R., & Williams, R. (2000). Innovation in Use: Interleaving day-to-day operation and systems development. *PDC*, 192–201.
- Wakkary, R., & Maestri, L. (2007). The Resourcefulness of Everyday Design. In *Proceedings of the 6th ACM SIGCHI conference on Creativity & cognition* (pp. 172, 163). Washington, DC, USA: ACM. Retrieved from <http://dx.doi.org/10.1145/1254960.1254984>
- Wakkary, R., & Maestri, L. (2008). Aspects of Everyday Design: Resourcefulness, Adaptation, and Emergence. *International Journal of Human-Computer Interaction*, 24(5), 491, 478. doi:<http://dx.doi.org/10.1080/10447310802142276>
- Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press.
- Westerlund, B. (2005). Design Space Conceptual Tool – Grasping the Design Process. In *Proceedings of Nordes, the Nordic Design Research Conference, "In the Making"*. Copenhagen: Nordes. Retrieved from <http://www.nordes.org/old/index.html>
- Westerlund, B. (2009). *Design Space Exploration. Cooperative Creation of Proposals for Desired Interactions with Future Artefacts*. Kungliga Tekniska Högskolan.
- Williams, R., Stewart, J., & Slack, R. (2005). *Social Learning in Technological Innovation: Experimenting with Information and Communication Technologies* (illustrated edition.). Edward Elgar Pub.
- Yin, R. K. (2002). *Case Study Research: Design and Methods, 3rd Edition* (3rd ed.). Sage Publications, Inc.
- Yudice, G. (2008). *El Recurso de la Cultura: Usos de la Cultura en la Era Global (Serie Culturas)*. Gedisa.

A

Articles

Codesigning Visions, Uses, and Applications

Andrea Botero Cabrera
Kari-Hans Kommonen
Iina Oilinki
Maria Koskijoki

First published in *Electronic Proceedings of the 5th International Conference of the European Academy of Design. Techné-Desing Wisdom*, Barcelona, Spain: Universidad de Barcelona. European Academy of Design. Reprinted with permission.

Abstract

An emergent idea in contemporary design discourse is that of users becoming actors in the design processes, especially those of ICT's and digital applications. It is clear however that users, or their wishes or needs, seldom initiate developments, nor are they in a position to suggest design or development processes. Our work concentrates on exploring ways in which the emerging possibilities of digitalization could be discussed, informed and envisioned with non-experts, before concrete product and business plans enter the stage. We will like to argue that it is possible to envision ways in which design research can give people tools to become more proactive rather than just reactive towards technological development. The paper illustrates some of our work in progress in order to understand this challenges, the work done with different communities, and the lessons learned along the way, in the context of co-designing visions for everyday life applications.

The position of the “users”

Contemporary design discourse has put forward the idea of users becoming more recognized actors in the design processes, especially of ICT's and digital applications. The emergence of diverse user-centred design approaches, the increasing use

of ethnographically informed studies of people and their activities to inform R&D, and the growing bibliography and dissemination of cases testifies for this interest.

From these experiences one can point out the diverse assumptions that are involved, different disciplines have different answers, and the approaches are of various kinds. As a result, the information society becomes one of the frameworks in which the position and the role that users play in the design process are being negotiated. For the diverse fields of design the implications are crucial.

However, It seems to us that the practice of certain kind of technological determinism is still at the centre of the ‘Information Society’ project. The majority ICT developments start from an idea of a potential technology or a product, which then, in a design process, finds a form and a set of functions that appeal (or not) to its future users. The role of a well-defined product as the ultimate outcome of a “design process” still dominates the discussions, even if it is done from a “user centred perspective.

The concept of strategies and tactics, elaborated by De Certeau has been analysed by Andrew Feenberg, in his search for alternative ways to conceptualize and question technological development (Feenberg 1999). This analysis might help to shed some light in to the development of alternatives for our current deterministic situation. As De Certeau frames them, the concepts of tactics and strategies are helpful to understand games as a model for society. In a Game the range of actions of the actors is defined, but their moves are not determined. Feenberg argues, that conversely in technological development, by understanding the presence of both strategically and tactical positions, technological determinism might be challenged. We can see the development insted as negotiation process that is framed in a Game like situation.

What the Game really means and what are the components? De Certeau refers to strategies as “the calculation (or manipulation) of the balance of forces which becomes possible once a subject of power (a firm, an army, a city, a scientific institution) is

isolatable. Strategy presupposes a place that can be circumscribed as one’s own (un propre) and that can serve as the base from which to direct relations with an exteriority consisting of targets or threads (clients, competitors, enemies...)” (Feenberg 1999:112).

From the current “product” driven perspective, to which we refer previously, we can then find 3 general strategies from where Designers and Producers act: **Brief, Use and Context**. These strategies do not exclude each other; they might be combined and presented in the same project at different stages, both in rhetorics and in practice.

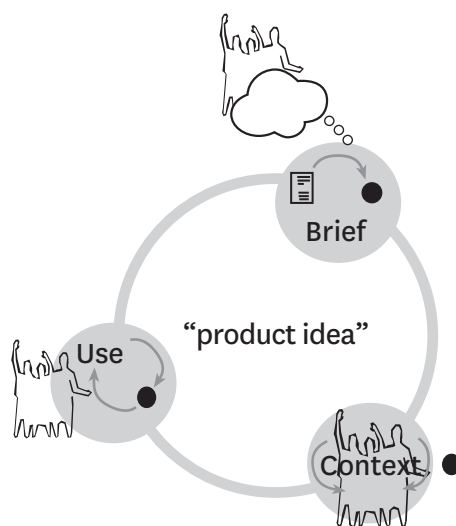


Fig 1 different bases from which to direct a strategy from the point of view of designers and producers.

1. “Brief” oriented approaches – Hold the idea that the brief talks about the product, constitute its prerequisite and is mostly independent from the design (and even from the designers). With such an approach the success of the end result was (is) always measured against the presumable fit with that brief and/or to the apriori requirements. In one hand Design could be the solely responsibility of one person or even a team, more depending

on the complexity of the project, its size and cost. In the other hand, end users are mostly represented by abstractions during the process and perceived as marketing constraints. There is usually poor communication between these actors

2. “Use” oriented approaches – become visible with an increased concern for the human aspects of product use (heavily influenced by more traditional ergonomics and later on by disciplines such as Human Computer Interaction -HCI). The very basic level dealt mainly with “human factors” or the adaptation of technology to general constraints (Shneiderman 1980) The higher level shifts also to include the situation of use (Norman 1986) and lately the “product” as a constituent of whole experience (Norman 2002). In these cases end users start to appear as more concrete factors, that can be then called to validate, test and inform during certain phases of the project. Following this strategy it is possible to construct an idea of what type of user is being constructed for a commodity (Pantzar 1996). Users are called in to the laboratories and designers mostly, remain in them.

3. “Context” design approaches refer more or less to the interests in social structures and their interplay with the product design situation and the expected context of use. At the basic level it is claimed that “social factors” will adapt (try) and appropriate computer-created environments (or other products) to social-group-needs. However some critical approaches to technology development recognized that the survival and shift of agency in the decision making process of technology development, is not only contested in the social process, but can also be affected in the design process (Sclove 1995, Feenberg 1999). The higher level then pursues the alteration of both the social and the technical (Suchmann 1986, Winograd

and Florez 1987, Weiser 1991), including the future situation of “use” as a premise for reflection and consideration of the interaction possibilities and the user involvement. Users do not appear working or doing things in isolation, but embedded in practices and communities, which need to be understood and embraced in order to design successfully [1].

Borrowing from De Certau’s analysis and making a parallel to the design process circumstances we can say that, depending on the point of view of those subjects of power (designers and producers), the emphasis on why users are interesting shifts. Users might be framed as market constraints, content of focus groups, testers, subjects for observation, informants in an interview, etc. In some cases they even could be considered as active designers. For the “Brief oriented approach” the usual strategy for design is based on introspection. Likewise common sense understanding and a high level of quick and dirty heuristics play a big role. The “use” oriented strategy goes one step further: iterative design and extensive testing of features are at the core, since good design can only be found in its use. Guidelines and standards complement the landscape of this strategy. For the “context” oriented approach, design is understood in a more contextual way, conversely it requires the explicit participation of a variety of actors. There is more reflection around the user’s involvement and the qualities expected from the solutions.

In all these approaches users may be regarded as actors, and may be empowered, but their agency is still dependent on how ‘useful’ they are for a design process of a certain kind of ‘product’ they are not necessarily able to initiate themselves. Nor they are usually in a position to suggest design or development processes. Even the term ‘user’ suggests that people do not elicit interest unless they ‘use’ the ‘products and services’ we want to design for them.

However, if designers-producers (the subjects of power) seem to employ strategies, or let’s say,

act strategically, then people (users) in their everyday life seem to act tactically. People remain more or less within the framework of the dominant strategy (designs offered to them), to keep on borrowing De Certau's concept. However they will respond with subtle deviations when implementing, appropriating and reinterpreting what was put forward for them. In Feenberg's terms this is "the margin of manoeuvre" that exists when implementing a supposedly rigid plan (Feenberg 1999). People will rely on their own understanding of things, they will search for help, improvise solutions and misuse the technology in all kinds of possible ways. In such environment marginal practices give new twist to preconceived solutions, generating what comes to be known as social innovation.

Social Innovation and the ways people appropriate and reinterpret the possibilities that are given to them is still very little understood, and while studied extensively in the social sciences, is seldom appreciated as something worth understanding and supporting in the pragmatic and focused product development process. In there 'strategies' are the dominant focus and tactics are left to be taken care by people themselves.

The current ecosystem and the need for codesign:

The ecosystem of digital products is more complicated and flexible than that one of traditional products in the industrial society. It is also a crucial issue since it becomes clear that our everyday life – and probably most people's life all over the world eventually – will be affected by the digital "systems" that are being designed at the moment. More than centring a product design process in the abstract figure of the user, we would like to explore the idea of driving it by the capabilities of appropriation and reinterpretation of real people in their everyday lives, and trying to make social innovation a pivotal point.

From this point of view we claim that this approach requires a more radical codesign process, one that could take advantage of both strategic

and tactical positions. We see it as a complementary starting point for constructing an alternative view to technological determinism. In such codesign process the emerging possibilities and limitations should become visible to both "users" and designers-producers in a dialogical way.

The ideal stage to influence a new solution, a new direction, is before it is out there, when things are in the making. As we have learned from studies of social construction of technology (Bijker et al. 1999: 39) this is also the most difficult, because none of us has much experience or opinions on that yet. For example some new modes of action, even quite radical, have been adopted quickly; one being the invasion of the mobile phones into everyday life in some parts of the world, and the new ways of socialising and taking care of things this has brought about (Mäenpää 2001) for instance: it is possible that if people had been asked a few years ago whether they would like to be always available while moving around, they had answered negatively. How does one ask the right questions? And how could users of today give answers to questions about future situations, when they have not yet experienced them?

Can design produce only products? Or can we understand the outcomes of design differently? Do designers and producers engage with 'users' and 'products', or rather could the design process engage with 'people' and their contexts and practices to understand the different 'applications' they might want to create?

Taking the user's reality seriously

People have problems with products that user centered design cannot easily solve. One class of such problems is ecosystemic in nature: some problems are the result of existing or missing interactions and/or compatibilities between products. These problems usually, cannot be adequately addressed by the design of a single product. Regardless of how well a single product is designed, people will use the product in a unique context, in interaction with several other products and services, and will

therefore always end up as the “system integrators” that have to fit the pieces of the puzzle together.

Another class of problems result from the fact that the design is usually created with the producer’s interest, not the users’, as first priority. Although business success depends on the producer’s ability to satisfy the users’ needs, in most cases the producers accommodate the users interest to the extent that their sales figures and their competition force them to do so. In many cases all the producers’ interests are so close to each other that from a customer’s point of view they form a cartel [2]

The fact that certain concerns, such as the ecosystemic issues and the users interests, are not represented enough in the design of new products, is in our opinion a major hurdle for the adoption of the new technologies. It is also a major structural problem in the current R&D system. There are possible and feasible uses and applications for those technologies that would most likely appeal to people, but the players who are in the position to develop them do not have the means to come up with the appropriate designs, and do not have the collaborative practices or strategies that could facilitate the emergence of the necessary ecosystemic conditions for the success of those applications.

To address this, we propose that the current R&D activities should be complemented with design that addresses the ecosystemic concerns and users’ interests. Our work attempts to develop such design approaches. We believe that this can be done by developing sensitivity to everyday life as an organic, individual whole, by focusing on applications rather than products, and by involving the users, the experts of their own lives, as codesigners.

Explorations: understanding everyday life

Changing the focus from “products” into practices and applications present at least two immediate practical challenges:

1. How to shift the focus from discussing in terms of people just as “users” into new kinds

of roles? Technology development comes to us not only as users or clients but also as citizens, family members, residents etc. Since the main objective is to enable people, our starting point tries to be aware of their roles as planners, actors, creators, decision makers, responsible citizens or prosumers in their own circumstances.

2. How to make sense about the future? For the purposes of envisioning possible futures, and design concepts, designers and developers have traditionally relied in their own intuition for the situation and the use of diverse representational objects. More structured approaches like trend analysis and so on have also entered in the design toolkit. Recently and due to the influence of diverse user-centred approaches and marketing analysis, this activity is also backed up with empirical data. Data is gathered through interaction with “test users”, leading trendsetters, or early adopters (if using typical segmentations). Another common strategy is that of facilitating a technology immersion experience for a controlled group. With such approaches, it is possible that the design team gains a better understanding of the users. However, the possibilities, limitations and problematic that the technology development might cause are usually not discussed and communicated in interaction with the ones that will eventually be affected by it – A probable exception might be in the ‘classical Scandinavian’ participatory design approach which has a more political agenda (Bratteig 1995)

In our efforts to engage and enable discussion about the design needs of non-experts of ICT’s or rather, experts of everyday life and address this challenges, we have chosen to approach the issue by:

- Firstly, we work with several ‘communities of interest’ instead of isolated users or user

groups. The term ‘community’ is used in a very pragmatic meaning in this paper. We use the term ‘communities of interest’ to refer to these groups of people that share a common interest and are committed to grow as a functional community, even if they do not necessarily “share” the same space. The communities with whom we have developed a more sustained collaboration are: An association of active seniors (<http://arki.uiah.fi/loppukiri>) engaged on designing their future communal home and in a sense the rules and structure of their future local community. The second one is a multicultural kindergarten (children, teachers, parents and friends) that is directed by the parent’s association (<http://www.micasita.fi>).

As more or less structured communities, they have developed a clear motivation towards developing a new way of doing something (securing a more nurturing third age, raising children in a multicultural bilingual environment, etc). They also have some experience in articulating their interests and needs in order to negotiate them with-in the community, which makes them interesting codesigners, fruitful design partners in future oriented work-based on long term engagement and sustainable collaboration.

- Secondly, we have tried to come closer to an approach that would engage both the informants and the research team in a shared project. With this we hope to create a more reflective atmosphere and a shared goal. The communities join our discussions having already spent sometime thinking about their own future and the kinds of things they need to consider. Which is something not very common. At the same time their expectations and experience do not involve any particular technology, solution or direction. In a sense one can call them lead users. But then again, users of what? They are not particularly using “something” but

rather engaged in designing new practices, while doing them.

- Thirdly, we try to actively facilitate the discussion of future possibilities by developing appropriate tools, concepts and language. We realize that in order for people to design, they must be given materials and tools that inspire and communicate new possibilities with their affordances. These affordances can be both visual and tangible or rather more intellectual, at the level of appropriate use of concepts and understanding of their implications. By providing such new tools and materials, for example in the form of illustrative textual and visual descriptions and narratives of new ways of doing something (scenarios), it is possible to assist these ‘experts of everyday life’ to see also new personal possibilities for alternative practices that rely on new technology, and in the process, explain new uses and needs for it.

The approach:

A starting point of our research and design is to consciously focus on the things people want to do, achieve or change with the technology – the “application” – after that on what kinds of designs and ecosystems of designs can help in realizing these needs. We use the term “application” to refer to this focus of interest, because we feel it is understood reasonably well by the technology development community, which can easily see that “buying tickets through a web service”, to give a blunt example, is an application of specific information technologies. At the same time, we acknowledge that the term is obscure for many other communities, for example to end users or social scientists. Other terms that we have seen used in a fairly similar sense, and that we have also used instead of ‘application’ are ‘use’, ‘activity’ or ‘practice’. We hope that further work helps us to develop a better term.

By identifying interesting applications with the communities, we would like to understand which components and aspects they find important. What

other ways of doing the same thing could they use and how? These aspects are important for us because we would like to find ways to separate the more general "application" from the tactics someone employs to achieve it. Lets say someone wants to be informed about the latest news, but she also wants to hear more opinions about them. In order to achieve this, the person can watch the 8 p.m. news at home, with her family, or call her friends who she knows have read the same article as her. For performing this tactics she makes use of different solutions and tools (watching news from TV or reading a newspaper, or hearing the radio and then calling or discussing face to face, maybe sharing notes, what ever).

Its important to understand that there are different solutions and tools available for the same application.

This distinction might help us to distance the discussion from the specific features of the technology or tools to a slightly more abstracted and

thus higher level, and focus more on the reasons and qualities that relate to choosing between alternative possibilities. Another benefit we hope to achieve with this is to make space in the discussion for the new features and characteristics of future tools that we cannot show or experience yet. As one of our goals, we hope that this approach can take us beyond tactics and enable and empower the development of new strategies.

An important part of the research is to explore different methods that could work for this kind of codesign activities, which are not centered in product as an outcome and that try to combine both strategical and tactical conditions. Here we will explain the main 3 activities we have engaged with these communities in order to make visible the possibilities and explore new ways of doing things.

a) **Shared dialogue** evolves through diverse excuses to talk about everyday life with the communities, in order to contextualize their par-

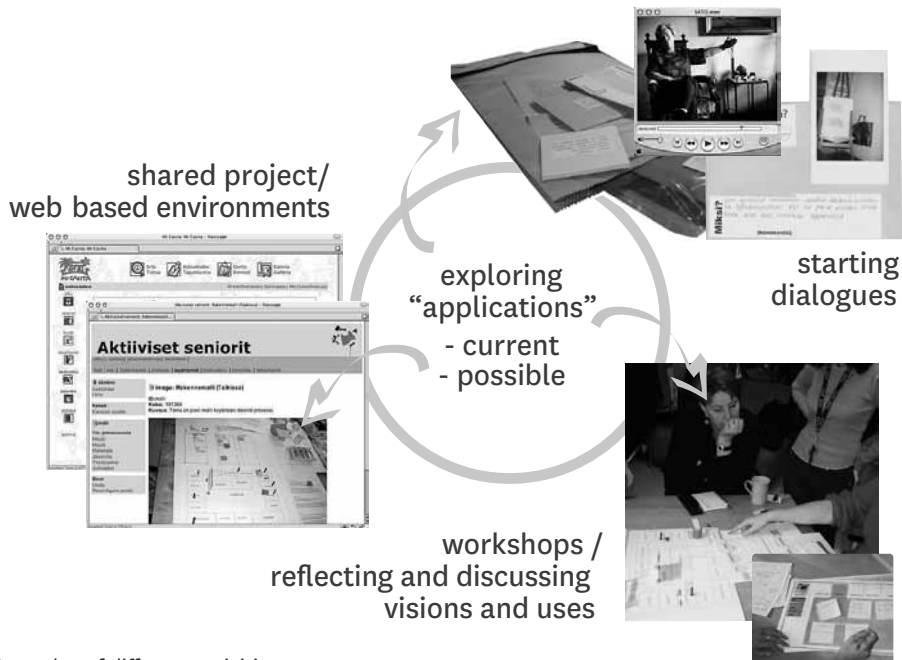


Fig 2 interplay of different activities

ticular circumstances, as well as to convey our interests and focus. The basic level includes semi-structured interviews with the members and observation sessions that are videotaped or at least audio recorded. Clips of them are produced, and analyzed afterwards, to gain a common understanding within the group. The material is afterwards shared with the communities, and has proven to be an interesting communicational resource [3].

We concentrate generally on finding connections and identifying relevant applications. One example found in the case of the active seniors emerged from the need to know how their community works, but also the planning of how it will interact once in their new home. They had a keen interests on knowing what kinds of things they were willing to share with each other (ranging from opinions about the media, to memories, personal information and objects). Such information will let them understand better the challenges ahead while presenting to us an interesting opportunity to chart some of their current practices. Through this we could then generate new scenarios of how such practices could evolve, if for example they had new tools and ways to produce more media by them selves.

To start interacting with as many members of the community as possible, and make them feel part of the process we begun to play with the idea of an action pack to hunt for applications. Inspired in particular by the cultural probes approach developed in the Presence project (Gaver 2001 Hofmeester 1999). In order to test this approach and adapt it to our idea of applications, we developed a series of action packs and activities that involved the communities more actively in the gathering of data (Botero et al.2002). We gave them a package with a camera, envelopes, notebooks, maps and other “probes” as these purposefully designed materials are called (Gaver. 2001, Mätelmäkki. 2002).

These packs try to shade light in to the tactics people employ when doing certain things. The topics were decided following the interviews and ini-

tial exchange of ideas with the community. Since they are already familiar with a particular area they want to explore, contrary to other probes approaches, the communities actively suggest the context and practices they want to explore.

The tasks to be performed using the action packs ranged from documenting the use of different media during a particular day, collecting articles and intangible things worth to share, specially with their close networks of people, etc. We aim to identify the qualities and nuances that make something important and worth of noticing for someone and then chart the ecosystemic relation and practices that need to be supported. The results of the experience have been compiled in a catalogue of possible applications, descriptions of interesting potentials, which are being translated in the form of scenarios for validation and recreation.

b) Since with both of these communities the starting point for the project has been to engage in a **common short term project** (as opposed the more vision oriented goals of the other 2 activities). The project involves the design and development of a community website for them. This activity started parallel to the previous one, and both have influenced each other in very interesting ways.

The sites host information they produce and want to provide for the outside world. More importantly they provide a closed (members only) space. This member’s only community area contains a set of tools for content creation and exchange. It is also intended to hold a shared memory of the communities, works as a communication media, while aiding up in the process of building community. This concrete design activity has helped to create rapport and partnership and to test some methods through a very concrete project, addressing the community as a whole.

The community web sites are important end products for the communities, however we feel they are essential tools for research, as a sort of code-

sign research environments, that bring new vocabulary and understanding for the group. The design of these spaces enables them and us, to elaborate future directions, since new vocabulary and new sets of problematics, relevant for other applications and scenarios started to emerge from them.

A clear example is represented in issues like accessing and joining the community, having different rights to see and change things; privacy, etc. These issues were not seen as crucial concerns for them before the implementation and design of the websites. However in exploring the possibilities they could have of producing more media by themselves, in defining the problematics and implications, their previous experience with the sites affected their understanding and concerns about this. It was clear that this issue had relevance for them in the context of future developments (for example: keeping a communal memory with different levels of access, defining priorities for friends and family in a flexible way, been able to generate content from different devices, etc)

One could make a parallel to a technology immersion kind of experience, anyway this do have a concrete purpose, a need that was identified before, and involve a spontaneous willingness to explore and through exploration discovery of new issues with out inventing a need.

c) We try to generate **spaces for reflection** and discussion, which are usually shaped in the form of workshops. In this stage is where we come together and find ways of processing and discussing together the information we have, and the scenarios that have been emerging. The idea is to work on both the shared concrete design problem (online email interactions, training sessions, workshops) and a more vision and ideation oriented process. We go through the material, present ideas and short demos, video clips, and try to start controversial discussions.

Conclusion: Designing influence networks?

In current conditions it is clear that design work portrayed as the crusade of the solo artist gets recasted as “negotiation” and multidisciplinary exchange. Even with free lancers or powerful teams, contemporary design happens in loosely structured networks of actors. However the case, it requires commitment from the part of the initiators to bring and empower more points of view and influences (possibilities for better tactical positions) into the process by using more shared resources, understandable by more people. As Suchman points it out “... persons are just those actants that conceive and initiate technological projects and configure material semiotic networks, however much we might be simultaneously interpolated into and through them” (Suchmann 2000).

Our purpose is to generate design visions within collaborative work with communities, codesign, through long-term relationships and mutual commitments. This creates a need for developing methods that support and produce mutual understanding and co-discovery of ideas, practices and how they can be evolved if new Information and Communication Technologies will be thought from the communities (and their individual members) point of view.

The challenges of digital technology design needs to be addressed with transdisciplinary competences that include that of the practice of everyday life. By discussing and generating visions and applications rather than end products, by designing communicational tools and experimental prototypes rather than strict methods, in close collaboration with different communities of interest, we hope to contribute to the ongoing debate of what can be fruitful design research activities.

In our position outside the R&D companies producing digital applications as well as outside the government policies we are able to conduct applied research and consider an approach that would not cross the threshold of importance in other circumstances. The real challenge will be to try to make

the need for these kinds of dialogues visible in the society at large, as well as in specific design contexts.

Footnotes

1. Represented mostly by work in the areas of Computer Supported Collaborative Work (CSCW) and Discussions in the “Collaborative Design” conferences
2. This is the case for example in the area of media technology, where recording and playback equipment is consistently purposefully designed and priced to make it artificially hard and expensive for users to record, manipulate, manage and share media compared to the capabilities and prices of available technology, because the entertainment publishing industry wants to keep a tight control on the way how the media they own is used in the marketplace. Even if this concern is legitimate, this way of addressing it does not serve user interests, as it also makes it hard and expensive for people to create media of their own and share it – an activity that the big entertainment industry should have no control over.
3. It seems that richer video and audio material involved in design research help to keep the voices and ideas of people closer and develops reflection

References

- Gaver, W., 2001. *The Presence Project*. RCA-CRD Research Studio Publications. London: RCA
- Hofmeester, K. and De Charon De Saint German, ed. 1999., *Presence, New Media for Older People*. Amsterdam: Presence at the Netherlands Design Institute.
- Mäenpää, P. 2001., Mobile communication as a way of urban life. *In: Warde, A. and Gronow, J., Ordinary Consumption*. London: Routledge.
- Pinch, T. Bijker, W., 1999., The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. *In: Bijker, W. E., and Hughes, T. P. and Pinch, T., eds. The Social Construction of Technological Systems*. Massachusetts: MIT Press.
- Bratteteig, T., and Bjerneks, G., 1995. User Participation and Democracy. A Discussion of Scandinavian Research on System Development. *Scandinavian Journal of Information Systems*. University of Oslo. Vol. 7 No 1 April 73–98.
- Sclove, R., 1995. *Democracy and Technology*. New York: The Guilford Press.
- Suchmann, L., 2000. *Located Accountabilities in Technological Production* [online]. Department of Sociology. University of Lancaster. Available from: <http://www.comp.lancaster.ac.uk/sociology/soco391s.html> [Accessed 12 November 2002]
- Suchmann, L., 1987. *Plans and Situated Actions: the problem of human-machine communication*. Cambridge: University Press.
- Schuler, D and Namioka, A., eds. 1993. *Participatory Design, Principles and Practices*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Feenberg, A., 1999. *Questioning technology*. New York: Routledge Publications.
- Winograd, T. and Florez, F., 1987. *Understanding Computers and Cognition. A new Foundation for Design*. Norwood: Addison-Wesley Publishing Company.
- Norman, D., 2002. Emotion and design: Attractive things work better. *Interactions Magazine*, ix (4), 36–42)
- Pantzar, M., 1996. *Kuinka teknologia kesytetään. Kulutuksen tieteestä kulutuksen taiteeseen* (Domestication of technology. From science of consumption to art of consumption). Helsinki: Tammi.

Co-designing for new city-citizen interaction possibilities: weaving prototypes and interventions in the design and development of Urban Mediator.

Andrea Botero
Joanna Saad-Sulonen

First published in *Proceedings of the 10th Participatory Design Conference PDC08 Experiences and Challenges*. (pp. 266–269).
Bloomington, Indiana, USA:
CPSR/ACM.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee if copies are not made or distributed for profit or commercial advantage. Copies must bear this notice and full citation on the first page. To copy otherwise in any way requires prior permission and must be requested in writing to Indiana Univ. Conferences. Proceedings Participatory Design Conference, CPSR/ACM Copyright © 2008 Trustees of Indiana University ISBN 978-0-9818561-0-0

Abstract

This paper explores issues of participation in urban life, particularly new partnerships between city and citizens to co-design new services for their cities. We will share experiences from working on the design and development of a software infrastructure, Urban Mediator, and its related social practices. We conclude by pointing out the necessity of considering the software artifacts designed as being part of a toolkit for co-design that can enhance conversations between cities and citizens, and enable the envisioning of new practices related to city-citizen interactions.

Keywords

Co-design, social practices, e-government, citizen-driven innovations, user innovation

Introduction

The following work is part of the ICING project (Innovative Cities for the Next Generation) a larger initiative funded by the European Union, aimed at exploring, through a series of ICT solutions, what “innovative cities” could mean [5]. Case studies in key regeneration districts of Barcelona, Dublin and Helsinki, as well as the development of a system (Complete ICING System) are part of the strategy. The particular theme in Helsinki has been citizen-

driven interactions, and our role as design and design research partners of the project has been the development of components to explore this issue; our insights and research are condensed in the concept of Urban Mediator (UM) that is the main theme of this paper.

Citizen-driven interactions as a starting point

The emergence of new Information and Communication technologies (ICTs) is said to be transforming the ways in which civil society and citizens interact with each other, and with the official systems of representation [2,3]. Today there is a vast array of government initiatives that aim to increase, often from a top-down approach, public participation and electronic government. At the same time, there is increasing interest in understanding the limits encountered by these approaches. Parallel to the official administration's initiatives, there are also subtler citizen and community-driven initiatives emerging from the widespread use of new networking and user-driven content production practices in technology-savvy circles. Some examples of this trend are to be found e.g. in popular photo-sharing sites, where a big proportion of the media shared shows urban-related themes. [8] Other examples are evident in the increasing popularity of map mashups, made possible with open access to online maps, and the use of GPS-enabled devices for attaching location data to media produced. All this has triggered the emergence of new interesting practices of documenting urban environments in general. Concrete cases of citizens' initiatives towards their cities, supported by new forms of media, range from collaborative projects to create a body of free and publicly accessible map data (e.g. <http://www.openstreetmap.org>), to civic platforms for reporting problems to fix in a neighborhood (e.g. <http://www.fixmystreet.com/>), and to the use of social networking sites for creating and supporting civic action (e.g. Save Sloane Square group at <http://www.facebook.com>).

It seems that more people are engaging in new practices for exploring, discussing and understand-

ing their cities, through infrastructures not necessarily provided by the city administration, nor connected to it. Is it useful to consider these examples as forms of potential innovations for new citizen-city interactions? Are they worth following, learning from and perhaps supporting in an "innovative" city? In innovation management literature, there has been much talk recently about the role of user driven innovations, most commonly carried out by users with "lead users" characteristics [10]. According to lead users theory, some users develop solutions on their own and in collaboration with other users, to address needs for which there is no solution in the market yet, much in the same vein of what those committed citizens are doing in the examples discussed previously. Our interest here lies in the discussion that ties the role of the lead-user to the dynamics of a broader process that is claimed to have implications for the democratization of innovation [10]. This seems to resonate partly with some earlier arguments in the participatory design community regarding the democratic imperative for early involvement of "skilled workers" [4] and their empowerment. While a "leading" citizen, might be difficult to identify, the trend discussed previously hints at the need for city administrations to consider citizen driven interactions seriously, rethink the role of citizen's contributions in the development of new services and perhaps provide infrastructures better suited to this type of interactions.

Exploring software tools and social practices

In order to explain the process, it is necessary to first give a brief overview of what UM is in terms of software, today. UM is a server-based software that provides a way for communities to mediate local, location-based discussions, activities, and information. Its goal is to provide users with the possibility to create, obtain, and share location-based information that is organized according to topics set up and maintained by the users themselves. UM uses a map-portrayal service as means for representing some of the information, and complements this with a set of tools for users to process,

share and organize this information. The service is accessed through the web, using a normal PC or any browser-enabled mobile device [8]. We envision UM as a mediator environment between, on one hand the official city systems that provides, among others, help desk services or GIS services, and on the other hand citizens' systems represented by community websites, discussion forums, or blogs. Both which can be plugged into UM using several syndication standards (RSS, GEORSS, etc).

Beyond testing

When the project kicked-off in 2006, we as the UM design team, extended the first grounding phase of ethnography planned for the project (mapping of the local test bed area through interviews and meetings with representatives of citizens and city office workers) towards a more participatory and design oriented research exploration. We started the process by building prototypes using repurposed software so that we could quickly start workshops with communities. Some of the envisioned features and functionalities were then quickly turned into new prototypes [6] that helped us further engage with the stakeholders.

Seeding

By the end of 2006, a first Urban Mediator seed prototype with basic functionality was available. This gave us the opportunity to develop the concept and the ideas by planning small-scale iterative interventions involving more people. To achieve this, rather than finding random users to test the prototypes, we specifically approached actors having a clear stake in the development of the Arabianranta area (the testbed neighborhood in Helsinki) and that were engaged in some sort of community activities. We proposed to them to collaborate in the Urban Mediator design and development process through a series of activities in which they were to use prototypes we were developing.

We first involved active citizens, and later a class of 12-13 year-old students and their teacher from the local school, asking them to mark points of interest in the neighborhood. We also held work-

ing meetings with the personnel of the local development agency, experimenting with ways to link the information they produce, through their portal, into UM. Through these interventions we discovered obvious usability problems, – but more importantly we were able to negotiate concepts and a common vocabulary (e.g in the interface) and identified concrete practices that could be supported by the tools we presented. This was possible as participants needed to appropriate the functionalities presented by the system and relate them to their own activities. These interventions also enabled us to populate the UM database with real location-based information, gathered by a diverse set of people.

Taking into account the emergent practices that the participants devised with the limited functionalities of the prototypes, we held a more focused workshop with a group of active residents lobbying for a new community activity house in Arabianranta, and envisioned together how UM could support such citizen action. With the help of paper prototypes and quick hacks in the UM code, we sketched with our collaborators tools for helping them organize the materials that they were sharing and give explicit sense of purpose to the use of UM. We also discussed the social practices that could be associated with the use of UM. This gave us materials and insights that advanced the design and development work. Parallel to that effort and with help from our ICING partners in the City of Helsinki, we tried to organize interactions with city employees; however, this proved more challenging. As we later understood from our partner in the city, this was partly due to the fact that the concept remained too abstract for them, and it was difficult to see how it could fit with their immediate needs.

Based on the first co-design experiences, during the year 2007 we produced new iterations of UM. The second iteration of the software included more tools targeted at organizing collections of information (collecting location points into 'boards' or 'topics'). It also made the different standard mechanisms for feeding and syndicating the environment (RSS and other feeds) more visible in the user

interface. Moreover, the new version of UM included several other conscious user interface strategies to encourage and facilitate links from other systems in the form of UM widgets and UM tools. In June that year, we launched a publicly available Urban Mediator demo for Helsinki [9]. By the end of that year we also made the first public release of the code [8].

Setting up a project

With the new features and improved interface, we were able to communicate better to all our collaborators the way in which we envisioned participatory projects to be constructed or to emerge with the help of UM. The more refined prototype was also easier to explain. This helped our colleague from the City of Helsinki to trigger the interest of one of the planners responsible for parks at the City of Helsinki Public Works Department. At that time, this person was taking part in a research project addressing the increase in numbers of non-indigenous bunny rabbits in the city as well as the damage they are doing to vegetation. The research was intended to feed a report about the matter to be used by the City's policy makers. Officials had some scientific information and data, but wanted to get first hand accounts from people about the areas where they were encountering rabbits. They had also manifested their wish to get a better grasp of the attitudes and opinions of the citizens regarding what should be done with the animals, as this was a controversial issue. After some negotiations and meetings between the planner from the Public Works Department, his colleague from their IT section, ICING partners in the City of Helsinki and us, the design team, the City team decided to 'take the risk' of using the Helsinki UM beta prototype to implement an intervention with larger public participation.

A participative research was sketched, which asked citizens to report sightings of bunny rabbits in Helsinki. As a starting point, we created a 'board' (later called 'topic') section in UM Helsinki beta for the bunny rabbit case. The board collected all con-

tributions (points) and made them accessible to anyone online, as well as provided links to further information and discussions of the topic. We also created a generic web info page [1] for the case to stand for the official City site of the project. Due to bureaucratic difficulties, the page resided in one of our own servers but was redirected to a domain controlled by the City. The official info page featured an UM widget that enabled citizens to directly send their reports, using the UM functionalities, via this officially recognized site. Another widget gave a real time list of the newest contributions collected in UM.

The project started the 1st of October 2007, with short announcements provided by the Public Works Department placed in different media, advertising the bunny rabbit info page (e.g in Helsingin Sanomat, the biggest newspaper in Finland, in the City of Helsinki main information portal, in the Arabianranta portal, etc). During this public trial that lasted until the 4th of March of 2008, 450 rabbits sightings were reported as points on the UM map. The information gathered included detailed accounts of the amount of rabbits seen, their eating habits and behavior, coupled with exact location information (easy to be imported to the City's own GIS systems). The fact that we had provided links to a web discussion forum on the Neighborhood Association of Helsinki, contributed partly to channel and awaken the public discussion regarding how the city should deal with the rabbit problem.

To follow the impact of the intervention, we monitored the content of the contributions and the strategies used to make them, the related conversations on the web about the rabbit consultation and the rabbit issue in general. We collected feedback about UM through a special feedback section in the service. Furthermore, we also contacted people that identified themselves to us. However, as contributions could be done anonymously or using a nickname (registrations or contact information were not mandatory), we did not interview contributors in a systematic way. The explicit feedback received has been varied. Some comments were

related to usability constraints of the tool. Other, more general comments, indicated for example appreciation of the fact that the information submitted had been made publicly available, unlike what is usually the case with polls, questionnaires or other reporting tools set up so far by the city.

Discussion

Up to now the results gathered have not been traditional usability evaluations of an isolated software component, nor validations of the suitability of the tool. Rather, the experiences in using the prototypes and setting up the interventions speak to all stakeholders, including ourselves, of the real practical socio-technical arrangements at play for the viability of systems such as UM and its possibilities. Through the work in the early workshops and the deployment of the first prototypes we have confirmed that active citizens often encounter problems, concerns or interests, which cannot be dealt with through any of the available channels of the city. Our experiences seem to indicate that more citizens would be willing to be more active in engaging with their city, if they had an assurance that relevant citizen inputs would be brought forward into the development processes of the city administration. Thus, the existence of mediating environments like UM, with openness to both city and citizens initiatives, seems to be a promising direction in investigating what kinds of new interaction channels could be useful.

In demonstrating that UM functionalities can be combined with existing systems – like the City's own web portal in the case of the rabbit project – we expected to exemplify the potential of flexible and modular tools to reduce the threshold of setting up a project (both for city and the citizens) as they have a lightweight, non-critical mission role and could be deployed fast, without compromising security, while keeping visibility and accountability towards the initiators.

By experimenting with different kinds of exchange formats, both popular ones like GeorSS feeds, increasingly used in popular map mashups,

as well as those readable by the city's legacy systems (e.g. csv format for spreadsheets), we want to support portability, compatibility and re-usability of the information gathered. These issues are important for everybody, cities and citizens alike, if innovative practices are to be encouraged.

Furthermore, there is a point to be made for practices that encourage openness of the interactions, where the exchange of the information is not only part of a unidirectional stream of information towards either the city or the citizens. In this case, the UM resides outside the city's systems and renders its content accessible to all viewers; submissions are available and transparent to anyone who either contributes or visits the site out of curiosity. This seems to have been particularly appreciated, for example, in the cases in which the city is the one asking for contributions. This practice needs to be followed more thoroughly as it could be associated with people's motivation to submit or to follow up an issue. In addition, we need to explore better if agendas different than the one set by the administration could also emerge – and inform an original project – when contributions are left available to other types of processing.

Questions about other important aspects like the ownership and accessibility of the map data, concerns about privacy issues, reliability and relevance of the information, as well as sustainability models for such participatory infrastructures have also been raised and need to be better understood.

Conclusions

There is a clear need for more experimentation and research on how new practices that enable city-citizen interaction can be facilitated. Our participatory approach of staging and producing concrete interventions (with the UM prototypes, and UM demo services) involving already active stakeholders has been effective in eliciting ideas regarding how new types of city-citizen interactions could be configured. The types of engagements that prototypes and interventions afford offer an interesting and viable path to develop not only systems themselves

but the practices that surround them, and ultimately make them viable.

We are currently in the process of planning and realizing other 'living' interventions around different topics and with a wide range of collaborators. Thanks to the visibility of the bunny rabbit case; other departments who were previously unable to relate to the system when it was still abstract seem to be more interested now. Through future activities we expect to continue designing UM itself in a participatory design way. Furthermore, we see UM as part of a toolkit that could help stakeholders in the collaborative design and development of various citizen and/or citizen-citizen interactions.

From the original practical questions of how to create interfaces and software components for making different forms of knowledge mutually accessible to all the stakeholders in a city, we attempt to draw attention to bigger questions: what are the processes by which multiple actors can imagine and deploy new interactions with the city? What are the new types of policies (open innovation, living labs, funding of open source and community lead initiatives), roles (lead-citizens, risk-takers inside the city administration), and engagements that these new interactions will require? Are these adequate strategies?

We are aware that the logics of production of public administration are not (and can not be) the same as the ones followed by a consumer product company expanding its markets in the most efficient ways possible - though new pressures on the competitiveness of cities and citizens seem to be altering this balance. However, it remains a fact that one of the biggest challenges for both cities and citizens is finding ways in which information and ideas can impact and inform local governments and decision makers in more effective ways.

Acknowledgments

We would like to thank all the participants in the co-design activities and our ICING partners, especially Iina Oilinki (City of Helsinki), who facilitated collaboration with city employees. Thanks to past and

current members of our research group, especially Taina Rajanti Roman Suzi, Tommi Raivio, Eirik Fatland, Mika Myller and Tuomo Tarkiainen who have contributed actively to the development of UM, and Kari-Hans Kommonen for comments and help. Support for ICING was provided by the European Commission through FP6-IST-2004-4 26665.

References

1. Bunny rabbits situation case webpage. Accessed online 20.11.2007 at <http://icing.hel.fi/villikanitilanne>
2. Catbree J. Civic Hacking, a new agenda for e-democracy. Open Democracy June (2007). Accessed online 13.01.2007 at: <http://www.open-democracy.net/>
3. European Commission. eParticipation work program, DG information Society and Media. (2007).
4. Ehn, P. Scandinavian Design: On Participation and Skill. In P. S. Adler and T. A. Winograd (Eds.), *Usability: Turning technologies into tools* New York: Oxford University Press. (1992). pp. 96–132
5. ICING committee. Annex I – “Description of Work”. In: *Contract for Project ICING Intelligent Cities of the Next Generation*, EU Sixth Framework Programme. (2005)
6. Saad-Sulonen, J., Susi, R. Designing Urban Mediator. In *Proceedings of the Cost 298 conference: participation in the broadband society*. May 2007, Moscow, Russian Federation. (2007)
7. Saad-Sulonen, J. *Everyday Life in the Interactive City: exploring the potentials of interweaving digital technologies and urban space*. In *Proceedings of Future Urban Research in Europe*, Bratislava February (2006)
8. Urban Mediator development website. Accessed online 13.03.2008 at: <http://um.uiah.fi>
9. Urban Mediator Helsinki Demo website. Accessed online 13.03.2008 at: <http://um.uiah.fi/helsinki>
10. Von Hippel, E *Democratizing Innovation*. MIT Press: Cambridge. (2005)

Coordinating everyday life: the design of practices and tools in the “life project” of a group of active seniors

Andrea Botero
Kari-Hans Kommonen

Abstract

This paper is about a community taking the initiative to design “holistically” their future conditions and how the process sheds lights in the complex interrelations of practices and tools that need to be in place in order for particular technologies to become viable. Instead of only focusing on the particular development of appropriate “senior” age technology, we want to draw attention to the co-evolution of practices and tools inside a “life project” which happens to be carried out by a very active group of seniors. Based in Helsinki (Finland) the Active Seniors Association has embarked on a collective project of organizing their future everyday life based on neighbourly help. Their project is quite substantial, as it includes both the construction of an apartment building for the community with the corresponding infrastructure as well as the continuous development and configuration of an active community life with shared practices amongst its inhabitants. Drawing upon their experiences and the authors’ design research collaboration with the association in the design of tools for coordinating everyday life, we argue that is viable and convenient to conceptualize “users” not only as experts of their everyday life but as expert designers of their own everyday life practices.

First published in *Proceedings of the 2009 COST 298 Conference: The Good, the Bad and the Challenging*. Vol. 2, (pp. 736–745). Slovenia: ABS-Center and COST 298 Action. Reprinted with permission.

Keywords

Everyday life, co-design, senior housing, social practices, user innovation, design of practices, design-in-use

1. Introduction

This paper is about a community taking the initiative to plan and design “holistically” their future living conditions and how the process sheds lights in the complex interrelations of practices and tools that need to be in place in order for particular technologies to become viable. Thanks to the efforts of Science and Technology studies, amongst others, it is possible to recognise how technologies do not develop in isolation; but are embedded in and co-evolve through complex social interactions [3]. However, if one is to intentionally support more inclusiveness and participation, questions of design need to be addressed. As everyday tools become increasingly digital, an important part of the design activity takes place also where users and technology meet, as opposed to only in product development laboratories [12][8]. Under these circumstances it is critical to understand how the world is changing, what and how to design, and who are the designers in these new circumstances.

Drawing on research for work-oriented cooperative design, Anthropologist Lucy Suchman and her colleagues have already made a point of how important it is to consider design or ‘*system development not as the creation of discrete, intrinsically meaningful objects, but the cultural production of new forms of practice*’ [17]. In making the analysis of this case we want to focus on the interplay of both specific tools and shared practices as a useful unit of analysis and of design intervention that is as relevant for the everyday life and the senior care contexts as it is for the work context.

1.1. The Life Project of a Group of Senior Citizens

The expected number of active years after retirement (also referred to as *the third age*) is steadily increasing in the West, whilst there is also a simulta-

neous crisis in state-led senior care. These trends have brought up questions about the urgent need to consider alternative ways of “growing old”, some of which have been the central concern of the “life project” of the group of seniors presented here. We refer to it as a “life project” since it is an ongoing endeavour, whose main objective is to develop alternative ways of growing old, which encompass a wide range of issues in a holistic fashion.

The project was initiated by a group of retired women citizens in Finland who wanted to have an alternative for Finnish senior housing. Organized as the Active Seniors Association¹, they started in 2000 the design and construction of the *Loppukiri house* (in English: *last spurt*) as a senior housing arrangement based on neighbourliness and self-help. Their collective project of organizing and designing this senior housing solution turned out to be quite substantial, as they also aimed to create a strong community that would be able to for example cook, eat and clean together, among other activities.

At the concrete level the project took off in January 2001 when the association managed to negotiate with the city of Helsinki the assignment of a price-regulated lot (HITAS) that permitted the concrete planning. The lot was located in a new housing development area of Helsinki called Arabianranta² where new urban regeneration strategies and technical solutions were been tried out. In the Spring of 2006 the construction of the house ended and all those members of the Association that bought a flat in it, moved to their new home. Loppukiri consists of a community of approximately 70 people that live in 58 compact apartments (between 30-50 sq2). There are large common areas, including library, kitchen, dining room, a guestroom, activity room,

1 See <http://www.aktiivisetseiorit.fi> for details on the Association (in Finnish)

2 See <http://www.arabianranta.fi> for an overview of the area and its services.

laundry and sauna³. Furthermore the community takes care of the maintenance tasks, eats together once a day, organizes and produces different kind of social activities and supports and encourages hobby groups to be enjoyed by the inhabitants.

1.2. Practices and tools: Defining Research Problems

In line with what has been proposed by some authors, the Active Seniors' experience suggests the need to articulate frameworks by which to analyse design throughout the whole life cycle [6][9]. It also speaks to the urgency to talk about design that extends to other things and not just technology [18]. In other words with this work we hope to contribute to the larger project of reframing social practices as types of designs that are composed by people – formerly known as "users" – as they go through their everyday life.

In using the term practices we draw attention to those embodied, materially mediated arrangements of human activities that are continually reproduced [16] and that are shared and evolve in social settings [23]. Furthermore practices are organized through practical understanding [17] and constitute a kind of silent and ubiquitous "consumer production" [4]. In doing this we explore an entry point to understanding interactions between design and use, beyond traditional dichotomies [17] following similar propositions regarding the reconfiguration of dynamics of consumption and production [19] and new conceptualizations of the ongoing processes of innovation, that also happens in 'what people do' [20].

Due to demographic trends there is an increasing interest in researching and developing Information and Communication Technologies (ICTs) for seniors and older adults (see e.g. [14]). Instead of focusing only on the particular development of a

product, in this paper we want to draw attention to the co-evolution of practices and tools inside a "life project" that happens to be carried out by a very active group of seniors. It is evident that in the Active Seniors' life project, there are direct references to ways in which technology plays a role in organizing elderly care. However from our point of view, the constellation of new practices that they were envisioning (cooking together, supporting neighbourly help, keeping active through community involvement), their organizational strategies (use of media, working groups, etc.) and the holistic scope present also an interesting case to challenge assumptions about the sources of innovative ideas and ways of organizing collective creative process. In thinking about these issues we asked: What resources and skills did the Active Seniors need to design their own housing/life? What kinds of design tactics do these "everyday life practice designers" employ? Is it useful to conceptualize them as such? Furthermore this bears reflection on role of the professional designers and the kinds of co-design strategies that could be put in place to facilitate such communities and their design endeavours.

The paper is structured as follows; we first introduce the setting of collaboration and our research approach, we then present elements of their collaborative practices and tactics follow by an account of the contexts and outcomes of our design interventions. We then conclude with reflections and conclusions for further work.

2. Research setting

2.1. Arabianranta – a promised innovation hub and future living lab

The Loppukiri house is located in the city district of Arabianranta, a recent development area of Helsinki, which is considered to be an example of important cultural and technical urban innovations [10]. An important feature for our discussion here is that the plans drafted for the area in the mid 90's, included the building of a fast data communication network right from the beginning. According to Kangasoja [11] who has done extensive research,

3 See <http://www.loppukiri.fi> for general information about the building and life at Loppukiri (partly in English)

in the evolution of the local ICT model, the initial network plans were used to market the area as a future innovation hub seeking to attract jobs towards the locality and improving its competitiveness. Arabianranta was going to offer cutting-edge ICT infrastructure and it was expected that small and medium size companies would be the main users of the network.

Kangasoja's research has shown how during the past 10 years of Arabianranta construction, those earlier innovation hub plans turned slowly towards developing the network more as something being part of the basic housing infrastructure, as water and electricity are. Today the network of Arabianranta offers very concrete down to earth services targeted to serve local residents needs (anti-virus, firewall, local email address, local information portal and discussions boards for every building among others). At the same time the broadband technologies have developed fast and become cheaper and accessible in general, though Arabianranta developed a unique ICT model⁴, other areas of Helsinki are today similarly well covered by broadband as this one is. In spite of this, there is continuous expectation that, in a Living Lab spirit, new broadband services could be deployed and tested with the local residents⁵.

We learned about the Active Seniors' project while it was still in its forming stage and soon proposed to them collaboration to explore how the capabilities and challenges of digital media could be brought into their plans [1] [21]. We wanted to take the opportunity to offer alternative visions of the uses of the network from their perspective addressing some of the challenges implied by the type of

housing arrangements they were designing. Their willingness to create an active network of collaborators, to share their experiences and also to learn from them, led then to a long-term design research collaboration between our research group and the association.

2.2. Methodology

In order to trace the design of tools and practices in Active senior's life project we make use of a diverse body of research and design material that has been produced either in close collaboration with the community, or by themselves during the past years. The research and design material from which we draw includes: 1) The Association's own communication materials as well as a recent book written by two of the members [5] which allows us to follow the ways in which they understand their project and their conscious attempts to document and share the experience; 2) Materials gathered with members of the community through formal and informal interviews as well as self-documentation exercises inspired by "cultural probes" [7] who have been analysed and discussed in collaborative ideation and design workshops at different stages of our collaboration; 3) Different situated design interventions with scenarios and prototypes dealing with broadband applications or services. We complement these with the experiences of co-designing what the seniors call their Everyday Life Management System. The system is a web-based collection of tools for the seniors, which assists in the coordination and sharing of everyday life activities and information in the house. These interventions allowed us to provoke a more general discussion and ideation process on the feasibility of certain practices while at the same time engaged us in a concrete design challenge.

3. Coordinating everyday life

3.1. A House and a Community

The idea of a new kind of senior housing project was born in leisurely meetings among a couple of old friends that discussed and brainstorm around

4 Through her research Kangasoja has identified several of the innovations tried out in the ICT development model that make Arabianranta an interesting case; for an overview of them see: [11].

5 See e.g. <http://www.helsinkilivinglab.fi/node/169> for an introduction to Arabianranta as a "Living Lab".

more friendly, secure and personal places to grow old. For the three women that initiated this project, neither of the alternatives offered by the Finnish society for senior housing – the institutionalized senior homes nor the usual lonely apartment – felt very appealing [5]. What started as the wild idea of a few, begun to turn into the collective project of a group of senior citizens that got organized as the Active Seniors Association around the summer of 2000. This instrument allowed a growing number of active men and women to get involved. As a working strategy they divided into working groups that focused on the different areas of the project to cover in this way all requirements and tasks such as fund raising, house and interior design, internal communication, community development, IT infrastructure, etc. When the lot was secured they also negotiated with the construction company (Sato-Rakennuttajat Oy) and the architect (Siven & Takala Architects) how they will be employed in a new type of collaboration in the project in close interaction with the Association's members, as they had crafted for themselves a much larger role than that of mere customers or consumers. The Active Seniors Association continues to play a role in the development of Loppukiri. However since not all of its members moved to the house after construction ended a new "residents association" was founded to develop the activities of those living in the house.

In order to achieve their objectives, the continuous development and configuration of an active community life, with shared practices and rules amongst its inhabitants, was as big a project as the construction of the building itself. Sirkka, one of the motors of the project, explains it: "*We built at the same time a house and a community*". All those construction years the Association members started doing things together from formal events to informal parties, they made trips to get acquainted with similar experiences and organized training possibilities for themselves. Regular meetings and social occasions were held and all those contributed to help on developing further the sense of community.

An important component of their vision was the idea that to create a strong community in their future house they would cook and eat together and take charge of maintaining and cleaning the common areas themselves. Doing and developing concrete services for themselves and at the same time keeping active was considered a way to create a sense of belongingness and purpose for all. All these related practices, rules and expectations were discussed, planned and designed within the community during the construction years, and continue to be reconfigured as the time passes. When asked about what she sees is the main motivation for their endeavour, Eila, one of the members of the association, and inhabitant of Loppukiri explained "*this project is about exploring new ways of growing old in a society that in the current circumstances is not going to be able to carry us in the same way as before, in here we experiment with the strengths, possibilities and limits of collaboration*". The residents of the building are also organized in working groups of ten persons, who take care of different tasks. Each group has a work shift once in six weeks during which they take care of the planning and preparing of a common meal served Monday to Friday at five o'clock (except for the three summer months), as well as cleaning the house and managing the shared spaces. The objectives of providing access to a lively social life and opportunities to practice different hobbies in order to keep active have been well met so far. By taking advantage of the common areas of the house and the diversity of its inhabitants, the community counts with reading circles, yoga sessions, cooking club and all sort of other activities, some of which are also open for people not living in the house.

Among their key tactics we can consider 1) A life-long learning and holistic approach to their vision; 2) A commitment to an ample circulation of information achieved through members newsletter, the website and monthly face-to-face meetings and self development activities; 3) The ability to build a large cooperation network beyond the community that includes authorities, contacts in re-

search centres and institutions that deal with senior issues, as much as the organizations directly implicated in the building of the house; 4) A flexible organizational practice embedded in the idea of the “association as an instrument and the working groups as the motors”, 4) experimentation with new types of agreements with collaborators where there was an expanded (but realistic) idea of motivations and profits gained by all those involved.

3.2. Co-designing broadband visions: broadband for a senior’s house?

By the time we started our collaboration with the Association the vision for the future network as an innovation hub for businesses in the area was at full swing and was greeted with mixed feelings amongst different stakeholders (including city planners, prospective residents, service providers, etc) [11]. Furthermore it was not clear for everybody if, on the one hand, the ICT model under consideration would include connections to residential housing and under what conditions, although there were certainly expectations of it. On the other hand it was not evident if a house like Loppukiri would need such connectivity, and if so, for what purposes⁶.

Being a very heterogeneous group of people, not all members of the Association subscribed to the idea of computers or networks needed to play a role in their future plans. However, the Association did have a realistic idea of the increasingly important role communication flows had in achieving their goals [5] and keen interest in improving their members “capabilities” towards new media. We asked ourselves what kind of applications would

be interesting and meaningful in such a community? Would there be a need for other visions than broadband for businesses and will such visions have a role in the development and maintenance of the community? Since key members were willing to collaborate in answering those questions, the concrete plans proceeded on two levels.

At first, a quite pragmatic track helped them to develop a web presence and an intranet for the association. The main objective was to increase their communication channels. This was also considered by the working group in charge to be a subtle way to encourage members to use the Internet and computers more. Through focused design sessions with some members, we made paper prototypes of the needed structures and created a basic infrastructure to publish material about the project (news of the development, forms to join the association, layout plans of the building and so forth). The main objective was to keep the more “ICT advanced” members informed and at the same time recruit new candidates or possible collaborators. The internal area served as a shared repository of official documents and resources that ended up being used mainly by the board of directors of the Association; all of whom had had jobs and careers that required the use of computers and information systems to some extent. Through the years it became evident that the possibility of using the network to share files and information was of importance to the community even if not all members were using it, and that having a web presence was a beneficial element for the Association’s project.

The second track had a more blue-sky agenda and aimed mainly to generate scenarios and illustrative sketches for “new media concepts” that could serve the future Loppukiri community. In engaging the community to consider the more future oriented topics, it was beneficial that the Association was in its forming stage as well. They felt the need to know how their community worked, what kind of expectations members had about the conditions in their future new home. They were particularly keen on exploring what kinds of things they

6 According to network studies made by the local development agency Art and Design City Oy (ADC) based on information given by the local operator, the traffic in Loppukiri has been considerable and sometimes even bigger than other residential units that are more “obvious” candidates for high broadband consumption, like for example student housing.

were willing to share with each other. We proposed to help them to realize a series of self-documentation exercises, where those topics could be explored.

The material provided them with a different view about the community and hopefully helped them understand better their strengths and the challenges ahead. At the same time this gave us an interesting opportunity to chart some of their current practices to understand the context better. We produced a set of postcards, asking projective questions like what is a typical day in Loppukiri? How do you describe a perfect neighbour? Etc. A second, and more elaborated exercise was done only with a small group of seniors and consisted of a pack with a camera, envelopes, notebooks, maps and other probes for documenting things such as the use of different media during a particular day, collecting news articles or stories and intangible things they considered worth to share, maps of their movements around the city as well as the task of ideating lists of rules for the future house. The material collected served as a basis to generate scenarios and ideas that were discussed in small workshop sessions with volunteer members of the community.

From those first exercises a series of issues started to emerge: Most of the seniors were interested and actively engaged in all kinds of knowledge sharing activities. They had very advanced practices for documenting extensively things such as travelling recommendations, gardening and cooking tips, book recommendations, etc. There were clear expectations that those knowledge-sharing activities would be expanded and enriched by their new conditions at Loppukiri. Another important concern was the importance of attending and keeping up with mental and physical fragility (specifically memories, personal recollections, reminders). Suggestions to address the issues through shared routines and care commitments emerged, and we discussed how making it possible to document those commitments and perhaps made accessible to all, while respecting privacy, could be a way forward. This was felt to be an important aspect to overcome some of the obstacles of living at home. Practical coordi-

nation challenges of the future house and activities were also identified: sharing and managing the common spaces, creating accountability and visibility of the common activities and resources and ensuring that activities could be organized and kept alive.

Through various workshops and other exchanges we developed a number of concept scenarios and ideas that illustrated new practices made possible by the infrastructure and old practices reinterpreted with new tools. Most of the concepts included the idea of more media being produced by themselves to be shared. We ideated for example an audiovisual archive of garden and gardening memories, a shared library of cooking recipes and tips made with videos, a voice message system to be used for community news sharing or organizing activities as well as to produce a private audio diary. We also played with several concepts for management of shared resources that included a virtual library distributed across their home bookshelves, a sophisticated reminder system that could be used for the sauna or laundry turns as well as for other things.

It was obvious that – given enough resources – there was no shortage of ideas for possible applications that could be appealing and could make sense for this particular community, and that Loppukiri could indeed benefit from good broadband connectivity; one that will consider the community both as a content source and as a service “provider”.

Despite the ambitious agenda of the exercises, traces of those ideas live today in some of their arrangements or have been implemented with more at hand resources. For example in one of the latest workshops, one of our colleagues, Kirsti Lehtimäki proposed a solution to assign a resident of Loppukiri a porter duty to greet visitors to the house. When a common doorbell rings, they could get video access to a door camera and greet the visitor. Alternatively, if the porter was downstairs, she or he can greet the visitor in person. The suggestion included the role of “on-duty” help, where an assigned person could get redirected to her phone all calls from members requiring help. The idea developed a life of its own in their imagination and

was finally implemented by purchasing a mobile phone and a SIM card, which is then rotated among the members of the community. Everyone has the number and it is also shown next to the doorbells for visitors who do not have a specific host in Loppukiri. Carrying the phone also includes the on-call duty so that any member of the community can call in case of need.

3.3. Co-designing an “Everyday Life Management” system

A second stage of our collaboration with the association continued later through a research project that gave the possibility of concretizing some of the earlier visions into implementable prototypes. By then it was clearer that the local network infrastructure would provide every flat (including Loppukiri) with a ready installed broadband connection⁷. With the imminence of moving to the new house, after an ideation workshop in 2005 on care and safety practices, a concrete goal was jointly defined and framed as the design and implementation of a digital “community calendar” [14]. The idea of developing this concrete prototype was born as a way to explore solutions to 1) organize and coordinate shared tasks of the community and 2) give a sense of security, belonging and independence.

Armed with their previous experiences, and the wide variety of expertise in the community, they brainstormed through their own working groups and in workshops with us, what a Loppukiri calendar would mean for them. The challenges, opportunities, limitations and requirements of the project become clearer as we advanced. The system was meant to support some of the practices that the community would engage in once living under the same roof and priority was given to: Sharing, booking and using communal spaces; planning

the common meal, and organizing and following up activities and offering neighbourly help. A design specification started to take shape through noting down all the requirements and ideas and concluded in a very complete document produced by the Active Seniors IT working group (December 2005). The “specification” formulated a list of features, an outline of what they considered an ideal interface, and a prioritized list with the minimal functions required from the Loppukiri calendar. The community calendar concept was then named by the seniors as “Miina” in honour of Miina Sillanpää⁸, a famous Finnish historical character-former maid turned in to one of the first women member of the parliament- because “*the system should accomplish as many things as Miina did*”. The calendar turned slowly in to an Everyday Life Management System, a collection of web-based tools for the seniors, which assists in the coordination and sharing of everyday life activities and information [2].

For design and production purposes the “system” was divided in several components: 1) a site – that will operate as a framework for other components and that takes care of common use cases (such as login and navigation); 2) Member’s info – or Profile component to take care of the information of the members of the community; 3) A Dining Calendar – specialized in announcing and registering for joint dinners; 4) A Shared Resources Calendar – with special features to reserve common shared resources and spaces such as laundry and sauna; 5) A General Group Event Calendar – to share information with the community about general events; and 6) A Personal Calendar – where each member could access all the information, register

⁷ Today actual and new residents do not need to subscribe or pay for the connection separately as it is included in the maintenance fees of the buildings at a very competitive price.

⁸ Miina Sillanpää (1866 – 1952) was one of the first nineteen female members of the Parliament of Finland and Finland’s first female minister. During her life she operated on various areas of life like journalism and politics, and was considered a competent, sensible and reliable person.

to different events, as well as being a starting point to organizing other personal events⁹.

Starting from the first stable version of Miina installed in their new home, roughly at the same time they moved in (May 2006), the Active Seniors tested the system vigorously and started to take it into use slowly. They also planned strategies on how to start teaching and helping the rest of the residents to use Miina. A team of volunteers started using the calendars for reservations and events, while a couple of the working groups used it to organize the common dinners. The rest of the community was using a parallel paper solution arrangement they also designed. The IT working group organized usability, or should we say “usefulness”, testing and ideation meetings where they tried and analysed how Miina connected to their practical arrangements. The meetings produced detailed walkthroughs of suggestions and changes to the rules and the behaviours available in the calendars and developed appropriate concepts to be used in the interface. Considerable amount of energy were spent on trying out alternatives for texts and sending requests for changes. At this stage we were mostly following the deployment from outside (following the use as we had access to the system) and were available by email and participated in their meetings whenever we were invited.

Announcing or planning?

While the calendar metaphor used during the concept design stage was an inspiring one, certain as-

sumptions contained in it did not scale to actual practices that were already emerging in the house. This was evident with some features made to support the daily meal at Loppukiri. At the conceptual level the “common dinning tool” emphasis seemed to be more on announcing dinners and registering for them. However the planning aspect was also crucial but not so well supported. For example, one of the community working groups had compiled a Loppukiri recipe book appropriate for the community. This was being used in its paper version for the cooking as well as for planning the weekly menu and shopping activities. It was also available for those wishing to join the dinner so that all could be aware of the ingredients of a meal (in case of allergies or other concerns).

The initial specification and some concept description did include a sketch for the Recipe Book but it was left out from the first iteration so as soon as there was a chance, a Recipe Book component was implemented quickly, in a sketchy way, using the code from the Members Profile component. Thus a new version of Miina with the “Recipe Book” component was rolled out, improving the situation. A second aspect is exemplified by the fact that though much effort was spent in setting the calendars for managing the shared spaces, their use presented some challenges when not everybody was using them since it was difficult to keep updated both the paper and digital versions of them. We soon realized that their uptake could be postponed and it was better to focus on the paper interfaces and develop more the practice of delegating certain maintenance of individual features, to some “neighbour” willing to help. Future versions of Miina need to address the need of planning and taking decisions (e.g. what to cook, and whether to eat or not) with more flexibility and expand the connections to the paper interfaces that many residents feel more comfortable using.

9 Inside our design team the software was called DailyWorks, to separate it from Miina, the specific implementation and configuration for the seniors [2]. We tried to keep an eye on use cases relevant to groups of friends and clubs, residents associations, extended families, food buying circles, day-care circles, and others that could potentially benefit from a similar infrastructure as the one we were developing with the seniors. The software has been released under an Open Source License. It is available at <http://arki.uiah.fi/adik>

Practice design informing the evolution of tools

While living together in the house it became more evident to the Active seniors that they will have many uses for a component inside Miina for storing various notes and documents. After the Recipe Book became available, the Active Seniors asked if it was possible to use a "copy" of the Recipe Book component as a bulletin board; in that case we did not have time to implement one. On their own, and to make their point clear to us, the seniors tried a couple of work-a-rounds to make the Recipe Book behave like a community "note board". They played with the titles of the recipes to get them to appear in different order (e.g. by adding numbers or other symbols before titles to manipulate their sorting, etc.) and "misused" it to fit their purposes. This request did not originally seem to be of high priority, as they had plans to use other infrastructures like the Arabianranta community portal discussion boards. Nonetheless, it became evident that their use would have required them to maintain and follow more systems, more passwords and user names to take care of, etc. Hence their Miina seemed to them the right location for such sharing of files and information.

To address that concern and experiment with ideas of more generic infrastructures, we decided to concentrate the remaining efforts in turning the Recipe Book into a component that could allow building of dynamic containers for information. The result was a tool called Card Box for composing "information boards" that could hold items (or cards) whose structure could be defined by the creator and refined. The appearance of a container could be changed directly by someone in the community if it did not work out (nobody understood what to do or it became messy after a while to manage) and new arrangements and concepts could be tried out at little cost by filling or editing a form. To help jumpstart the process we created the Recipe Book and two other examples of new information structures like notice boards and document storage places. The rest they did on their own (today

Miina has close to 18 different types of "containers" for announcing things, documenting, etc). We noticed how the collective negotiation of the naming of concepts and the meaning of the words used to talk about their practices was significant in the community. Since words establish shared understanding about their goals and responsibilities, they were considered very important. Therefore they appreciated the relative easiness, with which new things, with appropriate names, could be dynamically "tried out" with the new tool. There is still much work to be done in finding the right interfaces for these types of tools but we believe that efforts should be concentrated precisely in finding the right type of abstraction level that will allow everyday practitioners to continue fine-tuning (designing) their tools in use.

Co-design strategies followed in here include the earlier scenario work, the construction of an iterative specification document with clear ownership as well as paper and functional prototypes made and socialized early enough. Last, we can say that open systems that are flexible and can be extended open the ways for trying things out and weight it against actual practices and existing tools (e.g. their own paper interfaces).

4. Conclusions

Mainstream user centred design methods and tools (and to some extent certain readings from the social sciences), have recognized the larger number of actors and dimensions involved in design process, however those approaches still assume that the processes of "doing (designing)" and "appropriating (using)" are of a fundamental different nature. We challenge this assumption, and propose that, given appropriate circumstances, we can conceptualize "users" as not only experts in their own everyday life, but as expert designers of their own everyday life practices.

On a general level this group is a prime example of an everyday life design community, people who take an active stance towards designing the conditions, circumstances, facilities, tools and so

cial practices of their own life, and organize themselves appropriately to achieve their goals effectively. Their case sheds light on the dynamics of new forms of social collectivity, which challenge our established modes of politics and tradition [22] and the possibilities of organizing collaborative creative activities (see e.g. [13]). The Active Seniors are already existing active "co-designers", participating in the discussion of what could be alternative ways for growing old by initiating their own experiment and sharing their experiences. They have used the tools and means available to them – such as information, ideas, city services, construction companies, architects and various forms of social activity and organization – according to their best abilities, and in line with their purposefully developed design vision. This is of course not something that can be generalized. It indeed takes time, effort and appropriate conditions for such endeavours to flourish and become viable.

On a more specific level our collaboration with the Active Seniors life project has offered an opportunity to explore how diverse design activities, at the practice level, can be conceptualized and realized. Throughout our collaboration, they acquired new design tools and envisioning capabilities and some implementation resources, and were able to include more digital ideas and solutions in their life project. Compared to a traditional client/service situation, we did not propose a "product" for them, but instead an experiment in expanding their capacity to act as designers with new tools and visions. However, eventually we did realize some of the resulting designs as a validation of their meaningfulness. We can say that the capacity of this community to envision and design novel digital systems and their corresponding novel practices did indeed increase, and that they were able to act as quite competent co-designers in the implementation of their systems. We also noted that in the evolution of their practices, open ended and more designable tools are needed, as these provide them with more flexibility to mobilize and realize a greater variety of

configurations according to different purposes and circumstances.

The paper illustrated some of our research around developing co-design approaches thinking on the interplay between digital technology and the practices of everyday life. We asked is it possible to envision ways in which design research can give people tools to become more proactive rather than just reactive towards technological development? We believe that this is an important goal to keep pursuing; as the task of the professional designer becomes increasingly to provide the appropriate "design" interfaces (or tools) for the users to continue developing their practices and systems through design-in-use. We hope to continue research to understand the challenges involved in providing open-ended components, platforms, and toolkits that increase and support the design capabilities of the stakeholders themselves.

5. Acknowledgements

We would like to thank the Active Seniors Association for their invaluable collaboration. We are also in debt to many past and current members of our research group for contributions to the development of these thoughts. Without Mika Myller and Roman Suzi, it would have been impossible to produce the prototypes. Teemu Leinonen, Sanna Marttila and Paola Cabrera gave us timely feedback on the paper. This work has been partly funded by TEKES (Finnish Agency for Technology Development and Innovation); we greatly appreciate that support.

6. References

1. Botero Cabrera, A., Oilinki, I., Kommonen, K-H., Salgado, M.: Digital Tools for Community Building: Towards Community-Driven Design, Proceedings of the Participatory Design Conference. Computer Professionals for Social Responsibility 2002, pp. 215–219
2. Botero Cabrera, A., Myller, M., Susi, R., Kommonen, K-H.: DailyWorks – the journey from customizable towards co-designable. In Bo-

- tero Cabrera, A. (Ed.) Personal and Shared, Exploring Practices and Infrastructures. Arki papers. University of Art and Design Helsinki, 2007, pp. 32–42
3. Bijker, W., Hughes, T. P., and Pinch, T. (Eds.): The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology. The MIT Press, 1989.
 4. De Certeau, M.: The Practice of Everyday Life. University of California Press, 1984.
 5. Dalström, M., Minkkinen, S.: Loppukiri. Vaih-toehtoista asumista seniori iässä (*Loppukiri Alternative Living for Senior Age*). WSOY, 2009
 6. Fischer, G., Giaccardi, E., Ye, Y., Sutcliffe, A. G., & Mehadjiev, N.: Meta-design: a manifesto for end-user development. Communications of the ACM vol. 47, no. 9. ACM, 2004, pp. 33–37.
 7. Gaver, W.: The Presence project. RCA CDR Research Publications. Royal College Of Art, 2001
 8. Haddon, L., Mante, E., Sapio, B., Kommonen, K-H., Fortunati, L., Kant, A. (Eds.): Everyday Innovators: Researching the Role of Users in Shaping ICTs 1st ed., Springer, 2005.
 9. Henderson, A. and Kyng, M.: There's no place like home: Continuing design in use. In Greenbaum, J. and Kyng, M., (Eds.): Design at Work Cooperative design of computer systems, Lawrence Erlbaum Associates, 1991, pp. 219–240.
 10. Kangasoja, J and Schulman, H.: Introduction, in Kangasoja, J. and Schulman H. (Eds.): Arabianrantaan! Uuden kaupungin miihinousu. Arabianranta-Rethinking Urban Living. City of Helsinki Urban Facts, 2007, pp. 16–19
 11. Kangasoja, J.: From virtual visions to everyday services. Evolution of the Arabianranta local ICT model, in Kangasoja, J. and Schulman, H. (Eds.): Arabianrantaan! Uuden kaupungin miihinousu. Arabianranta-Rethinking Urban Living. City of Helsinki Urban Facts, 2007, pp. 142–157.
 12. Kommonen, K-H.: In Search for Digital Design. In: Media Lab Helsinki 10 Years. University of Art and Design Helsinki, 2004, pp. 105–113
 13. Leadbeater, C., Miller, P.: The Pro-Am Revolution: How Enthusiasts are Changing Our Society and Economy. Demos, 2004.
 14. Lehtimäki, K. and Rajanti, T.: Local voice in a global world – User-centered design in support of everyday practices. In Universal Access in Human Computer Interaction. Coping with Diversity, Springer, 2007, pp. 197–206.
 15. Morrell, R. W., Dailey, S. R., Stoltz-Loike, M., Feldman, C., Mayhorn, C. B., Echt, K. V., and Podany, K. I. Older Adults and Information Technology: A Compendium of Scientific Research and Web Site Accessibility Guidelines, The National Institute on Aging, 2004.
 16. Schatzki, T.: Introduction, Practice Theory, in Schatzki, T., Knorr Cetina, K D., Von Savigny, E. (Eds.): The Practice Turn in Contemporary Theory. Routledge, 2001, pp.10–22
 17. Suchman, L., Blomberg, J., Orr, J. E., and Trigg, R. Reconstructing technologies as social practice. American Behavioral Scientist, 1999, vol. 43, no. 3, pp. 392–408.
 18. Shove, E., Watson, M., Hand, M., Ingram, J.: The Design of Everyday life. Berg, 2007
 19. Shove, E., Pantzar, M. Consumers, producers and practices: understanding the invention and reinvention of Nordic Walking. Journal of Consumer Culture, SAGE Publications, 2005 vol. 5 no. 1, pp. 43–64.
 20. Pantzar, M. and Shove, E.: Understanding innovation in practice: a discussion of the production and reproduction of nordic walking. Technology analysis and strategic management. (Forthcoming).
 21. Rajanti, T.: Active Old Age. Active Seniors: the Right to Design Your Own Life. Convegno Internazionale realtà sociale e culturale degli anziani in Europa. Università degli Studi di Genova, 2004.
 22. Maffesoli, M.: Time of the tribes. SAGE Publications, 1996
 23. Wenger, E.: Communities of Practice. Learning, meaning and identity, Cambridge University Press, 1999.

Enhancing citizenship: the role of in-between infrastructures

Andrea Botero
Joanna Saad-Sulonen

First published in *Proceedings of the 11th Participatory Design Conference PDC10 Participation the Challenge*. (pp. 81–90). Sydney, Australia: ACM. doi:10.1145/1900441.1900453

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. PDC'10, 29-NOV-2010, Sydney, Australia. Copyright © 2010 ACM ISBN: 978-0-9818561-0-0

Abstract

In this paper, we draw on material from a participatory design project that focused on the practices, infrastructures, and technologies used for creating and sharing information about the urban environment. The research strategy that we followed includes the collaborative design of a prototype environment and service called Urban Mediator (UM), as well as its subsequent deployment and appropriation in use through several cases. We examine some of the challenges and opportunities that exist in designing in-between infrastructures that can both address a more fluid and active notion of citizenship and understand it as practiced, rather than as a given role. Our research demonstrates that in-between infrastructures can have a role in encouraging a variety of stakeholders, including city officials and citizens, to experiment with and understand some of the complex aspects of participation. Following this argument, we also suggest some ways in which Participatory Design contributes to supporting continuous and iterative design-in-use.

Author Keywords

Citizen participation, citizenship, design-in-use, innovation, e-governance, in-between infrastructures

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

In recent years, governments worldwide have been very interested in electronic government initiatives (e-government), with many related projects and design activities addressing the potential uses of new technologies for enhancing democratic practices. There is, however, a growing recognition that an overreliance on technology, an insufficient collaboration of all stakeholders, and a lack of emphasis on building human capacity tend to limit the potential positive impacts of these initiatives (Rosel and Finger 2007). As a result, the focus of some developments has shifted from developing technology-enabled improvements in e-government operations to developing broader interactions between government, non-government, and civil society stakeholders (e-governance) (Leadbeater, 2004; Rosel and Finger, 2007), with a focus on what is needed to better support the dynamics of collective action and collaboration.

Nevertheless, it is debatable what exactly e-governance entails, particularly from the perspective of broadening citizen participation. This is especially true in times when Internet developments, such as so-called Web 2.0 platforms, social networking services, and a myriad of other new media tools and information systems, have also been embraced by civic initiatives and third-sector projects (see Crabtree, 2007; Punie et al., 2007; Novek, 2008). Although these initiatives are promising, many challenges remain regarding how (1) these developments can more effectively influence decision-making processes, (2) public administrations can respond to these changes in constructive ways with their current practices, and (3) opportunities for collaboration can be created. Participatory Design experiences and practices have much to offer in terms of addressing alternative approaches to e-governance (see Dittrich et al., 2003; Ekelin, 2007; Sefyrin, 2009). A purpose of this study is to build on these experiences and complement them.

Practices as Locus of Innovation: Steps Toward More Active Notions of Citizenship

Situated and participatory perspectives on design have proposed that there are important design challenges beyond those associated with artefacts. In this view, design should be approached “...not as the creation of discrete, intrinsically meaningful objects, but the cultural production of new forms of practice” (Suchman et al., 1999, p. 404). In so far as design engages with shared forms of practice and, consequently, understanding, it “deals with the contradiction between tradition and transcendence” in people’s practices (Ehn, 1998, p. 161).

In contrast to these views, most of the current e-government design plans offer a simplified view of the complex dynamics at stake. There seems to be an inherent assumption that, by providing a sufficiently overarching city system (e.g., a new issue reporting and tracking infrastructure) or a new user-friendly entry point (e.g., one-stop government services shop), an increase in participation will automatically follow or “participation” will simply be fulfilled (Ekelin, 2007). At the same time, most of the projects and literature related to citizen participation refer loosely to “citizenship” as the act of a person taking part in public affairs. These projects mostly leave open for interpretation what is really at stake and how citizenship can be understood anew in contemporary contexts that are also characterized by new types of infrastructures and communication possibilities.

To open up this issue, we will now make a brief detour across different understandings of the notion of citizenship. In their review on citizenship thought, Jones and Gaventa (2002) clearly summarize three classical strands in the literature. The first strand belongs to what can be considered *liberal thought*, where citizenship is presented as being a *status* granted by a state to an individual, which is exercised mostly by representative strategies, such as voting. A second strand, characteristic of much of *communitarian thought*, identifies citizenship as a *relationship* that can be conceived in the sense of identity. This identity is asserted only in our belonging to a community and in relationship to it.

The third classical strand is represented by *civic republican thinking*, which understands citizenship as a more or less a careful balance between *tolerance* and the *obligation* to pursue common good, which is exercised primarily through process of deliberation. These variations across these short definitions exemplify how citizenship is by no means a straightforward concept.

Much of the work in developing contemporary ideas about citizenship attempts to productively link the insights made by these three separate strands (Jones and Gaventa, 2002). Although it is possible to track some of the ideas all the way back to Plato's *Republic*, more contemporary understandings of citizenship bring together the emphasis on individual rights and equality and the recognition of our relationships of belonging through their focus on deliberation and the construction of common responsibility. These new approaches invite us to reconceptualise *citizenship as practiced*, rather than as given. That is, what we should be talking about is not only a status or a defacto relationship, but also something that we practice.

Building upon these ideas, we argue that there is a need to explore design challenges and opportunities that arise from a more fluid and active notion of citizenship that goes beyond a status or isolated acts of involvement, such as the ones reported by Holzer and Kim (2008) in the case of e-government, toward concrete, cumulative contributions and engagements in everyday life (see Borchorst et al., 2009; Ekelin, 2007). The following serve as research questions in this paper: What is the role of new infrastructures and socio-technical arrangements in opening up new possibilities for the practice of citizenship? Where and how can the required “innovations” take place?

We draw on material from a participatory design project that explored the role of digital technologies, specifically location-based services, in facilitating citizen participation in issues related to the urban environment and in building new relationships to the city administration. We examine some of the design challenges that arose in experimenting with an *in-between infrastructure* (the

Urban Mediator (UM)) aimed at facilitating the creation of spaces for sharing the different kinds of knowledge of the city. Drawing inspiration from Ehn's (2008) invitation to consider participatory projects as forms of “Thing” Design, we will inspect our research material with the purpose of illustrating some of the conditions by which multiple actors have or have not imagined new relationships through the infrastructures and engagements that the UM interventions created and made visible.

Based on our experiences with these participatory design interventions, we argue that *in-between infrastructures*, such as UM, which include interfaces to many actors, can offer different stakeholders an opportunity to understand the many challenges that are associated with participatory processes. Through these socio-technical arrangements, the capacity of both citizens and city officials to construct new forms of citizenship and, therefore, initiate innovations in the way that digital participation processes and services are being planned and delivered, can be supported in use as well. Our experience also suggests that designing in-between infrastructures is neither a straightforward nor unproblematic endeavour.

In the following sections, we will expand upon the context of our study, the characteristics of the experimental platform designed and share some of the interventions and experiments made, to illustrate the link between our design project and these broader concerns.

Research context, activities, interventions and collaboration

From 2006 to 2008, we carried out a participatory design study of the practices, technologies, and socio-technical arrangements for creating and sharing location-based information about the urban environment. The context was the EU-funded Innovative Cities for the Next Generation project (IC-ING), which was aimed at exploring Information and Communication Technologies (ICT) solutions to “*help raise productive participation by citizens in how their cities are managed and to help city administrations provide cost effective, location-aware*

services to citizens” (Jung, 2008, p. 2). As a research strategy, we initiated the collaborative design of UM to help us re-examine these objectives.

Because the city was an official partner in the ICING project, city employees participated at different stages of the process in both a structured and an ad-hoc manner. On the other hand, citizens’ collaboration and engagement varied from the research group’s close engagement with active citizens (living mostly in the Arabianranta neighbourhood, which was considered to be the “test bed” of the whole project) to following citizens’ and city officials’ actual use of and appropriations and contributions to the online service itself. Other relevant stakeholders involved in the process included the local development agency in the neighbourhood as well as one of the city’s cultural institutions. Both organizations had an interest in understanding citizen participation from different angles.

Table 1 provides an overview of the variety of design research activities carried out during the project. Some of the activities occurred simultaneously or are grouped for consistency; nevertheless, the table primarily follows the project’s evolution. We conducted interviews with citizens, members of local organizations, and city officials and organized collaborative design workshops using scenarios, paper prototypes, and, ultimately, functional demos. These activities helped the participants to explore the issues and guided the design process. Based on those initial collaborative design activities with the different stakeholders, we released demo and beta versions of the online service in order to engage partners in different experiments to further refine the ideas. In addition, the actual working service was used, iterated, and evaluated through actual projects that were carried out through various cases established in collaboration with city officials.

We followed classical participatory design approaches (Greenbaum and Kyng, 1991; Schuler and Namioka, 1993) in planning the design research activities and organizing the materials. We embedded the prototypes (Ehn and Kyng, 1991) and scenarios

(Carroll, 1995) used in the interventions so that a reflexive and productive conversation for co-design could be achieved. Further, we supported a design-in-use approach (Henderson and Kyng, 1991) to address the co-evolution of practices and technologies and attended to issues of seeding and emergence (Hagen and Robertson, 2009). In doing so, we focused on developing features for UM that were supportive of meta-design strategies (Ehn, 2008; Fischer and Giaccardi, 2004) (see our discussion on that topic in Botero and Saad-Sulonen, 2008; Saad-Sulonen and Suzi, 2007; Saad-Sulonen and Botero, 2010; Suzi, Saad-Sulonen and Botero, 2009).

Data were collected in the form of field notes that were shared with the entire design team. A wiki and the software development issue tracker were used for this purpose. We also maintained audio recordings and pictures of artefacts that were created in the sessions, took screenshots, and have since followed logs of the system when possible.

Understanding the feasibility of an in-between infrastructure

In this section, we examine some of the ways in which practices are maintained and evolve in the settings that we explored. We will first introduce some of the insights gained from the empirical data collected during the initial co-design activities. We do this from the point of view of two of the main stakeholders: citizens and city officials.

City officials: Time and spaces to share are limited

When this study was conducted, the Helsinki city administration was structured around 36 different departments. From an official point of view, each department had its own practices to address citizen interaction and participation possibilities. By 2006, Helsinki had a wide range of high-quality online services available in terms of e-government according to international standards (Holzer and Kim, 2008). However, it was clear that the city lacked an overall strategy to guide the development and acquisition of new information and

ACTIVITY/DESIGN INTERVENTION	PARTICIPANTS/ COLLABORATORS	RESOURCES/ ARTEFACTS
[A1] Contextual studies and interviews	Arabianranta Residents and Parents Associations Arabianranta e-moderators (active citizens that volunteer to moderate digital bulletins of the buildings in the neighbourhood) City officials (public works department, planning department, research unit)	Participant observation Semi-structured interviews
[A2] 2 workshops for mapping practices related to location-based information	3 e-moderators 4 residents	Paper map, stickers and tasks, benchmark examples, a prototype based on repurposed software
[A3] 3 experimental trials for gathering and sharing location-based information (mixing the use of prototypes and workshops for ideation)	3 e-moderators 10 teenagers (school class and one teacher) 1 employee of the local development agency in Arabianranta	UM early seed prototype (desktop and/or mobile), scenarios
[A4] 4 workshops for charting current and emerging practices	3 local development agency employees 2 active residents lobbying for a community house 2 city officials from the planning department and 1 from the city's research unit 2 employees at the local contemporary art museum working on "street art"	UM prototypes and UM online service, other related services (e.g., Arabianranta portal, city department website), and paper prototypes with scenarios of use
[A5] 3 cases with the city of Helsinki: Bunny rabbits in Helsinki (5 months), Malminkartano traffic safety planning (3 months), skate park design and location	1 city official (public works department) 1 city official (city's research unit) 2 city officials (planning department) 2 city officials (youth department) + Citizens (in general)	Paper prototypes, UM online service (beta), cases' websites, UM widgets, external online forum, Helsinki city CMS
[A6] Following the use of the service (cases, independent initiatives, and other short experiments)	(Citizens, planners, city employees)	Use logs, screen-shots, feedback feature of UM

Table 1. Overview of design research activities.

communication solutions to support these aspects [A1]. In an insightful review of the situation, the City of Helsinki Urban Facts unit identified the lack of a systematic approach and the absence of guidelines to react to citizen feedback within the city to be problematic factors (Bäcklund et al., 2006).

It was common that each department decided on its individual technical implementation, which resulted in incompatibility among some systems. Moreover, the systems were primarily enterprise solutions that were bought for this purpose from a third party and considered to be impossible to customize or adapt in-house. There were certainly multiple and often overlapping or competing channels and strategies available for citizens to report issues, raise concerns, and document their experience of the city [A1, A2]. In any case, the city had already identified some interesting initiatives within several departments around the issue of citizen participation in general. There was also interest in exploring further potential solutions related to the use of ICT and new media for supporting interactions between city officials and citizens.

Despite the existence of infrastructures, such as the customer feedback service in certain city departments that makes it possible for citizens to report issues, most of the officials with whom we engaged expressed an interest in other ways of seeking the opinion of residents regarding the plans or projects they were working on and gathering facts.

Starting an initiative that would involve interaction with citizens through online tools was not an easy task. Both in the workshops and during the pilots, we found that complicated bureaucracy, a lack of knowledge of available technology, and the fear that the need to react to citizens' queries would require too much time, resources, and effort were some of the factors involved. In other cases where citizen involvement was a more established practice, it was understood only in terms of opening the discussion after plans had been made [A6]. In most cases, the officials' involvement was focused on concerns regarding how they would use the results, for example, in reports they needed to produce.

A common denominator stance for consultations and city involvement projects that we got to know was that, citizens' contributions, reports, feedback and results were available only to the city officials involved; and were not openly accessible. This did not seem to be of concern for the city official as they had no clear ideas to how else material like this could be useful [A1, A5, A6]. In general, they did not consider how to recycle or reuse data more efficiently internally, nor was it evident to them that someone else (e.g. citizens) could use the data. When we talked about dissemination of information about these activities, issues of accuracy and the need to give only thoroughly valid information to control credibility were considered important, and an issue that might hinder the wider availability of the data [A3, A4, A5]. These aspects were coupled with concerns about the limits of their own work resources and their capacity to react.

Citizens: How to share and when to report

Parallel to the diverse official initiatives, different organizations, communities, and individual citizens in Helsinki have experimented with a variety of grassroots initiatives for documenting the city, collecting public issues, shaping concerns, and discussing plans. As in many other parts of the world, the use of social networks and social media services were explored from an urban everyday life perspective. In addition, some citizen grassroots civic projects utilized new media to express their opinions regarding urban issues (Saad-Sulonen, 2008). However, few, if any, of these initiatives were truly connected to either each other or an official channel, which increased the risk of their being diluted or having little impact.

Through our engagements with citizens in Helsinki, we learned that information about the urban environment and city issues had a strong social component. This is not to say that information comes only from people (word of mouth); however, information was considered to be reliable if it was socially valid or recommended. When discussing the ways in which residents of Arabianranta were

searching for information or creating information about the immediate locality, there was a strong willingness to look at the information in terms of how it could be shared or “moved forward”. Citizens shared a lot among themselves and expressed their interest in sharing more [A1, A2, A4]. In communicating with the municipality, however, finding the right channel was not always an easy endeavour. Further, citizens often encountered problems, concerns, or interests, which could not be dealt with through any of the available mechanisms; consequently, they forgot about them or gave up.

It could be the case that more citizens would be willing to be more proactive in engaging with the issues if they had an assurance that the inputs were considered in the development processes of the city administration. The following question was a recurrent concern: Is somebody really going to listen and react to this idea or feedback? [A1, A3].

Encounters in the urban mediator

Having outlined the background conditions and context of the case, we will now introduce a few issues raised by the design interventions in some concrete cases, where the prototypes and the service were used. We will also discuss how they can contribute to our understanding of the dynamics involved. First, we introduce in general terms the design decisions that are condensed in UM features and its current set-up. Second, we will follow its use through several encounters.

As previously stated, UM was designed and evolved to be an *in-between infrastructure* aimed at facilitating the creation of spaces for sharing the different kinds of knowledge about the city. The proposal for an experimental in-between infrastructure meant that there would be no one single actor in control of it, so that it became possible to simultaneously offer interfaces for a variety of actors. This is based on the observation that on the side of the city authorities, the systems that provided, among other things, help desk services for customer feedback and geographical information system (GIS) data where difficult to connect to oth-

er infrastructures and it was almost impossible to get flexible or open access to them. On the side of citizens' initiatives, community websites, forums, blogs, and other Web 2.0 services were rich and densely populated with very particular contributions; however, they formed scattered discussion that were not necessarily linked together or brought up to the city systems.

In its current version, UM is a server-based software that provides users (i.e., citizens, city officials, or other interested parties) with the ability to create, obtain, and share location-based information (*UM Points*). This collected information is organized according to topics of interests (*UM Topics*), which can be set up and maintained by any registered user. UM uses a map-portrayal service as means for representing the location-based information and complements it with a set of *Tools* to help process, share and organize the points. The tools include also *UM Feeds* and *UM Widgets*, which allow some of the functionality of the service and the data it contains to spread out in other online services and places. A UM service is accessible and usable online through the web using a normal personal computer (PC) or any browser-enabled mobile device. The software is available under an open source license (<http://um.uiah.fi>) that allows new instances to be set up, customized, and developed by other interested people.

Figure 1 illustrates the main concepts used in UM, as well as some of the current relationships of the UM service to other components. In general terms, UM is meant to: 1) support the creation of repositories for sharing annotated locations in the spirit of openness and user-created content, 2) permit the aggregation of local and external information sources by means of harvesting and/or syndicating existing data to allow for the reuse and cross-fertilization of information, 3) provide tools to host both official and public initiatives or “projects” for location-based information collection, and 4) facilitate the creation of explicit channels to other systems, such as public authorities back-end systems, in a lightweight manner. The focus is on

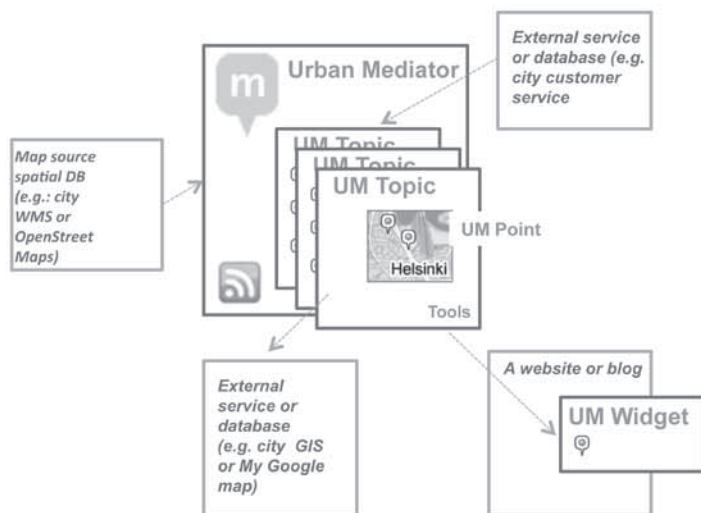


Figure 1. UM's main elements and relationships (UM v2.0).

lightweight project management and simple ways to identify who is behind the initiative or project.

In the following section, we present a few examples from the actual use of the UM prototypes that have unfolded during the iterative design process to identify the strengths and limitations of the ideas explored. We will focus more on the “design-in-use” decisions made by participants regarding their appropriation and use of UM tools and features, rather than the ways in which these experiences shaped the more “formal” iterative process and co-design of UM.

The possibilities of making things visible and the limits of revealing

Figure 2 shows an early UM web interface featuring a UM Point documenting a seemingly abandoned car in Helsinki. The point forms part of a UM Topic we set for a couple of active citizens in Arabianraanta called: *Active Citizens' Test Topic*. The point is openly accessible and includes the exact location where the car was seen, a set of freely associated keywords (tags), and a picture attachment.

The UM Topic was used during one of the early pilot studies with volunteers, when two active cit-

izens started to use the prototypes to document seemingly abandoned cars that they spotted during their walks [A3]. One of them first came up with the idea as a fun way to try out the functionality of the prototype we provided. Shortly after another participant in the trial *noticed* these types of points appearing, and started also contributing these types of points. This turned into a joint project and somewhat of a game that later sparked vivid conversations during the debriefing meetings with the participants. Despite the short duration of the experiment, they were able to *imagine different scenarios* in which this information could be made available to the city administrations. They were interested in understanding the *consequences* it could have if the city would actually follow such documentation over time. They even envisaged the future possibility of betting on how long it would take for the city to notice the cars that had not been moved from a spot in a long time and how some actions to pick them up could unfold.

Related issues were also raised repeatedly from other perspectives. For example, in the workshop with museum curators who were interested in using UM to spark conversations about “street art” with



Figure 2. A UM Point documents a potentially “abandoned” car on Tarkk’ampujankatu Street in Helsinki (UM alpha).

the general public, the problematic consequences of unintentionally “revealing” graffiti art to the city authorities were discussed. One individual asked, “*What if citizens’ spontaneous documenting is turned against them?*” [A4]. Because graffiti is an illegal activity in Helsinki, it is unclear whether their identification on UM will threaten the existence of street art, even though the goal of the participants is to appreciate graffiti.

These examples present both interesting and conflicting outcomes. Although it was important for many people to be ensured that the “city” (or someone) was truly listening and able to act upon feedback from citizens, the ultimate consequences of these moves were difficult to predict and not always necessarily positive. Hinting at the need for these interactions to be negotiated further. Due to the fact that all this content is still available in the service, it is possible to discuss in concrete terms with many different stakeholders related scenarios.

Laying down foundations for collaboration

Figure 3 features the desktop UI of the UM Topic called “Youth Department: Skate” (*Nuorisooasian-*

keskus: skeitti). Citizens, in these case mostly young skaters, contributed by creating UM Points via the web interface or mobile interface. There are two UM custom made buttons that allow for the creation of different types of points. The buttons indicate the nature of the contribution that is being sought: “*Where do you currently skate?*” and “*Suggest a new location for skating!*” When people used each button to create a new location, the points were tagged with a different set of predefined keywords created by the UM Topic initiator (the webmaster of the Youth Department). These keywords were then added to the free tags that contributors provided. Underneath these buttons, the UI provides a tag cloud, giving an overview of all of the tags used in the points so far. The buttons also worked as UM widgets when embedded in other websites dealing with this consultation. For example people could add directly their contributions to UM from the website of the youth department.

The UM Topic contains a brief description of the objectives of the initiative and features a link to the youth department website, which contains information on the current skating parks of the city. At

mobile desktop en fi

Urban Mediator Helsinki

log in | sign up | about | help | feedback

Nuorisosiainkeskus: skeitti

Onko jossain joku sopiva nurkkaus, jossa olisi hyvä olla skeittipaikka?

Nuorisosiainkeskus kartoittaa nuorten toiveita suunnittelutyön pohjaksi. Kaikkia toiveita ei ole mahdollista täyttää ja ne jäävät uneimiksi, mutta eihän sitä koskaan tiedä, vaikka juuri sinun ehdotuksesi toteutuisi jonakin päivänä.

Skeittipaikkakysely on päättynyt. Kiitos paljon kaikille vastanneille asiantuntevista kommentteista.

Nykyiset skeittipaikat Helsingissä

Showing all points in topic: (40) map list

Missä skeittaat?

Ehdota skeittipaikkaa!

Search

Only tags

13-17v 18-22v 2-12v eiolojuttu
 aukio avoin kenttä betoni
 ehdotus eläntarha haitalla
 hyväksyntäinen tyhjä kaivosputo
 kaivos kenttä keskusta kila
 kokeinen korjattava turviti laitasalo
 lähi matinkartano mallurimäki
 mikrotila mietittävä mikroavio
 murkkuvuori niemenniemi
 nuorisosiainkeskus paikka
 parannusehdotus parannuskohte
 paikka pieni pinnote pooli rullalauta
 ruuhkottu säälä siltä skate skeittaus
 skeitti skeittipaikka skeittipaisto
 take-1000 tapacimiyä tuonemmi
 vilkin vuorariisikeittaus y522v

This site runs Urban Mediator Software 2007 Terms of use | Contact
 Innovative Cities for the Next Generation - 2006-2008 |

Figure 3. A UM Topic gathering contributions for new skating park locations. The UI features a map view populated by UM Points (UM v 1.0)

the end of the consultation project, the webmaster added a note informing future visitors that the consultation time had ended. The UM Points can be *browsed* spatially through a map view or thematically through a list view. All of the information collected was *openly available* for casual visitors of the service, contributors, and of course to the officials in the youth department. When the UM Points appear in the interface overlaid on the map of Helsinki the map data is fed to UM from the city's official web map service server (by this time, UM could also use other map sources, such as openstreetmaps.org).

After two earlier relatively successful trials conducted in cooperation with different city officials (Botero and Saad-Sulonen, 2008; Saad-Sulonen and Botero, 2010), the City of Helsinki Youth Department was encouraged to contact us. They wanted to map possible locations for new skateboard parks in the city using input from young skateboarders. They thought that UM could be a valid tool for that

purpose, as they had seen some of the material that it contained [A5]. In contrast to previous occasions during which a member of our team had to facilitate and drive most of the planning of the trial and the setting up of UM, this time we gave the youth department's webmaster an overview of the UM and its tools and features, including how to create a UM topic and UM widgets to spread the project in other websites, and then mostly followed the development of the project [A6]. The idea of the Youth Department for this project involved mostly surveying *opinions* regarding the location of a new skating park and *soliciting* skaters to *share* their current skating locations with them, as it turn evident in the way the UM Topic was set-up.

UM tools allowed a small team in< the youth department to quickly put a consultation project in place using existing resources and make it visible to their target audience in a short time. There was no complicated bureaucratic procedure and no se-

curity risks to ponder associated with this experiment. In this case, we were also able to show that projects do not need to be large and that citizen contributions are valuable and will indeed materialize. The UM Topic allowed the youth department to successfully gather an interesting and varied set of materials. The contributors' proposals were detailed in terms of explaining not only why a certain location would be suitable, but even suggest materials and new configurations for the skate ramps.

Unfortunately, some of these important dimensions of the contributions were lost in the process. For example, one of the UM Points contributed included a link to a video, posted on YouTube, showing a skating pool, as well as a link to a U.S.-based company specializing in these types of skateboarding equipment. In the contributor's opinion, these were good examples of a concrete "pool" for a skateboard park, which s/he considered to be suitable for a park in the Alppipuisto area of Helsinki. Because UM was conceived as a sort of in-between space, we wanted to facilitate the transfer of data to the systems normally used by the city officials in their work. For this purpose, we made it possible to export the UM data in different formats. When analyzing further the material, the youth department only made use of the file in comma-separated values (CSV) format to import the collected data into their spreadsheet program and, eventually, into the city's GIS system. In this process, these types of links and attachments were lost and in the end forgotten. Another problematic issue, at least from our perspective, was the fact that little feedback on the future of the plans was shared afterwards with the contributors, given that the project's agenda was limited.

In a more speculative fashion, we also wanted to highlight the fact that, by using UM, the gathered points (data and information) could be potentially reusable or recycled into other UM Topics dealing with different or related issues. Any UM Point can be imported or linked to many different UM Topics. When asked their thoughts about this possibility, some of the city officials that participated in the cases saw no problem with it but it was

difficult for them to imagine sidetrack UM Topics that could make use the gathered information with other purposes or in a completely different agenda. That possibility had so far been inexistent and therefore broader implications and possibilities were not yet visible for them. They were more concerned with the fact that it must be made clear in any other initiative that would make use of the information, that it was no longer an official project set up by the city [A5]. In most of the trials however, both citizens and city officials appreciated the fact that more people were able to see parts of "the bigger picture" by browsing fellow citizens' contributions. Even though citizens have not realized concretely the possibilities of re-using either; it will be important to follow what happens if such re-appropriations of that seed points materialize.

Experiences like these definitively help city officials to gain insight into what factors they need to consider and devise steps to create the conditions for increased collaboration. They also help to move forward some of the early design ideas and hypothesis into concrete instances that link them to everyday events and use. Unfortunately, as such the experiments alone are insufficient to develop the broader agendas of e-governance if they are not framed inside a larger and comprehensive participatory agenda (Saad-Sulonen and Botero, 2010).

Sharing issues of concern?

Figure 4 provides details about the current mobile user interface. This UI is geared toward use cases such as *browsing* or *finding* "nearby things".

Another main purpose of the mobile user interface is to allow more straightforward creation of UM Points at a *particular location* when the device contains GPS functionality supported by UM.

In this case, the mobile device owner is *standing very close* (4 meters) to a UM Point contributed by another citizen. The UM Point contains an picture documenting the street, full of trash, in front of an automatic bank machine. The creator gives it the following title: "Thoughtless Decisions". In her description of the UM Point, the citizen asks, "Don't



Figure 4. A UM Point documents questionable decisions of some fellow citizens (UM v1.0 – mobile UI).

those machines allow users to choose whether or not they want to print a receipt?”.

The context of these experimentations was a personal citizen initiative to document garbage in the city [A6]. With our assistance, the citizen created a UM Topic called “Clean City!” (Siisti kaupunki!) to document and share places where there was trash in the city, as well as to collect ideas on how to make the city cleaner. She also involved friends and family in the initiative.

This example raises a point regarding how citizens have issues that not only refer to an “authority” (or an institution). For example, they might consider that it is not only the city that is not taking care of cleaning the streets well enough. They indeed might propose that it is also the behaviour of other citizens who make questionable decisions, which reduces the enjoyment level of the experience of the city for all because of more trash. This

is an example of the need to collectively change a shared situation and discovery of productive ways to deal with it. This is evident from the way the contributor framed the problem in the UM Point title, which demonstrates that there are also citizens that do not think enough when they use the automatic bank machines. It is also evident in her challenging question to fellow citizens in the description. Further, the initiative also shows that by sharing these instances, through the creation of a Clean City! topic and making some “facts” or “evidence” available to all individuals, the situation could stand a chance to be dealt collectively.

Challenges of openness

The platform was designed in such a way that it does not need to stand in isolation from other existing sources of location-based information.

For example Figure 5 shows a UM Topic populated by pictures of Helsinki taken by users of Flickr. This was achieved through supporting standard formats (e.g., RSS, Atom/GEORSS, and KML) and conversion mechanisms (e.g., CVS), making it possible to create UM feeds and UM data to link to information produced in other services such as locations in map services (e.g., Google maps) or geotagged images from photosharing services (e.g.: Flickr, Pictnik, etc). The strategy is to encourage the syndication of location-based information to UM from other services, as well as from UM to other services.

Although these features have not been explored fully in the spontaneous uses of the service, we believe that there are many potential ideas to experiment with, when offering these interfaces. In theory, it is possible to utilize some of the UM Points in other topics, as well as in other services that offer better functionalities than UM for specific types of contributions.

We made it technically possible to connect the official city GIS platform to UM without compromising the official system’s integrity, for example, by relying on CSV exports of UM data. However, it was difficult at the time to obtain a concrete commitment from city officials to provide data feeds

mobile desktop

Urban Mediator Helsinki

log in | sign up | about | help | feedback

flickr Kuvia Helsingistä / Pictures from Helsinki

This topic shows recent pictures posted on Flickr related to Helsinki. Urban Mediator uses the geoRSS feed from Flickr available here: http://api.flickr.com/services/feeds/geo/Finland/Southern+Finland/Helsinki&format=rss_2.0

The possibility to subscribe to this Flickr feed appears here: <http://www.flickr.com/places/Suomi/Etel%C3%A4-Suomen+%C3%A4%C3%A4ni/Helsinki>

NOTE: we set up this topic to receive the Flickr feed on 25.5.2008 and we stopped it on 4.6.2008 This was part of an experiment done to show the possibilities offered by Urban Mediator. If you have any opinions on this, let us know: [urbanmediator\(et\)zalk.fi](mailto:urbanmediator(et)zalk.fi).

Showing all points in topic (231)

map list

DSC_3292 [x]

Tero Heino posted a photo:

2596187,32902,667823,20874

Search

Only tags

2008 accident action battery brasiliankylsu bvc city ciudad club color cove cares cruise diablo dsc desol. europa europe finland finlandia geocaching geokätkely geokätkentä geotagged h9 helsingfors helsinki herttoniemi kasaniemi kallo kathrina kevät lehtenä lehti lightroom maemo meri msto nature nikon200 noika ocean ot photowalk picnic pw230508 ravintolacodina seurasali shoju sinebrykoffipulisto sony spring studio51 subway sunny suomi syndet theprefectphotographer twisted twistedrecords vanhankuunginlehti vilkinmäki viikki vuokkiventie24

This site runs Urban Mediator Software 2007 Terms of use | Contact

Innovative Cities for the Next Generation - 2006-2008 |

Figure 5. A feed of geotagged photos of Helsinki imported from Flickr populates a UM Topic (UM v2.0).

from their side. Making the necessary plug-ins for the geographical conversion with the city system took more time and negotiations than expected. In the end, the copyright of the information, licensing schemas, and standards-related issues complicated those attempts to give access to official databases through UM (except for the limited use of the map data and access to a street name database or other attempts where ultimately unsuccessful).

While user-created content is important and valuable, it would have been equally important to be able to populate the service with pre-existing data in the city systems that could have bootstrapped it more efficiently. However, the opposite happened much easier, as the city was able to test and use UM feeds within their systems in all of the trials and experiments. These opened up many new ideas and developments and demonstrate the value of looking at this issue closer.

In-between infrastructures for participation: from reporting to sharing practices

The proposition that citizenship is practiced, exercised, and asserted socially in mundane and less mundane activities has implications for how processes and infrastructures of participation like the ones we studied are arranged and initiated. This comprises, for example, the ways citizens are or are not able to access and create particular information about the city or the ways in which city officials are or are not able to make certain information available. We propose that participatory practices are linked to exercising citizenship, and they are not about issues of mere citizen involvement. However, as some of our cases suggest, constructing more active notions of citizenship requires reformulating and making visible certain practices as a shared project in which more stakeholders take collective action and become aware of an existing shared situation and negotiate further what it means to all.

One possible way to examine these encounters is to focus on two generally distinguishable attitudes that are present in the cases. We refer to them as *reporting practices* and *sharing practices*. However, it is important to keep in mind that they are general entry points to a variety of other practices in which the people with whom we engaged were involved.

By viewing their doings as related to reporting or sharing, both citizens and city officials imagine some scenarios for participation and close others. In the cases discussed above reporting practices can be identified as those primarily concerned with “I tell you about something” (informing citizens that there is a new plan) or “I make a complaint or denounce” (telling the city that there is trash here). Generally, this is done from a unidirectional perspective. In contrast, sharing practices refer more to aspects in which having a share or part in issues is a core component or using or enjoying something is done jointly or at least in turns. Using the previous example, we are all responsible for the trash. From a sharing perspective, there seems to be more possibilities for multidirectional perspectives. Further, from a sharing perspective the promise to construct more active notions of citizenship can be available, if there are spaces to negotiate those notions (Ekelin, 2007). That is, the “Things” that Ehn (2008) talks about can materialize more concretely -for all of those involved- in the deployment of in-between infrastructures.

Through the encounters with UM, it is possible to lay the groundwork for collaborative construction of more active forms of citizenship. However, our experiences underscore the many challenges, both technical and social, for actually making such complex in-between arrangements possible. Creating the supportive conditions for sharing and negotiating issues is not a straightforward endeavour.

Some of the challenges can be summarized as follow:

1. Practices that encourage openness of interactions, where the exchange of the information

is not merely part of a unidirectional stream of information toward either the city or the citizens, need to be exercised more by all parties. These require negotiation, scaffolding and seeding strategies in the Participatory Design approach that need to continue after the concept design stage ends.

2. The conditions for the success of these practices also depend on the institutional and organizational arrangements in place. These include (a) how to understand better new sustainability models for such participatory infrastructures. Given that in-between infrastructures are not under “control” of a particular actor, it might mean also that it is nobody’s business to keep them alive. It also (b) includes the larger participatory frameworks and objectives of the participant stakeholders.

3. Concerns about privacy issues, reliability, and relevance of the information play a key role. Therefore portability, compatibility, and reusability of the contributions are issues of concern in which case the ownership and accessibility of the data need to be addressed early with appropriate supporting strategies.

All the issues listed above belong to the wider design space that is collectively charted. Focusing on exploring some of the gaps and bridges between the official city systems and citizen initiatives to offer a space, in which experiments could be conducted, proved to be a valuable strategy. In-between infrastructures might aid in understanding what is required to shift the focus from practices and technologies dealing with reporting issues toward practices and technologies that are more supportive of sharing and negotiating these issues between both city officials and citizens. Our findings suggest that this shift has implications for the capabilities of the actors involved to initiate innovations and understand the broader design spaces that are available to them. A Participatory design

approach contributed to create conditions to explore this type of “Thing” design where there is “a public thing open for controversies” (Ehn, 2008 p. 96) not only during the concept design stage, but also during actual use.

Strategies for building such in-between infrastructures are compatible with recent developments in Internet technologies, such as the so-called Web 2.0, the emergent Open Data movement, and the Fee/Libre and Open Source movement’s insistence in securing users’ freedom to continue developing their own tools. All of these have been said to generate conditions to empower more actors to create ad-hoc designs (see Bizer et al., in press; Stallman and Lessig, 2006; TED2010, 2010; Tuomi, 2003).

Conclusions

Commentators have suggested that a more active attitude toward experimentation is a viable path to fulfil more of the positive promises of e-governance. Some argue that citizens need to be empowered to experiment and create new channels and technologies (e.g.: Crabtree, 2007), whereas others contend that it is the responsibility of the government to initiate novel partnerships (e.g.: Novek, 2008). Consistent with what was already discussed by Dittrich et al. (2003), our experience with UM suggests that “making it happen” requires engagement, commitment, and support from those who are ultimately involved in the everyday implementation and use of technical infrastructures: citizens and city officials. Consequently, a combination of both approaches is warranted.

The findings of our design research indicate that new infrastructures and socio-technical arrangements can create new possibilities for the practice of citizenship. This requires that people restructure and transcend their practices, perhaps toward more collaborative understandings of what they are doing. Such type of activities can contribute to more productive conversations about how true forms of e-governance can actually be achieved. However, innovations in the field, when understood as something that will be taken widely in use, require

social, political, institutional, and technological prototyping.

New processes by which multiple actors can imagine and deploy new forms of citizenship can create new agendas and possibilities for new collaborations. In this sense, the challenge for and contribution of Participatory Design approaches lay not only in facilitating the collaborative design of new technologies and socio-technical arrangements, but also in supporting appropriate conditions of continually redefining what participation might mean for those who are and should be involved, through the technologies themselves (design-in-use). Despite the limitations, the findings of our research demonstrate that in-between spaces can have a role in encouraging city officials and citizens to experiment, understand, and manage these complex aspects of participation.

Acknowledgments

We thank all of our ICING partners, the city officials, and all insightful citizens who took part in the activities of the project and collaborated with us in the design. Roman Suzi and Eirik Fatland deserve special thanks for their many contributions to the development of these ideas and their collaboration.

References

- Bäcklund, P., Kuokkanen, A. and Henriksson, R. *Kuntalaisten ja hallinnon vuorovaikutuksen käytännöt Helsingissä (Interaction practices between citizens and the administration in Helsinki)*. Helsingin kaupungin tietokeskus (City of Helsinki Urban Facts), Helsinki, Finland, 2006.
- Bizer, C., Heath, T. and Berners-Lee, T. Linked Data – The Story So Far. *International Journal on Semantic Web and Information Systems Special Issue on Linked Data*, in press.
- Borchorst, N. G., Bødker, S. and Zander, P. The boundaries of participatory citizenship. In *EC-SCW 2009*. Springer, London. 2009, 1–20.
- Botero, A. and Saad-Sulonen, J. Co-designing for new city-citizen interaction possibilities: weav-

- ing prototypes and interventions in the design and development of Urban Mediator. *Proc. PDC 2008*, 266, 269.
- Carroll, J. M. *Scenario-Based Design: Envisioning Work and Technology in System Development*. John Wiley & Sons, New York, New Jersey, 1995.
- Crabtree, J. *Civic hacking: a new agenda for e-democracy*. openDemocracy online journal, USA, 2007. <http://www.opendemocracy.net/debates/article-8-85-1025.jsp>.
- Dittrich, Y., Ekelin, A., Elovaara, P., Eriksén, S. and Hansson, C. Making e-Government Happen Everyday: Co-development of Services, Citizenship and Technology. *Proc. HICSS36 2003*.
- Ehn, P. *Work-Oriented Design of Computer Artifacts*. Arbetslivscentrum & Lawrence Erlbaum Associates, 1988.
- Ehn, P. Participation in Design Things. *Proc. PDC 2008*, 92–101.
- Ehn, P. and Kyng, M. Cardboard computers: mocking-it-up or hands-on the future. In J. Greenbaum and M. Kyng (Eds.), *Design at Work: Cooperative Design of Computer Systems* Lawrence Erlbaum Associates, Hillsdale, New Jersey 1991, 169–196.
- Ekelin, A. The Work To Make e-Participation Work. Blekinge Institute of Technology, Sweden, 2007.
- Fischer, G. and Giaccardi, E. Meta-Design: A Framework for the Future of End-User Development. In H. Lieberman, F. Paternò, and V. Wulf (Eds.) *End-User Development – Empowering People To Flexibly Employ Advanced Information and Communication Technology*. Kuwer Academic Publishers, The Netherlands, 2004.
- Hagen, P. and Robertson, T. *Dissolving boundaries: social technologies and participation in design*. Proc of the Conference of the Australian CHI Special Interest Group: Design: Open 24/7, ACM (2009), 129–136.
- Henderson, A. and Kyng, M. There's no place like home: continuing design in use. In J. Greenbaum and M. Kyng (Eds.), *Design at Work Cooperative Design of Computer Systems*. Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1991, 219–240.
- Holzer, M. and Kim, S. *Digital Governance in Municipalities Worldwide (2007)*. The E-Governance Institute, Rutgers, The State University of New Jersey, Newark, New Jersey, 2008.
- Jones, E. and Gaventa, J. *Concepts of citizenship: a review*. Institute of Development Studies, Brighton, 2002.
- Jung, E., ed. *The ICING Cookbook*. ICING Project & Dublin Institute of Technology, Dublin, 2008. (Available online at: http://www.fp6-project-icing.eu/icing_cookbook.pdf)
- Leadbeater, C. *Personalization through participation – a new script for public services*. Demos, London, England, 2004.
- Noveck, B.S. *Wiki-Government*. Democracy: A Journal of Ideas, 7, 2008, 31–43.
- Punie, Y., Misuraca, G. and Osimo, D. *Public Services 2.0. The impact of Social Computing on Public Services*. European Commission – JRC Institute for Prospective Technological Studies, Seville, Spain, 2009.
- Rossel, P. and Finger, M. *Conceptualizing e-Governance*. *Proc. ACM 2007*, 399–407.
- Saad-Sulonen, J. Everyday life in the interactive city: exploring the potentials of interweaving digital technologies and urban space. In U. Bucher and M. Fincas (Eds.), *E-City*. Berliner Wissenschaftsverlag, Berlin, 2008, 65–76.
- Saad-Sulonen, J. and Botero, A. The Urban Mediator as a tool for public participation: a case of collaboration between designers and city planners. In S. Wallin, L. Horelli and J. Saad-Sulonen (Eds.), *Digital Tools in Participatory Planning*. Aalto University, School of Science and Technology, Center for Urban and Regional Studies, Helsinki, 2010.
- Saad-Sulonen, J. and Suzi, R. *Designing Urban Mediator*. Proc of the Cost 298 conference, COST Action 298 – (2007).
- Schuler, D. and Namioka, A. (Eds.). *Participatory Design: Principles and Practices*. CRC/Lawrence Erlbaum Associates, 1993.

- Sefyrin, J. and Mörtberg, C. We do not Talk about this: Problematical Silences in e-Government. *Electronic Journal of E-Government*, 7(3), 2009, 259–270.
- Suchman, L., Blomberg, J., Orr, J. and Trigg, R. *Reconstructing technologies as social practice*. *American Behavioral Scientist*, 43(3), 1999, 392–408.
- Suzi, R., Saad-Sulonen, J. and Botero, A. *Co-designing with web.py: urban mediator*. *Python Magazine*, 2009, 27–34.
- Stallman, R. and Lessig, L. *Free Software, Free Society: Selected Essays of Richard M. Stallman*. Free Software Foundation, Boston, MA, USA, 2002.
- TED2010 (Prod). Tim Berners-Lee: The year open data went worldwide. 2010. TED Talks video (Available online: http://www.ted.com/talks/tim_berniers_lee_the_year_open_data_went_worldwide.html)
- Tuomi, I. *Networks of Innovation: Change and Meaning in the Age of the Internet*. Oxford University Press, 2003.

Aging together: steps towards evolutionary co-design in everyday practices

Andrea Botero
Sampsä Hyysälö

Abstract

In this paper we outline a temporally extended co-design process of media technologies developed in collaboration with elderly people. In the course of doing so, we identify a set of design strategies that helped sustain the collaboration. Based on our experiences we recognize the need for developing design strategies for extended and evolutionary design collaborations with ordinary communities that have special needs, and do not possess significant resourcing, design experience or skills in the technology in question. Such communities of practice pose challenges to shorter term project centered forms of codesign and also require updates to the existing extended design approaches, which rest on relatively high user skill and resourcing. The “Aging together“ design strategies outlined in this paper hence take needed steps in adjusting codesigners’ repertoires of engagement in this type of everyday contexts.

Key words

Co-design, design for communities, design-in-use, elderly, long term engagement, participatory design,

First published in *CoDesign*, Vol 9, Issue 1, 2013 (pp 37–54) doi:10.1080/15710882.2012.760608
Reprinted with permission of the publisher (Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>).

Introduction

Back in the old days the Designer created an elegant solution and left the public to admire the fruit of his genius. Since then several hundred methods and techniques have been created to help designers, as well as their publics, to place design on a more collaborative grounding (for overviews of co-design techniques see Muller and Kuhn, 1993; Bødker, et al 2004). Some argue that this has dramatically increased designers' ability to reach the right definition of the design task, and the uptake of co-design approaches has marked a shift in how design profession and its engagement with its publics takes place.

Yet, the part where the public is left to enjoy and admire the fruits of design has remained curiously intact. Co-design activities take place predominantly during the concept design, and even when spread throughout the design cycle (as in many venerable participatory design approaches) most design activities end when the product is taken into use (for a review and critique, see Hartswood et al, 2002; Voss et al 2009). This state of affairs is well and honestly depicted in Sanders and Stappers (2008) model for co-designing (Figure 1).

In light of research on how designs shape society, however, this view appears “so 80s”. Since mid 1990s consumption, workplace, technology and design studies alike have consistently found that ordinary citizens, consumers and workers are not just docile adopters but active in reinterpreting, adding-onto, and repurposing technologies (Silverstone, 1992; McLaughlin et al, 1999; Hen-

derson and Kyng, 1991). Often a long process of mutual adaptation of technology and organization happens (Leonard, 1995). Today, after the spread of social media services, peer-to-peer co-creation, user innovation platforms and open source development, the evolutionary nature and longer temporal reach entailed in many co-design initiatives is evident. Given these developments, the project view of co-design that Sanders and Stappers articulate seems to take for granted the production process of industrial physical goods, where design is organized into a project that ends at a product launch, albeit this no longer matches the realities of many co-design engagements. There is an urgent need to elaborate approaches that help to navigate co-design engagements that may extend after the market launch as this means entering a terrain less familiar than the traditional project structure typical of R&D. (Figure 2).

This concern is timely also because the extended timeframe of co-design remains only halfway realized. Most extended co-design takes place with social media services, lead-users, geek communities and other technically savvy and design-disposed peoples. Such peoples are quite happy taking over work that professional designers used to do, which may indeed call for serious reflection on what the future of the design profession and its core skills may be (Sanders and Stappers, 2008). But many other publics are not, and will not be, so design savvy. It is those publics that truly need the designer, and often it is exactly them who suffer the most from technology that is ill-fitting to their practices

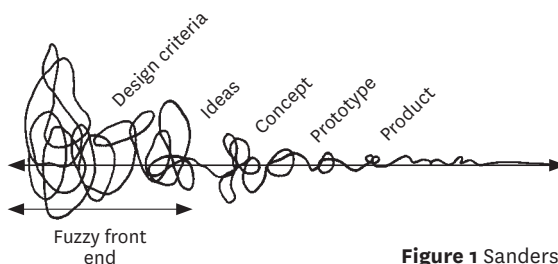


Figure 1 Sanders and Stappers (2008 p:6) model for codesigning

and poorly adaptable to changes and new possibilities that may emerge after the initial appropriation of the design.

We are not alone in noticing this. Evolutionary approaches for co-designing in settings where collaboration with designers is needed are being developed in multiple forms (see next section). In this paper we contribute to this emerging area of design research by elaborating on “Aging together” strategies for designing media, with and for ordinary people in their everyday life practices. The strategies have emerged and been iterated in a long-term collaboration with a co-housing project by elderly people. We use this project here to illuminate their rationale and challenges as they appear to us after the experience, in light of several iterations of the same approach in different settings (Botero and Saad-Sulonen, 2010).

2. Continuing co-design in use

2.1. Designing for the evolving workplace

The turn of the millennium saw the birth of several approaches for extending co-design activities to include concerns for what has often been referred to as design-in-use (Henderson and Kyng 1991). In what follows we recount four of these approaches as they articulate well some of our starting points.

The co-realization approach was developed as a principled synthesis of ethnomethodology and participatory design (Hartswood et al 2002), to address what Dourish and Button (1998) called the “paradox of ethnomethodologically informed design”. Meaning that the implications of a new system for work practices do not become evident by studying

the work as it is now, but will only be graspable during the system’s subsequent use. Co-realization thus explores a more radical and shared practice between users and IT professionals, grounded in the lived experience of users in-situ, and beyond the deployment of working product. Designers continue to be present at the workplace for extended periods of time, allowing both the workers as well as designers to jointly realize where the system and work practice could be taken and then iteratively realize these development directions as they emerge (Hartswood et al 2002), opening possibilities for further development (Voss, 2009). Co-realization has been successfully deployed in research projects in various medical IT applications and in manufacturing information systems.

Along parallel lines, Metadesign has been proposed as an alternative system design practice that bridges participatory activities towards those of evolving working life contexts (Fischer and Giacardi 2004). A central tenet of the approach is to develop during ‘design time’ under-designed, yet complete, systems. These are then made available to “owners of problems” in concrete domains. The approach includes developing sufficient flexible functionality to allow users to make re-designs during ‘use time’ without or with minimum developers’ involvement.

A similar trend towards continuous co-design has been proposed in co-configuration, an approach informed by Activity Theory, where the product continues to be adapted after its initial customization to the changing needs of the user organization (Engeström 2007). Co-configuration rests on a tailorable

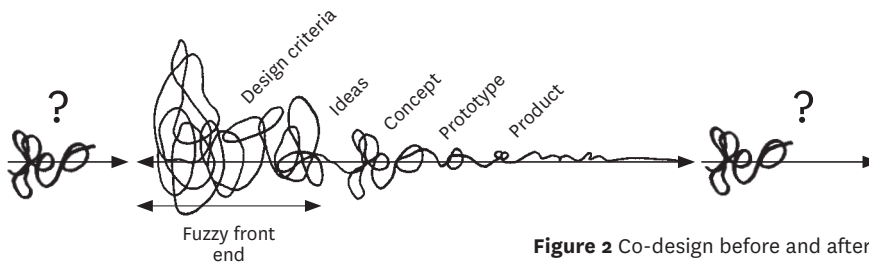


Figure 2 Co-design before and after a design project?

product or service offering as well as on a continued relationship between the producer organization and users. Examples of such extended collaborations range from the design of paper machines, to private banking and medical practices.

Many of the principles from these extended co-design approaches hold beyond the workplace and apply beyond technology development. However, these approaches to extended ICT design have been used exclusively at the workplace, mostly in technology intensive settings, with well educated practitioners, producing outcomes that have high societal or economic value (e.g. medical cancer screening or optimizing a paper machine). Such settings make it plausible for designers to be paid to work full time in the setting for long periods of time, do ethnographic work to initiate the project, use sophisticated and extensive software tools should the need arise and rely heavily on users' redesign competences. These are conditions that are not necessarily present in many everyday settings, let alone in communities that may have special design needs, and less privileged resource bases. In short, these approaches to ICT design have not been applicable to working with everyday communities without significant reworking – and nobody we know of has pretended them being so. This reworking is a mission we seek to advance in the present paper.

2.2. Extended media co-design with everyday communities

Our aim in this article is to elaborate on some design strategies suited for extended collaborative design with communities of ordinary people. We refer to them as “Aging together strategies” as they seek to gradually uncover and make jointly visible the design space available for a community of practice (Wenger 1998) and realize an evolving line of well-suited technologies, media and practices within a community. In doing this, we draw from and contribute to the ideas for “designing for practices” (e.g. Shove et. al. 2007, Björgvinsson 2008), which depart from the observation that it is change in the everyday practices that is the targeted outcome of

design, and that those practices by their nature intertwine systems that are simultaneously affected by other developments aside design. In the same token, the available space for design is not limited to designed objects, but includes immaterial designs that affect how social arrangements, norms, timing and the pacing of everyday routines are carried out¹.

We shall now proceed to recount a nine-year design engagement with the Active Seniors association in Helsinki Finland, where we explored new media technologies to support their growing old together goals. We describe our engagement in chronological order, and after each phase reflect on the key design strategies, how they become visible during the project period discussed, where they originated and what re-iterations we have deemed important. We then draw these strategies together and discuss what this might mean for developing co-design approaches more attuned to longer time frames of engagement in everyday life.

3. Beginning to age together: From settings to access design and constituency building

As in co-realization and co-configuration, Aging together strategies build on the premise that design engagements should not begin at the studio or in concept design workshops but in the practices, infrastructures and development trajectories of people who come together to become the “clients”, “users” and “designers”. The setups that surround all those that engage in a project largely govern what is sensible to design and how to do it. There-

-
- 1 Similar concerns are discussed in urban renewal collaborations such as in Amplify! (Penin et al 2012), Feeding Milan (Cantù et al 2012) and Malmö living lab (Hillgren et al 2011). However, these settings and correspondingly the strategies used differ somewhat from settings where technological possibilities and/or user practices are evolving rapidly such as in current information technologies.

fore, we now briefly outline the key settings that laid the ground for and lead to the mobilization of the design research engagement we report here.

3.1. Active Seniors: setting a communal alternative for growing old

The expected number of active years after retirement is steadily increasing in the West. A large number of initiatives have aimed to assist seniors' independent living and increase the efficiency of senior care with innovative technologies. To date, their uptake and impact has remained modest (e.g. Östlund, 1995; Hypönen, 2004; Hyysalo, 2010) and greater advances have followed from new housing initiatives even as these have provided mostly incremental changes to senior care (see e.g. Sonkin et al 1999).

Inspired by the Scandinavian co-housing movement (see e.g. McCammant et al 1994), the Active Seniors Association (www.aktiivisetsejororit.fi) was founded in 2000 to further alternative arrangements for growing old in Finland. It also sought to develop a shared housing arrangement, Loppukiri house (in English: last spurt), that is based on four basic principles: neighbourliness, self-help, community spirit and open decision-making process (Dahlström and Minkinen 2009). Members actively participated in the six year planning and construction of the building.² They organized events, parties, courses as well as developed and tried out associated future practices, rules and infrastructures to make their arrangement viable and sustainable (Figure 3).

Today, Loppukiri consists of a community of approximately 70 people that live in 58 compact apartments in a building that has large common areas. Residents take care of the maintenance and shared regular meals. They have six week "work shifts" among them and they nurture social activi-

ties, like reading circles and yoga sessions. Despite numerous challenges, the objectives of providing access to an active, social, safe and familiar environment seem to have been well met. The community is visited and consulted continuously by other groups in Finland and the association itself is involved in the design of a second similar project.

3.2. Organizational and technological setting: Arabianranta "fore-runner" district

The Loppukiri house is located in Arabianranta; a regeneration district of Helsinki built with high broadband connectivity seeking to attract jobs and IT companies. After such networks became more commonplace, plans turned towards developing broadband access more as part of the basic housing infrastructure, akin to water and electricity (Kangasoja, 2007). Today the area is still marketed as a Living Lab environment for innovation where local actors cooperate.³ For the case at hand, novel ICTs provide a setting that is conducive to gradual and deepening collaboration.

3.3. Researchers: new media in mundane everyday life

The Active Seniors association contacted the researchers in the design school at an early stage of their project in 2000. Researchers were looking for communities to collaborate with in an open-ended participatory project to study how ideas for using digital technology might emerge if a communities' capacity of envisioning digital tools and practices was nurtured (Botero and Kommonen 2009). There was also a hidden agenda to offer some "common sense" scenarios for the Arabianranta network. The Active Seniors were a well-suited collaborator; they were growing as a community, had a design agenda of their own, and were ready to invest effort even if not all members were keen on

2 They negotiated a price-regulated lot from the city of Helsinki and special working agreements with the construction company and the architects' studio.

3 See <http://www.openlivinglabs.eu/helsinki.html> for how the area is presented as a Living Lab.



Figure 3 Active Seniors in front of the construction site



Figure 4 Early paper prototype for the intranet.

computers or networks. For seniors, interacting with researchers stimulated new interesting concepts for their project. The collaboration also offered both parties the possibility to influence the visions for Arabianranta.

3.4. Access design to explore collaboration, targets and settings

Instead of storming in to perform a joint large co-design project, we started with a small joint exercise that could help us all in constituency building and defining targets for design engagement; a sort of “access design”. This was possible to fund through an ongoing open project exploring uses for 4G networks.⁴ The seniors’ working group collaborating with us envisioned that a website for

their project was a subtle way to encourage members to use computers more.

We recommended adding in an intranet with different levels of access to build new communication channels for the community, as they were still dispersed and getting to know each other (Figure 4). The outcome was immediately useful for sharing the newsletters and printed materials, announcing and documenting social events, face-to-face meetings, lectures and so on as well as in for recruiting new members and collaborators for the association. The intranet allowed us to initiate some preliminary knowledge sharing experiments, even though it was used mainly by the board of directors of the Association.

3.5. Design strategies to initiate long term engagements

Let us now shift from the specifics of Active Seniors collaboration to the more general design strategies for long-term collaborative design with ordi-

4 From the onset it was clear that collaboration would need to happen creatively across different projects and funding instruments.

nary communities we have identified. Our first design strategy (DS1) is *start with social practices*. The possibilities of design are already present in the practices, infrastructures and development trajectories of those involved, which entails that design activities do not begin or occur only at the studio or in exploratory workshops. Even as this begins to be acceptable common sense, it is hard to remember that it is not only the practices of users that are important to recognize⁵. The second design strategy (DS2) we want to highlight is the key role that *exploring the constituency has*. For both users and designers it is crucial not to take for granted which kind of stakeholder configurations are able to achieve the kind of practices, technologies, media or change the parties envision⁶. At the same time, generating sufficient awareness of starting points and sensible collaboration possibilities also requires careful attention. Our suggested strategy for gaining this (DS 3) is to *begin with small but relevant “access design”*. A well bounded initial teaser can initiate trust and give a sense of how the collaboration feels like, which is important in deciding whether everybody want to get more serious or not.⁷ The access design also helps to start early with our fourth key design strategy (DS 4),

which is *managing expectations by anchoring*. Having something concrete to talk about helps setting joint goals and clarifying the resources and uncertainties involved in more extensive collaboration.⁸

4. Developing an open agenda: envisioning, design seeds and targets

4.1. Developing an open agenda with active seniors

After the initiation phase, Aging together strategies turn towards the *development of an open agenda* (DS 5). In these engagements, concept generation activities were organized around practices related to remembering, coordinating, sharing, care and security, as well as shopping and cooking (Botero and Kommonen 2009). These ideation activities, facilitated by participatory workshops (Bødker et al. 2004) and co-design techniques like probes (Mattelmäki 2006) and experience prototyping (Buchenau and Fulton Suri 2000), provided a variety of “design seeds”.

A first type of design seeds were those that spurred “indigenous design” evolution (Björgvinsson and Hillgren 2009), where ideas take shape and evolve inside the community and were implemented with resources at hand. A good example is that of a video-access concept developed in an early workshop, linked to an “on-duty porter” to greet visitors to the house when they rang the doorbell. The “on-duty porter” role grew to include also receiving calls from residents requiring help. Later the idea of video connection was found cumbersome, but the “on-duty help” was realized by simply purchasing and rotating a mobile phone amongst the residents. For several years the number was shown next to the doorbell.

-
- 5 As such this is not a novel premise, it is shared with the most radical co-design approaches. Earlier roots can be traced to Scandinavian participatory design (PD) in 1970s (for a review see Voss et al, 2009).
 - 6 Confronting from the onset of a project the stakes, interests and limitations of stakeholders has been a feature of PD approaches (Bødker, 2004). It was a starting point also for us and its importance was underscored in the course of our design engagements.
 - 7 We are not aware of systematic uses of access design elsewhere, however various kinds of preliminary studies in co-design approaches tend to function as ice breakers, which suggest there is a need to further work on possible strategies for this stage.

-
- 8 Managing expectations is a pervasive part of successful long-term design collaboration. Its importance was clear to us from the outset, but anchoring it as concretely as possible as an important strategy in its own right became evident only as we went along.

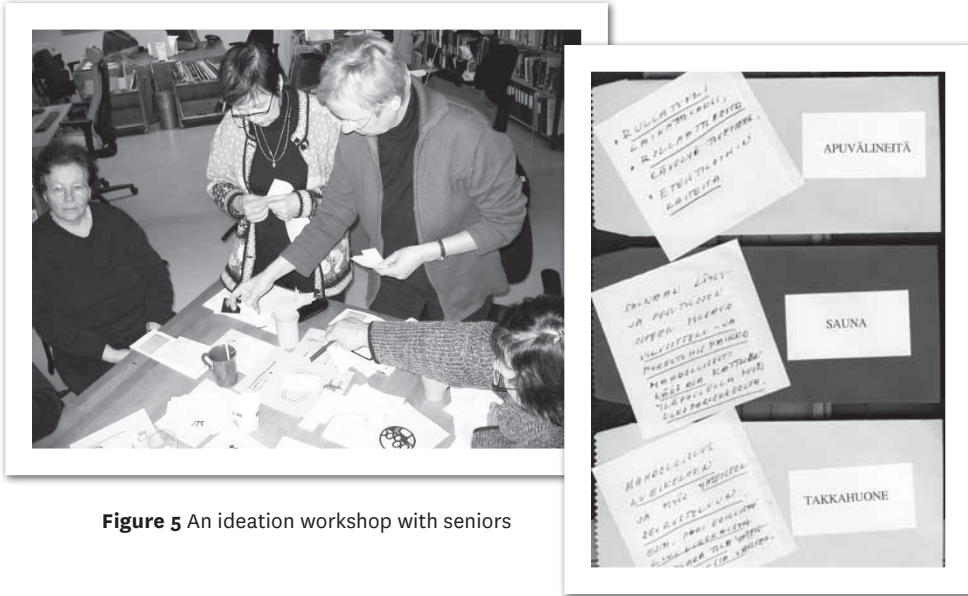


Figure 5 An ideation workshop with seniors

The second type of design seeds are those that grew jointly. For example we worked on knowledge-sharing activities since the Seniors had advanced practices for documenting travel stories, gardening tips, recipes, book recommendations to mention a few. This realization prompted ideas for an audiovisual archive/library for creating and sharing memories and recipes, which we report below in more detail.

Thirdly, joint envisioning was key in helping everybody to map and discuss together the kinds of practices that could take place in Loppukiri (Figure 5). The materials developed made important issues visible to everybody, from practical arrangements and rules all the way to new ideas about what to do and how to relate to others (see DS1). This required looking beyond technology choices and infrastructures into the social arrangements and commitments that were related to them (see DS2). The material was also immediately useful in funding applications.

4.2. Aging together design strategies regarding the development of an open agenda

Cultivating an open agenda (DS 5) means efforts to explore what would be sensible development directions in the design collaboration.⁹ Possible design avenues can be explored in by *building scaffolds* (DS 6) that help cultivate the sense of possibilities by bringing materials, solutions and practices used elsewhere, developing joint vocabulary and experiments¹⁰ An essential part however, is doing as much of this on-site as possible, physically *going*

-
- 9 In the course of our work we have come to understand that the function of collaborative design techniques for “Aging Together” is to get design moving, not just iterating ideas for the realization of a design object as in many UCD and co-design methods.
 - 10 On the importance of Scaffolding for realizing ones needs and competences see Vygotsky, 1979. For related co-design techniques see e.g. Bødker et al. 2004; Binder and Brandt 2008.

there and being there (DS 7) to gain sensitivity to the context and to follow how initial ideas begin to evolve. If the community is dispersed or only beginning to emerge, people can be met, workshops can be arranged and similar practices and experiences can be studied as a starting point.¹¹

5. Co-designing through prototypes

5.1. Iterative prototyping with

Active Seniors

An open agenda is no good if nothing ever comes out of it. With Active Seniors, both parties agreed on focusing the information sharing issues on designing a digital “community calendar” (Lehtimäki and Rajanti 2007), which was elaborated in the Seniors’ own working groups and in workshops with us. After several rounds of paper prototypes, the calendar idea morphed into something the Seniors called their Everyday Life Management System. The software developers started to work on a more general-purpose framework that could be useful in the future for other communities, available as open source. The system was divided into basic components: 1) The site – a framework for other components and common use cases (such as login and navigation); 2) The profile component to take care of the information of the members of the community; 3) The Dining Calendar for announcing joint dinners and registering for them; 4) The Shared Resources Calendar to reserve common shared resources and spaces such as the laundry and sauna; 5) The General Group Event Calendar; and 6) A Personal Calendar (Figure 6).

The first working prototype was released when seniors moved to their new house in May 2006. Vol-

unteers tested and used the calendars for making reservations and creating events and some working groups used the system to organize the common dinners. The Senior’s IT working group organized what they called “usefulness testing”, and ideation meetings where they analyzed how the different functionalities connected to their practical activities and produced detailed suggestions for changes to the rules and the behaviours of the system. A considerable amount of energy was spent on trying out alternatives for the labels and concepts to use in the interface.

This stage was a period of fluid collaboration. Concrete artifacts produced in workshops and outside of them (written document, scenarios, paper prototypes, lists for interface labels, beta testing session reports) helped the seniors in articulating their visions and ideas at different levels to the designers and amongst themselves. Intense periods of working together for a software release (spurts) were followed by periods of distance and separation. This alternation offered space for reflection and appropriation and saved designer hours. The seniors IT groups felt ownership of and responsibility for the platform.

5.2. Aging together with prototypes

We encourage choosing one or several development efforts to concretize the visions. The design strategies that became visible at this stage intertwine closely with organizing software development, such as *building and releasing prototypes iteratively, rapidly and from early on (DS 8)*¹². This allows community participants to engage with the designs, and for all to follow how these are being used, ideas for improvement, shortcomings, contradictions and new design directions etc. that may emerge.

11 Systematic and sustained presence at user sites has been stressed in the ethnographic tradition to systems design and taken to extreme in the co-realization approach (Hartswood et al, 2002; Voss et al, 2009). We discuss in the next section why shorter exposures may work better with ordinary communities.

12 Design strategies 8 and 9 draw on extreme programming and Agile Software (Beck et al. 2001) principles; however, their application in pure development contexts might be slightly different.

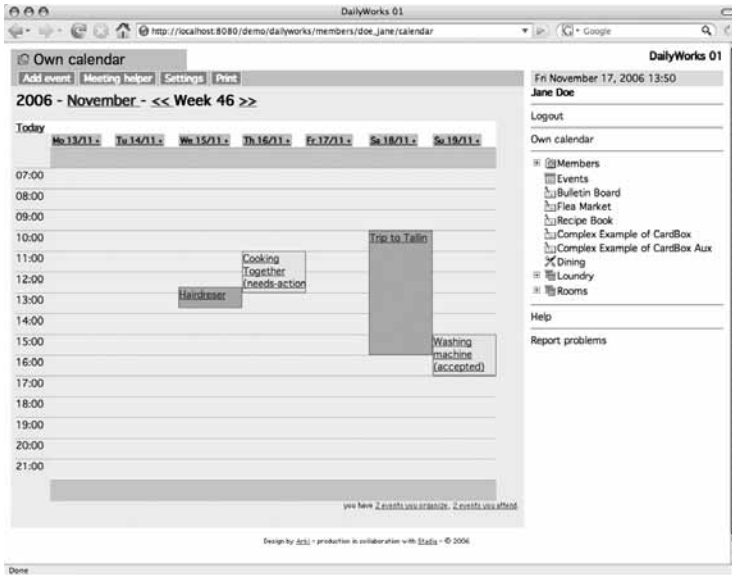


Figure 6 Screen shot showing the personal calendar view (demo version)

It further allows responding to the evolving needs through design iterations¹³. A characteristic design strategy to Aging together is to *alternate close working periods with lighter engagement* (DS 9). This makes the most of the time spent together, but also allows people to find their own ways to use the technology and to try things out on their own (which avoids spending designer hours unduly). This links to a further key principle seeking to *foster ownership of the process, technology and media* (DS 10)¹⁴. This requires not only giving time, but keeping multiple communication channels open

13 For seeding design processes with prototypes see e.g.: Ehn and Kyng (1991), Fischer and Ostwald (2002); Voss et al (2009); Hagen and Robertson (2010). On collective experimentation and prototyping see Björgvinsson (2008).

14 This principle is core to all PD approaches (see e.g. Schuler and Namioka 1993). In “Aging together” strategies it is also linked to concrete design decisions to be made in terms of intellectual property rights (See DS 13)

for offering advice, showing alternatives and documenting the processes.

6. The age of evolutionary re-designs

6.1. Redesigns with active seniors

The difference between working prototypes and evolving ready products has become increasingly blurred in many corners of technology and media design. An open design agenda and iterative development allow taking advantage of and systematically working with evolutionary re-designs. However, designing for practices means that we do not endorse only evolution in design objects but in other elements and levels of practice as well. We assert that the full space and time for co-design, the design opportunities and limitations, emerges only through this evolution (Botero, Kommonen, Marttila 2010).

Let us illustrate this with a four-stage design evolution. Upon release, the system had a dining tool for announcing and registering for meals. Once in daily use, it became evident that knowing the ingredients of a meal was important due to allergies and



Figure 7 The Recipe Book co-opted as a bulletin board

other concerns. To coordinate that, the community had their own recipe book. When adapting the book to the actual conditions in Loppukiri, typical problems in tailoring (Henderson & Kyng, 1991) appeared such as an increasing amount of annotations and alterations, and problems to keep track of the versions and their location. To remedy the two “failures”, designers built a recipe book inside the system using the code from another component. Today the subsequently evolved recipe book is one of the key reasons to use the system, while registrations to dinner are also partly handled using the parallel paper version.

This recipe book then prompted a further line of design. Living together in the house revealed to the seniors that they had many needs to store notes and documents. They had plans to use the neighborhood community portal discussion boards, but this required learning and maintaining additional systems and passwords. Their community calendar seemed a preferable location for such information sharing. At the time the Recipe Book became available, some of the active seniors tried a couple

of workarounds to make the new Recipe Book behave like a community “notice board”. Someone played with the titles of the recipes to get them to appear in a different order (e.g. by adding numbers or other symbols before titles to manipulate their sorting) and others “misused” the recipe fields to create document categories or different kinds of content. Designers received a request with a link to the “example”, asking if it was possible to make a “copy” of the Recipe Book so that they could use it as a bulletin board in case there might be no resources to implement one. This set the scene for a joint workshop where we sketched what could be implemented (figure 7). The Recipe Book thus seeded evolutionary design evolution (cf. Fischer and Ostwald 2002).

The next step was taken by designers, who decided to experiment with ideas of more generic infrastructures, and built a new component to create different information “containers” in a dynamic way by filling up simple forms. To illustrate the functioning of this new component, a new Recipe Book, a notice board and a place for document

storage were created. This jumpstarted the creation of new “containers” and since then, seniors have built containers for announcing things, documenting activities in the house, swapping things and so forth. The new component also creates dynamic connections among the containers to generate more advanced structures. Unfortunately, the resources at hand did not allow for the development of an appropriate user interface, thus this possibility remains obscure for most seniors. Despite its limitations, this is the most used component in the system, and one that would deserve further iterations and development in the future.

Finally, we wish to illustrate how successful design evolution is not just about improving or adapting technology. Calendars for sharing spaces and resources were carefully co-designed; however, their management presented challenges. Not everybody had access to the system, and as Seniors’ arrangements were fluctuating and our development resources were scarce, it remained difficult to keep both the paper and digital versions of the calendars updated. At some point the paper was opted over digital, even though it meant that the only way to reserve or know if a resource is free is to walk to where the calendar is physically located.

Similarly, when it came to the general maintenance of the system (members’ accounts, use of personal calendars, etc) it made more sense to develop practices and social agreements, rather than trying to make actual changes in the code, that would for example allow neighbours to (automatically) help and take actions on behalf of each other. Many workarounds have been devised by sharing passwords and accounts or by settling down on a common known standard to select a password so that the right person easily guesses it. Unfortunately, software infrastructures still embody very simple ideas of access management strategies, ownership, groups and so forth that do not address the complex realities and practices of multifaceted communities. This calls for strategies to expand co-design to the software architecture (Bücher et al 2009).

7. Evolutionary Aging together

The rationale of the Aging together approach lies in that interesting and crucial co-design opportunities emerge only in design-in-use, when activities are made concrete and relevant to all. Being there once in a while (see DS 9) makes it possible to closely explore the meaning of certain design decisions and help the collective prototyping process (see DS 10). Our final trio of design strategies begins with *keep attentive to partial failures and what can be learned from them* (DS 11). An encompassing and stable design is slow to achieve and may easily embody things that are not needed or that end up serving other purposes. Failures can provide serendipity handles¹⁵. Further, it is hard to predict what will work and be most worthy of investing development effort onto. To this end we stress *embedding design at different levels* (DS 12). Support multiple access modes and make sure there are parallels from old to new in order to weave things together and support design activities at different scales¹⁶. In committing ourselves beyond short-term goals we recognized the need for more flexible planning. The challenges to sustain and ensure continuity of the efforts at many levels in turn demands infrastructural strategies for co-designing (Hillgren et al. 2011), such as *avoiding design locking-in with crucial choices* (e.g. technology) (DS 13). Open and/or flexible alternatives for technologies and infrastructures should be preferred, whenever possible¹⁷.

8. Aging together design strategies

The Aging together strategies we have elaborated in the course of describing our work with Active Seniors outline the initial contours of an approach suited for realizing an extended and evolving de-

-
- 15 Henderson and Kyng (1991) provide a nice early elaboration of this.
 - 16 Suchman (2002) argues similarly for the need for artful integrations
 - 17 Similar implications are discussed in Büscher et al. (2009).

sign engagement with ordinary communities in their everyday life practices. Above we recounted the key strategies, as they became relevant in the design engagement with Active Seniors. It should be noted, however, that initiation strategies aside, they are pervasive rather than chronologically relevant guidelines. Let us now view them together:

1. *Start with social practices.* Design activities do not occur only at the studio or in exploratory workshops. They are already present in the practices, infrastructures and development trajectories of people who come together to become the “clients” “users” and “designers”.

2. *Explore the constituency, build new alliances if needed.* It is key to explore stakeholder configurations to be able to achieve the kind of practice and technology or media change that is being envisioned and determine if the agendas of each party can be aligned.

3. *Start with the relevant small “access design”.* Design engagement is not guaranteed to work. A well bounded initial teaser can give a sense of how the collaboration feels like – should everybody want to get more serious or not!

4. *Manage expectations.* Set joint goals and do not expect or do not have the participants expect that you or resources will be there forever. Clarify and check these constantly. Apply for funding as the project advances and needs arise.

5. *Cultivate an open agenda.* The idea is not to focus on realizing a killer application but instead, fostering contributions that lead to improving the practices in the community.

6. *Go there, be there.* Collaborators should get a real feeling of each other. If the community is dispersed or only beginning to emerge, people should meet, workshops should be arranged

and similar experiences studied as a starting point.

7. *Build scaffolds.* Provoke imagination and cultivate the sense of possibilities by offering the community a sense of what could be done. Bring concepts, materials, solutions and practices from elsewhere. Design avenues can be explored in hands on workshops and with experiments. Tune in by doing it on site if possible.

8. *Build and release prototypes iteratively, rapidly and from early on.* Follow how things are being used, what ideas for improvement, shortcomings, contradictions, new design directions etc. may have emerged and respond to the evolving needs through collective and cumulative design iterations.

9. *Alternate close working periods with lighter engagement.* Make the most of the time spent together, but also allow people to find their own ways to use the technology and try things out on their own and avoid spending designer hours unduly. Communications channels should be created towards this end.

10. *Foster ownership of the process, technology and media.* Offer advice, solution help and alternatives so that the community can make final decisions. Negotiate and decide jointly which new design directions are pursued further and clarify why.

11. *Keep attentive to partial failures and what can be learned from them.* An encompassing and stable design is slow to achieve and may easily embody things that are not needed or that end up serving other purposes. Failures can provide serendipity handles.

12. *Embed design at different levels.* Support multiple access modes and make sure there are parallels from old to new to weave things

together. Make possible design activities at different scales.

13. *Avoid design locking-in with crucial choices* (e.g. technology). Open and/or flexible alternatives for technologies and infrastructures should be preferred whenever possible. An open discussion about things such as intellectual property rights should not be avoided.

9. Conclusions: It's about time

The Aging together experience with elders shows that the kind of co-design exercised here can succeed in introducing helpful technology into the lives of the elderly – a mission where much money has been invested with mostly meagre successes with more designer and technology driven approaches (Östlund, 1995; Hyppönen, 2004; Hyysalo, 2010). The design strategies we suggest outline the beginnings of a new extended and evolutionary approach to organizing co-design activities with communities of ordinary people, and that this set of strategies make such engagement feasible beyond “high value” work contexts.

To clarify what these strategies entail for design processes, let us contrast them with the still prevalent portrayals of co-design that rest on assumption that design takes place within R&D project forms. Such a frame is easy for design practitioners and researchers to recognize. Sanders and Stappers diagram (figure 1) does not need to explain the vertical axis or what their squiggles stand for as readers are so thoroughly familiar with the frame they operate in. This familiar frame carries the implicit

assumption that extended collaboration would, by and large, mean repeating the “start wide and focus to product” project form over and that it is the design process which should be the area of concern in organizing collaborative design. (Figure 8).

Alas this familiar frame is increasingly ill-fitting for design contexts where the market launch of an industrially produced design does not structure the sensible frame of operation. Sustaining co-design throughout concept design, implementations, re-designs and further iterations calls for well-rehearsed means such as design games, workshops, generative tools, and observational techniques. On their own, however, these means of engagement are not sufficient to achieve the required levels of learning and trust building. Users' sense of ownership, their coming to understand their own needs and desires as well as designing at multiple levels of practice and technology all require more sustained and open design strategies. The designed systems, usages, users practices and designers need to become more seasoned, that is, to “age together”. Ensuring a healthy balance in doing it for the people, with the people and leaving people grapple with it by themselves is paired with efforts at finding resources and tools, and mobilizing them, as well as creating conditions to support the unfolding of a truly collaborative space for design.

The ensuing portrayal of an extended co-design process is messier than that departing from an R&D project. Design activities fluctuate between developers and users (figure 9 vertical axis), and even as some designs are closed every now and again, they tend to seed further evolution, iterations and de-

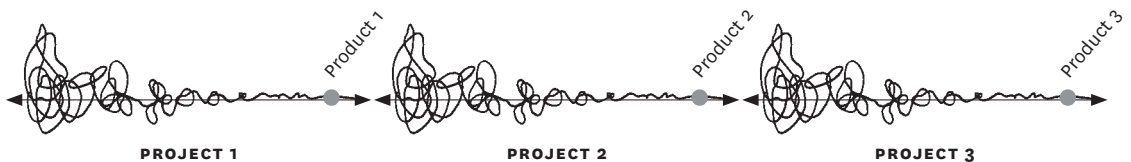


Figure 8 R&D frame assumes co-design long-term engagement is about repeating the same process a number of times

sign directions later in time (horizontal axis) rather than “close” or diminish co-design activities.

Increased complexity and less pre-decided temporal structure follow from the fact that when designing for communities with their practitioners, design is only one line of development that affects the attainable outcomes. Figure 10 uses the same squiggle metaphor to highlight how the developments in the co-design engagement, in the community of practice and in the infrastructure factually affect and pace each other. Another way to say this is that the point of centering (practice or design) and the temporal organization of co-design activities are among key factors that co-design must pay attention (in addition to methods, norms, tools, power, participant roles and so on).

This leads us to the question of where Aging together strategies are applicable more generally. Sustained design engagement is certainly not needed for most of our “culturally mature” artefacts. It makes sense in settings where technological possibilities and/or user practices are evolving, information technologies being one but not the only area presently¹⁸. We also wish to emphasize that by now, many communities do not need designers to design for them. Parasitic professional presence in such communities is not what we have in mind.

Reflecting back on the engagement with Active Seniors, dedicated research or development funding does not appear to be a necessary requisite either; we believe that many communities of practice might well afford this type of design engagement, and so do cities and municipalities. Various cooperative and commons movements are on the rise and sustained collaborative and open design with professional practitioners appears a timely contri-

bution to these movements. Application to a range of projects in communities and foundations may also help counter one of the key time-related problems in aging together: platform development and commitment. Guessing what flexibility users may need, availability and pricing of proprietary solutions, longevity of open design efforts and so on is not straightforward. In good working relations such thorny questions may well turn into possibilities for furthering development work, as indicated by a message we received from the Active Seniors during the writing of the present article, indicating that our engagement with Seniors may become still further extended:

“Hi Andrea how is life with two children? ...I do not wish to burden you, but one active seniors thing keeps running in my head. Do you think Miina [the system] would work in the new web? I use many iGoogle applications and have lots of photos in Picasa. These days Twitter is available for quick communications. You Andrea have an understanding of web, our house and all the different actors. Do not use too much time to this question now, just tell what do you think of it.

With Sunny spring morning wishes!”

Acknowledgements

We thank the Active Seniors for invaluable collaboration, colleagues at Arki research group and Kari-Hans Kommonen for contributions to the development of the work. Thanks to the anonymous reviewers for insightful suggestions. Without Mika Myller, Kirsti Lehtimäki and Roman Suzi, there would be no prototypes.

References

- Beck, K. et al., 2001. Manifesto for Agile Software Development- Agile Alliance. Available at: <http://agilemanifesto.org/> [Accessed September 28, 2011].
- Binder, T. and Brandt, E., 2008. The Design:Lab as platform in participatory design research.

18 Work done in urban studies and for instance Stewart Brand’s study of how buildings “learn” through time, (1994) demonstrate that an extended design space is not ICT specific feature, even though its sensible form change in different design contexts.

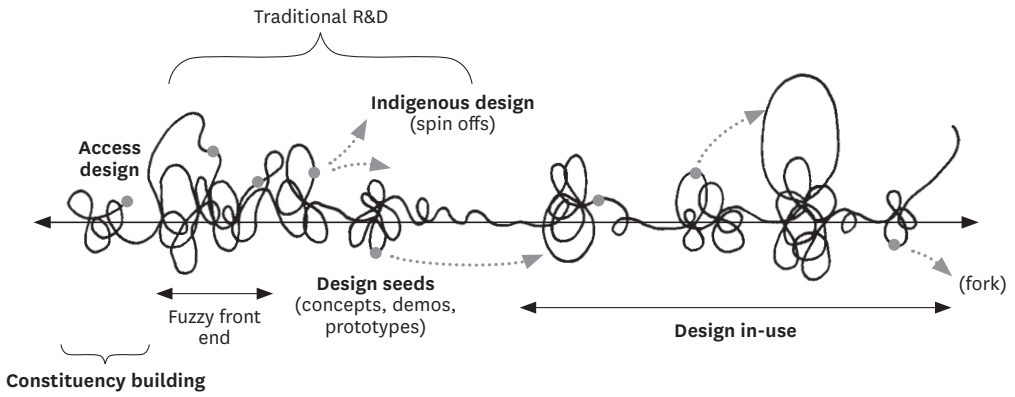


Figure 9 Portraying design engagement with “Aging together” strategies using Sanders and Stappers squiggles.

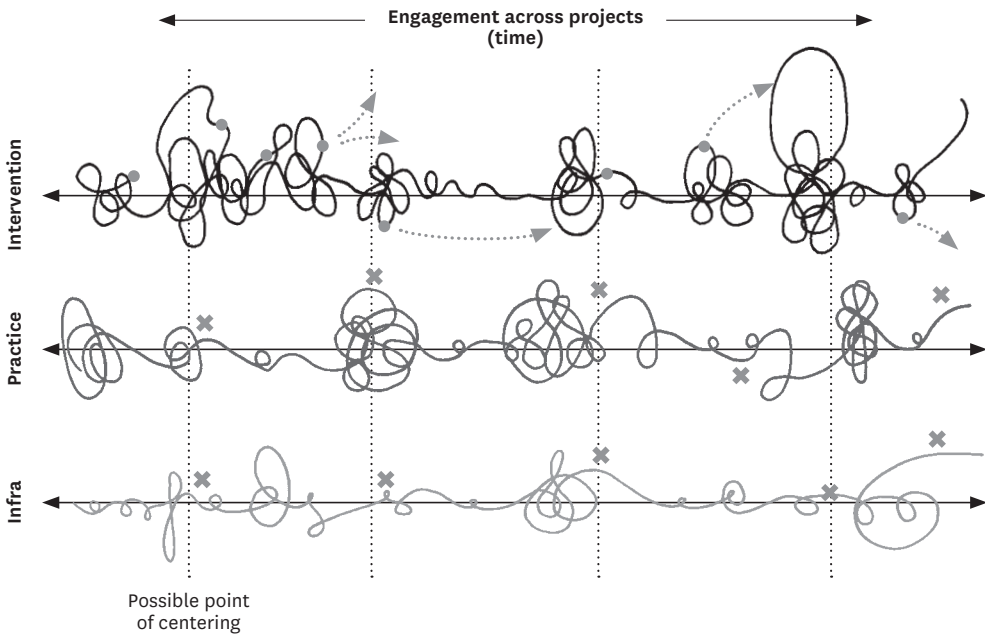


Figure 10 Extending the squiggle metaphor to underscore that long-term codesign engagement requires recognizing the trajectories and rhythms of stakeholders’ own projects and devising strategies to work with them.

- CoDesign International Journal of CoCreation in Design and the Arts*, 4(2), pp.115–129.
- Björgvinsson, E., 2008. Open-ended participatory design as prototypical practice. *CoDesign International Journal of CoCreation in Design and the Arts*, 4(2), pp.85–99.
- Björgvinsson, E., and Hillgren, P.-A. 2009. Indigenous Design: healthcare professional using self-produced video in articulating and developing work practices. *Nordic Design Research Conference 09*. Oslo, Norway: NORDES. Retrieved from Retrieved from: <http://ocs.sfu.ca/nordes/index.php/nordes/2005/schedConf/presentations>
- Bødker, K., Kensing, F. and Simonsen, J., 2004. *Participatory IT Design: Designing for Business and Workplace Realities*, Cambridge, MA: The MIT Press.
- Botero, A. and Kommonen, K.-H., 2009. Aspects of social media design and innovation in a project for aging together. In C. Mueller and M. Lewkowicz, eds. *Enhancing Interaction Spaces by Social Media for the Elderly*. International reports on socio-informatics. Bonn, Germany: IISI, pp. 21–34.
- Botero, A. and Saad-Sulonen, J., 2010. Enhancing citizenship: the role of in-between infrastructures. In *Proceedings of Participatory Design Conference*. PDC '10. Sydney, Australia: ACM, New York, NY, USA, pp. 81–90.
- Botero, A., Kommonen, K.-H. and Marttila, S., 2010. Expanding Design Space: Design-In-Use Activities and Strategies. In *Proceedings of the DRS 2010 Conference*. Design and Complexity. Montreal, Canada: DRS.
- Brand, S. *How Buildings learn: what happens after they're built*. New York: Viking Press.
- Buchenau, M. and Suri, J.F., 2000. Experience prototyping. In *Proceedings of Designing Interactive Systems - DIS '00*. New York, United States, ACM New York, NY, USA, pp. 424–433.
- Büscher, M. et al., 2009. Bottom-up, top-down? Connecting software architecture design with use,. In A. Voss et al., eds. *Configuring user-designer relations: Interdisciplinary perspectives*. London: Springer Verlag, pp. 157–189
- Cantù, D., Corubolo, M., and Simeone, G. 2012. A Community Centered Design approach to developing service prototypes. In *ServDes2012 Online Proceedings* Espoo, Finland, 1-11. ServDes Network. Retrieved from <http://www.servdes.org/conference/servdes-2012-research-papers/>
- Dahlström, M. and Minkkinen, S., 2009. *Loppukiri. Vaihtoehtoista asumista seniori iässä (Loppukiri Alternative Living for Senior Age)*, Juva, Finland: WSOY.
- Dourish, P. and Button, G. 1998. On “Technomethodology”: Foundational Relationships between Ethnomethodology and System Design. *Human-Computer Interaction*, 13(4), 395–432.
- Ehn, P. and Kyng, M., 1991. Cardboard computers: mocking-it-up or hands-on the future. In *Design at work: cooperative design of computer systems*. L. Erlbaum Associates Inc., pp. 169–196.
- Engeström, Y., 2007. Enriching the Theory of Expansive Learning: Lessons From Journeys Toward Coconfiguration. *Mind, culture and activity*, 14(1–2), pp.23–39.
- Fischer, G. and Giaccardi, E., 2004. Meta-Design: A Framework for the Future of End-User Development. In *End User Development – Empowering People to Flexibly Employ Advanced Information and Communication Technology*. The Netherlands: Kuwer Academic Publishers, pp 427–457
- Fischer, G., and Ostwald, J. 2002. Seeding, Evolutionary Growth, and Reseeding: Enriching Participatory Design with Informed Participation. In *Proc of the Participatory Design Conference (PDC'2002)* Malmö, Sweden: Palo Alto, CA US-ACPSR, pp. 135–143.
- Hagen, P. and Robertson, T., 2010. Seeding social technologies: strategies for embedding design in use. In *Proceedings of the DRS 2010 Conference*. Design and Complexity. Montreal, Canada. DRS.
- Hartwood, M. et al., 2002. Co-realisation: Towards a principled synthesis of ethnomethod-

- ology and participatory design. *Scandinavian Journal of Information Systems*, 14(2), pp 9–30
- Henderson, A. and Kyng, M., 1991. There's no place like home: Continuing Design in Use. In Greenbaum & Kyng (eds). *Design at Work Cooperative design of computer systems*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, pp. 240, 219.
- Hillgren, P.-A., Seravalli, A., and Emilson, A., 2011. Prototyping and infrastructuring in design for social innovation. *CoDesign, International Journal of CoCreation in Design and the Arts*, 7(3–4), 169–183.
- Hyppönen, H., 2004. *Tekniikka kehittyy, kehittyvääkö palvelut? (Technology develops, do the services develop?)*, Helsinki: STAKES, the Finnish Center for Research and Development of Welfare and Health.
- Hysalo, S., 2010. *Health Technology Development and Use: From Practice-Bound Imagination to Evolving Impacts* 1st ed., New York, NY, USA: Routledge.
- Kangasoja, J., 2007. From virtual visions to everyday services. Evolution of the Arabianranta local ICT model. In J. Kangasoja and H. Schulman, eds. *Arabianrantaan! Uuden kaupungin mairhinnousu. Arabianranta-Rethinking Urban Living*. City of Helsinki Urban Facts, pp. 142–157.
- Lehtimäki, K. and Rajanti, T., 2007. Local Voice in a Global World – User-Centered Design in Support of Everyday Practices. In *Universal Access in Human Computer Interaction*. Springer, pp. 206–197.
- Leonard, D., 1998. *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*, Harvard Business Press.
- Mattelmäki, T., 2006. *Design Probes*. Helsinki, Finland: University of Art and Design Helsinki.
- McCamant, K., Durrett, C. and Hertzman, E., 1994. *Cohousing: A Contemporary Approach to Housing Ourselves*, Berkeley, California: Ten Speed Press.
- McLaughlin, J. et al., 1999. *Valuing Technology: Organisations, Culture and Change*, Routledge.
- Muller, M.J. and Kuhn, S., 1993. Participatory design. *Communications of the ACM*, 36(6), pp. 24–28.
- Östlund, B., 1995. Experiences with Safety-Alarms for the Elderly in Sweden. In Wild, C and Kirschner, A, eds. *Safety-Alarm Systems, Technical Aids and Smart Homes*. The Akon Series: Ageing in the contemporary society. Knegsel: Akontes Publishing, pp. 101–114.
- Penin, L, Forlano, L., and Staszowski, E., 2012. “Designing in the Wild: Amplifying Creative Communities in North Brooklyn.” In Proc of Northern World Mandate – Cumulus Conference, Helsinki, Finland: Aalto Univeristy, School of Art, Design and Architecture, pp 1–17
- Sanders, E.B.-N. and Stappers, P.J., 2008. Co-creation and the new landscapes of design. *CoDesign International Journal of CoCreation in Design and the Arts*, 4(1), pp.5–18.
- Schuler, D. and Namioka, A. eds., 1993. *Participatory Design: Principles and Practices* 1st ed., Hillsdale, NJ: CRC / Lawrence Erlbaum Associates.
- Shove, E. et al., 2007. *The Design of Everyday Life*, Berg Publishers.
- Silverstone, R. and Hirsch, E. eds., 1992. *Consuming Technologies: Media and Information in Domestic Spaces* 1st ed., London: Routledge.
- Sonkin, L. et al., 1999. *Seniори 2000. Ikääntyvä Suomi uudelle vuosituuhannelle (Seniors 2000. Aging Finland for the next century)*, Helsinki, Finland: Sitra.
- Suchman, L., 2000. Located accountabilities in technology production. *Scandinavian Journal of Information Systems*, 14, pp.91-105.
- Voss, A. et al. eds., 2009. *Configuring User-Designer Relations: Interdisciplinary Perspectives*, London, England: Springer-Verlag
- Vygotsky, L., 1979. *Thought and language*. Moscow: Progress.
- Wenger, E., 1998. *Communities of practice: learning, meaning, and identity*, Cambridge University Press.

Expanding Design Space: Design-In-Use Activities and Strategies

Andrea Botero
Kari-Hans Kommonen
Sanna Marttila

Abstract

This paper introduces an analytical framework for understanding the collaborative nature and distributed structure of what is often referred to as *design space*. We propose that the design space should be conceptualized as the space of possibilities for realizing a design, which extends beyond the concept design stage into the design-in-use activities of people. By locating different activities and mapping participants' possibilities in a continuum from consumption to active creation, we develop a framework for understanding and locating design research interventions and a tool for mapping design activities. We argue that: 1) a design space is always actively co-constructed and explored by multiple actors through their social interactions with and through technologies and 2) the participating actors, resources, conditions and supporting strategies frame the design space available. In doing this, we bring forth relationships between an expanded view of the design space, contemporary discussions on the nature of innovation and the imperative to support explicit collaborative and participatory design activities.

First published in *Proceedings of 2010 Design & Complexity: Design Research Society International Conference* (p. 18). Montreal, Canada: DRS. Reprinted with permission.

Keywords

Design-in-use, design space, collaborative design, participatory design, practices, social practices, use, user innovation

The term design space seems to be fairly common concept in design research literature (see e.g. Westerlund 2009). While many make use of the evocative dimensions of the word-pair to convey a place that can be explored, few define it explicitly. In general terms we can say that the concept of design space is used to highlight the freedom to choose from many options and to explore alternatives (e.g. Fischer & Giaccardi 2004, McKerlie & MacLean 1994, Sanders 2001, Westerlund 2005). Sometimes it also seems to refer to all design relevant information that is available in a design process (e.g. Hassenzahl & Wessler 2000). Another common use is to describe it as a territory that expands and contracts as the brief or challenge for the project changes during the process (e.g. Gero & Kumal 1993). However, two common threads emerge from the literature. First, the fact that the discussion of the idea of a "design space" is taken up from the point of view of a typical "design actor" – a designer or an organization involved in the creation of a product. It is usually the professional who defines and explores the design space, or if it is done in collaboration, he or she will be the one typically initiating the explorations. Second, the design space seems to be considered as a space that is mostly present at the concept design stage or rather a feature of it.

This is in contrast to other strands of research located in-between innovation and science and technology studies, which could contribute to the design field new dimensions for understanding the nature of a design space. For instance, the capacity of so-called lead users (von Hippel 2005) to actually envision and construct the design space themselves leads them to create new product genres, as e.g. described by Baldwin et al. (2006). Building on those insights, distributed accounts of innovation that focus on the role of users suggest how a design space could be effectively and collectively explored

and constructed by a network of users alone (von Hippel 2007). Furthermore there is a range of research contributions that argue for expanding the scope of what counts as innovation, suggesting a richer and varied view of what counts as the design space that is been explored when innovations emerge (Tuomi 2002, Shove & Pantzar 2005, Hyysalo 2007). These accounts, for example, point out how individual user customizations and more importantly, the social practices of users, form a part of the design space that is being collectively charted and created.

There are two important and most immediate implications of this view: firstly, more people are exploring the design space (not only producers or designers, or designers inviting users into some user centred process) and secondly, what counts as design space should also be expanded to include other things like social practices and agreements and not only physical artefacts. In so far as the design space available to stakeholders frames largely the evolution of the artefacts involved and the practices that carry them (e.g. Hyysalo 2007, Shove & Pantzar 2004), a clearer account of what could be considered as design space and what are its components is needed.

In the rest of the paper we will follow Redström's invitation to develop accounts that explore "*what it is that we do rather than who we are*" (2008:410p) with respect to a design process in order to avoid unproductive user-designer dichotomies. The paper is structured as follows: first we will introduce our definition of the concept and its relationship to design-in-use discussions. The next section concentrates in locating different activities in a continuum from consumption to creation in order to develop a framework for understanding and locating design research interventions and a tool for mapping design activities that make those design spaces explicitly visible. In addition we introduce some design research cases and related support strategies for designers that we have experimented with. The paper closes with some remarks and directions for future research.

Expanding design space

Westerlund's elaboration of the concept of design space, in terms of a conceptual tool to design and understand design processes (2009), is a good starting point to elaborate more on the potential of this concept. In his work Westerlund describes how workshops are ideal locations to explore jointly the design space of future product functionality with a variety of actors in a user centred design processes (UCD). He found out that the exploration of the design space is not only done from the point of view of problems, but rather from the vantage point of view of possible solutions. Those solutions, he claims, are what actually constitute the design space. From this perspective, the design space is turned into a useful concept to reframe and develop more up-to-date design process by focusing in "possibilities" rather than dwelling in the problems alone. While his conceptualization identifies the co-operative nature of this exploration and moves the focus from problems to possibilities, it leaves a lot of explanatory weight on the shoulders of complete "solutions" or at least ideas that are considered as meaningful solutions. In this conceptualization other surrounding factors, like for example the resources available to participants to actually imagine those solutions are not thoroughly explored.

In this paper we will refer to the design space as the space of potentials that the available circumstances afford for the emergence of new designs. This space though, is not constituted in a vacuum or somehow "pre-existent". It is rather made possible through the presence of different stakeholders, tools, technologies, materials as well as social processes and agreements. Within that space all of those who are designing make choices and eventually a design comes to being in an ongoing process that extends beyond the concept design. The design space in this case is actively co-constructed and co-designed by multiple actors in their social interactions with and through technologies and processes, which are brought to the design space and mobilized by the participating actors.

Building on this expanded view of the design space, we believe that it is increasingly important to recognize the role of the former "users" as designers, more so because of changes in our technology landscape and new opportunities for collaboration. In an earlier era, where the capability to manufacture products was tied to an industrial mass production process, considering the idea that so-called end-users have always been designers in their everyday life, at home as well as at work, was philosophically interesting but had very little significance for design practice. However, in the digital, globally networked circumstances, a dramatically wider diversity of roles and potentials beyond consumption and production become relevant.

Design-in-use

From an earlier exclusive focus on the role of the "object" and "the design brief" as the focal points of the design process, we have seen a gradual opening up towards more situated perspectives on design activity. It is more common today that designers and researchers situate design activities in a wider complex socio-technological context, where it also matters how a project is approached, and not only its results (Findeli & Bobaci 2005, Krippendorff 2006). As asserted by several commentators, the relationship between "design" and "use" has become central concern in developing design approaches and theory (Jones 1984, Redström 2006, Ehn 2008). The opening up of new concerns is perhaps more evident today in the growing popularity of techniques for user orientation and user experience and a general embracing of so called user-centred design approaches. As a matter of fact, studying people and use situations to inform design process has become a recommended design practice in many areas, especially in relation to computer artefacts and digital systems and services (see Bekker & Long 2000 and Iivari & Iivari 2006 for reviews). These approaches, especially the pragmatic orientations, are today no longer an obscure research endeavour of a few, they are rather relatively well recognized lines of practice, or at least

featuring high in the list of differentiation factors of design “expertise”.

There is no doubt that concerns regarding user orientation and involvement have brought a wave of fresh air and new insights for professional design practice. However it has been questioned whether these stances truly recognize the complexities of what it is at stake (Iivari & Iivari 2006, Stewart & Williams 2005); or whether they are able to recognize that so called “user needs” and “experiences” are not phenomena that exist a priori or in isolation (Shove and Pantzar, Shove, Watson, Hand & Ingram, 2007). In line with insights made through decades of research in areas like Science and Technology Studies, there is a need to recognize that a variety of people, through their everyday activities, are already engaged in a continuous and dynamic process of learning, creative appropriation, domestication and shaping of technology (Shove et al. 2007, Haddon et.al. 2006), and furthermore, that these appropriations take place even under adverse circumstance (see e.g. Eglash et.al. 2004). Some commentators even remind us that people are not necessarily waiting to be taken into consideration by a user centred process (Spinuzza 2003), and that there is an unproductive stance that needs to be challenged, specifically when some of the user oriented perspectives in design tend to portray designers as the “heroes” that fix the situations while users are considered sort of “victims” in need of salvation (Spinuzza 2003, Stewart & Williams 2005).

In contrast, the idea that indeed a variety of use situations can display design-like characteristics invites us to consider that it is in supporting those instances (of design-in-use) that more work needs to be carried out from professional designers’ side. Already in the early 60’s design theorist and architect Christopher Alexander described processes of “unselfconscious design”, in an attempt to account partly for the pervasive enactment of design activities over time well beyond the professionals’ intervention. These activities, he claimed, were usually taken for granted but nonetheless exercised by all kinds of people; in order to maintain the equilibri-

um of designed systems (Alexander 1964). More recently Brandes (2008) and Wakkary & Maestri (2008) have provided concrete illustrations of some of the resourceful, adaptable and emergent qualities of everyday designs in contemporary mundane and domestic contexts. To support these types of pervasive design-like activities, several propositions have been made. An important earlier conceptualization made by Henderson and Kyng (1991) identified continuing design-in-use and tailorability as key things to consider for truly collaborative design. Extending these arguments, Fischer & Scharf (2000) and Fischer and Giaccardi (2004) amongst others have advocated for strategies to support meta-design. Despite these advances on our understanding of design-in-use activities, the fundamental ways in which these activities are articulated in our everyday life practices and vice-versa have not been fully understood and analysed (Shove et. al. 2007).

When new practices and contemporary forms of innovation have flourished in parallel to the growing access to network technology, collective endeavours and sometimes bottom up creation projects have been made visible. There is no doubt that computer users and developers are probably one of the most recognized and discussed user-designers and innovators in the literature (see e.g. Tuomi 2003, Floyd et. al. 2007). The case for blurring up the division between design and use (production and consumption) has been made several times using examples from Free and Open Source projects. These communities have a long history where software developers and advanced users engage in a collaborative design and development process with established tools, methods and work practices.

Unfortunately, everyday people without particular technological expertise (i.e. knowledge of specific programming languages) have had very limited possibilities to explore some areas of the design space of these technologies. However, recent emergence of collaborative digital tools, technologies and their associated practices (e.g. linked to blogs, wikis and rss-feeds) have also made other types of

active and concerted participation more visible. It has also opened the possibility for more diverse contributions that are not limited to programming. This effectively expands the design space that is visible and available for the people. These developments locate current discussions of design-in-use in a very different setting than the one that existed when user centred design approaches emerged.

These issues outlined above effectively invite us to reconsider: What does design-in-use mean for professional designers interested in creating partnerships and collaborative alliances, and what should we do about it? In doing this we propose that a better understanding of the scope and structure of the design space is needed. We proceed now to introduce the main components of the framework and its relationship.

Structure and components of the design space

In this section we present an analytical framework that aims to understand the structure of the design space we see emerging and to locate and identify different strategies. The following key questions are discussed in particular: What kinds of activities are people engaged in? What kinds of possibilities for appropriation are available? To construct the framework we have made use of several strands of research that have discussed similar issues in the past, and complemented it with empirical observations of current digital practices, when deemed necessary.

Figure 1 presents the basic dimensions of the framework. The vertical dimension presents an account of “**What people do**” as a *layered view* on different design activities in the digital realm. The activities are located in a continuum from “structural” to “soft” types as a way to convey the different points of view that need to be reconciled and that effectively complement each other. The horizontal dimension is meant to qualify those previous activities, by proposing that they might relate differently to the continuum between “**Use and Creation**”. Some of these activities might be more linked to basic

aspects of consumption (understood in its more passive side), and others are aspects more linked to engagement and creation. To elaborate the discussion further, we illustrate the framework by positioning three contemporary examples along the continuum. In this case, their particular position depends on the conditions and possibilities that surround the activity carried out, which, effectively makes “slices” of the design space more explicitly available for people. We will now elaborate further on the components and meaning of each element.

What people do:

The bottom part of these design activities deal with issues of composition, material selection and definitions of structures. These are easy to recognize as activities pertaining to design or development professionals. In identifying them we draw on contemporary practices around human computer interaction, interaction design and software programming, all which deal with the design of digital media and technology. Every time a layer is added, the upper element represents more of an organizational or social type of activities. Some of these top layer activities would not necessarily be considered as design activities from a pure product design point of view. However, these activities increasingly account for what can be considered as design (Shove et al. 2007, Hyysalo 2007). To define and synthesize these “soft” design activities, we used concepts and ideas from literature in Science and Technology studies (STS) and issues explored in e.g., Participatory Design (PD).

- *Program / write modules*: On the basic level, digital system design operates with compiled software programming languages, such as C, C++, Java, and on a slightly higher level with interpreted languages such as JavaScript and Python. These activities require understanding of algorithms, data and information management, and include design decisions and exploration that affect the technology choices and production tools. Moreover it deals with

the actual writing of code and the abstraction process required. The resulting designs are usually organized into modular reusable components that provide streamlined services for other designs through an Application Programming Interface (API).

- *Use modules and libraries:* On the next level of software design, software is composed into applications that perform some functions relevant to users. These integrated software packages take advantage of underlying modular software libraries. This usually takes place within one computer.

- *Assemble components:* Some software design can take place without extensive software exper-

ience, and many toolkits have been designed with the intention that non-experts could design their own systems or at least customize ready-made systems for some more specific purpose. Usually some, but most often quite a lot of programming expertise is still required. (MacLean et. al. 1990, Henderson & Kyng 1991). These types of design activities customize and expand a system by attaching new components, such as plugins, that bring new capabilities to the system and create localized manifestations of it.

- *Aggregate / remix:* A complex ecosystem of loosely connected services is evolving (Hartmann et al 2008, Nestler 2008), where mash-ups (a recent evolution of Internet applica-

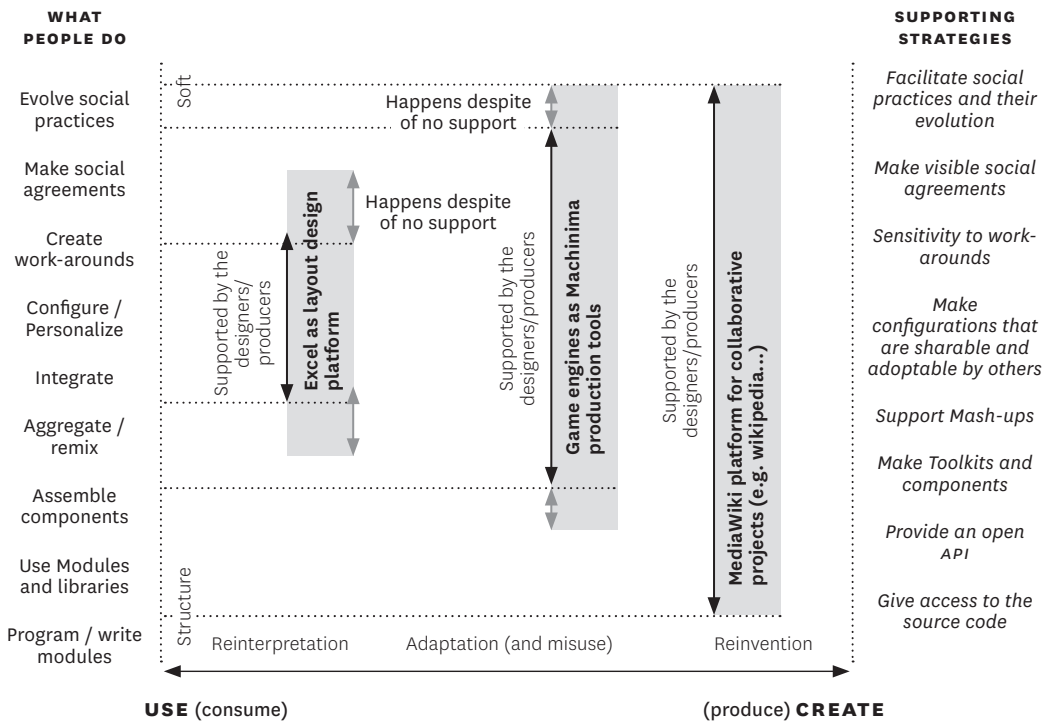


Figure 1 Framework for a structure of the design space

tions and representative feature of the Web 2.0 phenomenon) can be considered as new service designs created by aggregating selected information from other web services, to some extent relying on services that offer an open web API.. A lot of contemporary design activity is concentrated in developing skills to aggregate and remix in inspiring ways. (Several web services, such as Google Maps, YouTube and Flickr, have quickly embraced the opportunity to become the platform of choice to be a standard component in mash-ups by offering e.g. map, video or image related services).

- *Integrate*: Most of the software that we use daily in our personal devices is in some ways connected to other software, those particular configurations are only known in use. Since the diversity of circumstances of use calls for a diversity of tools this represents a formidable and growing system integration and design-in-use challenge that faces us in our everyday lives.

- *Configure / personalize*: This is a typical area where more and more end-users need to engage in design activities when it comes to digital products. Software based systems usually include many kinds of settings, and as they often also mediate communications and interactions, they often contain also a lot of various types of information that is very much context dependent and often quite personal.

- *Create workarounds*: Workaround is a type of activity used to describe the ways in which users of some product or system develop creative ways to overcome a shortcoming of the product or service they have encountered. Creating workarounds is not only creative but also dynamic way of weaving artefacts to own working and ways of doing things. It is an especially familiar term for software developers, but has also been used widely within the sociology of technology community, to highlight the ways

in which users can act when facing an inflexible technology (Pollock 2005).

- *Make social agreements*: A social agreement is a shared understanding or consensus around a particular task or objective within a certain group or community. The nature of the agreement is usually a small group initiative that later evolves into a commonly implemented convention. One example of a social agreement with growing creative and practical consequences is *hashtagging*, the use of the hash symbol (#) to precede a term when micro-blogging in services like Twitter. The hashtag (e.g. “#opendata”) adds additional context and metadata to the posts/tweets that makes it also easier to follow, organize and disseminate later.

- *Evolve social practices*: Social practices are embodied and materially mediated arrangements of human activities; they describe a particular way of going about an activity with its associated resources (Reckwitz 2002). Social practices, as an analytical unit, are shared and persist, because a group of people continuously reproduces them (De Certeau 1984). Eventually a set of social agreements (like the ones described above) or patterns of behaviours can evolve into a social practice that makes use of specific artefacts and conventions. For example, in video sharing sites like YouTube there are very advanced community initiated social practices for inviting and sustaining audiovisual conversations, via specific uses of visual genres, annotation workarounds, making visible of time-coded information and so forth.

Use-create:

The Use – Creation continuum is structured around three intermediate positions: reinterpretation, adaptation and reinvention. These analytical categories are borrowed and further adapted from the ones introduced by Eglash when referring to tech-

nology appropriation (2004:xi), which we found insightful and relevant to this endeavour.

- *Reinterpretation*: This stage refers mostly to possibilities that exist for surpassing the semantical associations that are proposed to people in relationship to a given structure. An example provided by Eglash was that of the graffiti artists' interventions into the urban space, which provide a reinterpretation of the function of that space as a place for self-expression or political commentary without changing the structural conditions of the space itself. In digital environments, reinterpretation is obviously a possibility that is always available and relays strongly in the activities occurring at the soft layers of our "what people" do categories. An interesting case of reinterpretation can be found in the unintended uses of spreadsheet programs designed to calculate and manipulate numbers, as graphical layout design programs to create interiors and user interfaces (Berger 2006). This is done by reinterpretations of certain features of the software and basic shared agreements between a group of users. As seen in Figure 1, from a design process point of view the explicitly available design space is made visible mainly through the possibilities for basic configuration of the product, but there is little support to share and or extend user practices as this are mostly developed informally or in closed circles. In this case the possibilities of changing or adapting the lower layers are also more restricted; although there is always hacking strategies, this is not something that is encouraged.

- *Adaptation*: this second stage according to Eglash, implies a certain degree of flexibility in the underlying technology coupled with a sense of violation of intended purpose. These means not only of the designers' intentions, but also equally of the marketing strategies

and / or gender assumptions embedded in a product. An adaptation involves creativity to look beyond assumed functions and recognize new possibilities, while the underlying structures are not necessarily changed. Eglash's classical example includes the "misuses" of early cassette players by Beduine tribes that saw beyond the playback machines (as they were marketed and sold to them) and used them as recording equipment for their own cultural productions. An example from digital realm can be found in the use of real-time three-dimensional game engines to produce computer animations. These animations were originally made to record playing episodes and performances, and they soon evolved to include the creation of new story lines and different creative appropriations for game-based movie making (Lowood 2008). This practice generated a new genre termed "Machinima". In Figure 1 we illustrate the layers that are covered by this example. Besides of being a very clever reinterpretation of what computer game software is meant to be for, the further development of the practice includes activities such as custom made adaptations and hacks of the software engines, in some cases supported directly by the game engine producers. Machinima practitioners gather in online forums to develop and discuss the genre as well as present their work in festivals, which effectively support the consolidation of a community with a shared practice.

- *Reinvention*: In the category of reinvention, a manipulation of semantics, use and structure is usually achieved and new functions are created. A true reinvention usually involves being able to produce changes and alterations to the original structures, like the case reported by Eglash in which Latino mechanics appropriate automobile shock absorbers to create shock producers for their low-rider cars. The multiple adaptations and recreations of the Medi-

aWiki engine that runs Wikipedia to endeavour different than and encyclopaedia writing can be considered as an example of reinvention on the digital realm (see an overview in: MediaWiki 2010). As Figure 1 shows the platform is offered with open access to the code, so it includes explicitly the possibility of altering the lower levels. However reinvention is complemented strongly by the soft layers as well. The Wikipedia project exemplifies how it also involves adapting and evolving the social practices that made these type of collaborative production possible through many sophisticated and well-documented community agreements (Slattery 2009).

Making the design space explicit: some supporting strategies

In previous sections we introduced a layered view on design activities in the digital design domain by giving examples of what people do in the design space; with the focus on revealing design-in-use activities. In the digital realm shifting and moving between stages is –in theory– easy to perform, but in practice it is hampered by such things as the type of programming knowledge required to make the changes, standards conflicts between products and services, providers' and producer's use and licensing policies (open or closed), lack of support and shared practices, to mention just a few. For these reasons, the project of making the design space more explicitly available also in design-in-use, requires changes and support in mostly all the layers of the design activities.

In this section we will briefly introduce three design research cases we have conducted that have helped us to reflect on the possibilities of the suggested analytical framework. Based on these cases we have identified resources, conditions and supporting strategies needed; these characteristics will be elaborated and discussed further.

Facilitating practices of creative production and reuse of media: Today more communities

are engaged on audiovisual creative activities, while some have not yet been able to take advantage of the many possibilities that audiovisual media could bring to their activities. How to make it easy for anyone to create, reuse and share audio and video productions over the Internet legally, without costly servers and complicated system management? As part of our research strategy we designed and implemented the Fusion platform (<http://p2p-fusion.org/>). The platform binds together a peer-to-peer network, a distributed metadata layer, social processing and enrichment features, support for embedded licenses and a component-based toolkit called Social Media Application ToolKit (SMAK). A specific, practical goal for the system was to support social activities that include the creative use and reuse of audiovisual content, and to provide a software toolkit with re-usable components. The aim was to enable people to build their own applications with SMAK to share and distribute videos, edit and socially enrich them collaboratively. The work was carried it in collaboration with different Finnish communities (possible end-users) ranging from a music makers' community, to an extended family as well as enthusiast practitioners of acrobatics and parkour (For a more complete account of the case see: Marttila et al. Forthcoming).

Facilitating practices for active citizenship:

This case deals with the role of digital technologies, specifically location based services, in the emergence of new forms of citizen participation in the urban environment. As a research strategy we initiated the collaborative design of a prototype environment and service called Urban Mediator (UM). UM is a server-based software that provides users with the possibility to create, obtain, and share location-based information (<http://um.uiah.fi>). The service contains a set of tools for both city administration officers aimed at increasing their capacity

to construct more active forms of citizenship and thus initiate innovations in the way digital participation services are being planned and delivered, by offering an in-between-space that is not in control of any actor. Collaborations were initiated with both active citizens and city officials in Helsinki (For a more complete account of the case see: Botero & Saad-Sulonen 2008, Saad-Sulonen & Botero 2008)

Facilitating the coordinating of everyday life in a project of growing old together: This case intertwines with a collective project to develop and experiment alternative social arrangements for growing old initiated by a seniors association in Helsinki. Together we asked ourselves what kind of applications and digital media would be interesting and meaningful in such a community? Besides of other experiments, the biggest intervention made was centered around the collaborative design and development of what the community called their Everyday Life Management System (DailyWorks) and it's articulates to their project of ongoing design of the communal living arrangements. In concrete terms this is a collection of web-based tools for the seniors, which assists in the coordination and sharing of everyday life activities and information (<http://arki.uiah.fi/adik/dailyworks>). (For a more complete account of the case see: Botero & Kommonen 2009)

Based on the experiences gained in the cases, we want to discuss how e.g. professional designers or other stakeholders who are in a position of power regarding the design structures in question, could support and facilitate these multiple activities that vary from "soft" creations into "structured" and more rigid designs. In other words: How to expand the design space, in Eglash (2004) terms, to accommodate more explicitly "reinterpretation", "adaptation" and moreover, the "reinvention" activities (the results of design-in-use activities)? We open

up the discussion by proposing four key factors we have identified based on our projects:

**Support open-ended design process and flexible agency:* Design space, as traditionally perceived by designers, has been available for everyday people only by invitation or engagement through a professional designer or a predetermined process with objectives and outcomes that are identified a priori. This setting implies also preset roles and agencies available for people, which might prevent the richness of design-in-use activities that would trigger and uncover the social patterns, agreements and practices that people might possess in the design space. Moreover, these "soft" social designs should be carefully turned into design descriptions, structures and functions without losing the essence of the design knowledge (e.g. practices, agreements and workarounds).

**Provide meaningful access to the resources available:* In order to facilitate the creative design-in-use activities and expansion of the design space, professional designers should provide access to infrastructures a pool of resources that are reusable. By granting open and meaningful access (e.g. contextualization of data, digital tools and guidance for various levels of engagement) we might enhance the different agencies in the space. Also access to knowledge can be critical when people are experimenting and being creative.

**Create means for sharing designs:* another key factor is to create means for sharing "designs" that have been created in design-in-use. Individuals, groups and communities share their design knowledge and experiences with peers, social networks and other stakeholders in the design space e.g. in discussion boards, wikis and social media platforms. In these environments for sharing, professional designers should acknowledge existing procedures and

collaboratively design and develop mechanisms for giving recognition and attribution to contributors, aim for nurturing trust and building motivation, and when applicable, create means for compensation.

**Design for openness and designability:* The fourth and final aspect of supporting strategies of design-in-use is the design for openness and further designability of other designs. Fischer (2000, 2003) refers to a similar stance with the concept of Meta-Design. This strategy should acknowledge people as potential designers of future applications and platforms, and should provide an open access to different levels of software from source code to API's and CSS, through appropriate licensing and publishing of the designs – for instance: Free, Libre and Open Source and Creative Commons, and so on.

Formulating insights and sharing these design-in-use strategies are focal to the extended design space and its vitality. The means of exchange of design knowledge, e.g. solutions, workarounds, practices and innovations, varies from diverse things such as ad-hoc crowd-sourcing to the formation of communities (see e.g. Botero et.al. 2009). It is also important to notice that sharing design knowledge and experiences in a design space does not only happen between peers; but also with other stakeholders who have access to the information (e.g. what companies like Google can infer based on their user data).

Conclusion

The emergence of the digital environment and its ecosystems has created a new set of circumstances for design. These new circumstances provide many new opportunities for all types of stakeholders to benefit from new design interventions and engage in design activities. The framework presented here has been of great value for our work, as we have tried to make such new potentials visible

and relate them to already familiar design processes and patterns. The framework highlights how the design-in-use activities of a very diverse set of actors can become realistic sources of innovation and material for other designs. By mapping specific activities on the graph, and through considering their potential design interactions with new actors or the adoption of new strategies, new collaborative design spaces can be envisioned and possibly explored. Since, these different activities have not been discussed with in a single framework it is possible that further refinement of the categories would be needed in the future. In any case, we believe that the novel combination and holistic understanding of the activities we are proposing has interesting implications and presents a useful view of the design space. Our future work includes testing the validity of the model with other empirical cases with a view to iterate the concepts and the structure of the framework.

As design is usually a pragmatic activity, the actors engaged are concerned with finding a workable solution, and are likely to draw the boundaries of the design space so that they exclude unrealistic options. This of course also means that things like ideas, ideals, imagination and inspiration belong all to the category of conditions that influence the dynamic composition of the design space. Along the same lines, all design operates with tools and on the basis of earlier designs and design expertise or experience that is available to stakeholders. These aspects can become available through personal experience, knowledge sharing, external services or collaborative team effort. In this sense, the design space of a stakeholder that has the necessary economical means, access to tools, a good design network around and working experience of collaboration within it, has most likely a persistently wider design space for a variety of projects than an actor with few means or bad and un-motivating earlier experiences. Thus for supporting successful design-in-use, it would be important to make available useful and realistic sets of resources and conditions for constructing solid design spaces.

The expansion of the design space has also wider societal significance. If the design capacity of free and collaborative actors that operate in the various levels of design-in-use activities we outline, is grown through open strategies as we propose in this paper, and they are linked together in a well functioning and dynamically self-organizing ecosystem, the collaborative design space is expanded and made more persistent for all – in effect increasing the design capability of all people in society. This is a very powerful strategy to increase the capabilities of more people to influence the transformations that are taking place in society. We hope our work is a contribution in this direction.

References

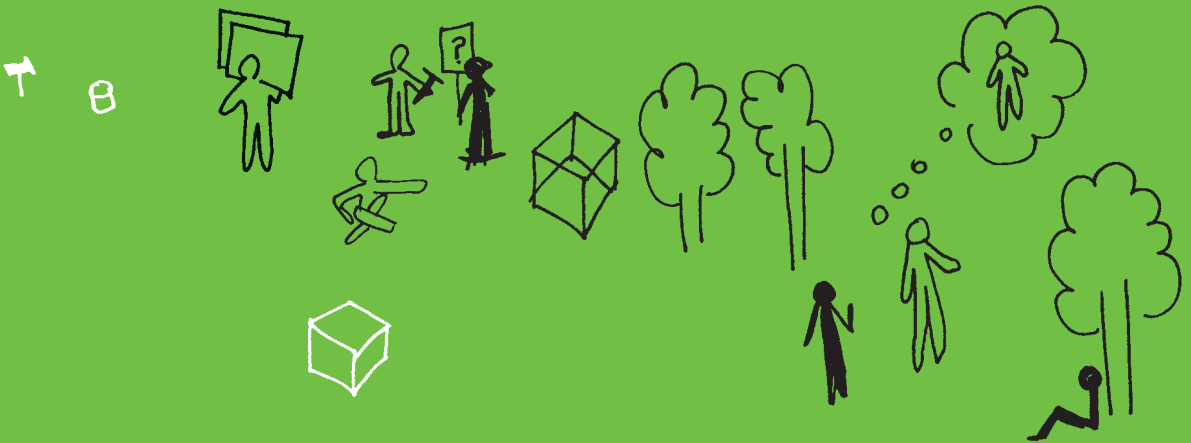
- Alexander, C. (1964). *The Synthesis of Form*. Cambridge, MA: Harvard University Press.
- Baldwin, C. Y., Hienerth, C., & von Hippel, E. (2006). *How User Innovations Become Commercial Products: A Theoretical Investigation and Case Study*. *Research Policy*, 35(9), 1291–1313.
- Bekker, M., & Long, J. (2000). User Involvement in the Design of Human-Computer Interactions: Some Similarities and Differences between Design Approaches. In *People and Computers XIV – Usability or Else: Proceedings of HCI 2000* (pp. 147, 135).
- Berger, N. (2006). The Excel Story. *Interactions*, 13(1), 14–17. ACM
- Botero, A., & Kommonen, K. (2009). Aspects of social media design and innovation in a project for aging together. In *Enhancing Interaction Spaces by Social Media for the Elderly, International reports on socio-informatics* (Vol. 6, pp. 21–34). Bonn, Germany: IISI – International Institute for Socio-Informatics.
- Botero, A., & Saad-Sulonen, J. (2008). Co-designing for new city-citizen interaction possibilities: weaving prototypes and interventions in the design and development of Urban Mediator. In *Proceedings of the Participatory Design Conference 2008* (pp. 266, 269), Bloomington, Indiana, USA: CPSR/ACM.
- Botero, A., Vihavainen, S., & Karku, K. (2009). From closed to open to what? An exploration on community innovation principles. In *Proc. of MindTrek Conference: Everyday Life in the Ubiquitous Era* (pp. 198–202). Tampere, Finland: ACM / MindTrek.
- Brandes, U., Stich, S., & Wender, M. (2009). *Design by Use: The Everyday Metamorphosis of Things* (Board of International Research in Design). Berkhäuser Verlag AG.
- De Certau, M. (1984). *The Practice of Everyday Life*. University of California Press.
- Eglash, R. (2004). Appropriating Technology. An Introduction. In R. Eglash, J. L. Croissant, G. Di Chiro, & R. Fouché (Eds.), *Appropriating Technology. Vernacular Science and Social Power*. University of Minnesota Press.
- Ehn, P. (1988). *Work-Oriented Design of Computer Artifacts*. Arbetslivscentrum & Lawrence Erlbaum Associates, Inc.
- Findeli, A., & Bousbaci, R. (2005). L'éclipse De L'objet Dans Les Théories Du Projet En Design. In *Proc. of the European Academy of Design, EAD Conference: Design-Système-Évolution*, Bremen, Germany. EAD
- Fischer, G., & Giaccardi, E. (2004). Meta-Design: A Framework for the Future of End-User Development. In *End User Development – Empowering People to Flexibly Employ Advanced Information and Communication Technology*. The Netherlands: Kuwer Academic Publishers.
- Fischer, G., & Scharff, E. (2000). Meta-Design: Design for Designers. In *Proc. of the Third International Conference on Designing Interactive Systems (DIS 2000)* (pp. 405, 396). ACM.
- Floyd, I. R., Jones, M. C., Rathi, D., & Twidale, M. B. (2007). Web Mash-ups and Patchwork Prototyping: User-driven technological innovation with Web 2.0 and Open Source Software. In *Hawaii International Conference on System Sciences* (Vol. 0, p. 86c). Los Alamitos, CA, USA: IEEE Computer Society.
- Haddon, L., Mante, E., Sapio, B., Kommonen, K., Fortunati, L., & Kant, A. (Eds.). (2006). *Everyday*

- Innovators: Researching the Role of Users in Shaping ICTs* (1st ed.). Springer.
- Hartmann, B., Doorley, S., & Klemmer, S. R. (2008). Hacking, Mashing, Gluing: Understanding Opportunistic Design. *IEEE Pervasive Computing*, 7(3), 46–54.
- Henderson, A. and Kyng, M. (1991). There's no place like home: continuing design in use. In *Design At Work: Cooperative Design of Computer Systems*, J. Greenbaum and M. Kyng, Eds. L. Erlbaum Associates, Hillsdale, NJ, 219–240.
- Hysalo, S. (2007). User innovation, design space, and everyday practices: Rodeo Kayaking case revisited. In *Proc. of the Nordic Consumer Policy Research Conference* (pp. 1542–1558). Helsinki: Nordic Forum for Consumer Research.
- Iivari, J., & Iivari, N. (2006). Varieties of User-Centeredness. In *HICSS 2006. 39th Annual Hawaii International Conference on System Sciences* (Vol. 08, p. 176.1). IEEE Computer Society.
- Jones, J.C. (1984). Continuous Design and Redesign. In J. C Jones (ed) *Essays in Design*. John Willey and Sons.
- Krippendorff, K. (2006). *The Semantic Turn: A New Foundation for Design*. CRC.
- Lowood, H. (2008). Found Technology: Players as Innovators in the Making of Machinima. In T. McPherson (Ed.), *Digital Youth, Innovation, and the Unexpected*, The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning (pp. 165–196). Cambridge, MA: The MIT Press.
- MacLean, A., Carter, K., Lövstrand, L., and Moran, T. (1990). User-tailorable systems: pressing the issues with buttons. In *Proc. CHI '90 Conference on Human Factors in Computing Systems: Empowering People*, New York, NY, 175–182: ACM
- MediaWiki Contributors. (2010). *Sites using MediaWiki - MediaWiki.org*. Retrieved May 1, 2010, from http://www.mediawiki.org/wiki/Sites_using_MediaWiki
- Marttila, S., Kati, H., & Kommonen, K-H. (Forthcoming) *Collaborative Design of a Software Toolkit for Media Practices - P2P-Fusion Case Study*. COST 298.
- Nestler, T. (2008). Towards a mashup-driven end-user programming of SOA-based applications. In *iiWAS '08 Conference on information integration and Web-Based Applications & Services*. New York, NY, (pp. 551–554). ACM
- Pollock, N., (2005). When Is A Work-Around? Conflict and Negotiation in Computer Systems Development. *Science Technology & Human Values* (30:4) 2005, pp 496–514.
- Redstrom, J. (2006). Towards user design? On the shift from object to user as the subject of design. *Design Studies*, 27(2), pp 123–139.
- Redström, J. (2008). RE:Definitions of Use. *Design Studies*, 29(4), pp 410–423.
- Reckwitz, A. (2002) Toward a Theory of Social Practices. *European Journal of Social Theory* 5(2): pp 243–263.
- Saad-Sulonen, J., & Botero, A. (2008). Setting up a public participation project using the urban mediator tool: a case of collaboration between designers and city planners. In *Proc of Nordic Conference on Human-Computer Interaction: Building Bridges* (pp. 539–542). Lund, Sweden: ACM.
- Sanders, E. (2001). A New Design Space. In *Proceedings of ICSID 2001 Seoul: Exploring Emerging Design Paradigm*. (pp. 317–324) Oullim. Seoul, Korea. ICSID
- Schuler, D. and Namioka, A. Eds. (1993). *Participatory Design: Principles and Practices*. L. Erlbaum Associates Inc.
- Shove, E., & Pantzar, M. (2005). Consumers, Producers and Practices: Understanding the invention and reinvention of Nordic walking. *Journal of Consumer Culture*, 5(1), pp 64, 43.
- Shove, E., Watson, M., Hand, M., & Ingram, J. (2007). *The Design of Everyday Life*. Berg Publishers.
- Slattery, S. P. (2009). "Edit this page": the socio-technological infrastructure of a Wikipedia article. In *Proc. of the 27th ACM international con-*

- ference on Design of communication* (pp. 289–296). Bloomington, Indiana, USA: ACM.
- Spinuzzi, C. (2003). *Tracing Genres through Organizations: A Socio-cultural Approach to Information Design (Acting with Technology)*. The MIT Press.
- Stewart, J., & Williams, R. (2005). The Wrong Trouserers? Beyond the Design Fallacy: Social Learning and the User. In *User involvement in innovation processes. Strategies and limitations from a socio-technical perspective*. Munich: Profil-Verlag.
- Tuomi, I. (2003). *Networks of Innovation: Change and Meaning in the Age of the Internet*. Oxford University Press.
- Von Hippel, E. (2007). Horizontal innovation networks-by and for users. *Industrial and Corporate Change*, 16(2), pp 293–315.
- Von Hippel, E. (2005). *Democratizing Innovation*. Cambridge, MA, MIT Press.
- Wakkary, R., & Maestri, L. (2008). Aspects of Everyday Design: Resourcefulness, Adaptation, and Emergence. *International Journal of Human-Computer Interaction*, 24(5), pp 491, 478.
- Westerlund, B (2005). Design Space Conceptual Tool - Grasping the Design Process. In *Proc. of the Nordic Design Research Conference: 'In the Making'*, Copenhagen: NORDES.
- Westerlund, B. (2009). *Design Space Exploration. Cooperative Creation of Proposals for Desired Interactions with Future Artefacts*. Kungliga Tekniska Högskolan

The author disassembles the language of design to realise broader conceptions of temporality, design spaces, roles, and entities implicated in design processes. Based on two case studies of fledgling communities (seniors aging together) and emergent collectives (citizens and city officials sharing locative media), the thesis shows how continuities and collaboration can be achieved between design and life-practices more generally. A significant move is the re-conception of 'design space' to capture the wider interplay of possibilities, practices, partly assembled technologies; as well as developing competencies and social arrangements that are the basis for ongoing design choices. Design space(s) presents us with a collection of principles and practices, to design within and for communal endeavours.

Andrea Botero (BA Universidad Nacional de Colombia and MA University of Art and Design Helsinki) is a researcher and designer exploring services, media, and technologies for communities.



ISBN 978-952-60-5173-4
 ISBN 978-952-60-5174-1 (pdf)
 ISSN-L 1799-4934
 ISSN 1799-4934
 ISSN 1799-4942 (pdf)

Aalto University
 School of Arts, Design and Architecture
 Department of Media
books.aalto.fi
www.aalto.fi

**BUSINESS +
 ECONOMY**

**ART +
 DESIGN +
 ARCHITECTURE**

**SCIENCE +
 TECHNOLOGY**

CROSSOVER

**DOCTORAL
 DISSERTATIONS**