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Getting Participatory Design Done: *From Methods and Choices to Translation Work across Constituent Domains*

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Collaborative arrangements between users and designers today are enacted in a broadening array of circumstances. These include extended, even years-long projects within corporations, the public and third sectors, as well as open-ended, peer-to-peer open design initiatives. Building on a literature review and analysis of four concrete participatory design projects, in this paper we argue that besides skills in selecting and implementing co-design methods, there is a larger repertoire of issues that need attention, if one takes the promises and limits of participatory design seriously. We elaborate on how these issues have purchase in the interplay of four interrelated domains: the strategic considerations that drive all those implicated, the mundane acts involved in co-design work, the choice of methods that is conditioned by strategic and mundane issues, and the producing of design outcomes permeated in turn by all the above. These domains co-constitute each other in such a way that one domain cannot easily be considered apart from the others. Participatory design understood from this perspective is not about facilitation skills, but rather skills to translate among strategic, mundane, method and design domains, and being aware of how they qualify and permeate each other in order to achieve results.

Keywords – Co-Design, Collaboration, Open Design, Participatory Design, Strategic Design.

Relevance to Design Practice – Practicing participatory design today is more than implementing methods. It is better practiced and articulated in terms of translations: how actors account for elements like resources, competencies, preparations, procedural details, and strategic contingencies, and how the interplay among these elements is translated into alignments, decisions, actions, and eventually design outcomes.

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Introduction

Collaborative approaches to design with users today consist of large and varied practices, a diverse and broader envelope that includes highly formalised corporate and public user engagement initiatives, participatory design projects of many kinds, as well as peer-to-peer open design processes in a variety of citizen domains (Aitamurto et al., 2015; Ehn et al., 2014; Hyysalo et al., 2016; Simonsen & Robertson, 2013). This means that the orchestration of user involvement and participation in design, but also active users' own collaborative and participatory design endeavours, are no longer fringe or invisible activities, but part and parcel of how contemporary design operates. This move has important implications for design in general and for subfields such as Participatory Design (PD), which has traditionally been concerned with "how collaborative design processes can be driven by the participation of the people who will be affected by the technology that is being designed", as Simonsen and Robertson (2013, p. 22) put it.

There is a growing body of academic and practitioner literature exploring the areas briefly charted above. Design research literature is dominated by novel and successful projects, mostly done as case studies, especially when we look at the subfields of co-design and participatory design wherein this study is situated. Often these successful cases are presented in relation to the workings of specific techniques or facilitation tools (Dorst, 2008; Irani et al., 2010; Smith & Iverson, 2018). There

is increasing recognition, however, that method case studies tend to brush over the many decisions, changing conditions and work that occurs before, after and around the mobilisation of particular creativity cards, facilitation procedures or design games (Bratteteig & Wagner, 2012; Lee et al., 2018). Designers continually face key strategic questions while creating something in a context where the actors, the participants, have a stake in the outcome. They must simplify and abstract out complexity of their contexts and problem framing, while being more or less conscious of how this impacts their processes, along contextual conditions beyond design and beyond the participative methods used.

The situation has gone beyond the traditional PD insistence on political anchoring of design through, e.g., principles of conflict perspective or a collective resource approach (Beck, 2002; Bjerknæs et al., 1987), as in the 21st century there are many more actors involved in collaborative and participatory design processes; they are located in a wider variety of contexts, including

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peer-to-peer citizen-designer communities (Aitamurto et al., 2015; Menichinelli, 2016; Verhaegh et al., 2016); and processes are sustained through longer temporalities (Botero & Hyysalo, 2013; Hartswood et al., 2002; Voss et al., 2009). Simultaneously designers interested in the participatory dimensions of their practice perform many practical tasks behind the scenes that condition how collaboration with users, and others, subsequently unfolds, limiting some outcomes while enabling others (Hyysalo & Hyysalo, 2018; Smith & Iverson, 2018).

In this landscape it becomes apparent how practitioners' and researchers' accounts tend to sweep over important details about how design, user involvement, collaboration, and participation are achieved or not. This paper is thereby motivated by the need to add clarity, nuance and depth to analyses of how contemporary participatory and co-design research gets done in real-life settings. In what follows we chart what is involved in user and citizen engagements in industry, in the public and third sectors, and in peer-to-peer open design engagements.

Maturing of Participatory and Co-Design Research beyond the Deficit and Method Orientation

Prior to the 1980s, users were, some maverick and idealist projects aside, acknowledged as important actors in the diffusion and acceptance of new technologies but not as active agents of technological change (Hyysalo et al., 2016; Von Hippel, 2016; Williams et al., 2005). In the 1980s and 1990s several vanguard projects in industry and academia as well as from grassroots movements gave rise to new areas of practice and research including *user-centred design* (Norman & Draper, 1986),

participatory design (Bjerknes et al., 1987), and *user innovation* (Von Hippel, 1988). Today, in-depth user engagement and user collaboration in design are considered viable alternatives for practice and have even become a normalised way to proceed in development activities for products and services alike (Bødker et al., 2004; Hyysalo et al., 2016).

From the 1980s to date, the dominant orientation to involving and collaborating with users has been largely treated as an issue of deficit: there have not been enough opportunities for user participation, and collaboration between users and developers and designers needs to be strengthened because low user involvement is the main cause of lack of fit or poor fit between humans and technologies (e.g., Sanders & Stappers, 2008; Schuler & Namioka, 2009; Simonsen & Robertson, 2013). To address this deficit, a large body of research on co-design and participatory design has concentrated on developing and reporting on the various techniques, methods, and approaches to involve and collaborate with users. Already in the 1990s, at the point where participatory design was rather modest in scale, Muller and Kuhn (1993) classified as many as 66 different methods and techniques. Today, several hundreds of co-design and participatory design methods have been introduced, evaluated and formalised in the literature (e.g., Bødker et al., 2004; Brandt et al., 2013; Curedale, 2013). In early participatory design the techniques and methods developed and reported were closely tied to analysis of the political economy and the development of design principles, for instance within the *collective resource approach* (e.g., Bjerknes et al., 1987; Ehn & Kyng, 1992; Kensing & Munk-Madsen, 1993). Since the 1990s, technique and methods introduction has taken place increasingly as a response to project specifics (Mattelmäki, 2008; Keinonen et al., 2008; Ostergaard & Summers, 2009; Sanders & Stappers, 2008; Wang et al., 2016) and, as Lee et al. (2018) note, normally and normatively mapped to correspond to particular phases of a design process or development lifecycle (see, e.g., Laurel, 2003; Muller & Kuhn, 1993; Smith & Iverson, 2018). In an attempt to make collaboration and user participation easily applicable for design practitioners who could be trying to make up for the deficit, alongside method descriptions, research reports and grey literature outline successful projects and case studies in the hopes of providing inspiration. These two genres (single method and single case study) have historically intertwined such that project reports often motivate new methods or ways of working with users as the novelty pursued in a success case (see, e.g., IDEO method cards), making method introduction one of the most common ways to legitimise academic novelty. Methods, as a domain, therefore constitutes much of the current knowledge space available in co-design and participatory design (Figure 1).

The method-prone-deficit-fill research orientation has been increasingly judged as inadequate in both participatory and human-centred design alike. A key problem with methods has been elaborated by Woolrych et al. (2011) and Johnson et al. (2014a) who draw upon the metaphor of cooking. These authors point out that the proliferation of *recipes*, i.e., method descriptions, in current research comes at the expense of due attention to the needed *ingredients*, i.e., the low-level techniques and mundane acts that are needed if one is to operationalise the recipes, that is,

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Cindy Kohtala is a Postdoctoral Researcher in the Department of Design, Aalto University (FI). She studies DIY makers who design, make, invent, and innovate in shared community technology workshops (fab labs, makerspaces, hacklabs and other niche spaces), from a Science & Technology Studies perspective foregrounding design and socio-environmental sustainability. She examines makers' techno-utopian imaginaries in enacting a *new industrial revolution* and how makers self-organize and act to democratize and localize material production.

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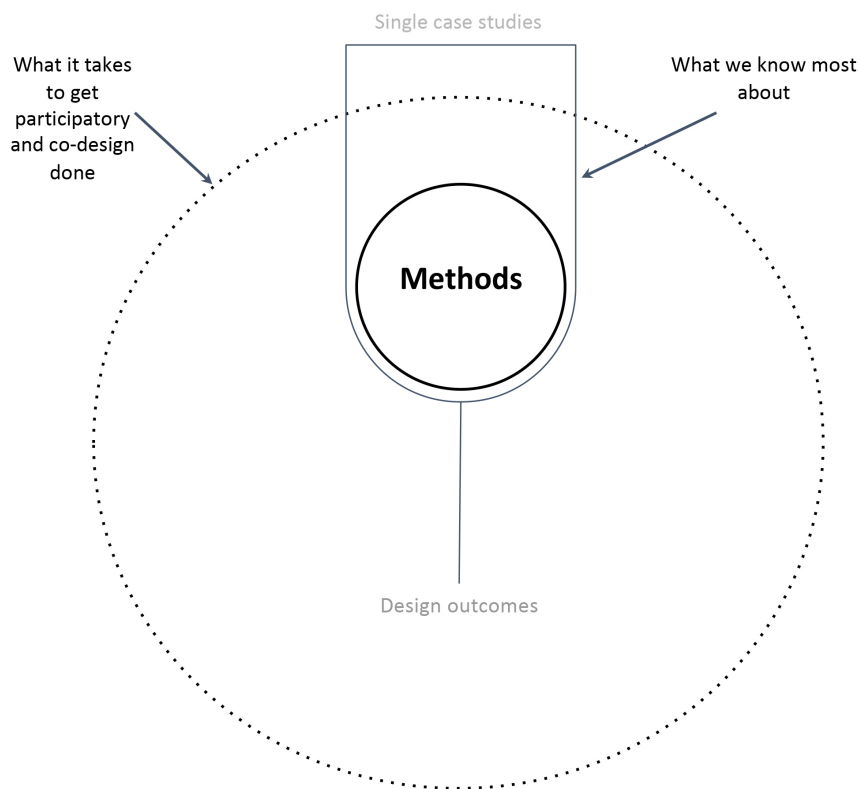


Figure 1. What we know most about: Methods.

the methods. Importantly, they contend that in real life, even if one follows a recipe, it is mainly *meals* that are prepared. This means that methods are always adapted and deployed to feature as part of broader and concrete design work. Johnson et al. (2014a, 2014b) show further that accomplishing user involvement and collaboration is not invented anew or on the spot for each and every project; instead, the work becomes part of historically developed repertoires for how to engage (and manage) users and other stakeholder constituencies at many levels. There are thus particular *diets* in place that constrain and make available certain types of ingredients and meals if one continues with the cuisine metaphor. These authors thus stress that research efforts must be expanded to cover both the nitty gritty of operationalising methods, as well as issues of historical trajectories, business models, capacities and organisational or political dependencies that frame involvement, collaboration, and participation (see also, e.g., Mäkinen et al., 2018; Savolainen & Hyysalo, 2020; Van der Bijl-Brouwer & Dorst, 2017). Similarly, the limitations of single method and single case research are also discussed by Lee et al. (2018) who, in a cross-comparison of thirteen co-design projects, observed that designers have to respond to local contexts and develop and modify methods as situated practice, and propose ten areas of design choices that characterised recurring problem dimensions and contingencies in the projects they studied, including areas such as openness of the brief and distribution of power.

Similar findings have come from another recent body of work that researched how participatory design projects were carried out in practice. In this line of work, participants in collaborative

endeavours (designers, users and other stakeholders) were found to be engaged in a myriad of ongoing practical challenges permeated by both routine aspects as much as by strategic implications and effects (e.g., Hyysalo & Hyysalo, 2018; Jensen & Petersen, 2016). For instance, building on the notion of infrastructuring (Karasti, 2014), Bødker and colleagues (2017) have traced various levels of strategising that need to be conducted to sustain participatory design across projects, instances and organisations, and how they are often intertwined with backstage, unacknowledged work. Perry and Sanderson (1998) have indicated how interim designs are vital to mundane forms of communication and coordinating. Eriksen (2012) has further drawn attention to the importance of the materialising process involved in staging co-design, which renders varied invisible mundane work as inseparable from design and from their collaborative and participatory methodological underpinnings. Hyysalo and Hyysalo (2018) demonstrate that “all the kinds of work that go into collaborative design should be examined as *co-constitutive* to the processes, results, and further uptake of the collaborative design outcomes”. In real-life, ongoing collaboration, we should be seeing these interplays as “internal issues of stakeholder involvement and *not just as external context or excludable routine execution*” (p. 43, emphasis in original).

Taken together, the above reviewed literature stresses the ways in which mundane choices (e.g., how to implement a method) have strategic implications (e.g., organisational change) and conversely how strategic imperatives (e.g., the particular business model of a company) also bear on the possibilities of involving users and the use of participatory methods (Figure 2).

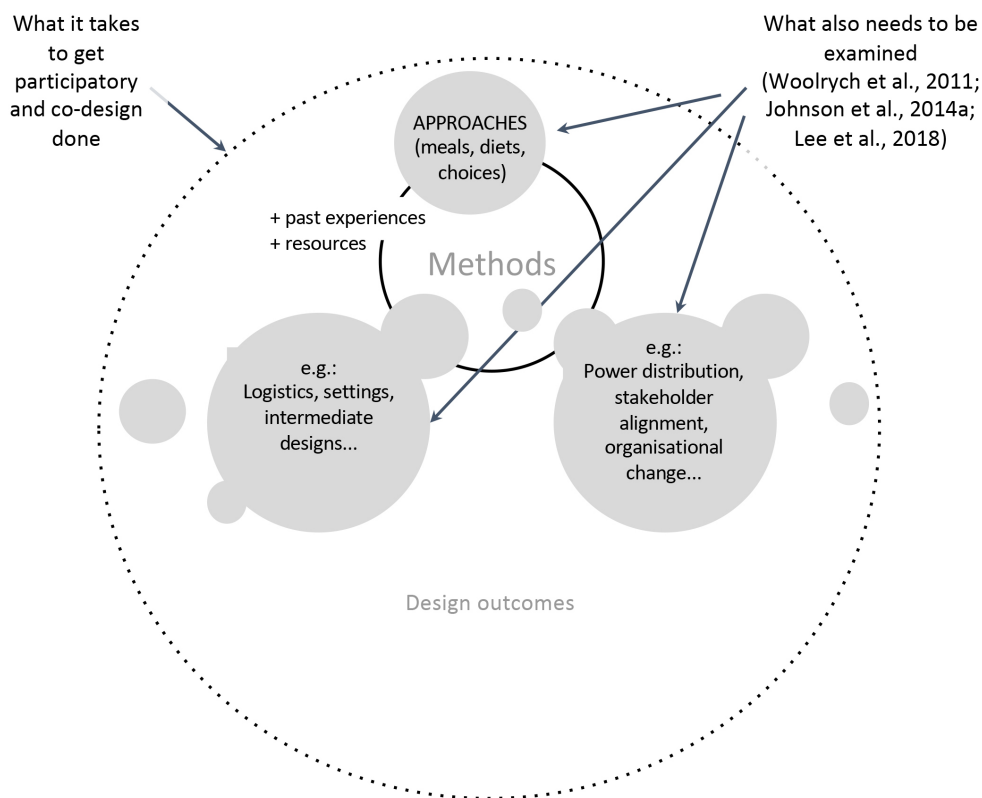


Figure 2. Methods is only one domain of co-design and participatory design work.

However, the research to date does not as yet adequately address the interrelatedness and interplay of these domains nor how such interrelation affects the carrying out of design processes, design decisions or implementation of participatory and co-design activities, even as managing such interplay is a core part of participatory and co-design today. Indeed, design outcomes and methods are neither isolated, separate entities, nor are users or contexts something that can be identified at the outset once and for all. To remedy this lack of research, we next revisit four extensive case analyses from different domains to better clarify the aspects of participatory design and co-design that need more research attention and particularly how they interrelate in the realisation of participatory design projects.

Researching the Aspects and Interrelations of Participatory Design Projects

To informatively discuss the different aspects of participatory design and their interrelations, we build our argument stepwise through revisiting four major and well-documented participatory design projects from our accumulated stock of data from 18 participatory design projects, which have been conducted in our research group between 2000 and 2020. From a first overview of instances identified across our 18 cases, we built a first approximation of four aspects in terms of *mundane*, *strategic*, *methods*, and *design outcomes* (all of which we describe in more detail below) and produced a visualisation framework that we have

used to help in comparisons. To refine the argument and identify their interrelations we cross-analysed and re-examined four projects more deeply for their overall dynamics. Our argument could be illustrated by any of the other projects; however, we chose one from four authors, working within different domains and participant groups, to ensure the findings could not be attributed as particularities of one case or one designer’s way of working. Moreover, the different cases also emphasise some aspects over others and thus provide a richer elaboration of the aspects discussed and their interrelations. Selecting projects in which we ourselves were involved also ensured we had access to as much data as possible. We present summaries of those analyses here, each emphasising one aspect of the key domains and interactions for clarity and economy. All four projects are documented and reported extensively elsewhere for their original research aims (Botero, 2013; Botero & Hyysalo, 2013; Hyysalo & Hyysalo, 2018; Hyysalo et al., 2014; Hyysalo et al., 2019; Kohtala, 2016, 2017, 2018; Kohtala & Hyysalo, 2015; Kohtala et al., 2020; Whalen & Bobrow, 2011). Appendix 1 documents the details of the projects in question as well as the nature of the data, duration, contexts, and analysis methods.

Translation of Mundane and Strategic in Design Work: Revisiting a Flagship Library Case

We shall first revisit the participatory design of a 100-million-euro flagship public library in Helsinki city in which the second and third authors were involved. This case helps to elaborate what is typically missing in the reporting of participatory design, as well

as how to provide more encompassing analysis and reporting. Part of the early research on that engagement was initially reported in two papers (Hyysalo et al., 2014; Kohtala & Hyysalo, 2015) that focused on a novel method adaptation for a workshop to gauge mid-range trends and solutions for the library focused on the prospective makerspace the library could host. The workshop design combined elements of lead-user workshop (Von Hippel, 1986) and participatory design (Bødker et al., 2004). One of the papers concentrated on a subsection of findings and the other on the new workshop approach and its yield for the planning project. The papers report the theoretical background resources, the procedures, and the knowledge gained in terms of co-design gains and user participation. As we elaborate below, however, there were important aspects that were sieved out of reporting as being of secondary importance and to meet eventual word lengths by the authors and then by reviewers.

For example, the earlier papers mention, but do not discuss at length, the existence of an underlying strategic agenda shared by the project responsible on the client side (library) and the academics. They were both aiming to push the City of Helsinki towards closer and more equal collaboration with existing citizen-designer activist communities. This agenda affected the participant selection to purposefully seek highly competent lead-users who were central to local citizen-designer networks, to ensure the engagement would generate high *demonstration value* in order to convince other, more conventional planners that indeed

citizen collaboration could and should involve joint design and not merely collection of feedback (Hyysalo & Hyysalo, 2018; Hyysalo et al., 2014).

Early reports also do not elaborate on the depth and importance of underlying community membership that secured committed user participation. The papers explicate how the lead-user identification relied on Kohtala's in-depth knowledge and networks in Finland's DIY maker scene, but do not discuss how this decade-long membership added considerable legitimacy in furthering *common cause* in the various maker communities (i.e., they felt there was also something beneficial for them). Furthermore, the earlier accounts tend to underestimate the resource intensiveness of some activities, *invisibilising* some work or the conditions that made it possible. The library makerspace workshop for example required the work of about 15 person-days for a minute-level timing plan, documentation procedure design, role casting, building of contingency measures, and testing to realise the particular workshop *method*. Approximately 20 further person-days went into writing out workshop results, pre-ordering and preparing the materials so that other library planners could do relevance scoring, plus the additional time invested in academic coding and analysis. Hyysalo and Hyysalo's long-term analysis, revisiting the project, shows how similar care in pre- and post-workshop pragmatics was simply not attainable in many of the focused participation events conducted within the broader library project (Hyysalo & Hyysalo, 2018; Hyysalo et al., 2019). Doing

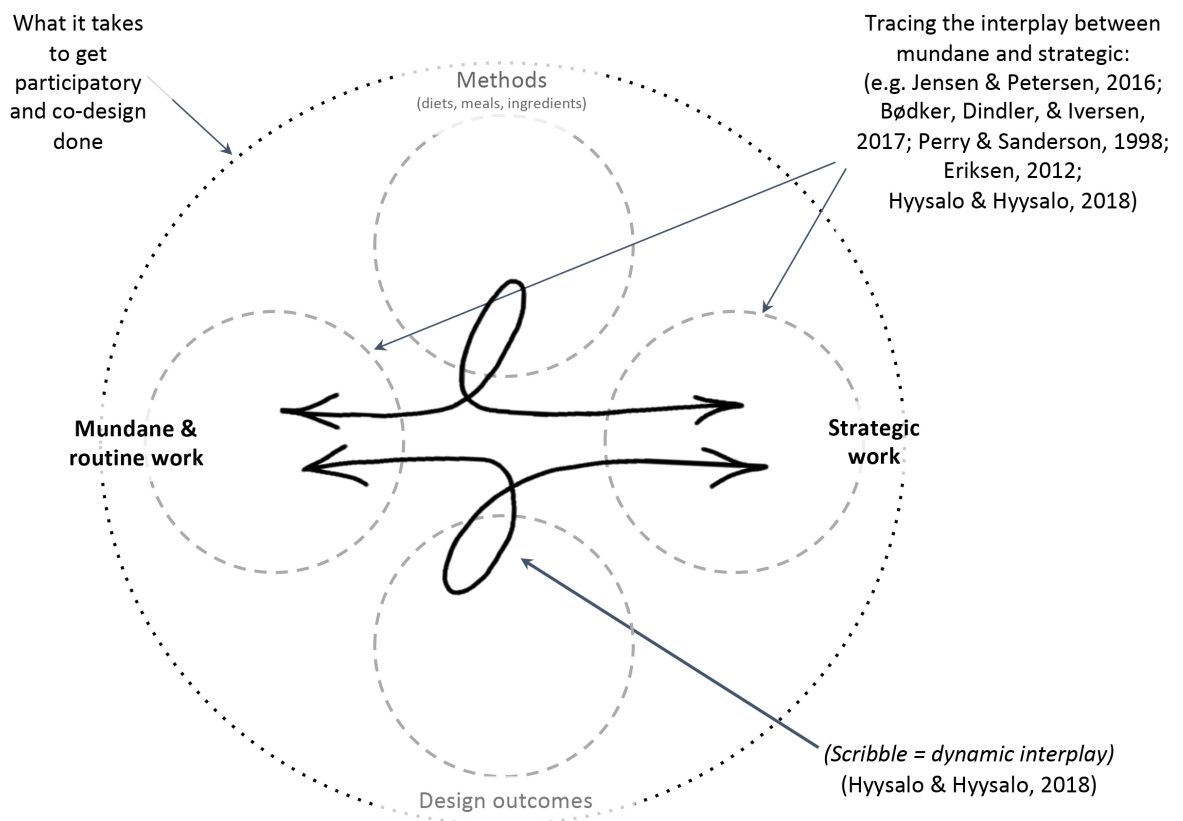


Figure 3. Interplay between mundane work and strategic implications.

it this way was, however, possible due to the complementarity of academic and practical interest and the possibility of ensuing double budgets. Similarly, in the wider library programme, some activities were strategically linked to marketing budgets and framed as public relations efforts conducted in the public in an open manner. This had substantial implications in broadening participation both in terms of citizens and the library staff involved. Furthermore, once the authors widened the scope of analysis, it became evident that the mundane work included all manner of practical tasks such as formulation of email invitations to participants or choosing feasible venues, as well as interim, intermediate designing in the form of props, games and tools to be used in various events, sessions and other engagements (Hyysalo & Hyysalo, 2018).

Overall, Hyysalo and Hyysalo's (2018) long-term analysis demonstrates how the complexity and ongoing-ness of user participation in the 21st century is far from common perceptions of co-design as a simple matter of choosing a workshop format or deploying post-it notes and flip-charts in a meeting. It shows some of the effects and dynamics implied in choreographing methods, organising activities, aligning stakeholders, designing and strategising at many levels. All the concerns that go into organising even one sole workshop, its declared aims, the resources available, the props needed and so on, form the core of designing it: these concerns and the contextual conditions permeate the organising and qualify it. The *context* cannot be taken

as a separate entity, nor can the work be reduced down to a set of choices. Mundane practical work and strategic considerations permeate and articulate what ends up being possible (Figure 3).

In ongoing engagements these articulations are obviously dynamic (the scribble in Figure 4) and not discrete activities; they rather constitute the work of participatory design. Because elements co-constitute each other in this way, we see the work of participatory design as akin to translation, as it has been elaborated in sociology of science and technology (e.g., Callon, 1986, 1998; Latour, 2005; Latour & Woolgar, 1986): constant work between and among a variety of domains (methods, mundane work, design and strategy in Figure 4), which actors perform in order to design collaboratively and get their ideas developed and implemented. This understanding of translation in participatory design borrows from the work of Callon (1986, 1998), who uses translation to describe processes in which human and non-human entities are transformed into new assemblages that have capacities to act in novel ways. Translation actively establishes relations between entities and materialises into arrangements that can sustain alliances and advance ideas and causes (Callon, 1992). Actors who do translation must (re)define the identities of entities they seek to assemble in relation to the others (within the range of choices open to them), and in this capacity translation is never a process of just linking unfettered elements, but active transformation of interplays and interdependences between things or actors involved (Callon, 1986). Translation work reminds us that there is a variety

(C1) Translation of mundane and strategic as design work: Revisiting a flagship library

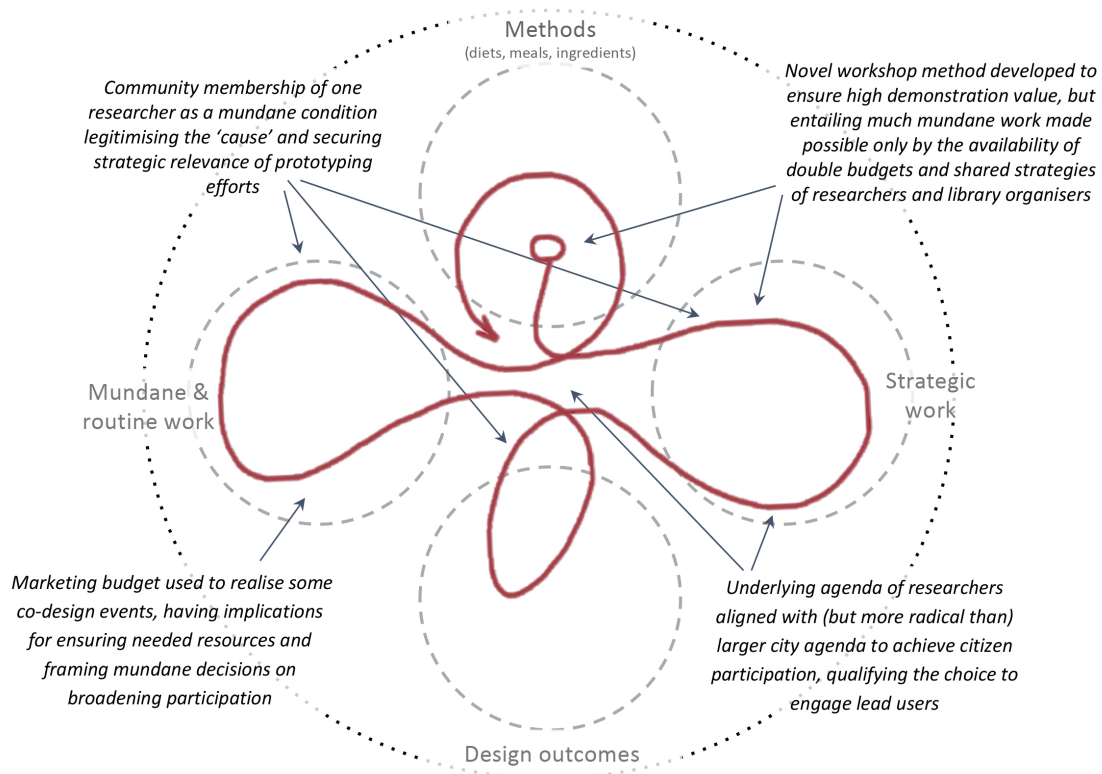


Figure 4. Revisiting the library project: How mundane work, method deployment and strategising permeated each other, the scribble representing translating in participatory design work.

of already existing elements, relations and agendas that impact the work and the interplay between and among the domains. At times, this implies misunderstandings and misalignments. Translations are never pure and involve some *betrayal* (Latour, 1993) of the origins and nature of elements assembled: the contrary vectors actors must decide upon and among. In that sense the scribble in Figure 4 is a sort of proposition: that movement, interplay, and those translations are what it takes to accomplish participatory design. That said, translations at the core of participatory design are of a specific kind; participatory design translation is a skill that is deployed to adjust mutually constituted actions and outcomes, involving continuous qualification between different aspects or domains: one thing is tried, and as the implications of the movement become clear they permeate other actions and movements in how strategic and the mundane inform each other, what moves are performed between design work and method availability, on an ongoing basis while immersed in the practicalities and intellectual pursuits of design. Thus, not all translation work is participatory design, nor does all work in participatory design require translation: some tasks are performed without being qualified by, e.g., strategic considerations.

Acknowledging the constant adjustments and negotiation in these processes is particularly crucial today, when we also urge recognition of how participatory design is conducted in ways that are open and emergent, a state of perpetual beta. This is especially salient in peer-to-peer open design and production of digital and physical artefacts, such as free, open-source software and hardware (Aitamurto et al., 2015; Benkler, 2006; Jones, 1983; Özkil, 2017; Verhaegh et al., 2016). Even in large multinationals with internal design teams and more strictly defined objectives and resources, design processes can evolve over long stretches of time where interventions interlink, and participation might emerge, thereby forming and re-forming the very context that is being analysed. Processes that simply stop where designers exit may not sustain, or designs may not even be implemented. Conversely, where resources allow, long-term and sustained processes, as those seen in academic design research projects, for instance, continually capacitate stakeholders to design for themselves and identify opportunities for action (Botero & Hyysalo, 2013; Hyysalo et al., 2019; Verhaegh et al., 2016). To clarify participatory design translation under these current conditions further, we move to revisit three additional case analyses.

Supplanting Methods with Design and Mundane User Participation: Revisiting an Award-Winning Expert System

Eureka is an information system for repair and maintenance based on leveraging technicians' tacit knowledge realised within a large, multinational corporation, Xerox. It is a well-documented case (see, e.g., Bell et al., 1997; Bobrow & Whalen, 2002; Whalen & Bobrow, 2011) spanning design and development for at least 15 years during which the system (and its practices) co-evolved.

The case shows how projects such as the one that eventually produced Eureka might have little to do with participatory design at the onset but grow to do so as the project unfolds, and articulating the translation work involved reveals the nuances of the necessary participatory dimensions involved. At that time, the Xerox organisation had what can be described as a top-down *knowledge strategy* that assumed what technicians needed to know to do their work properly and how this knowledge should be generated and controlled. Such strategy also implied an almost default commitment to an equally top-down approach to design. A starting point for the design team located at Xerox's Palo Alto Research Center (PARC), the renowned R&D unit of the company, was to build a prototype of an expert-system-like application that could provide diagnosis and repair guidance for technicians, replacing the lengthy printed service manuals. When shown a prototype, technicians were impressed with the system but dismissive of its practical value. They emphasised that they usually knew the repair procedures for the common faults and would not require *expert system* guidance. Instead, the truly challenging problems they encountered in the field could not be covered by technical documentation, as they related to, e.g., particular configurations (among machine, a customer, and a place).

Looking closer at the mundane practices of technicians, the research team learned that when technicians ran into a problem they had not seen before, they called a fellow technician who would be familiar with similar configurations and could thus provide ideas on how to solve the problem. When unusual problems were solved, solutions would circulate as stories at meetings with co-workers (see also Orr, 1996). The recognition of this mundane practice pointed to the importance of noncanonical knowledge generated and shared within the service community, and suggested to the team that it made sense to propose a *living* expert system, instead of the artificial one they had been tasked to produce.

Creating a living expert system required a different kind of design effort and strategy, one where technicians' communal practices and knowledge would be at the centre. Whalen and Bobrow (2011) make clear how this reconfiguration of the issue created an unavoidable dependence on participatory designing together with the technicians, for their strategy to have any hope of being effective. An initial trial experiment of the idea with 40 technicians in France generated important service provision improvements and furthered the interest of field workers. However, management's commitment to the well-established top-down strategy of the corporation did not provide support for further experiments. Lack of support meant that design activities could only continue through what was more or less a guerrilla-style operation, finding, observing and collaborating with small groups of technicians keen to participate and, equally important, locating field supervisors (all former technicians) who would support this involvement. This required choreographing a considerable amount of mundane work that had to be presented as *research* to the executive level of Xerox's service organisation, while constantly reassuring that these activities were not interfering with technicians' servicing of customers, since what they actually did in the field was essentially in opposition to the official strategy.

Further prototypes were created by aligning them to technologies locally in use already and then disseminated opportunistically. In France, the scaling of the experiment was done by using the MiniTel system (the national online service accessible through telephone lines) and in Canada through a bulletin board service already used by technicians. In the United States, where management continued to balk at its implementation, Xerox researchers distributed floppy disks that were then passed between technicians (a *sneaker-net*, they called it) in several regions. In all these ways, then, there had to be continuous translation work between the strategic—what it would take to gain enthusiasm amongst enough technician users to convince management that Eureka deserved their support—and the mundane, the practicalities of collaborating in the field with technicians to improve and effectively test its design. At the end of a long and uneven process, Eureka proved crucial and important enough—insofar as Xerox’s Canadian and French service organisations were now officially supporting it and ever-increasing numbers of technicians in the United States were successfully using it or had heard about it from their colleagues and requesting access to it—that management had to support its further design and development, and corporate strategy was (at least partly) turned upside down.

The Eureka project underscores how participatory design—in practice—rarely follows an identifiable and repeatable step-by-step linear process through fixed stages. At the same time, it is possible to trace how the design choices and design strategies

were set against both the corporate strategy and the everyday practices of the technicians, and how the mundane practices of repair technicians eventually qualified the corporate strategy and led to a particular design approach. Translating between the technicians’ community and the corporate envelope as a participatory design strategy was not just any choice, but arguably the only one that could get such a successful system done.

Intertwining Methods and Design to Capacitate others to Design: Revisiting Designing with Active Seniors

The *seniors* case refers to an engagement with the Active Seniors Association that was founded in 2000 to further alternative arrangements for growing old in Finland (Botero, 2013). As part of their activities the association embarked on a long-term community building life project and a six-year design and construction project of Loppukiiri house (in English: final spurt), a shared housing arrangement (Botero, 2013; Botero & Hyysalo, 2013). The seniors collaborated with the first author in a variety of activities to support their project, moving to the house and, more importantly, developing shared arrangements and practices for growing old together (Botero, 2013).

Similarly to Eureka, the case shows how participatory engagements grow and expand in time from bottom-up alliances, but features a stronger tie between explicit participatory methods

(C2) Supplanting methods with design and mundane user participation: Revisiting an award winning expert system

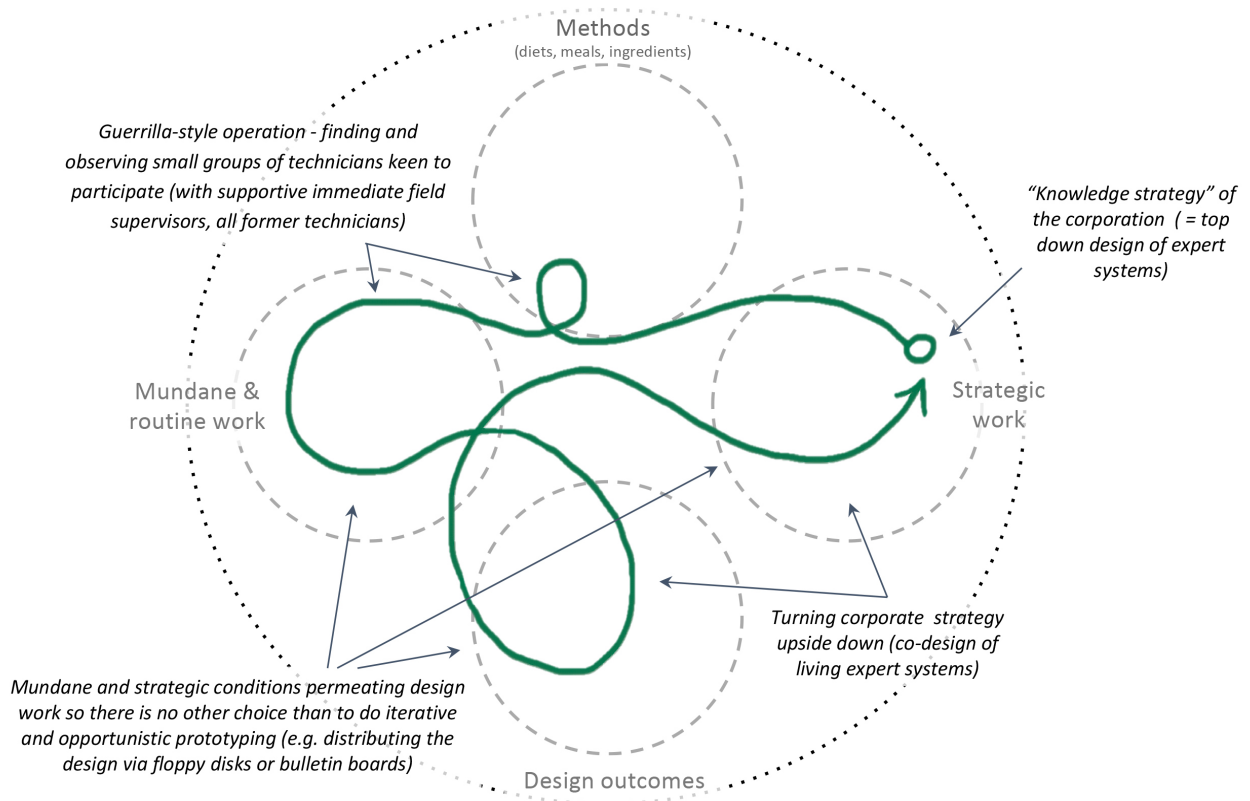


Figure 5. Eureka project revisited: Translation work between and among (mainly) strategy, mundane work and design.

and capacitating the user community to design for itself. In analysing the participatory and collaborative engagements in the case (Botero, 2013), we identified 13 strategies where a variety of translation instances can be seen at play. For example, the association contacted the researchers in the design school at an early stage of their project, wanting to collaborate but not yet sure how to go about it. Instead of storming in to perform a large, joint co-design project, the collaboration started through small interventions, such as building together a website for the co-housing project, which helped to define targets for the collaboration and allowed everyone to assess the possibilities of a successful longer participatory project. Similarly to the library case, mutual participation and collaboration was possible thanks in part to sharing resources with another project that benefitted from some of the scenarios developed with the seniors. Also, as Botero (2013) and Botero and Hyysalo (2013) report, collaboration was premised on the opportunity it offered to exercise both parties' hidden strategic agenda to diversify the development visions of the urban area in which the housing project was to be built.

One result of the engagement was the co-design of an *everyday life management* platform taking care of planning and cooking shared meals, booking spaces, coordinating cleaning shifts and providing neighbourly help in the co-housing arrangement (Botero, 2013). This platform was built, taken in use, iteratively developed, hacked, reproduced, transformed, and eventually abandoned after some years, following a similar path of close

collaboration with the community participants as in the Eureka project. However, translation work here was more permeated by deployment of specific participatory methods, to speculate with the seniors who, unlike the Eureka technicians, had not yet developed practices themselves as they had not been co-habiting for long. Introducing prototypes required more mundane detailed planning of joint workshops, illustration of scenarios and careful documentation and, thus, reliance on explicit participatory design methods. The circumstances required that intermediate designs and design outcomes had to be very concrete. They were methods to drive the process forward, as well as outcomes in their own right. For example, early sketches of a video porter, which never got built, turned into design seeds for the seniors themselves and a building block for another solution; later, once living in the house, the seniors bought a mobile phone that rotated amongst the residents assigning the person holding it the role of doorman. Similarly, many other design ideas ended up being reused and continued to be adapted for other purposes, or as ways to collectively explore other designs. The back and forth translation between methods and design outcomes presented a continuous *double loop* (as illustrated metaphorically in Figure 6).

Together with the Eureka case, the seniors case makes clear how reconfiguring everyday practices and living arrangements, through practical everyday exploration (Jalas et al., 2017) and participatory design alliances, can, if allowed to *grow old*, extend in time indefinitely. Besides providing a concrete design outcome, the

(C3) Intertwining methods and design to capacitate others to design: Revisiting Ageing together with elders

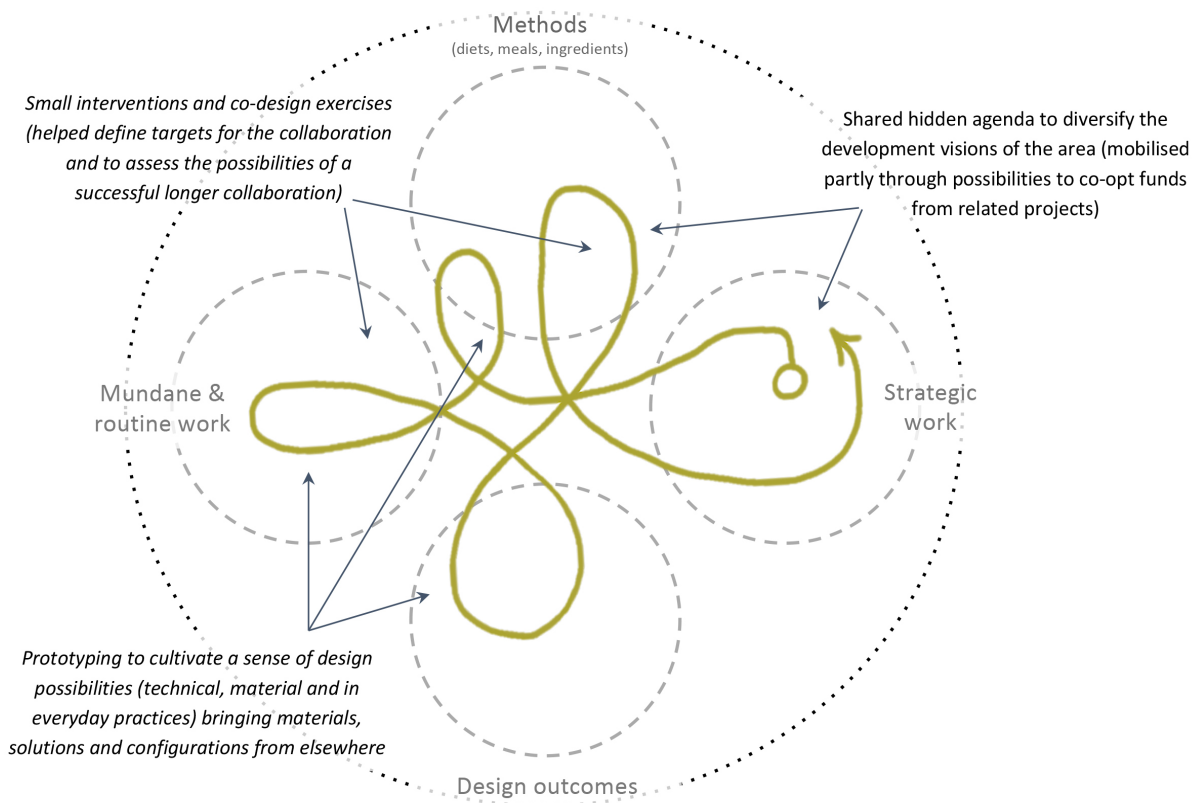


Figure 6. Designing with active seniors revisited: Translation work among (mainly) methods, design, and mundane work.

joint prototyping efforts and the collaborative design engagement helped the seniors to cultivate a sense of design possibilities (technical, material, and in everyday practices) and brought materials, solutions and configurations that have continued to be further translated elsewhere into their plans for ageing together.

Enacting A Hidden Strategic Agenda through Mundane Design Methods: Revisiting the Design of Spaces for Peer-to-Peer Interaction in Fab Labs

Fab labs and makerspaces are shared, open-access community workshops for digitally-enabled fabrication of artefacts, anything from jewellery or furniture to electronics projects. Our starting point relates to a broader study and engagement with peer-to-peer (p2p) citizen–designer communities involved in digital–physical *making* and open design in northern Europe, where the third author has been engaged as an insider-outsider ethnographer for the past eight years (Kohtala, 2016, 2017). To illustrate this case, we use details from the development of a particular lab hosted by a university, a typical context for labs in, e.g., Finland and northern Europe (Kohtala, 2016). University fab labs are not typical design school workshops, but rather exist to offer the general public a space for free exploration, creative expression and prototyping inventions.

While not always discussed in terms of participatory design, we contend this is one of the most interesting manifestations of it. Participatory design in p2p making is fluid and emergent, involving the open-source design of products, but also the co-design of facilities and capabilities (technologies and processes) for fabricating; the co-production of events; and equitable collaboration on community rules, governance and shared visions. Actors' roles as organisers, designers or users constantly shift, as the meta-objective of DIY making is to *democratise* technologies in non-hierarchical and self-organising actions. Actors design ways to foster a sense of ownership and community, a sense of the lab and its knowledge-building activities as a *commons* to be stewarded (Benkler, 2006). Such conditions make fab labs compelling cases for examining how participatory design unfolds: horizontal prosumer networks collaboratively designing in novel ways and in various modes, indicating important ways people participate in technology decision-making and potentially larger-scale transformation (Aitamurto et al., 2015; Ehn et al., 2014; Menichinelli, 2016; Nascimento & Pólvora, 2013; Özkil, 2017; Rychwalska & Roszczyńska-Kurasińska, 2017; Smith & Iversen, 2018; Verhaegh et al., 2016).

To exemplify, in the fab lab we examine here, the lab managers began to use the whiteboards in the lab to transparently display to-do lists and ideas for collaborative build nights (such as building an arcade game over a defined weekend). By such means they opened up the workings of the lab for others to view and contemplate their own role, to consider how they may contribute, by, for example, participating in a collective project and then suggesting their own, or repairing a 3D-printer listed as needing servicing. The whiteboard lists were mundane: a practical action for listing tasks to be done. However, this mundane act also moved to being a method for collaboration and to get others to participate in this p2p community, an invitation to participate

that borrowed from *Barcamp* or *unconference* meeting formats (where participants self-organise and self-select for sessions; Singel, 2005). As a mundane act co-constituting a method, the whiteboard lists were also permeated with strategic implications. As a Barcamp-informed method, the lists were open-ended: oriented to known and unknown users and future others in a way that is in distinct contrast to how conventional design school workshops are run. They embody the culture of *openness* and self-selection integral to commons-based peer production (Aitamurto et al., 2015; Benkler, 2006; Özkil, 2017): the action's strategic implications are embedded in the mundane action of writing with an erasable pen on a publicly visible whiteboard. The actors were explicitly aware of these implications, of how method, strategy, mundane routine and design outcomes co-constituted each other, having been immersed in *maker and hacker culture* and transmitting it to others through these very means.

Adopting the whiteboard as a design tool for participation and collaboration qualified the setting towards openness, temporariness, and flexibility, and initiated new interrelations (or potential for them) among stakeholders. Regular users began to annotate the lists and use the whiteboards for their own documentation. However, this engendered a sense of a conversation going on among insiders, and often newcomers would enter the space in confusion, seeking clear instructions on how to begin to use the lab, if they were allowed to and whom to ask questions. It thus became apparent that the openness of the whiteboard did not explicitly invite people in, and its very flexibility did not necessarily nurture commitment. Any strategic gains—the objective of *democratising* the space—were permeated by the mundane: the very temporariness of the method. The whiteboard device enrolled some participants, but displaced others (cf. Callon, 1986). Actors thus had to also employ other means to engage in collaboration.

The managers then began to post up conventional printed posters and stickers indicating space functions, machine instructions, opening hours and contact information, to cater to a different level of participation, entice people in and engage them in fab lab practices. On the face of it, this was conventional visual communication design work, but its meaningfulness was premised on the manoeuvres by managers and users to establish identities, explore boundary zones and seek to enter into collaboration: that is, translation in the sense that Callon (1986) described it, understood here in the context of people designing things together.

Not all mundane tasks in a fab lab, however, are performed with their strategic implications clearly in view, even when they involve prioritising some resources over others. The mundane, practical work of running a lab is not as salient in the texts that practitioners share with each other, which are rich with vision and ideology, so new lab managers easily underestimate how it will consume them (Figure 7). In the words of a p2p maker activist in a recent event in Helsinki, *small decisions matter*. Recent studies do attempt to address this gap: examining the mundane work of co-designing democratised technologies, processes and open access spaces, in interplay with strategic goals (Ehn et al., 2014; Kohtala, 2018; Nascimento & Pólvora, 2013; Rychwalska & Roszczyńska-Kurasińska, 2017).

(C4) Enacting a hidden strategic agenda through mundane design methods: Revisiting design of spaces for peer-to-peer interaction in fab labs

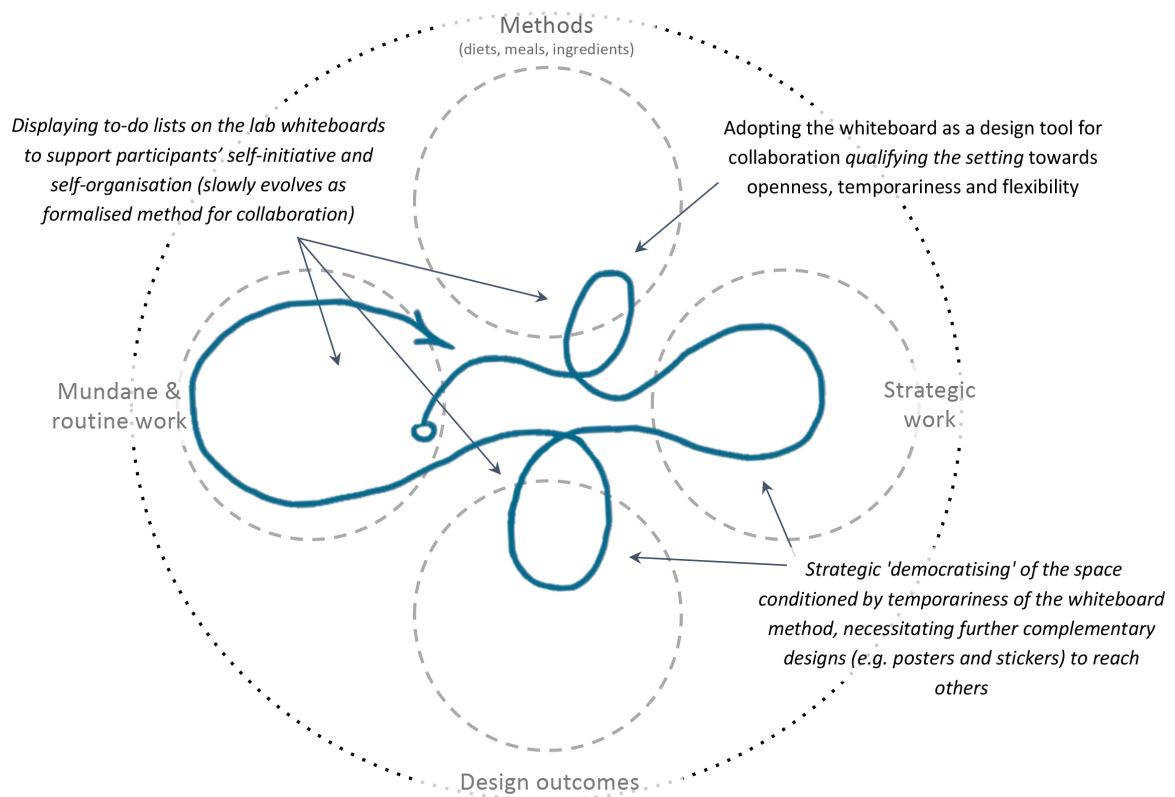


Figure 7. Fab lab revisited: Translation work among (mainly) mundane work, design and methods.

Discussion

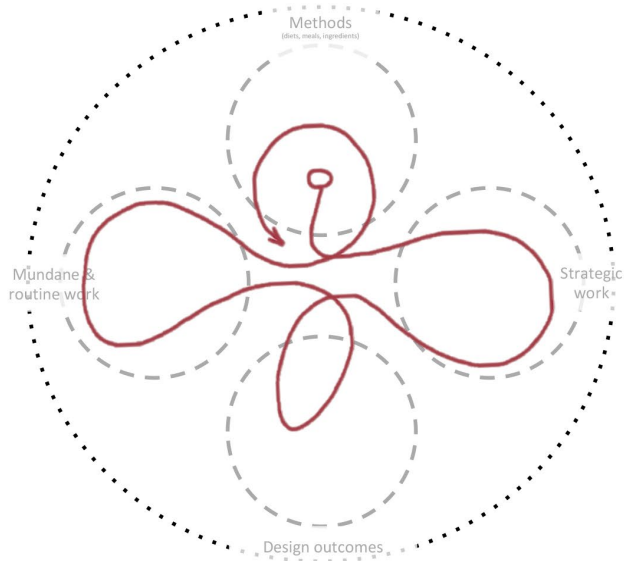
Through translation things are woven (skilfully or not) into the process in multiple configurations, as we have attempted to roughly portray with the scribble in the Figures illustrating each project. While key domains are visible and shared amongst the cases (which makes them instances of participatory design and not just projects), the movement, direction and permeation between domains differ. In the library example (C1) the interplay between mundane work and strategic considerations permeated method use and intermediate designs for the actual library, which was only in the early planning stage. In the Eureka example (C2) the translation work into methods and the permeation this entailed is less prominent, as those engaged in the endeavour took shortcuts around the need for collaborative methods through the design outcomes and active community participation. Conversely, in the seniors' case (C3) methods permeated the translation work more, as they were necessary for working effectively with the community in question. In the fab lab example (C4) the community was enacting novel practices by mundane means, co-constituted as participatory methods and less systematic attention to strategy. (See Figure 8.)

As highlighted in our examples, actors in participatory design processes are continuously considering several intertwined elements in order to ensure outcomes, establish legitimacy and implement designs. Strategic underpinnings are

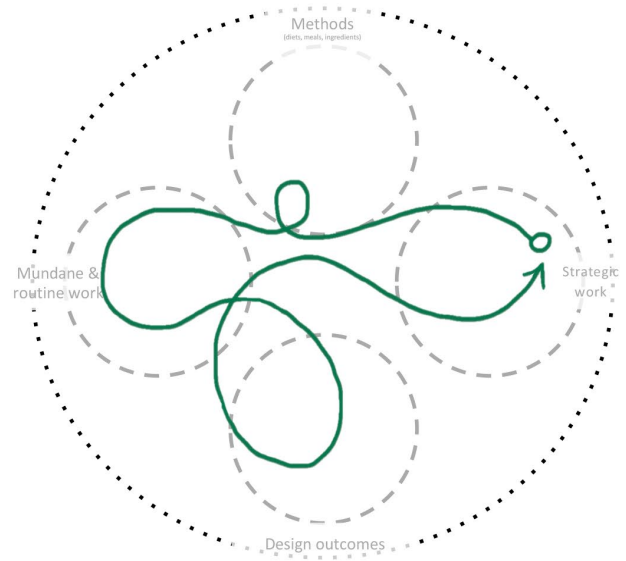
not emptied in *politics*, nor are mundane practicalities emptied in *operationalisation* of design. We can identify the most important participatory design translation issues as the following:

1. Those engaged in these processes are constantly making adjustments in decisions and actions in specific settings. This should be considered distinct from selection of discrete co-design workshops or any other single method. It is also not helpful to reduce these processes to a consideration of issues, decision items or mere trade-offs, nor as contextual elements simply added to what is already there (Dourish, 2004; Suchman, 2002). There is no pre-fixed context; it rather emerges and evolves in and of the situation and collaborative design actions. There is, thus, an augmenting, network effect at play when translating across the domains of participatory design. (For example, in the p2p fab lab case, the simple act of writing agendas on the whiteboards affected several factors at the same time.)
2. Within this ongoing adjustment, the actors involved are working with layers of strategic alignments in organisations and social groups, often resulting in multiple agendas at play, involving politics. Actors broker power and define roles while protecting their interests (Callon, 1986; Jensen & Petersen, 2016). This means that, as participatory design proceeds, actors change and qualify other domains; translation and qualification processes are going on simultaneously (Callon, 1998). Settings

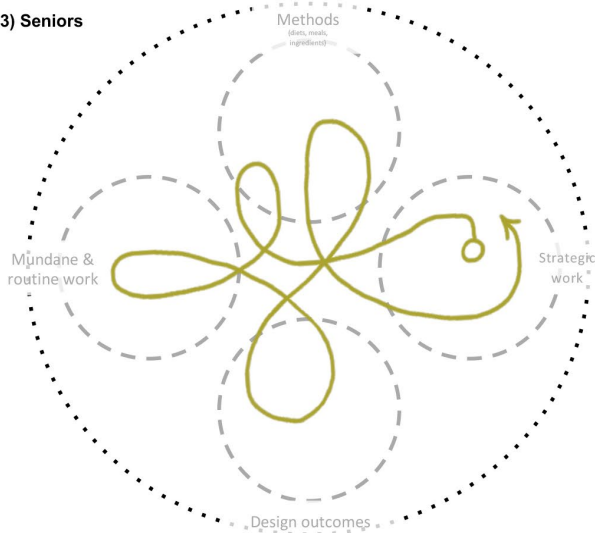
(C1) Library



(C2) Expert System



(C3) Seniors



(C4) P2P open design

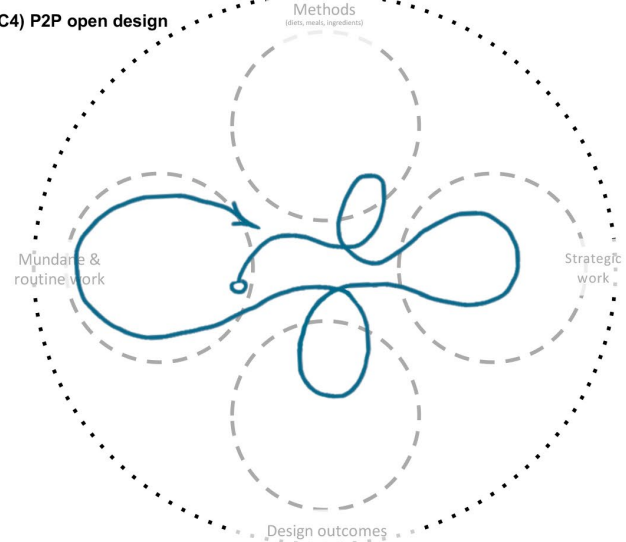


Figure 8. Collaborative design translation work emphasises interplay between and among domains in different ways.

change and thus the *context for design* is constantly emerging: a *context* is never stable, nor can *context and activity* be separable (Dourish, 2004). In such complex *multilevel games*, power relations and conflicts of interest blend with *mutually beneficial collaboration*, which can enrich the process if reflexively approached (compared to diluting or compromising ideals; Hyysalo, 2010). For example, in the library project, connecting participatory activities to the marketing budget ultimately served to generate more accountability and transparency regarding results, rather than pegging them to mere public relations communications or being seen as a compromise.

3. By aligning with certain actors and adjusting settings, collaborators and participants are often prototyping practices and not only products and services, which may better ensure implementation and attempts to make room for future

possibilities. Prototyping serves to anticipate and materialise these practices, which are then rehearsed and simulated through the processes and phases of participatory design.

4. There are often no predefined ideas on how long and how many cycles the participatory design engagement takes; processes are continuous and open-ended. Many actors (potentially) have the agency to influence settings, organise action and design.
5. Actors engaged in participatory design processes are accounting for more than one or two domains: beyond methods choice and the strategic context beyond design, also conventional design work and its outcomes and practical routine tasks. The domains cannot be considered discretely or through clearly defined choices because they interrelate and permeate each other.

6. Each domain carries its own logics, stemming from, e.g., practices and disciplines that inform it. Staying *true* to ideological principles or *pure* regarding methods deployment is expected in much of the academic literature, regardless of how the adherence to a single domain works within the project realities (for an extended example see Hyysalo et al., 2019).
7. Not everything in participatory design requires translation work. There are occasions where there is little permeation across domains or it is temporarily suspended: there is a framing that contains the overflows in other domains (Callon, 1998). Designers or users may be merely focusing on using the technology or designing a detail; expertise in one domain may offer temporary leverage to stave off concerns stemming from another domain. (For example, the Eureka team had resources to program functioning prototypes, which skirted broader attention to co-design methods.) How concerns co-constitute each other, and the importance of this, fluctuates, from *everything constitutes everything* on the one hand, to simple well bounded design decisions in just one domain.
8. Achieving adequate interrelations requires translation work—the process of bringing constituents together, in the face of the contrary vectors that the domains often pose to collaborative designers. Conscious, strategic awareness of the interrelations and permeations, and orchestrating the translations among dimensions, we argue, actually constitutes participatory design work in the 21st century.

We can now characterise participatory design translation work as the ongoing articulation of strategic considerations and routine mundane acts that inform each other through alignments and enrichments performed via design outcomes and method performance or availability. As participatory design engagements are imagined, planned, unfold, and are reported, these enrichments and alignments translate into concrete designs, decisions, and actions. These are not, and cannot be made up as, universal cookie cutter solutions.

There are many practical reasons why articulating translation work is currently rather rare in design research, despite the need for more nuanced discussion. For example, focusing on strategic aspects and foregrounding, e.g., the socio-economic context easily pulls more towards discussing organisational or managerial issues that traditionally belong to design management or organisation studies, and may appear to be beyond design's jurisdiction or disconnected from design research. Narrow views on cultural differences are also used as excuses to avoid proper analysis. Nevertheless, in all the cases we discussed above, when actors recognised their going concerns as mundane work with strategic implications and vice versa, or how method choice, contextual conditions, designing at both mundane and strategic levels, co-constituted the work they must do, their likelihood of achieving concrete outcomes increased. Likewise, when, in one or another aspect they have failed to do so (as in, e.g., the peer-to-peer case where strategic implications are often less salient), making progress becomes all the more challenging.

Conclusions and Practical Implications

The argument presented in this paper puts forth a call for a more ambitious co-design and participatory design research programme that both acknowledges the different domains that impact the work and can pay closer attention to the interconnections and translations among them. Such a programme carries implications for both practitioners and researchers.

For practitioners, it is important to be aware that the art and craft of participatory design lies not in making straight connections between, e.g., method, politics, and strategy, but it is rather constituted in the circulation of considerations and actions amongst different domains: how issues and work in each domain can be acceptably translated to the others across an array of trade-offs, tactics, and strategies. Accomplishing this movement is a type of skill that builds with practice, experience and reflexivity. Such awareness helps one, amongst other things, not to underestimate the resources, alignments, competencies, preparations, procedural details, and strategic contingencies that must be considered in participatory design. In the same vein, for practitioners reading academic co-design research reporting to help them plan and prepare, it also becomes necessary to learn to recognise which domain (e.g., method) has been prioritised in the written work, as well as which others are left unaddressed (e.g., mundane invisible work) and build adequate contingency measures.

For researchers writing up studies and interested in conceptualising participatory design in nuanced terms, it would be important to scrutinise which domains are more sensible to keep in view and explicate more duly which ones have been left out. While it may be impossible to report upon details in all domains, it becomes crucial nevertheless to record, report and discuss the translation work between them to provide a more encompassing account of the limits and possibilities of participatory design, than merely mapping the tensions involved or providing method descriptions. A more nuanced and encompassing understanding of how to work across domains, keeping all these aspects in play, forms a research agenda of arguable (academic and political) importance in the future.

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Appendix

Data and Analysis

The four projects we use in this article to illustrate the interrelations between methods, design, mundane practicalities, and strategic issues have been selected from an accumulated stock of data from 18 participatory design projects conducted between 2000 and 2020 in our research group. All cases are extensively documented and reported for their original research aims elsewhere and are re-visited in the paper for their overall dynamics. The data, analyses and previous analyses related to the four cases are as follows:

C1: Flagship Library

The analysis of the Helsinki City Library project was done through multiple-perspective and multiple-method case study research. The main data trace resulted from action research by the participation planner responsible for designing and organising all the library's participatory design activities during 2012-2015. Her participant observation of altogether 13 different participatory design activities was condensed in notes and synthesis documents, which were reviewed with the authors during the analysis stage. The second author was an academic consultant to the participatory activities from 2012 to 2015. He was involved in the preplanning of the participatory activities, choosing the formats and methods used, as well as in the analysis. To foster ownership of the events at the library, the consultant participated only in the lead-user workshop personally, but he was involved in reviewing the results and making adjustments to the process between participation forms that featured multiple workshops. Additional outside researchers have acted as non-participant observers in the lead-user workshop and the user-designer community project, the latter covering eight planning meetings among the project workers, one training event for the facilitators, three workshops, and the final event. The observations were documented in field notes and audio recordings. Numerous documents and emails produced during the planning process were also collected. The interim and final results of participation activities were recorded, most as openly posted result descriptions on the library website and thus open to public commentary by participants and others. To further improve the data set, interviews with the participating library staff ($n = 12$) and participants ($n = 28$) were collected and analysed by the participation planner regarding the user designer community. Formal feedback questionnaires from the user-designer community and lead-user workshop were also collected and analysed.

These modes of data gathering complemented each other and provided rich insider and outsider views of the project. All the data was thematically coded using open coding, and triangulated regarding data types and data gathering methods, followed by examining the data in chronological sequence and with respect to how different phases and aspects of the process affected each other (Flick, 2014; Miles & Huberman, 1994). Presentational narratives were constructed for the four case study articles published on different aspects of the process (Hyysalo & Hyysalo, 2018;

Hyysalo et al., 2019; Hyysalo et al., 2014; Kohtala & Hyysalo, 2015), and revisited by the first, second, and third author for the present analysis.

C2: Eureka Expert System

The Eureka analysis builds on action research and ethnographically informed qualitative research derived from 15 years of observation, documentation and direct design involvement in Eureka by the fourth author of the current paper. The data includes: 1) Observations and field notes from background workshops with technicians (France and Canada), logs of a prototype system, service improvement metrics and transcripts of interviews with technicians ($n = 40$) done in the context of initial prototyping efforts in the field (France) with a control group during a six-month period. 2) Logs of a pilot system, performance indicators (service response improvement metrics, service quality metrics), field notes, workshops and informal interviews with technicians in the context of pilot deployments of Eureka in the field in Canada for 6 months ($n = 1300$ technicians); in France for 4 months ($n = 6000$ technicians) and in the United States for 2 years ($n = 10000$ technicians), and 3) Logs of the system, performance indicators (service response improvement metrics, service quality metrics, increase metrics), knowledge base (actual tips added), group interviews with technicians, reports from service managers, regular field observations, request for improvements sent from first roll-outs of the working system in France, Canada, and the United States.

The fourth author—who was an active participant in Eureka design and deployment—presented a retrospective narrative of the project that was revisited in regards to the design domain interrelation by the first, second, and third authors (who were not involved in the original project) and revisited together iteratively, examining the data in chronological sequence and with respect to how different phases and aspects of Eureka played out. Comprehensive accounts of the case co-authored by the fourth author with other members of the original development team (Bobrow & Whalen, 2002; Whalen & Bobrow, 2011) were also used to triangulate and check observations and insights.

C3: Active Seniors

The Ageing together project was done through a mix of participatory action research, constructive design research (Koskinen et al., 2011) and case study research (Stake, 1994). The main data traces resulted from the personal involvement of the first author in a long-term participatory design engagement with a seniors' association as part of her PhD research. The data was gathered from a diverse body of empirical and design material collected through multiple methods across a six-year engagement (2000-2006) consisting of: 1) Participant observation and semi-structured interviews ($n = 9$) done at the initial entry point to the design interventions. 2) Documentation of workshops, design sessions, and group discussions in the form of textual and audio-visual field notes and sketches. Field notes were updated with partial transcription of interviews and group sessions (100

documents), with production notes of the core design team in a wiki (40 entries) and a collection of e-mail exchanges with key collaborators during interventions and prototyping stage. 3) As prototypes were deployed in real settings, data was complemented by episodic interviews ($n = 15$) and data generated as by-products of the use of actual prototypes (content created by end-users and logs of the systems gathered as text files, pictures, and screenshots of the artefacts taken at regular intervals); content of issue tracker and bug collector of the software development environments was also gathered (~80 entries). Data was triangulated to reconstruct the evolution of the features, track design conversations and resulting decisions with detail. Insights of that work have been reported elsewhere (Botero, 2013; Botero & Hyysalo, 2013; Botero et al., 2010).

Data analysis consisted of bringing together emergent themes in the data as the engagements proceeded and then looking at those themes across the materials and data collected both for purposes of advancing participatory design work and analysis at different points in time, and in particular when planning for new participatory design workshops and field trials; every time a new release of the prototypes were made; and when writing up research. The second author was involved in some of the earlier analysis (Botero & Hyysalo, 2013) and the second and third authors participated in re-analysing the case for the present article.

C4: Peer-to-Peer Interactions in Fab Labs

The analysis of fab lab projects rests on the doctoral and postdoctoral research by the third author. The largest body of data comes from a longitudinal ethnographic study conducted in the main fab lab site for about three years (2012-2015), which examined actors' collaborations in setting up the lab, aligning its goals and identity, and working on design projects. Subsequent studies have continued to observe the main research site, and fieldwork (participant and non-participant observation) and semi-structured interviews have been conducted in other fab labs. The research material analysed and reported in (Kohtala, 2016, 2017, 2018) consisted of extensive field notes (more than 150 documents), substantial photograph documentation, videos, participants' documents (such as brochures and training manuals) and about 80 semi-structured interviews with fab lab actors, as well as other actors in the maker context. The 13 European labs were selected to optimize diversity in sample, in their espoused focus (such as entrepreneurship, education, or community engagement), their host and funding model (such as municipality-supported or founder-self-funded), and their life cycle (labs of various ages and in differing phases of development). Attention was paid to the design and layout of the spaces, the material and equipment configurations, and how stakeholder interaction and engagement was planned.

The material was analysed using the social world framework of Symbolic Interactionism (Clarke & Star, 2008), a Science & Technology Studies framework, which practically entailed open coding, writing up empirically grounded narrative summaries (Miles & Huberman, 1994) and creating positional maps and diagrams (Clarke, 2005). Beyond these datasets and analyses, the

third author has also conducted fieldwork and interviews at six international fab lab network meetings; eighteen other fab labs, hackerspaces, makerspaces, and DIY biology labs, in Europe, North America, South America, China, and India; and events in the local maker scene. The previous studies (Kohtala, 2016, 2017,

2018; Kohtala et al., 2020) were revisited by all four co-authors in cross-analysis sessions, where the third author presented empirical examples from the fieldwork illustrating various ways collaboration was orchestrated in fab labs, including when citizen engagement was not successful by design.