Jonathan Romm

INSIDE HEALTHCARE DESIGN LABS

Exploring the practice of healthcare service design in the context of embedded service design labs

Arkitektur- og designhøgskolen i Oslo
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PhD thesis

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Abstract

Over the past two decades there has been a rise in using service design within healthcare and service design has been identified as particularly appropriate to support adaptations and innovations in the healthcare context through using a participatory, action-oriented, step-by step processes of learning and decision making. However, the complex characteristics of healthcare systems and wicked nature of problems that arise in such settings can challenge service design practice to develop new methods and ways of working. Recently, design labs have emerged in the area of healthcare as a way to support service design practices carried out in such settings. Despite a growing body of knowledge, there is still a lack of in-depth understanding of how service design is practiced inside such lab spaces in general and specifically in the context of healthcare. It is important to create a better understanding about healthcare service design practices and how design labs may support them to strengthen healthcare organisations' ability to innovate and change.

The overarching aim of the research presented here was to explore how service design labs may act as supportive spaces for practicing service design inside large healthcare service systems. Framed by pragmatism as its philosophical stance, the research applied a blend of narrative inquiry and action research by design as the overall methodologies. Four 10–12-week-long action research interventions supported inquiry into real-life service design processes that were carried out inside three large Norwegian hospitals. The empirical findings from these interventions were then systematically reflected upon and analysed using the coresearchers' own experiences as design managers and service designers before being blended with theoretical perspectives from design and service design, service marketing theory and systems theory. The insights from these interventions, alongside the narrations of healthcare service designers, were merged with viewpoints from theory into four publications and the current exegesis.

This study explicates the compound approaches used by service design practitioners amid the complexities inevitably found in healthcare. It identifies and explicates the central healthcare service design conversation and facilitation practices. Further, it builds a theoretical frame for service design labs to act as supportive physical, social and imaginary spaces. Additionally, the research conceptualises service design labs as temporal and situated meta-designs inside complex service systems. These contributions are important because temporally embedded service design labs allow for more flexible and situated applications of such supportive infrastructures. Furthermore, this research offers practical guidelines for setting up and using temporally embedded service design labs as supportive spaces for integrating service design capabilities into healthcare organisations to help them adapt to changes and harvest innovations.

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Abbreviations

AHO – Oslo School of Architecture and Design

Ahus - Akershus University Hospital

C3 – Centre for Connected Care

CAS - Complex Adaptive Systems

DHW - Design for Health and Wellbeing

dR - Centre for Design Research

ICT - Information and Communication Technologies

IDE - Institute of Design

NHS - National Health Service

NSD - Norwegian Centre for Research Data

OECD - Organisation for Economic Cooperation and Development

OUH - Oslo University Hospital

REK - Norwegian Regional Committees for Medical and Health Research Ethics

S-D logic - Service-dominant logic

SDN - Service Design Network

Sunnaas - Sunnaas Rehabilitation Hospital

WHO - World Health Organization

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Dedicated to the memory of my mother, Inge Lise Romm.

1

INTRODUCTION

To help meet the increasing pressures emerging from various drivers of change and utilise the possibilities that technological advancements, user-centredness and new collaborations carry with them, there has been a global rise in using service design within healthcare, especially during the last two decades (Mager et al., 2017; Mager, Nisbett, et al., 2016). Since the late 1970s—and accelerating from the 1990s and onwards—service design has evolved as a distinct field that combines a mixture of both analytical and creative knowledge domains to support innovations in service delivery (Blomkvist et al., 2010; Miettinen, 2009; Moritz, 2005). Service design has been identified as particularly appropriate in the context of healthcare because it facilitates a range of action-oriented approaches, from decision making to problem solving. Through participation, service design helps diverse actors form teams and support them in going through the step-by step processes of learning, sensemaking and the joint formation and realisation of novel healthcare service proposals (Jones, 2013; Patrício et al., 2019; Pfannstiel & Rasche, 2019; Tsekleves & Cooper, 2017a).

1.1 The need for healthcare service innovation

In Western countries, the healthcare system is pressured by strong drivers for change, such as increasing costs, an expanding elderly population and rising

user expectations (Organisation for Economic Cooperation and Development [OECD], 2018; World Economic Forum, 2013). At the same time, new innovative opportunities have continued to emerge, such as technological advancements and patient-centric approaches that pave the way for entirely new care models (Proksch et al., 2019). Service design is positioned to help healthcare systems by adapting to change and innovating by incorporating new technologies and new care models on different societal scales (Jones, 2013, 2017). New approaches to healthcare service may include care models that are person-centric, self-managed, community-oriented, holistic or preventive healthcare services (Tsekleves & Cooper 2017b).

Despite the need for healthcare service developments, service design in healthcare is especially demanding because of the inherent complexities that often are manifested in such settings (Jones, 2013). Matters such as hierarchic culture, the need for collaboration across organisational divides, strict evidence-based procedural policies and costly infrastructures hamper or create thresholds for bringing forward new service initiatives (Oliveira et al., 2005; Wang et al., 2015). Responding to these challenges, healthcare service design is evolving to adapt new practices, develop supportive organisational structures and explore new ways of integrating its capabilities into healthcare (Freire & Sangiorgi, 2010; Macdonald & Robert, 2014; Sangiorgi et al., 2017).

The integration of service design capabilities into healthcare has primarily been done through the commissioning of service design consultants and through research collaborations (Sangiorgi et al., 2014; Snook & Design Managers Australia, 2014). Recently, some healthcare organisations have begun embedding service design capacity into their organisations to support internal transformations over time (Bailey, 2012). This is typically done through in-house employments and, increasingly, through the establishment of design labs (Molloy, 2018).

1.2 Design labs as emergent supportive spaces

Design labs are currently being applied at different levels in the public sector (Fuller & Lochard, 2016; McGann et al., 2018; Tõnurist et al., 2017), in research (Binder et al., 2011) and in healthcare[1] (Molloy, 2018). Design

1 Some examples of design labs in healthcare are the Helix Centre, a collaboration between Imperial College London and the Royal College of Art, Experio Lab, a collaboration between several Swedish regions using service design as a method and approach in regional healthcare, and the Health Design Lab, which is based in Thomas Jefferson University in Philadelphia.

labs are described as safe spaces for collaborative experimentation and a demonstration of new solutions that are related to social needs (Mulgan, 2014b; Torjman, 2012). In many cases, such labs support healthcare organisations to navigate the fuzzy front-end stages of new service initiatives. Such new service development processes hold the potential to significantly impact the outcome of service realisations (Clatworthy, 2013).

Because service designing inside labs is a relatively new phenomenon, there is currently limited in-depth knowledge on how service design is practiced in lab settings. Most of the literature on design labs relates to policy and government-level support, covering the theories, overall characteristics and managerial aspects of such labs (e.g., Carstensen & Bason, 2012; Fuller & Lochard, 2016; McGann et al., 2018; Mulgan, 2014; Tõnurist et al., 2017). Currently, there is a lack of rigor knowledge on how service design practice may be supported by design labs amid the complexities of healthcare. With a few recent exceptions (e.g. Molloy, 2018; Reay et al., 2017; Vink, 2019), most current accounts on healthcare service design practices inside labs are described through webpages and blogs that are hosted by these labs or as part of non-scientific literature.

To make sure that these practices are properly aligned with and adapted to the complexities of healthcare, there is a need to bring forward rigorous knowledge on how service design is practiced and is adapting itself as a subfield in the context of healthcare while being carried out inside design labs. Currently, because of the limited specific research, there is a risk that design labs are being set up in healthcare settings without in-depth knowledge of the practices they are intended to support. Failing to understand how service design practice inside labs may be aligned to support healthcare renewal may create false expectations to service design in general, poor utilisation of design labs or disappointment when it comes to using design labs as an integrational model altogether. Hence, we need more research to be able to convey correct information about how these labs work and to correct and optimise current practices.

1.3 Research objectives and questions

The current research explores and contributes new knowledge to the evolving field of healthcare service design; its aim is to explore how service design practices can be supported by design labs in the complex contexts of healthcare—helping healthcare service providers respond to societal changes and create new, improved and innovative care services. To guide the inquiry

presented in this thesis, the focus of the investigations has been on the following overarching research question: **How can service design practices be supported by design labs in the complexities of healthcare?**

To explore, explicate on and discuss this main question, three subquestions were created:

1. What are the tensions faced by service designers when working in the complexity of healthcare?
2. How do service designers facilitate fruitful interactions among multiple actors in healthcare?
3. How can the design lab space be made use of to support healthcare service design practices?

The three research subquestions build on one another as a basis for exploring the main research question. The first research subquestion zooms out on exploring the general tensions that service design practitioners are faced with amid the complexity of healthcare, hence serving as a backdrop for the present study. While navigating these overall contradictions, the second research subquestion zooms in, investigating the ways conversations and interactions among multiple actors are facilitated by service designers. The third research subquestion explores how lab space can support such interactions as a service codesign space. The insights gained from exploring the three research subquestions are synthesised to shed light on the main research question—explicating how service design practices can be supported by design labs amid the complexities of healthcare.

The research itself was carried out using action research as the main methodological approach, here by establishing four design labs inside three different hospitals in Norway over a period of six years, to study how service design is practiced in healthcare settings and how this practice may be better supported by design labs. Because of the nature of action research, these research questions emerged and were further refined through the four studies conducted as part of the present research, hence resulting in the four included publications.

1.4 Approach and methods

A pragmatist philosophical frame and way of working was applied to bring forward new knowledge through practice and in-depth reflection on the practices addressing the above-mentioned research questions. Central to

pragmatist thought is a view on the theories as inherently linked to practice or experience (Rylander, 2012). John Dewey (1859–1952), who was one of the late classical pragmatist philosophers, developed a theory of inquiry—a collaborative learning approach through embodied experience and the intellectual questioning of the meaning of experience (Dewey, 1938). This research aligns with Dewey's theory of inquiry as a philosophical stance; it aims to bring forward new knowledge through the construction of meaning from reflections on the experiences of practicing service design in the context of healthcare design labs.

Throughout this inquiry, a qualitative practice-led research methodology was applied (Denzin & Lincoln, 2011b; Rust et al., 2007). Action research informed by research through and by design was used as the main methodological approach. Action research is a collaborative investigation using the recurrent cycles of reflection on action to explore and generate knowledge through action (Adelman, 1993; Reason & Bradbury, 2008). Because healthcare service design practices inside design labs is the main object of study of the present research, approaches of researching through and by design were used (Fallman, 2008; Frayling, 1993; Jonas, 2007a; Morrison & Sevaldson, 2010). Research by design is an approach where the practice of designing itself supports a research commitment through 'explorative and generative actions' (Sevaldson, 2010, p. 13). The researchers position in research by design is inside the object of study. In line with a pragmatist stance, this specific position exposes the researchers to levels of understanding that are difficult to access by applying more distanced approaches (Sevaldson, 2010).

As a point of departure, visits to healthcare innovation hubs and service design labs were carried out initially[2]. To address the first research subquestion of the current research, the central tensions amid the complexities of healthcare facing healthcare service designers were studied by analysing the narrations (Smith, 2007) of practicing healthcare service designers from Scandinavia, the UK and North America. Afterwards, to address the second and third research subquestions, embedded service design labs were set up and used to conduct four temporary service design interventions inside three large Norwegian hospitals. Manifested as communities of practice (Wenger, 1999) over a period of 10–12 weeks, each service design lab intervention facilitated several parallel design processes

2 Visits were done to the Centre for Innovation at the Mayo Clinic in Rochester, Minnesota, The Helix Centre in London, UK, the Experio Lab in Karlstad, Sweden, and MindLab in Copenhagen, Denmark.

simultaneously. Acting as 'pop-up design studios' inside complex healthcare organisations, the labs were used as spaces for practicing service design and conducting research. By involving a variety of healthcare actors and service design students, these embedded service design lab interventions were supporting real-life collaborative service design processes inside a specific healthcare context. In parallel, they were used to investigate and develop new understandings about healthcare service design and how it is practiced inside design labs using systematic reflexive cycles, an analysis of empirical data collections and through consultations with the literature.

1.5 The context of this research

Norway's healthcare system is built on the principles of universalism and is primarily provided as a public welfare service financed through citizen taxes (Lindahl, 2015). The current research was carried out in Norway through a research partnership between the Centre for Connected Care (C3) at Oslo University Hospital (OUH) and the Centre for Design Research (dR) at the Oslo School of Architecture and Design (AHO). Supported by the Research Council of Norway, C3 is a research-based innovation centre, in which the dR is a research partner through an eight-year commitment period. Established in 2015, C3 brings different actors together from public healthcare, research institutions and the medtech industry to jointly develop innovative healthcare services and conduct research. The dR, which is based in AHO, supports practice-based and inquiry-centred research that draws on design processes, products and services. Beside a number of other partners, three large hospitals from the Oslo region are affiliated with C3. These hospitals were used as hosts, allowing for Master of Design students from AHO to develop service design projects inside these hospitals through close collaboration with multiple actors. These collaborations were supported by the temporally embedded service design labs established and utilised to assemble cross-functional development groups inside these hospitals for 10–12-week-long service design interventions. These interventions provided most of the empirical basis for the present practice-led research.

1.6 Publications included in this thesis

The current research is a compilation thesis including four publications and an exegesis (or a kappe in Norwegian). The exegesis introduces and summarise the research carried out. Further, it offers the overall research

findings and contributions that link and expand the specific findings and contributions derived from the four included studies and their related publications. The four included publications focus on exploring the three research subquestions of the current study. To provide an overview, Figure 1 illustrate how the research subquestions were explored by each of the four studies, hence providing the basis for the exegesis addressing the main research question. The second research subquestion is connected to two publications.

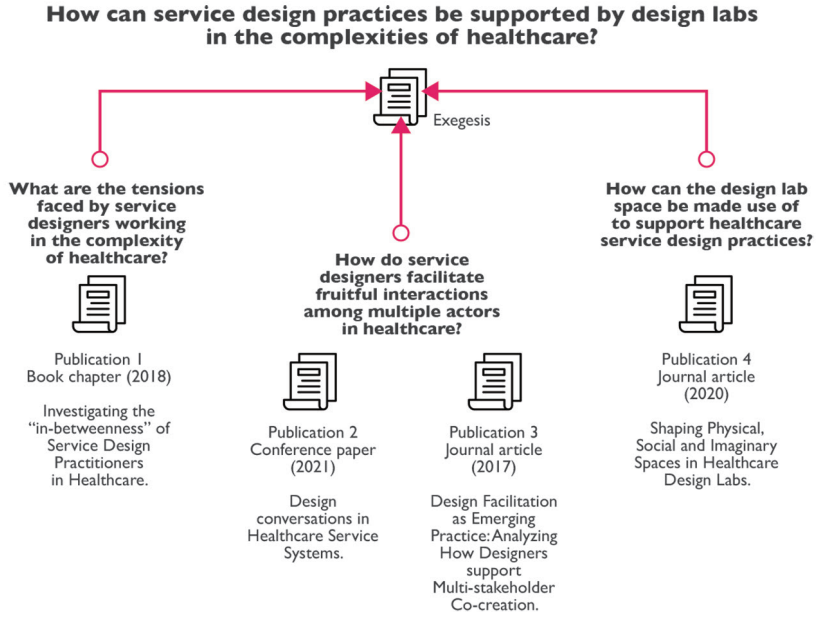


Figure 1: The four studies conducted for exploring each research subquestion as a basis for addressing the main research question.

Below is a short summary of all four included publications and my contributions to each of them. Full versions of each of these publications can be found in the appendix of this thesis.

Publication 1: Investigating the 'In-betweenness' of Service Design Practitioners in Healthcare

Romm, J., & Vink, J. (2018). Investigating the 'in-betweenness' of service design practitioners in healthcare. In M. A. Pfannstiel & C. Rasche (Eds.), *Service design and service thinking in healthcare and hospital management -Theory, concepts, practice* (pp. 117–135). Potsdam: Springer.

The focus of the book chapter is the ways practicing healthcare service designers describe dealing with working in complex healthcare settings. It focuses on extracting meaning on central subjects, such as the position these practitioners have, how they handle the degrees of change that they may seek to inspire and their abilities to influence the organisation. The chapter explicates the ways practicing healthcare service designers flexibly make sense and linkages when working within the complexities of healthcare. Furthermore, it introduces the concept of healthcare designers as being in-between, navigating the contradictions in healthcare settings. Using this in-betweenness, healthcare service designers are creatively blending and strategically leveraging contradictions while working inside these systems. The articulations provided in this book chapter aim to nuance the understanding of service design practice in healthcare, moving it beyond 'either/or' strategic choices for creating incremental or radical change (Mulgan, 2014b) in healthcare settings or the in-house versus ex-house discourse (Freire & Sangiorgi, 2010; Sangiorgi, 2015). Accepting the compound nature and embracing the advantages that this way of practicing offers may help to further explain and explicate the value that designers bring into these contexts.

The publication was initiated by me as the first author. My contributions to the book chapter were to develop its research design, prepare and participate in data collection through carrying out interviews, making transcriptions of audio files and participating in analysis workshops together with the coauthor. Additionally, I was engaged in advancing most of the book chapter's writing alongside driving the text forward towards publication.

Publication 2: Design Conversations in Healthcare Service Systems

Romm, J., Dudani, P., & Prakash, S. (2020). Design conversations in healthcare service systems. In *Relating systems thinking & design (RSD9): Systemic design for well-being* (pp. 1–28). National Institute of Design.

The focus of the second publication is design conversations, which are described as conversations that are planned, facilitated and used by service designers or by other codesigning actors as part of the design processes carried out inside service systems. It introduces design conversations as a central service design material, expanding the current discourse on such materials being touchpoints, service flow representations, process tools and repertories (Blomkvist et al., 2016). The research identifies five levels of design conversations taking place during service design processes and

that are helping service designers to gain propositional leverage by linking conversational insights to one another, thus influencing how change is made inside healthcare service systems. Further, by exploring the point where conversational interactions take place during such processes, the study identifies conversations as the specific act where interactions are shaping new mental models (Vink et al., 2019) and renews the discourse, causing broader ripples of new social formations inside healthcare ecosystems.

The conference paper was initiated and prepared by me as the first author. I developed its research design, prepared and participated in data collection, propelled the analysis forward and did most of the paper writing. Furthermore, I was responsible for reviewing and developing its illustrations in close collaboration with the third author. Furthermore, as a corresponding author, I was engaged in preparing the text for publication.

Publication 3: Design Facilitation as Emerging Practice

Aguirre, M., Agudelo, N., & Romm, J. (2017). Design facilitation as emerging practice: Analyzing how designers support multi-stakeholder co-creation. *She Ji: The Journal of Design, Economics, and Innovation*, 3(3), 198–209.

The third publication explores service design facilitation practices (Tan, 2012). The research identifies design facilitation practices as central to service designers while orchestrating the participatory processes of learning and making changes in complex healthcare settings. It focuses on the underlying dimensions infused into contextually designed facilitation tools to support a series of codesign events, hence moving the service design processes forward collaboratively. The study identifies three dimensions that are used specifically by service designers while shaping these facilitation tools. These dimensions allow for combining human perspective tools, experiential facilitation tools and creative facilitation tools in different intensities to support anticipated purposeful multiactor interactions. These interactions that are taking place in preplanned tasks and phases of codesign events are used to foster cocreative emergence among fellow participants.

My contributions to this publication consisted of providing one of the cases as a basis for the study. I participated in data collection and data analysis, as well as structuring and writing several of the paper's paragraphs. During the publication process, I was involved in reviewing the publication content and its figure illustrations in close collaboration with the other two coauthors.

Publication 4: Shaping Physical, Social and Imaginary Spaces in Healthcare Design Labs

Romm, J., Agudelo, N., & Freitas, T. (2020). Shaping physical, social and imaginary spaces in healthcare design labs. *Artifact: Journal of Design Practice*, 7, 1–29.

The fourth publication focuses on how service design labs act as supportive spaces for service designers as they work inside the complexity of healthcare. The research identifies the supportive spatial dimensions of service design labs to be aligned with the conceptual framework of codesign space (Sanders & Westerlund, 2011), including the physical, social and imaginary supportive dimensions. Furthermore, the study highlights how these multiple supportive spatial dimensions are interlinked and affecting one another dynamically inside service design labs. The article further discusses how service design labs can be envisioned as a space of many spaces and how they can be linked to other codesign spaces. Finally, the capacities of service design labs as spaces that may support change in cultural patterns, meaning and social action—beyond specific projects and service value propositions and how this may create a long-term impact on the healthcare ecosystem—are discussed.

The publication was designed and initiated by me as its first author. While developing the publication, my role was to produce most of its writing. Further, I was engaged in data collection and analysis in collaboration with the other two coauthors. Besides this, I was engaged in developing its illustrations in close collaboration mainly with the third author. As the corresponding author, I was responsible for handling the review process and publication procedure.

1.7 Summary of contributions

The current research unpacks the emerging practices of healthcare service design when carried out inside embedded service design labs. The main contribution of the current research is that it adds a missing theoretical frame for service design labs by conceptualising them as meta-design spaces (Ehn, 2008; Fischer & Giaccardi, 2006), hence supporting design-for-service work (Wetter-Edman, 2014) inside complex service systems. Further, it helps in envisioning these supportive spaces as temporal entities, thus allowing for more direct and flexible applications of such arrangements in supporting service design work that aims to innovate and develop healthcare services. Furthermore, the current research delineates key considerations

for practitioners on how to make use of these labs as supportive spaces for service design practices in healthcare service systems. Finally, the trajectories and agendas for future research on similar temporal spaces supporting service design practice in complex settings are proposed and reflected upon.

Making both theoretical and practice-led knowledge explicit and accessible can support healthcare service designers in doing their jobs better, thus helping healthcare systems adapt to changes and harvest the full potential of innovations. It may also inform healthcare reformers about the theories and practices that are involved when seeking to integrate service design as a developmental capability (Malmberg & Wetter-Edman, 2016). Setting up and running embedded service design labs is an effort that demands focused stakeholder commitment, know-how and investments. A better understanding of how service design is practiced and may be supported by service design labs may provide a more informed basis that make all stakeholders better equipped to meet the need for change.

1.8 Outline of the thesis

This opening chapter is followed by six additional chapters and an appendix containing the four publications that make the basis of the current thesis. Below is a short summary of the remaining chapters.

Chapter two provides a background for the current research. It starts by providing an overview of the drivers of change that place pressure on Western healthcare systems, forcing them to adapt and innovate. Second, the characteristics of healthcare institutions as complex adaptive systems and the ways adaptations and innovation processes happen inside such bodies are described. Then, the field of service design and how service design is evolving to support healthcare change and innovation processes are addressed before moving into the difficulties that service design often faces while working within healthcare as a domain. At the end of the chapter, design labs are described as an emergent phenomenon supporting healthcare service design practices.

Chapter three describes the theoretical frame, methodologies and methods used as part of this research. It starts by framing the current research, here by taking a pragmatist philosophical stance. It then goes on to describe how and why narrative inquiry, action research and research by design were applied as methodologies for the current research and describes the context in which they were applied. Then, the chapter specifies the qualitative methods that were

used to generate, collect and analyse the data. Towards the end, ethical considerations and measures taken during this research are described, as well as critical reflections on my own position as a designer and researcher. Finally, the chapter evaluates the findings of the current research using validity and transferability as criteria.

Chapter four presents an overview of the empirical context of the current research. It begins by describing how embedded service design labs are envisioned and how the interventions were conducted during the research. It then portrays and explains each of the four interventions that were carried out during the study period. At the end, the chapter provides reflections on the effects that these interventions had on different participant groups.

Chapter five outlines the research findings. Initially, the findings related to the complexities faced by service designers working in healthcare are described. Then, the findings related to the ways service designers are facilitating fruitful interactions amid the complexities of healthcare are presented. Further, the findings that were uncovered with relation to the supportive spaces of embedded service design labs are explained. At the end of the chapter, links are made between the supportive service design lab spaces, the tensions faced by service designers working in healthcare and the facilitation practices service designers use to promote actor interactions. These links illustrate the overall findings related to the main research question.

Chapter six discusses the contributions and implications of this research. Based on the findings, the chapter first discusses its theoretical contributions. Then, the chapter offers practical guides for healthcare reformers and service designers who may be interested in making use of temporal embedded service design labs, helping healthcare systems adapt to change and harvest innovative potential. Towards the end, the chapter addresses the limitations and benefits of the study, finishing by providing suggestions for future research.

Chapter seven concludes the current research by offering third-, second- and first-person reflections on healthcare service design and embedded service design labs. These reflections consist of both the envisioned lines of thought feeding forward ideas and opening questions about the future of healthcare service design practices and how they may be supported by embedded service design labs inside healthcare systems.

2

BACKGROUND

The following chapter provides a backdrop to position and justify the current research. It starts with a brief overview of the major drivers of change that pressure the Western healthcare system to adapt and innovate. It then describes the characteristics of large healthcare institutions as complex adaptive systems (CASs) before going on to describe how adaptation and innovation processes happen inside such bodies. Afterwards, it describes service design as an evolving field and how it has been engaged to support change and innovation in healthcare. Then, it highlights the difficulties that service design practices face when working with healthcare service development. Towards the end, the chapter describes the recent and rising growth of using design labs to support service design practices in the public sector in general and, more specifically, in healthcare. Finally, arguments for why we need more practice-oriented knowledge about healthcare service design and service design labs in healthcare are provided.

2.1 The changing landscape of healthcare

Healthcare is a critical societal infrastructure and has been a main concern for humans throughout history (Magner, 2005). Healthcare advancements and achievements have made great progress over the past two centuries,

particularly during the past 60 years, in most countries around the globe (Rust, 2017). However, these developments have also come with heavy investments and increasing national healthcare spending over the past three decades. For many OECD countries, these rising healthcare costs are greater than the relative overall national economy growth, meaning that they are economically unsustainable (OECD, 2018; OECD & European Union, 2020; Proksch et al., 2019). Given the causes of these imbalances, future adaptations towards more economically sustainable healthcare systems are needed. These changes demand radically new ways of thinking and acting, forcing all involved institutions to broaden their understanding of the system as a whole, and its interlinked parts (World Economic Forum, 2013). According to the OECD, meeting these challenges will require that the European healthcare systems become more proactive and preventive, more people centric and efficient in ways of delivering care services and, when appropriate, increase access to care for citizens of all kinds. Further, the health systems in Europe need to become more resilient by increasing their abilities to adapt to rapid changes of societal and people's needs and to a changing environment (OECD, 2018). However, macro-economic sustainability is not a main focus of the current research; therefore, the demands to work smarter and more efficiently and the need for shifting perspectives to gain socioeconomic gains acted as a macro-context for this research.

2.1.1 Healthcare trends and anticipated future developments

Apart from socioeconomic challenges, several other large drivers of change are pressuring the Western healthcare sector. A recent example of one such pressure is the outbreak of the COVID-19 pandemic, that, since December 2019, has been spreading and stretching healthcare systems globally, forcing them to adapt and change. Besides such unexpected drivers of change, there are several other strong drivers that have been known for a while. A foresight study from the World Economic Forum and MacKinsey & Company (2013), identifies and analyses the healthcare megatrends from five different countries (China, Germany, Netherlands, Spain and the UK). The report points towards a gap between increasing public demands and a pressured healthcare supply. Three main global thematic drivers of change within healthcare are summarised as follows: 1) new technology making data and information more accessible, 2) creating innovative and better healthcare service delivery systems and 3) the proactive promotion of healthy culture and health-supportive infrastructures (World Economic Forum, 2013). Taking action towards jointly reducing the variations in healthcare and well-being, strengthening the digitalisation of health management and improving the

health system resilience and preparedness for responding to changes are highlighted as important strategies forward (OECD & European Union, 2020; World Health Organization - Europe, 2019). All of these tendencies underline the need for ongoing adaptation and innovation in the healthcare sector.

2.1.2 People centricity catalysing change

In a comparison between the healthcare systems in Denmark, Norway and Sweden, Magnussen (2009) describes the changes that the Scandinavian healthcare systems have gone through during the past few decades. External pressures alongside internal factors have introduced changes such as increased freedom of choice for citizens and a rise in patient's expectations of service quality and ways of delivery. These high expectations are driven by a specialisation in the healthcare services, including advancements in diagnostics and treatments and the increased integration of information and communication technologies (ICT). Access to information affect treatment approaches, causing patients to take a more active part in their own treatment while interacting with healthcare providers. 'Patients today are conscious and demanding consumers – not simply recipients of healthcare' (Magnussen, 2009, p. 64). These circumstances affect today's healthcare systems, shifting their attention towards becoming more people centric.

For the past two decades, people centricity in healthcare has been a main subject on the political agenda. For example, the National Health Service (NHS) Improvement Plan which was launched by the UK Department of Health in 2004, stressed the need for moving the approach of healthcare provision from 'a service that does things to and for its patients to one which is patient-led, where the service works with patients to support them with their health needs' (NHS Department of Health, 2005, p. 4). Ten years later, the World Health Organization (WHO) launched a global strategy for the years 2016–2026 with the vision to place people and communities at the centre of all health services (World Health Organization, 2015). In 2014, the Norwegian Ministry of Health launched a political campaign that translates into 'The Patient's Healthcare Service' (The Norwegian Ministry of Health and Care Services, 2016). The policy addresses the patient's freedom of choice, the lowering of the waiting time for treatment, more effective diagnostic processes and the establishment of cohesive treatment packages, the regional strengthening of mental healthcare services, the sectorial plans for meeting demographic changes and the increased quality and safety of treatments. Further, the white paper launches a national commitment to integrate ICT into all levels of the healthcare system. The push toward patient-centric healthcare services is an important part of the context of

this research, opening up for new and more inclusive approaches towards healthcare service development.

2.1.3 Technological advancements and innovations in healthcare

Technological advancements are a major factor that can introduce change and potential disruptive innovations into the healthcare system. Rapid technological developments that are both directly related to diagnostics and treatments but also technologies that are more broadly related to digital handling of information and communications hold the potential to radically change and improve the ways health services are provided (Frist, 2014; Jones, 2013; Proksch et al., 2019). For example, biotechnologies and nanotechnologies may offer the possibilities to deliver proactive personalised medical care (Collins & Varmus, 2015). Another example is biomonitoring and ICT technologies, which make it possible to monitor and provide treatments remotely and design entirely new care models (Rubel et al., 2005). Although technological developments were not in themselves a central focus of the current research, they have provided a backdrop for some of the explorations that were carried out as part of the specific interventions in the current study.

2.1.4 A growing elderly population

Another strong driver of change is the demographically unbalanced growth of the elderly population that will take place during the period 2020–2035 in Scandinavia and elsewhere (Schultz et al., 2016). The growing elderly population challenges the healthcare system to develop new approaches and innovate elderly care services. These developments pose a particular challenge to a number of healthcare services for the elderly, such as nursing homes, home care services, geriatrics and palliative care, as highlighted by a Norwegian governmental white paper (Morgendagens omsorg - Meld. St. 29 (2012–2013), 2013). Further, the paper highlights that in the future, elderly health seekers must become more involved in managing their own health and care. Caregivers such as relatives and friends might be engaged to support and lower the pressure on institutions. Private providers and NGOs will most likely also play an important role in the delivery of services to meet the rising demands and expected standards of healthcare services for elderly people. To succeed in adapting to these circumstances, the healthcare system needs to increase the quality of care for elderly, support a better working environment for the actors involved and incorporate societal approaches to ensure the efficiency of new and coherent healthcare services for

elderly people (Schultz et al., 2015). The growth of elderly populations in Norway provides a contextual background for one of the interventions carried out during the present research.

2.2 Healthcare improvement and innovation efforts

As a response to these pressures and opportunities, healthcare improvements and innovations are becoming a growing priority to advance treatments, develop new structures and transform healthcare delivery processes (Snyder et al., 2016). The Oslo Manual, which was published by the OECD and the European Commission's Directorate-General for Statistics (Eurostat), provides guidelines for innovation data and serves as a platform for experimentation and research on innovation. According to the Oslo Manual, the concept of innovation incorporates knowledge as fundamental for novel value creation or preservation as a presumed goal. Further, an innovation signifies both the activities and their outcomes are made available and put into use. The manual defines innovation as 'a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)' (OECD/Eurostat, 2018, p. 20). Hence, to a certain degree, all innovations include novelty. Minor or incremental innovations are the most frequent, including innovative applications and improvements of already existing processes or products (Eurostat & OECD, 2005). More disruptive or radical innovations are defined as the 'application of significantly new concepts or technologies that were previously nonexistent or that require dramatic behavioural changes' (McDermott & O'Connor, 2002, p. 424). The aim of the current research is to explore new ways that may support both improving and innovating healthcare services through the use of service design capabilities supported by embedded service design labs inside healthcare systems.

2.2.1 The need for advancing healthcare quality improvement

Related to incremental change, over the past 30 years, healthcare quality improvement has been promoted as a problem-solving approach (NHS Department of Health, 2005). Focusing on increasing care quality and safety for patients, such improvement efforts may include both top-down policies and incentives, along with bottom-up initiatives and practices, mostly through clinical audits focused on efficiency issues (Stewart et al., 2016).

The practice of quality improvement is based on techniques that combine testing and the measurement of changes adapted from popular industrial efficiency processes such as Six Sigma and Lean[1]. Despite this continuous attention, the evidence for the paybacks of quality improvement is mixed and lacks rigour (Dixon-Woods, 2019). To resolve this matter, quality improvement practice needs to be further developed and researched to 'improve improvement, and thinking beyond effectiveness when considering the study and practice of improvement' (Dixon-Woods, 2019, p. 1). Healthcare quality improvement has provided the overall motivation for the present research.

2.2.2 Cocreation processes supporting radical healthcare service innovation

Radical healthcare innovations are typically introduced through technological and medical advancements (Rust, 2017). However, during the last decade, the focus on radical healthcare innovation has expanded towards also attending to service innovation (Snyder et al., 2016). According to Samuelsson et al. (2019), radical healthcare service innovation may be applied in three ways: 1) Internally, being significantly valued by the healthcare provider; 2) externally, such as in creating new value for patients; and 3) impactful innovations that both the care provider and the patients value. Although radical innovations may have a greater impact, it is important to note that over time, several incremental value-adding changes may create large effects. Further, incremental healthcare improvements are important in relation to more radical innovations because radical innovations will most likely need to be followed up by incremental adjustments and improvements (Samuelsson et al., 2019). Changing the value creation process is seen as central in service development—a process that may lead to radical innovations (Ostrom et al., 2010). In such processes, the integration of new resources and competencies into the value cocreation process can transform a complex service (Vargo & Lusch, 2008). The premise that value is always cocreated is linked to efforts related to coproduction, where citizens and other actors are more explicitly engaged in the value cocreation process. Such collaborative healthcare service innovation processes serve as an overall developmental approach of the current research.

1 **Six Sigma** contains a set of process improvement tools and techniques introduced by American telecommunications company Motorola. Six Sigma strategies seek to identify and remove the causes behind defects to improve the quality output of a process. **Lean** manufacturing is a production efficiency method introduced by the Japanese automotive manufacturer Toyota. Lean focuses on minimizing waste and eliminating inefficiencies in a production flow through continuous improvements.

2.2.3 Coproduction of care as an approach for improving healthcare services

The term coproduction is related to public service development and delivery, which is based on the idea that 'inputs used to produce a good or service are contributed by individuals who are not 'in' the same organization' (Ostrom, 1996, p. 1073). Coproduction in healthcare is described as an approach where actors such as patients and others take part through direct interactions with care providers in different levels of service development and delivery (Batalden et al., 2015). Such interactions include the processes of service cocommissioning, service codesign, joint delivery of healthcare services and collaborative monitoring and evaluations of care services (Loeffler et al., 2013). Coproduction of healthcare is viewed as a 'dynamic, experimental, and reflective process sustained by different forms of engagement, interactions, and social relations and that may generate, in turn, new forms of care other than healthcare (e.g., inclusive relationships, solidarity), values beyond economic value (e.g., equity, justice), and new insights and research practices that are relevant to different disciplines and practices (e.g., community participation, patient advocacy, collaborative research)' (Filipe et al., 2017, p. 5). Coproduced healthcare services through better-balanced and closer collaborations between healthcare providers, patients and other actors can improve the service quality, create better treatment outcomes, increase the efficiency of service delivery and improve the working conditions of care providers (Loeffler et al., 2013). Coproduction values service codesign, which is a central part of service design practices (Miettinen, 2009; Sanders & Stappers, 2008) and of this research.

2.2.4 The need for new service development approaches in complex healthcare settings

Despite the needs for change in the healthcare system and the ongoing efforts of improvement and innovation, the adoption and diffusion of innovations and managing change in the healthcare context is particularly difficult and slow. One main reason for this is the complexities that are involved in healthcare settings (Braithwaite et al., 2017; Jones, 2013). 'No other system is more complex: not banking, education, manufacturing, or the military. No other industry or sector has the equivalent range and breadth—such intricate funding models, the multiple moving parts, the complicated clients with diverse needs, and so many options and interventions for any one person's needs' (Braithwaite, 2018, p. 1). The complexities of healthcare create a situation where problems are hard to define, resolutions are difficult to make and keep, and the upscaling of innovations is particularly challenging. These circumstances

call for developing new standards of research, generative learning and adaptations to contexts that are dynamically changing (Greenhalgh & Papoutsi, 2018). There is a pressing need for bringing forward new approaches to healthcare service development that can deal with these inherent circumstantial complexities.

2.3 Transformation and design in complex adaptive systems

To provide a contextual understanding of where the present research is positioned, this section describes the complex character of healthcare institutions, the nature of problems that are manifested in such settings and the theories addressing change processes in complex systems. Healthcare institutions, such as hospitals, are increasingly conceived of as CASs (Begun et al., 2003; Braithwaite et al., 2017; Jones, 2013). In contrast to earlier conceptions, where healthcare systems were viewed as machines containing parts designed to control and process inputs and produce outcomes (Morgan, 1997), CASs are viewed metaphorically as living organic and networked ecosystems; they are perceived as a mesh of more or less autonomous subsystems that are dynamically linked to each other, with the capabilities to learn and respond to pressures and for utilising opportunities (Begun et al., 2003). CASs are characterised as unclearly bordered, containing a variety of dynamic nonlinear and interrelated causal factors, where, for example, small differences in the initial variables in one part of the system may lead to huge outcome differences in another (Plsek & Greenhalgh, 2001). External pressures on CASs may trigger uncertainties, leading to unexpected reactions and cause ripple effects (Plsek & Greenhalgh, 2001). However, the capability of CASs to change and respond is also recognised as what makes them resilient. Adaptability is described as the systemic capacity to change as a response to pressures and incentives (Holland, 1995). Adaptations inside CASs are obtained through the identification of rewarding positive uses of existing rules and mechanisms and through the development of new rules and mechanisms by generating plausible future projections (Holland, 1992). Exploring supportive mechanisms and service design practice that promote adaptation processes through anticipated future projections in complex healthcare systems has provided the general motivation for the current research.

2.3.1 Transformative interactions addressing wicked problems

The wicked nature of problems that typically arise in such complex settings are making developmental efforts extra challenging (Carstensen & Bason, 2012; Jones, 2013; Tsekleves & Cooper, 2017a). Related to matters of

development and planning in complex settings, wicked problems (Rittel & Webber, 1973) are described as a 'class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing' (Churchman, 1967, pp. B–141). In healthcare settings, such high levels of nonlinear uncertainties are manifested as inherent in many improvement and innovation endeavours. Innovations and transformations inside CASs are typically emergent in character, meaning that the higher-order novelties inside the system are developed through interactions and exchanges among actors from the lower-order parts of the system (Lichtenstein, 2014). To deal with these uncertainties, using relationship-based approaches in development efforts are suggested as being the most effective, which can be done by recognising and leveraging the relationships among actors (Leykum et al., 2014). Such transformative adaptative interactions may promote new actor behaviour, cause a change in the norms, create new systemic patterns and shape the structure in CASs (Khan et al., 2018). In the context of healthcare systems, these actors may be associated with several subsystem networks.

Subnetworks inside CASs, such as in healthcare, are commonly affected by a 'silo mentality'—a term that describes the different mindsets of individuals in subgroups—causing organisational divides (Fenwick et al., 2009; Kaufman et al., 2014). These devising mindsets are often manifested as communication barriers that lead to disadvantageous and disjointed ways of working (Fenwick et al., 2009). Bridging across silos inside CASs through interactions may create or reinforce ties among actors (Granovetter, 1973), increasing the odds of the emergence of new behaviours and structures that can lead to adaptations and desired innovations. Such interactions across silos may take place as part of structured arrangements, occur through collaboration or happen because of self-organised interactions (Rouse, 2008). Hence, both self-organised and prearranged actor interactions can stimulate innovation and adaptation processes inside complex adaptive healthcare systems. Apart from the actors that represent the different parts of the internal healthcare delivery system directly, there are other actors that may represent valuable resources from other parts of the larger ecosystem. Such actors may inform and add valuable perspectives in the adaptation and innovation processes in healthcare settings. In service codesign processes, the patients and their supportive caregivers are such actors. Others could, for example, be industrial partners developing useful technologies, civil servants, policy makers, people working with communications, researchers adding new knowledge and so on. Prearranged multiactor interactions as a means to

stimulate innovation and adaptation processes inside complex healthcare systems has helped provide an overall approach for this research.

2.3.2 Resource integration and value cocreation in service systems

Increasingly the understanding of service is informed by CAS and systems theory. In service marketing theory, these collaborative developmental processes are framed as resource integration—processes where micro-specialised competences are adapted and transformed into complex service exchanges (Vargo & Lusch, 2008). Such processes happen between 'a set of unique actors with unique reciprocal links among them' (Chandler & Vargo, 2011, p. 40) on the micro, meso and macro levels that jointly constitute a service ecosystem. On the micro level, interactions between actors that affect each other directly are taking place. On the meso level, value cocreation happens between actors that are indirectly affecting one another. Finally, on the macro level, the synergies of both direct and indirect value exchange take place between networks. Hence, service innovation becomes open and is carried out by value networks and actors that cocreate value by shaping new codesigned service offerings and value exchanges through the technology and institutions inside service ecosystems (Lusch, Vargo, & Tanniru, 2010). Increasingly, design theory is preoccupied with the value cocreation processes inside complex domains through a process of codesign that promotes the integration of resources.

2.3.3 Developments in design theory dealing with complexity

Over the past three decades, industrial design, interaction design and participatory design theorists have been concerned with the expansions of design into more complex domains and how to deal with them. For example, expanding on industrial design, Buchanan (1992) identifies the extensions of the societal effects of design in four main areas: the first area is the area of symbolic and visual communications, the second area is within the design of material objects, the third area is the design of activities and organised services, and the fourth area is the design of complex systems or environments for living. These conceptions have been further developed into the four orders of design (Buchanan, 2010, 2015) and the 1.0, 2.0, 3.0 and 4.0 design domains (Barroso & van Patter, 2015; Jones, 2014; Jones & van Patter, 2009). In interaction design, a meta-design framework for open-ended collaborative designing in computational settings has been developed (Fischer & Giaccardi, 2006), which consists of three levels: 1) designing design—defining the design approach focusing on structures and processes; 2) designing together—the codesign activities, both during development

and in use; and 3) designing the 'in-between'—supporting social networks to shape new networks and trigger structural change. Another similar example comes from participatory design, where the expansions of design processes into complex domains are described as challenging their supportive infrastructures and the staging processes needed for the proper inclusion of participants (Bjögvinsson et al., 2012; Ehn, 2008). Furthermore, in the field of social design, Manzini (2014) promotes a collaborative and plural attitude of design for the social good by facilitating acts of place-making and cultural activism through codesign. All of these contributions show a movement within design theory toward acknowledging greater levels of complexity.

The current research adopts a view of healthcare institutions as CASs. Further, in line with service design, which blends several theories as a basis for its practice (Joly et al., 2019; Yu, 2020), the current research draws on the compatible conceptions provided from systems theory, service-dominant logic and the developments in design theory addressing change and innovation processes inside complex systems. This blend of theories helped to inform this practice-led research from various theoretical perspectives. Systems theory provided a perspective on the characteristics of large healthcare organisations and the way they adapt and develop. Service-dominant logic, stemming from service marketing theory, provided a perspective on service descriptors as well as new service development phenomena. Design theory provided an understanding of contemporary movements and challenges in design as a field while it expands into new domains. These theories served as a set of compatible scaffolds supporting the empirical explorations of the current research—explorations on how to use service design as an approach and the ways service design may be supported to promote and inspire adaptations and innovations taking place inside complex healthcare service systems.

2.4 Service design

Over the past 50 years, service design has developed from several knowledge domains, such as service theory, marketing, operations management, design theory and interaction design, and it is still evolving (Blomkvist et al., 2010; Joly et al., 2019; Moritz, 2005; Wetter-Edman, 2011). Stemming from research during the 1970s (Shostack, 1982, 1984) and commercialised during the beginning of the new millennium, service design is now broadly recognised as a practice within the design community, as a research field itself and inside the service sector specifically (Sangiorgi, 2009).

2.4.1 Service design purpose, focus and practice

Service design combines analytical and creative design methods and approaches to support the innovation of service provision (Blomkvist et al., 2010; Joly et al., 2019; Segelström, 2010; Wetter-Edman, 2011). In the Design Dictionary, edited by Michael Erlhoff and Timothy Marshall (2008), Brigit Mager defines service design as follows: 'Service design addresses the functionality and form of services from the perspective of clients. It aims to ensure that service interfaces are useful, usable, and desirable from the client's point of view and effective, efficient, and distinctive from the supplier's point of view' (Erlhoff & Marshall 2008, p. 355). This description highlights the combined attention of perspectives that are integrated in service design as an approach and practice. First, service design attends to the front stage, where service users exchange value with service providers over time, as mediated through numerous service touchpoints (Clatworthy, 2011). Here, ensuring good and coherent user experiences and managing expectations is the main focus (Buchenau & Fulton Suri, 2000; Chase, 2004; Moggridge, 2007). Second, is the attention to the backstage of service provision, where different institutional arrangements create the basis for offerings and upholding service touchpoints (Junginger & Sangiorgi, 2009; Kurtmollaiev et al., 2018). According to Mager, the role of the service designer is to 'visualize, formulate, and choreograph solutions to problems that do not necessarily exist today; they observe and interpret requirements and behavioural patterns and transform them into possible future services. This process applies explorative, generative, and evaluative design approaches, and the restructuring of existing services is as much a challenge in service design as the development of innovative new services' (Erlhoff & Marshall 2008, p. 355).

Six commonly understood characteristics of service design practice are highlighted in popular literature (Stickdorn et al., 2018). First, service design is characterised as user experience oriented, here focusing on meeting user needs and desires through service touchpoint encounters that happen over time (Clatworthy, 2011, 2013). Second, service design is holistic—it is concerned with the service system as a whole, the service flows that typically play out in a certain context and with its parts—the specific service touchpoints and their value exchanges (Bitner et al., 2008; Clatworthy, 2011). Third, service design is cocreated through facilitated collaborations involving multiple actors (Miettinen, 2009; Sanders & Stappers, 2008). Fourth, service design is characterised by being alert to value—it is concerned with the propositions of service offerings that include value creation and value exchange as service outcomes (Patrício et al., 2018; Yu & Sangiorgi, 2018).

Fifth, service design is typified using representations to mediate service proposals—including visual and physical representations and enactments to investigate ideas, resolve problems and communicate service resolutions (Blomkvist, 2014; Buxton, 2007). Sixth, service designing is iterative—it uses a repetitious and flexible process to explore a subject matter, develop propositions, conduct trials and support implementations (Akama & Prendiville, 2013). In line with these characteristics, Wetter-Edman (2011) highlights the interdisciplinary character of service design, how service design is practiced through participatory processes and by using visualisation and prototyping techniques and that service design attends to transformation and value creation.

The literature emphasises the repeated divergent and convergent thinking patterns that are used as a part of practicing service design iterations when going through the typical design phases of exploring a variety of possibilities, which is followed by prioritising specific directions for further developments (Design Council, 2007; Stickdorn & Schneider, 2011). Further, the practice of service design involves supporting multiphased processes that typically include the following activities: research through fieldwork explorations using ethnographic techniques (Segelström et al., 2009), the orchestration of codesign events and workshops with a variety of actors (Miettinen, 2009; Sanders, 2020), visual sensemaking activities from multiple data sources (Jones & van Patter, 2009; Kolko, 2010), responding to circumstances by representing possible future configurations of service value propositions (Blomkvist & Holmlid, 2010), developing roadmaps and plans (Almqvist, 2020) and conducting trials, pilots and evaluations to support agile implementation processes (Polaine et al., 2013; Shaw et al., 2018).

2.4.2 Service-dominant logic and its influences on service design

Service-dominant logic (S-D logic) is an emerging and evolving school of thought stemming from marketing theory; it has gained momentum over the past 15 years (Vargo & Lusch, 2004, 2006, 2008). As opposed to regarding goods and products as the basis for value exchange, S-D logic holds that services are the fundamental basis of all value exchange (Vargo & Lusch, 2004). Vargo and Lusch (2004, p. 2) define a service ‘as the application of specialised competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself’. S-D logic is based on five axioms suggesting that: 1) ‘service is the fundamental basis of exchange’; 2) ‘value is co-created by multiple actors, always including the beneficiary’; 3) ‘all social and economic actors are resource

integrators'; 4) 'value is always uniquely and phenomenologically determined by the beneficiary; and 5) 'value co-creation is coordinated through actor-generated institutions and institutional arrangements' (Vargo & Lusch, 2016, p. 47). As mentioned earlier in this chapter (see section 2.3.2), S-D logic denotes three levels of abstraction and aggregation of service contexts with a macro, meso and micro focus (Vargo & Lusch, 2016). Further, zooming in and out on these levels is essential for understanding a phenomena at any level (Chandler & Vargo, 2011). To date, S-D logic has been mostly concerned with metatheoretical development, so there is a need to substantiate midrange theory and bridge theory and practice (Vargo & Lusch, 2016). Over the past decade, service design scholars have worked to develop such midrange theories and practices (e.g., Alves da Motta-Filho, 2017; Blomkvist et al., 2011; Wetter-Edman, 2014; Wetter-Edman et al., 2017; Wetter-Edman, 2009). Influenced by S-D logic, service design has expanded its focus on working with resource integration across organisational boundaries inside complex service systems (Sangiorgi et al., 2017; Vink et al., 2020).

2.4.3 Service design as an evolving concept and practice

In line with the acknowledged importance of resource integration and the interlinked character of the different levels of service contexts in S-D logic, an expanded understanding of this theoretical approach has been developed in service design theory. These developments include expanding the field from focusing only on the design of services as a subject matter in new service development processes (Mager, 2009; Shostack, 1982) towards also designing for service, supporting the continuity of service development and value creation processes (Kimbell, 2011; Meroni & Sangiorgi, 2011; Wetter-Edman, 2014). Further, recent expansions suggest including a specific focus on service ecosystem design (Sangiorgi et al., 2017; Vink, 2019; Vink et al., 2020), having service design focus on 'the intentional shaping of institutional arrangements and their physical enactments by actor collectives through reflexivity and reformation to facilitate the emergence of desired value cocreation forms' (Vink et al., 2020, p. 2). Figure 2 shows the extended conceptual building blocks of service design through a service ecosystem design perspective, as proposed by Vink et al. (2020, p. 6).

These new conceptions and theories affect service design practice in complex settings, such as in healthcare, in several ways, including expanding the purpose of the practice, its approach towards process, the scope of the materials that are used and the multitude of actor involvement that needed to be included. Several practice-related challenges can arise because as a field,

service design is moving into more challenging domains, such as supporting healthcare transformations (Mager, Nisbett, et al., 2016; Sangiorgi, 2015). These developments affect service design practice by acknowledging that service design efforts are situated inside larger reformation contexts. Derived from S-D logic, Vink et al. (2020) propose that in the context of service ecosystems, the outcomes are only partly controllable and the value that is created through the physical enactments of new services is enabled or constrained by hidden institutional arrangements. Further, the collaborative

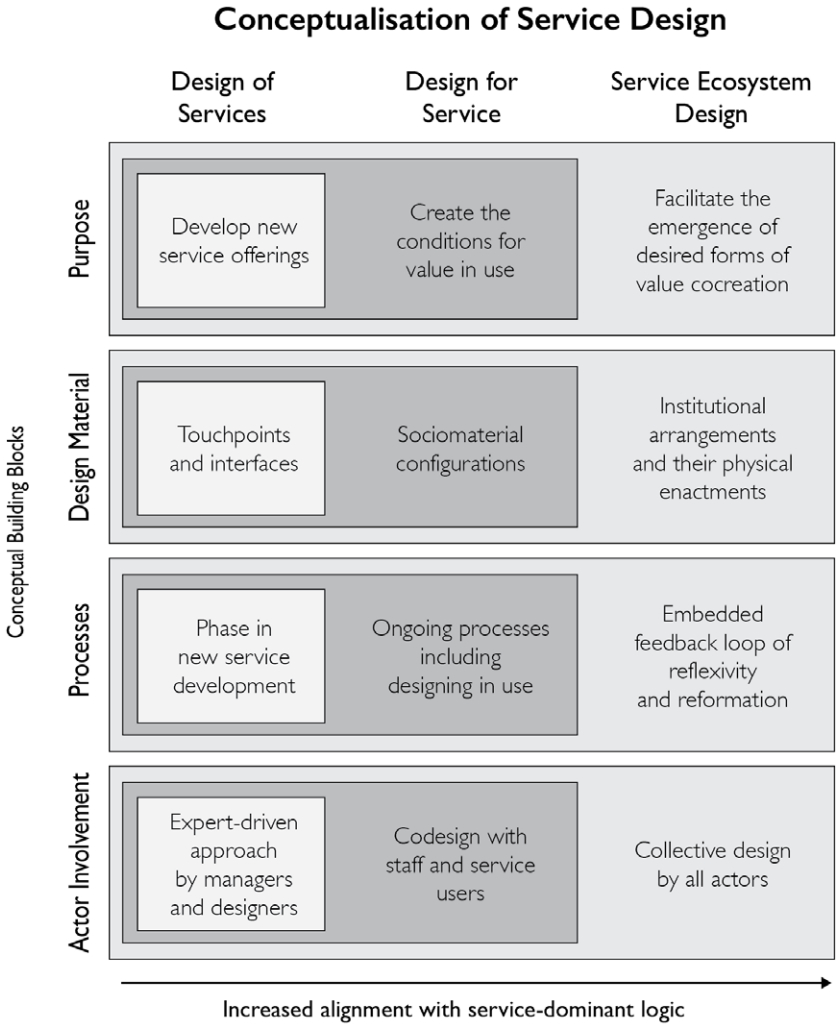


Figure 2: The extension of the conceptual building blocks of service design through the perspective of service ecosystem design (adapted from Vink et al., 2020, p. 6).

effort of transforming institutional arrangements depends on the embedded reflexive feedback loops and interactions with and between other design or nondesign processes that may be aligned or conflicting with the systemic service design endeavour (Vink et al., 2020).

These evolvements in theory have several practical implications for service designers working to support deeper systemic changes. For example, when practicing systemic service design, besides merely focusing on bringing forward service value propositions, the objective shifts towards including the shaping of value relations and supporting reflexive feedback loops '[…] within a socio-material configuration involving diverse actors including people, technologies and artifacts' (Kimbell, 2011, p. 41). Such relationships create social infrastructures that enable service providers to continuously and creatively support each other (van der Bijl-Brouwer, 2017). Further, when designing services with the intention of creating impacts on service systems, making use of service design materials is broadened. Apart from the more conventional service design materials that are typically used, such as shaping service flows and touchpoints alongside process tools (Blomkvist, 2014; Blomkvist et al., 2016; Clatworthy, 2011), more abstract service design materials are added, such as social structures (Vink et al., 2020). Furthermore, the role of service designers will change, from acting mainly as a design experts towards taking the role of process facilitators of multiactor codesign processes (Body et al., 2010; Sanders, 2020; Tan, 2012).

Currently, there is limited in-depth knowledge about the practices involved when applying a service ecosystem design perspective. 'There is a need to develop hands-on approaches that enable actors to work together more intentionally within complexity and grapple with the influence of institutional arrangements' (Vink et al., 2020, p. 14). Further, given the scale of the challenges that healthcare systems are faced with and their inherent contextual complexities, there is a need to explore how to support service design practitioners in influencing healthcare systems more broadly so that their efforts may become more impactful.

2.5 Service design in healthcare

Following the developments of Western healthcare, design has developed a tradition of supporting the healthcare sector. Architectural healthcare design, the design of medical instruments and the design of communications and

pharmaceutical products marked the start of this tradition (Rust, 2017). Today, the intersection of design and healthcare also includes service and behavioural design, here covering a range of healthcare domains such as public health, acute health, chronic health and elderly care (Tsekleves & Cooper, 2017a). Service design is increasingly used as an approach in the context of healthcare service improvement and innovation. In 2016, a global survey conducted by the Service Design Network (SDN) shows that healthcare service design counts for the largest volume of projects in the public sector (Mager, Nisbett, et al., 2016, p. 13). A follow-up global impact survey by SDN shows that 54 % of the total of about 680 service design projects that were analysed were directed towards improving existing care and treatment service experiences, while 47 % of the projects had the aim of developing new care service offerings (Mager et al., 2017, p. 8). Based on an international survey, Figure 3 shows an overview of the types of healthcare services that used service design as an approach and practice:

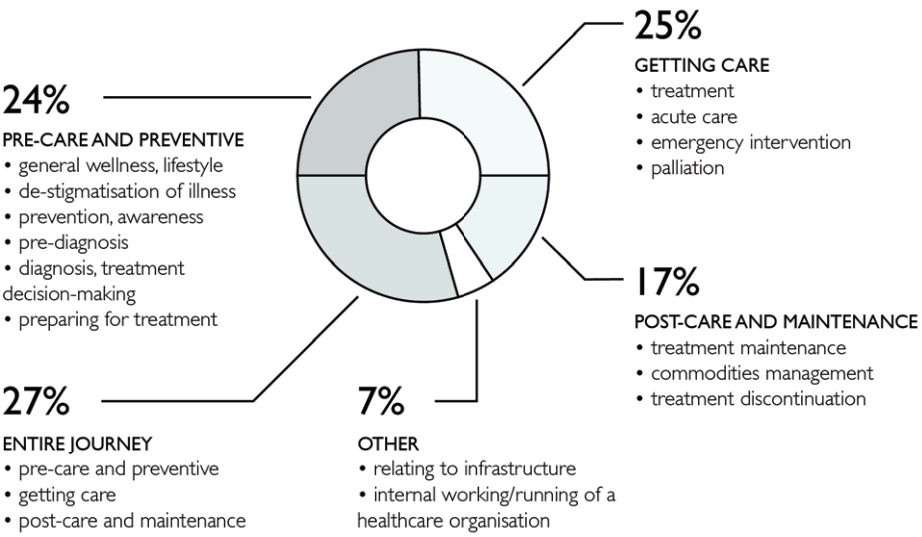


Figure 3: The distribution of healthcare service design projects in the healthcare sector (adapted from Mager et al., 2017, p. 7).

Service design practice facilitates a range of action-oriented approaches that are specifically appropriate in the context of healthcare; this practice may supplement the dominant top-down, evidence-based and protocoled approaches in healthcare with situated, in-depth and experience-based bottom-up understandings derived from actor involvements (Carr et al., 2011). Service design in healthcare supports decision-making and

sensemaking processes, as well as helping spark institutional change (Patrício et al., 2019). Service design holds the potential to significantly contribute to the future of healthcare, including working with the integration of technology into care services and by supporting the development of person-centric healthcare services, preventive care services, self-care/health management services and community-oriented services of care (Cottam & Leadbeater, 2004; Tsekleves & Cooper, 2017b).

However, the complexities involved in the healthcare sector and wicked nature of problems that are nested in such settings challenges service design practice (Freire & Sangiorgi, 2010; Jones, 2013). Structural changes are difficult to make because of the slow processes of institutional rearrangements (Oliveira et al., 2005), and healthcare hierarchies with strong organisational cultures that are rooted in rigorous norms and routines hamper developmental efforts (Wang et al., 2015). These circumstantial challenges cause numerous service design proposals to become stranded before being implemented (Almqvist, 2020; Overkamp, 2019). All these challenges point towards the need for developing supportive structures when using service design in the context of healthcare. Further, besides these overall challenges, there are several particular challenges found at the intersection of healthcare and service design.

2.5.1 Differences in approaching and recognising knowledge

Integrating service design into healthcare affords the bridging across different fundamental understandings and traditions of what is ‘evidence’ and what is valid ‘knowledge’ (Macdonald & Robert, 2014). These divides include different paradigmatic standpoints and methodologies of knowledge production, methods and ways of assessing the validity of knowledge. Tensions may arise between the dominance of quantitative randomised controlled trials as the gold standard of ‘evidence’ in healthcare to measure the effects of new treatments and innovations and the more experienced-based qualitative social science approaches of service design practice (Boström et al., 2021; Carr et al., 2011). These gaps are also problematised as a part of healthcare development and quality improvement work more broadly as an important factor that challenges healthcare institutions to develop—and sustain—people-centred high-quality services (Anjum et al., 2020; Bate et al., 2008). There is a growing understanding that healthcare may benefit from using experience-based approaches from service design and, vice versa, that healthcare service design may benefit from integrating evidence-based medicine approaches to create synergies (Carr et al., 2011; Carr et al., 2009; Macdonald & Robert, 2014; Malmberg et al., 2019).

From a practical perspective, these divides may force healthcare service design practitioners to explain or demonstrate how they work and why these approaches may be of value while also defending the validity and transferability of qualitative experience-based data. At the same time, these differences also challenge healthcare service design practitioners to understand, critically assess and work through integrating evidence-based medical approaches into their generative work.

2.5.2 Participation challenges

When using a codesign approach as part of healthcare service design in the complexities of healthcare, ensuring proper participation becomes critical. In complex settings, participant inclusion strategies are difficult to choose among when it comes to achieving a required variety of representatives across systemic subdivides and in a way that signifies a plurality of attitudes (Jones, 2018b, 2018a). This emphasises the particular importance of staging for participation in healthcare settings, or 'the considerations of conditions that enable proper and legitimate user participation' (Björgvinsson et al., 2012, p. 103). Besides figuring out whom to include and when, there are a number of other more practical participation challenges that are manifested in the context of healthcare (Pirinen, 2016). First concerns the inclusion of patients. The patient's health condition may pose a challenge to participation alongside the strict ethical standards and rules regarding privacy and confidentiality in healthcare settings. Second, there are challenges when involving staff and leadership that may arise in healthcare, especially if the same participants need to take part in several events because of the often pressured capacities of staff, their shift-based work and the need for securing vacancies to accommodate for the absence of frontline staff (Groeneveld et al., 2018; Pirinen, 2016). Further, a variety of participant perspectives may create tension and expose the contradictions that are important, though challenging, to handle during service design processes (Donetto et al., 2015).

2.5.3 Lack of suitable infrastructures

Service designers are extensively using representations and prototypes as an integral part of the design process (Blomkvist, 2014). Often, to create such representations, designers need access to resources and facilities. These may include accessing shared digital files, cloud-based software and online resources that can enable the production of high-quality visualisations and presentations. Further, to be able to produce process tools and prototypes, service designers depend on having access to facilities for printing and producing quick mock-ups and other supportive artefacts. One central aspect of building design capacity in

the public sector includes the structures and facilities that enable design practice (Malmberg, 2017). Many healthcare organisations lack access to appropriate design facilities, such as access to high-quality printers and suitable spaces for facilitating larger codesign events and workshops.

2.5.4 The challenges of integrating service design capability

Integrating service design capabilities into the healthcare sector implies that service design approaches and methods need to be acquired, assimilated and exploited (Malmberg, 2017; Malmberg & Wetter-Edman, 2016). According to Malmberg (2017), building design capabilities in the public sector consists of building awareness and knowledge about design, getting access to design resources and embedding the structures that enable design practice (Figure 4).

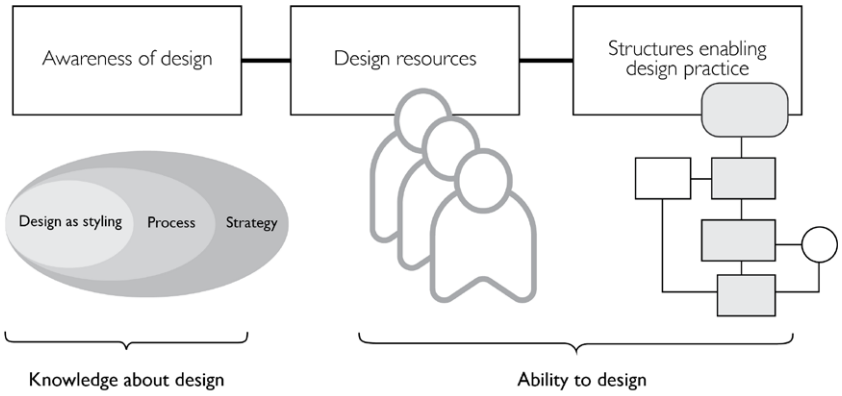


Figure 4: The understanding of what building design capability in the public sector implies (adapted from Malmberg, 2017, p. 205).

The use of service design in healthcare has mostly been realised through the procurements of service design consultants and through collaborations carried out as part of research (Sangiorgi et al., 2014). However, the use of service design consultants has been questioned as a model for working in the public domain. This is mainly because of its high costs and the lack of continuity regarding support during the implementation process in service design (Blyth et al., 2011; Mulgan, 2014a). These concerns highlight that procuring design competence for individual projects only may lead to poor utilisations of service design capacity and may only provide limited design capabilities (Malmberg & Wetter-Edman, 2016). To deal with these matters, some healthcare organisations have worked to more permanently embed service design into their organisations through in-house employment (Design Commission, 2013; Snook & Design Managers Australia, 2014).

These embedded service designers work to both support change initiatives coming from inside the organisation and with the implementations of service propositions developed in collaboration with design agencies (Bailey, 2012). Usually, such designers work as part of larger development teams or innovation units inside healthcare organisations. Growingly, so-called design labs have been used as supporting structures for building service design capability into healthcare (Molloy, 2018). Inspired by the establishment of public service innovation labs in governments around the globe, design labs in healthcare are increasingly being used to integrate service design capabilities in healthcare and support service design processes.

2.6 The rise of labs as supportive structures for service design

During the eighteenth and nineteenth centuries laboratories were developed in science and technology, combining experimentation, development and observation of new ideas - before successful achievements were then brought out into the world (Mulgan, 2014b). The use of labs has become common in many fields such as in biology, chemistry, physics, medicine and electronics. In the case of the current study, the term ‘lab’ is used to typify a space providing opportunity for experimentation and design of healthcare services by focusing on practice, process and outcomes. It is distinguished by being service design led and through using service design as main approach. Related to the rising interests in incorporating service design capabilities into the public sector—more specifically into healthcare—design labs have been emerging around the globe (McGann et al., 2018; Molloy, 2018).

Design labs are described as safe spaces for collaborative exploration, experimentation, problem solving and the demonstration of possibilities as a response to social needs (Mulgan, 2014b; Torjman, 2012). Grounded in strands of positivism and utopian reform thinking from the nineteenth century, these innovative social assemblies are rooted in the belief that small-scale experiments can demonstrate practical potential and new directions of larger social changes (Mulgan, 2014b). Design labs, which are also sometimes labelled as change labs, innovation labs or innovation hubs, are increasingly used in research, in the private sector and in the public sector (Binder et al., 2011; Mager et al., 2016; McGann et al., 2018). They focus on combining user-cantered design perspectives and methods into collaborative processes to address and resolve sociotechnical challenges (Tõnurist et al. 2017). Providing a supportive structure, ‘design labs are often set up as

creative spaces intended to scaffold inquiry and development for some or all phases of design processes' (Lucero et al., 2012, p. 3).

Currently, the literature concerned with design labs mainly addresses theories, managerial issues and general descriptions of the characteristics of public service innovation labs and mostly as related to governance and policy design (e.g., Fuller & Lochard, 2016; McGann et al., 2018; McGann et al., 2019; Mulgan, 2014; Tõnurist et al., 2017). More practice-oriented accounts on how to set up design labs and how service design is practiced inside these spaces are mainly found in non-scientific literature. For example, a practical guide of establishing and running innovation labs published by NESTA (2014) states that innovation labs 'come in a variety of sizes, use a range of techniques, are equipped with different resources, and try to tackle different issues and challenges' (Puttick, 2014, p. 6).

A typology of innovation labs using service design, including two healthcare labs, was published in Touchpoint (2016), exposing the diversity of purpose and orientation of these labs (Figure 5).

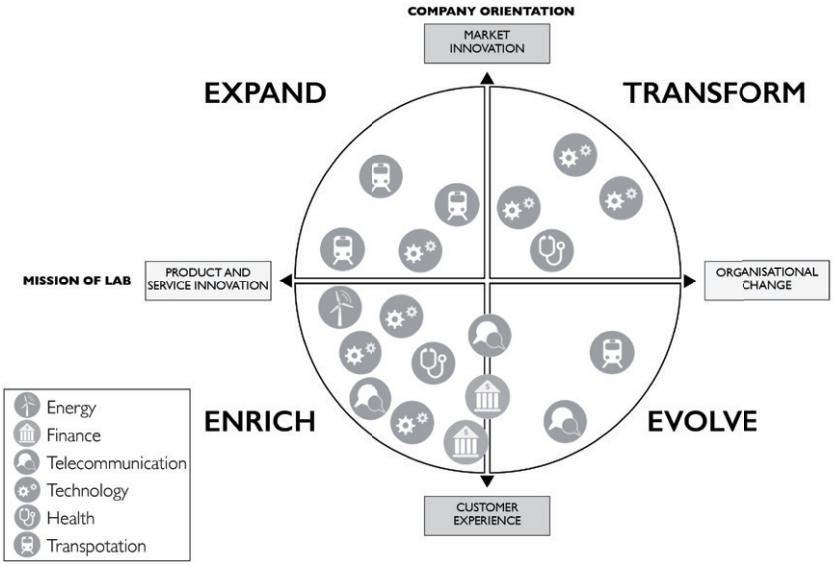


Figure 5: A typology of innovation labs' mission, purpose and orientation (adapted from Mager, Evenson, et al., 2016, p. 51)

Because healthcare design labs are mostly inspired by the emergence of public sector innovation labs supporting governance and policy

developments, the next section briefly describes the background and some of the characteristics of these public sector innovation labs.

2.6.1 Public sector innovation labs

The increasing interest in using service design within the public sector may be related to current paradigmatic shifts of management models, in which the public sector has been going from new public management to new public governance. Replacing the older top-down bureaucratic model known as public administration, new public management was introduced as a model in the 1980s and 1990s, integrating management tools from the private sector into the public sector (Hood, 1991). However, over the past two decades, the model of new public governance has gained momentum (Osborne, 2006). Aligned with service design practice, new public governance introduces a networked and cooperative form of governance that values a participatory public value creation approach and views citizens as the coproducers of public services (Bason, 2010; Sangiorgi, 2015). Innovative units have previously been used in the public sector—inspired by new public management reform attempts of institutionalising a more 'entrepreneurial' public sector (Osborne & Gaebler, 1993). However, the currently expanding public sector innovation labs emphasise the use of service design approaches and methods as a core capability (McGann et al., 2018). They do so by focusing on exploring problems and identifying and trying out public service proposals as a contribution to policy change processes by involving many actors including private organisations and citizens (Bason, 2010; Kimbell, 2015; McGann et al., 2018). At the same time, they combine elements from systems theory and thinking processes of synthesis with design—also referred to as 'systemic design'—as part of their expertise and practice (van der Bijl-Brouwer & Malcolm, 2020, p. 386).

An example of one such public sector innovation lab is MindLab. Established in 2002, MindLab managed to create a strong brand during its 16 years of operation, which occurred in close collaboration with several Danish governmental institutions. Founded on the premises of applying collaborative and open innovation strategies (Enkel et al., 2009), MindLab managed to demonstrate the possibilities of integrating ethnography and design capacities into public sector policy and administration reform processes (Carstensen & Bason, 2012). Following the example of MindLab, public sector innovation labs have grown rapidly over the past two decades, popping up around the globe. In Europe alone, more than 60 public sector innovation labs have been registered (Fuller & Lochard, 2016). Public policy labs are defined as 'dedicated teams, structures, or entities focused on designing public policy

through innovative methods that involve all stakeholders in the design process' (Fuller & Lochard, 2016, p. 1). Supporting a coproductive and more citizen-centred approach to problem solving in the public sector, these innovation labs 'constitute a distinct form of policy actor in comparison to both prominent external advisory organizations, such as think-tanks and consultancies, as well as "traditional" advisory units within public administrations' (McGann et al., 2019, p. 15).

Mulgan (2014) lists three critical challenges related to public sector innovation labs: 1) mobilising the appropriate support and developing methods that can link systemic problems to codesign and prototyping; 2) using impact and scaling models for securing widespread adaptations; and 3) demonstrating the success of transformative ideas that may take years to integrate into society. These concerns are also mirrored in a critical self-evaluation of 20 social change labs written by Kieboom (2014), raising fundamental questions regarding shifting the discourse from developing 'solutions' towards supporting societal change processes and addressing ethics in a transparent and more politically aware way. Further, to create an impact when using a design-led innovation approach in the public sector, facilitating relational community building, ensuring capacity to change, and maintaining leadership support are identified as central conditions (Yee & White, 2015). Achieving these conditions may challenge service design practitioners who are working inside labs. Furthermore, Mulgan (2014b) describes a fundamental challenge that public service innovation labs are faced with, which are labelled as 'the radical's dilemma' and which link the degree of change that labs are able to influence—incremental versus radical—to their position related to the system as being insiders or outsiders. The dilemma is presented as follows: '[…] do you work from the outside to create a coherent alternative to the status quo, but risk being ignored and marginalised; or do you work within the system and directly influence the levers of power, but risk being co-opted and shifted from radical to incremental change?' (Mulgan, 2014b, p. 8). This highlights the paradoxical tension that links these social innovation labs' abilities to envision and influence the degree of innovations coming from different positions—as entangled with and influenced by a given context or by approaching a context more coherently and critically from the outside.

Hence, public sector innovation labs need to combine the perspectives of both inside and outside and outbalance the mobilisation of power structures by conducting bottom-up experiments (Mulgan, 2014b). However, the tensions that are exposed and brought to the surface through working inside

public sector innovation labs are ‘a necessary condition for enabling the emergence of new ways of working within a dominant organizational culture if transformational effects are sought’ (Aguirre, 2020, p. 221). By applying codesign systemically in public sector settings, ripple effects from small-scale cycles that address the needs for reorganisation may cascade to change the organisational culture more broadly (Aguirre, 2020).

2.6.2 The growth of service design labs in healthcare

Inspired by the above-described public sector innovation labs, a growing number of healthcare systems around the globe have established in-house service design and innovation labs. Although using a similar approach as the public sector innovation labs, healthcare service design labs are less focused on governance and policy design and are more oriented towards advancing and reconfiguring healthcare services on the ground. This means that they operate closer to the end users (such as health seekers, care providers, logistics providers, healthcare leaderships, etc.) and are usually targeting more specific healthcare issues and contexts. Molloy (2018) identifies 32 innovation labs in healthcare organisations in North America, Europe and Oceania that are mostly located inside hospitals, from which 17 have in-house design capabilities embedded mainly in the form of service design. Although the size of these labs varies, most labs have less than 14 full-time members and are funded by various sources, such as government or research grants, philanthropy and project-specific industry investments. Some of the labs that Molloy (2018) identifies are supported by volunteers and students, while others are acquiring designers from agencies when needed. Further, by facilitating for building both internal and external relationships, these healthcare design labs support both incremental quality improvements and more radical innovation endeavours. Additionally, Molloy identifies that many of these labs are aspiring to take on greater levels of complexity. Molloy (2018) maps out the diverse levels of complexity related to the innovation ambition of these different healthcare design labs by using the four orders of design (Buchanan, 2015) and the four design domains (Barroso & van Patter, 2015; Jones, 2014, p. 101; Jones & van Patter, 2009) as a backdrop (Figure 6).

Recent studies have explored healthcare design labs in more detail. For example, Reay et al. (2017) examine a case of prototyping an embedded hospital codesign space within a hospital in Auckland, New Zealand: The Design for Health and Wellbeing (DHW) lab. The DHW lab is described metaphorically as a ‘Trojan horse’ penetrating ‘an institutional context […] characterised by hierarchies of clinical expertise and bureaucracy’ (Reay et al., 2017, p. 9). The DHW lab is characterised by its open space

located inside the hospital and its ability to flexibly facilitate collaborative improvements of the healthcare system alongside its services and products. By promoting codesign as an approach used inside the hospital, the DHW lab draws participants' attention towards how services are currently delivered and experienced and how these could be developed and delivered in the future, challenging existing conceptions. Further, by introducing and seeking support for using codesign as an approach supported by a design lab inside the hospital, organisational priorities and political tensions are exposed.

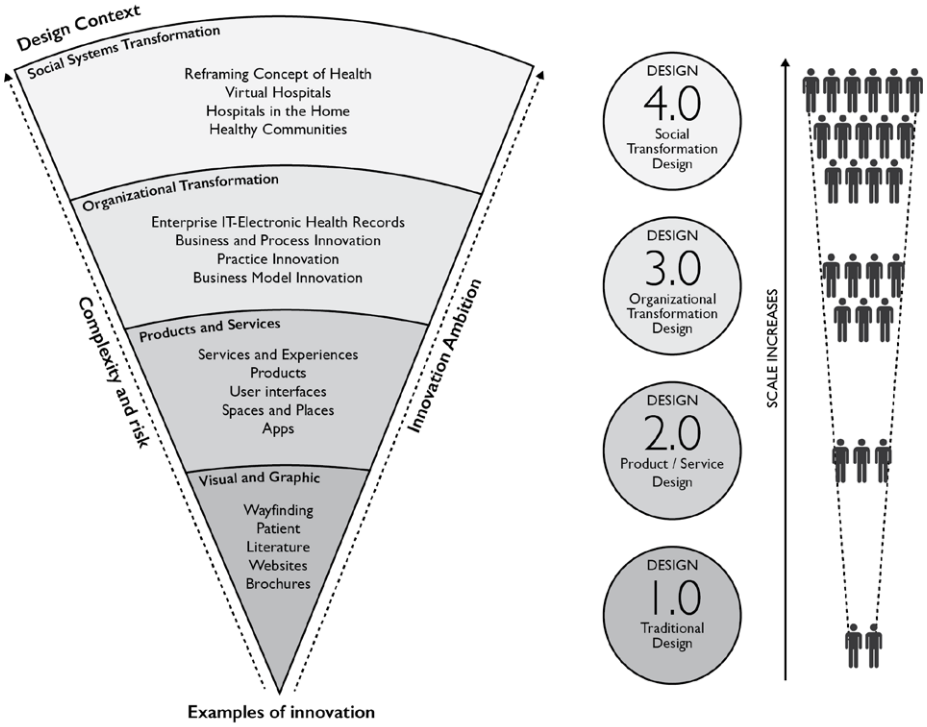


Figure 6: Healthcare design labs' different levels of innovations, ambitions and complexities (to the left) aligned with the four design domains (to the right) (compiled and adapted from Molloy, 2018, p. 48; Barroso & van Patter, 2015; Jones, 2014, p. 101).

Another example is the research carried out by Saidi et al. on 'innovation hubs' in healthcare, which are described as 'spaces for purposeful human interaction' that promote innovation processes (2017, p. 38). Their research builds on the literature on sociology of space (Foucault & Miskowiec, 1986; Lefebvre, 1991), with examples from an innovation hub located at Groote Schuur Hospital in Cape Town. They argue that designated innovation hubs support the building of social networks that hold the potential to promote

innovative culture across organisational and professional divides inside healthcare institutions. Further, they highlight the need for more research on innovative hubs in healthcare to further substantiate and empirically ground their findings.

A third example is a study carried out by Sangiorgi et al. (2019) that explores the initial steps of setting up three service design labs in mental healthcare units in the Lombardy region in Italy. Using action research as method, the goal of this initial interventional study was to explore how one of these labs, located in the city of Brescia, supported the first steps of service ecosystem reorientation towards framing a more recovery-oriented and community-based psychiatric approach. Through conducting four workshops and analysing empirical data, their exploration finds that the codesign process had an effect on different levels; 1) It raised a shared awareness of the existing status, as well as the needs and potentials for transformation. 2) It supported the ability to overview the available resources and identify potential developments that could be achieved by recombining and integrating them. 3) It supported the envisioning of possible futures and enabling future discourse. 4) It kept conversations open to prevent 'falling back to existing "rules of the game"' (Sangiorgi et al., 2019, p. 12).

Further, the doctoral thesis of Malmberg (2017) uses a healthcare design lab to study design capability building in the public sector. Following the establishment process of an in-house design department inside a county council healthcare organisation, Malmberg studies two projects facilitated by a health lab. According to Malmberg, the lab has helped raise an awareness of design inside the organisation, even though the needed design resources and supportive structures were still not entirely in place to enable the organisation to fully use design capabilities.

The doctoral thesis of Vink (2019) is partly developed using the participatory observations and interviews of the participants from several service design cases carried out at Experio Lab as an empirical basis. Experio Lab is a healthcare service design lab that was established in 2013 as part of the Region of Värmland in Sweden. Since then, Experio Lab has expanded its activities into other regions and has become a national movement. Currently, the lab employs over fifty people in eight different regional healthcare service design labs across Sweden. Experio Lab has gained both national and international recognition by involving hundreds of people in a range of healthcare service design projects that have won a number of healthcare innovation and design awards. However, behind the impressive achievements

of the lab, through narrated examples from several project carried out at Experio Lab, Vink reveals a messier and more difficult reality. By exposing the embedded nature of the lab practice—of people working from within the Swedish regional healthcare system to improve patient experience and increase the coproduction practices of care—Vink shows that these efforts are often constrained by powerful existing—and sometimes invisible—social structures. Building on these insights, Vink challenges the basic design assumptions in service design that is practiced in such settings towards a conceptualisation of service ecosystem design. For example, by shifting the understanding of service design value from focusing on its outcomes more towards valuing the process itself or by shifting the perception of the designer's role as the creator of new service designs towards a more collaborative understanding that focuses on all involved actors actively designing the services involved. Further, Vink highlights the importance of embodied experiences and embracing the subjectivity of being involved while including social structures as a design material and, hence, accepting the inherent political nature of service design in such settings (see Vink, 2019, pp. 108–109).

2.7 Summary

The increasing costs related to an ageing population and a general rise in service quality expectations are some of the major drivers of change that push the healthcare sector to change. Concurrently, rapid technological developments that provide new innovative diagnostic and treatment opportunities and better commutations are causing a digitisation wave of healthcare services. Further, increased demands for patient centricity and more preventive and community-oriented care approaches are being flagged as political agendas and acts, causing healthcare organisation to rethink their care models and services entirely. All of these drivers are considered major factors that are pushing Western healthcare systems to change and increase the pace of exploiting innovations.

Despite these strong incentives and pressures, innovation efforts in healthcare are slow, and changes are difficult to make. Current efforts in healthcare improvement work and the coproduction of care services are striving to implement lasting changes on the ground. In many cases, these thresholds are caused by the inherent contextual sociotechnical complexities manifested in healthcare settings. Healthcare institutions are understood as CASs—a mesh of dynamically interrelated subsystems with the capacity to learn and react to circumstances. Adaptations and innovation processes inside

complex healthcare systems happen through the processes of facilitated or self-organised subsystem actor interactions. Such interactions can result in the emergence of novelties that ripple out, potentially changing these systems more broadly. These types of facilitated actor interactions are linked to service design practice using codesign as one of its main approaches.

Service design is increasingly engaged in supporting change and innovation processes in healthcare. Drawing on S-D logic and systems theory, service design is evolving to deal with more complex contexts, such as in healthcare, by expanding its perspectives towards design-for-service and service ecosystem design. However, service design is still faced with a range of specific difficulties when used to support healthcare service developments; these thresholds include different approaches to valuing knowledge, the participation challenges of involving actors into codesign processes, the lack of suitable infrastructure and the difficulties related to building service design capabilities inside healthcare organisations. All these challenges point towards the need for introducing supportive structures that can help service design become more impactful in healthcare settings.

Responding to this need, a growing number of design labs are being set up as supportive structures for embedding service design practices into the public sector more broadly and into healthcare more specifically. There is still limited in-depth knowledge on healthcare design labs and how service design is practiced in these settings. Design labs are currently being set up in healthcare without a complete understanding of the practices they are intended to support; this does not necessarily imply a risk of failure. However, by gaining more knowledge, the risk of the poor application of design capabilities, the creation of false expectations towards their contributions or disappointment based on a lack of knowledge about how such processes are carried out will presumably decrease. The next chapter describes the approach, methodologies and methods used during the current study to explore how healthcare service designers deal with the complexities of healthcare and how healthcare service design is practiced and supported by embedded service design labs.

Despite a growing awareness of the promising effects and challenges of using healthcare design labs, there is limited in-depth knowledge on the practices taking place inside healthcare service design labs. To ensure that these labs provide applicable support for service design efforts, there is a need to explore how service designers are dealing with the complexities of healthcare and to better understand and explicate the service design practices taking place in such settings.

3

PHILOSOPHICAL FRAME, RESEARCH APPROACH AND METHODS

Addressing the approaches, methods and criteria related to design research, Friedman (2000) proposes that design research should be linked to philosophy and theory so that designers can conduct inquiries that reflect better founded understandings, thus bringing together both better design knowledge and practice. Because the current research is focused on studying the emergent practice of healthcare service design carried out inside a relatively new context of healthcare design labs, it felt appropriate to combine learning from practice and learning through practice as the main research approaches (Rust et al., 2007). Pragmatism has been referenced by several prominent design scholars such as Schön (1983), Buchanan (1992) and Stolterman (2008) as a philosophy central to research approaches, discussions and situations where design practice makes a subject matter. Pragmatism is also emphasised as a central theory for understanding and developing service design practices (Wetter-Edman, 2014; Wetter-Edman et al., 2017). The following subsection describes how the current research is framed by pragmatism as a philosophical stance. This is followed by a description of how and why narrative inquiry, action research and research by design were used as methodologies before the context of the current research is described. The chapter then goes on to explain the specific qualitative methods applied for data collection and the methods used for data analysis. Towards the end of the chapter, ethical considerations related

to the application of methods throughout the current research are discussed. Finally, the chapter evaluates and positions the findings of this research in terms of their validity and transferability.

3.1 Pragmatism as a philosophical frame

American pragmatism was initially developed as a philosophy during the mid-nineteenth through mid-twentieth centuries and is considered to have had an extensive and deep influence on American and European line of thought. The origins of pragmatism are attributed to the works of Charles Sanders Peirce (1839–1914), William James (1842–1910), John Dewey (1859–1952) and George Herbert Mead (1863–1931). Their shared commitment was to develop a philosophy rooted in situated human experience and the consequences these have in and on practice. Pragmatism includes a line of thought assuming that all humans are active participants in social worlds through their practice. As a result, social meaning is constructed and reconstructed continuously, shaping understandings and affecting action (Dalsgaard, 2014; Simpson, 2009). Derived from this, pragmatism understands truth not as an absolute entity but only as that which is useful to achieve situated valuable outcomes, meaning that our experience in practice constitutes the basis for evaluating our conceptualisations, which are superior to predetermined doctrines (Dalsgaard, 2014). Although not typically credited as a classical pragmatist, Nobel-Prize-winning Jane Addams' (1860–1935) practical contributions provide a prominent example of pragmatism as a living philosophy in the United States. Identified as a radical pragmatist, Addams' work as a social reformer and organiser in areas such as childhood poverty, women rights, immigration, race relations, labour, welfare and public health is unparalleled (Lundblad, 1995). Addams' approach was to engage as a philosophic, embedded and situated active agent. Her practical work in social reform emphasising women participation and grassroot community education served as an inspiration that was followed by other influential social activists, such as Grace Lee Boggs (1915–2015) in the United States (Lake, 2020). Towards the later part of the twentieth century, pragmatism lost its momentum and was overtaken by American analytic philosophy and European phenomenology. However, during the last three decades, interests in re-exploring and further developing pragmatism have returned and begun to flourish. Pragmatism has, for example, influenced prominent European postwar philosophers like Jürgen Habermas and a variety of areas in the humanities and social sciences, such as linguistics, feminism (Lake, 2020; Rotry, 1990) and design (Dalsgaard, 2014; Melles, 2008; Rylander, 2012).

Among the classical pragmatists, Dewey's philosophy is viewed as a theoretical framework that most directly offers an understanding of design practice (Buchanan, 1992; Dalsgaard, 2014; Dixon, 2019, 2020). The reason for this is partly based on Dewey's work related to humans' embodied implicit aesthetic experiences of all objects (Dewey, 1934) but perhaps even more so because of his theory of inquiry (Dewey, 1938)—a theory that emphasises the collaborative construction of knowledge through experiences embodied and the conscious questioning of the meaning of experience. Unpacking his theory of inquiry, Dewey particularly attends to the common pattern of identifying and resolving problems as an act of transformation that reconfigures the contexts in which we find ourselves (Dixon, 2020; Rylander, 2012). Opening up a paradigm of inquiry, Deweyan pragmatism asserts a worldview regarding situated practice as the proving grounds in which conceptualisations become valuable. Practice emerges in the making that occurs through the interactions between actors and their physical and social surroundings, both to clarify understandings of the challenges that they face and to create new knowledge derived from situated experiences by providing feedback through reflection on action.

In parallel with the notion of inquiry, George Herbert Mead was preoccupied with the analytical process of deliberate and dynamic reflexive thinking as a source of creating future alternatives and the emergence of possibilities. Manifested through the agency to influence social meaning and action of individuals inside social systems, Mead argues that the 'social act' itself is necessarily both temporal and interactional in its basic form (Simpson, 2009). According to Melles (2008), these ideas have helped inform wicked problems as a metaphor of planning in complex contexts of design (Rittel & Webber, 1973). In line with Meads' ideas on reflexive thinking, Donald Schön (1983) describes a design way of knowing as gained through action and reflection on action. According to Schön, this way of knowing involves obtaining an experienced understanding concurrently: with the mind, body and senses. While addressing wicked problems, designers engage in inquiries by moving forward through iterative thinking and carrying out cycles to create alternative future propositions that hold the potential to affect social meaning and action.

The use of a pragmatist stance in the context of healthcare service research, development and implementation implies being sensitive to the context, application of a practice-led research approach and valuation of various knowledge construction forms (Long et al., 2018). This dynamic and situated philosophical frame that pragmatism offers is particularly useful to apply in

the case of the present study because the current research aims to explore a dynamically evolving practice—healthcare service design—as it is practiced inside design labs. These labs are, in and of themselves, regarded as relatively new phenomenon that are still developing in healthcare settings. In contrast, applying a phenomenological philosophical approach, for example, through noninterpretative descriptions of the experienced given lifeworld (Cosgrove & McHugh, 2008) would be less useful because the phenomenon in itself is still emergent and not yet fully established. Further, pragmatism offers a philosophical frame that can host the different theories used to inform the present practice-led research from various perspectives. Here, systems theory, service marketing theory and design theory were used to provide a compatible blend of support for reflecting on experience in practice and thus shape new understandings.

In conclusion, pragmatism provides an overall philosophy that is suitable for exploring service design practice in the context of embedded service design labs amid the complexities of healthcare. It provides a frame that values the situated and embodied experiences of what may work out as useful to support service design processes in these contexts. Next, an introduction to the methodologies used in the current research is provided.

3.2 Practice-oriented methodology

To explore healthcare service design practice inside design labs, a practice-led qualitative research approach was applied throughout the present research. Qualitative research leans towards the humanities and social sciences with an interpretive orientation to the development of theory and conducting research (Denzin & Lincoln, 2011a; Lingard et al., 2008). Practice-led research is defined as ‘research in which the professional and/or creative practices of art, design or architecture play an instrumental part in an inquiry’ (Rust et al., 2007, p. 11). This implies that creative practices as an activity are used as part of a research process and that the contributions of practice must be made explicit by using methodology and methods. Practice-oriented research in design may include innovations in the research format itself, which is a unique mixture of approaches to process, the integration of practice work into the inquiry and the use of the visual representation and analysis (Yee, 2010).

Action research was used as the main methodological approach during the present research to collect qualitative data from situated first-hand

experiences of healthcare service design as it was practiced inside the labs. Action research applies the systematic cycles of reflection on action in a collaborative inquiry to better understand and improve a subject of study through action (Reason & Bradbury, 2008). The reason why action research was chosen as an approach is because design and healthcare service design practices are both relatively new phenomenon that are dynamically evolving. Adopting a methodological approach of exploring through changing helped to incorporate and make use of these circumstantial dynamic properties as an integral part of this research. To direct this research more specifically towards design practice, action research as an approach was informed and supported by the traditions of research through and by design (Fallman, 2008; Frayling, 1993; Jonas, 2007b; Sevaldson, 2010)—an approach where the 'explorative and generative actions' (Sevaldson, 2010, p. 13) of design practices themselves are applied to support a research purpose.

To prepare for the interventions, a narrative inquiry (Smith, 2007) was used as a methodology to collect accounts from experienced international practitioners about their experiences on working inside the complexities of healthcare, including perspectives from outside the Norwegian context. Because healthcare service design is an emergent practice, situated knowledge from within the community of practitioners helped in making sense of the ways that practitioners dealt with the complexities that they were exposed to; this functioned as a backdrop to support the practice-led action research part of the present research. A thematic approach to analysing narratives was applied to investigate and articulate common fundamental issues and events narrated by the involved participants (Reissman, 2005). By analysing the accounts from the practitioners' experiences on practicing service design amid the complexities of healthcare, new insights on the compound nature of this practice could be extracted.

Combining narrative inquiry and action research as methodologies helped when it came to complementing each other because the first approach illuminates what practitioners are saying by looking back at their experiences of practicing, while the other approach covers the practitioners' reflections on experiences about what they are doing in situ. Further, the mixed views of practitioners coming from outside of Norway provided a broader contextual understanding of the complexities that healthcare service design practitioners are faced with and the needs they must respond to. Furthermore, the different settings and themes that provided a context for the interventions were ensured a good variation and breadth related to the types of service design tasks that were carried out. By repeating these interventions four times, it

became possible to analyse data from across interventions, providing richer datasets and detecting practice-related patterns that were detached from the circumstantial complexities of each intervention when the current exogenesis was written. Figure 7 shows an overview of the methodological approaches that were used in this research (at the top) and how they contributed to each research subquestion (in brackets below). Together, they allowed for an exploration of the main research question (written below). The embedded service design lab intervention is illustrated as grey circles. The red arrows between each intervention illustrate the learning process across interventions and how these are feeding experience forward (top arrows), while the analytic reflections drift back from previous interventions to detect patterns across interventions (bottom arrows). For the sake of clarity, the illustration follows the research design and structure of analysis of the current exogenesis—not the actual chronological order of the interventions because they were sequenced differently—because of practical and circumstantial reasons.

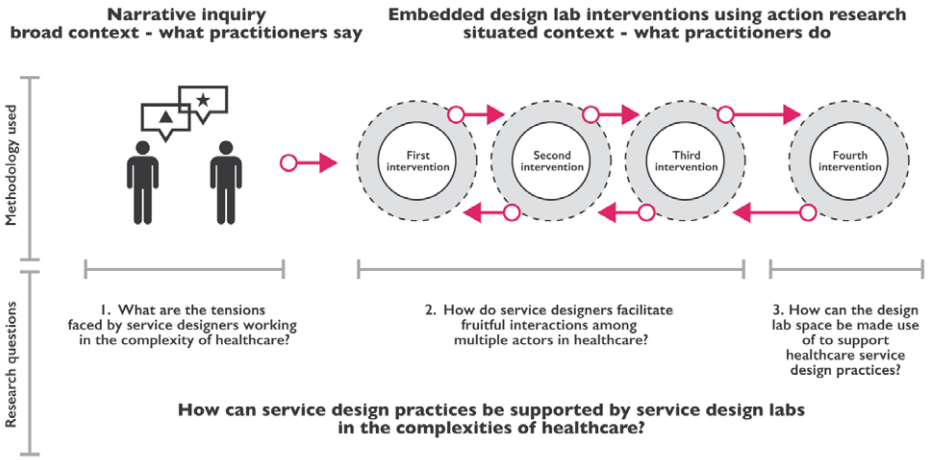


Figure 7: The methodologies used to explore each research question of the current research.

The use of these methodological approaches was done with a position of the researcher being inside the object of study. This was done both by using reflexive autoethnographic accounts (Ellis & Davis, 2008) from the coauthoring researchers' own experiences as part of the narrative inquiry and by taking active part in the collaborative design processes of the conducted action research interventions. In line with a pragmatist stance, this specific position of being coresearching codesigners exposed the researchers to certain types and levels of understandings that are difficult to access when using more distanced research approaches (Sevaldson, 2010). This standpoint

implies that the researcher is actively and explicitly engaged in reflexive meta-cognitive processes as part of the research itself, which is in line with George Herbert Meads' thoughts on reflexivity in the processes of social engagement and inquiry (Simpson, 2009). At the same time, this position raises difficult questions regarding the legitimacy of knowledge claims and use of appropriate criteria to evaluate findings. These potential shortfalls are mitigated by illuminating the researchers' subjective standpoint, here by explicating the researchers' background, influences and limits that may distort the line of research. Also, by including multiple perspectives into reflexive sessions, the coanalysis of data and coauthoring may help balance out subjectivity during the research process. Further, it is important to apply the appropriate criteria of credibility, transferability, dependability and confirmability to establish trustworthiness (Patnaik, 2013). Matters of ethics, credibility and transferability related to the current research are addressed in more detail later towards the end of this chapter.

To inform and prepare the planned action research interventions and explore the first research question, a wider perspective and better understanding of the complexities faced by service designers practicing in healthcare contexts was needed. To obtain a sense of the involved circumstantial complexities, visits to other service design units and labs in healthcare settings were first carried out. These excursions included a visit to Experio Lab in Karlstad, Sweden, to observe and discuss their experiences with working inside municipality care as an ecosystem that provides care services to people. Further, a visit to the Centre for Innovation inside the Mayo Clinic Hospital in Rochester, Minnesota, was also carried out. During a week-long stay at the Mayo Clinic, I was invited to observe how they worked inside the hospital and discuss the complexities of healthcare with service designers working at the Mayo Clinic. Furthermore, a visit to the Helix Centre—an innovation lab working with healthcare placed inside St. Mary's Hospital in London—was also done, though as part of a narrative inquiry. Additionally, a visit to MindLab was carried out to get a first-hand impression of their project portfolio, their approach and the lab's physical presence. Although MindLab was not directly connected to healthcare, the visit provided general insights into how design labs can take shape and the ways they operate. Despite these preliminary visits being of great value, a deeper level of understanding was needed to explore the first research subquestion about the issues service designers face when working inside the complexities of healthcare. To illuminate these aspects more specifically and create an informed backdrop for carrying out these action research interventions, experienced healthcare service designers from Scandinavia, the UK and North America were approached and

interviewed as part of the narrative inquiry. The UK, Scandinavia and North America are all regarded as front runners within service design (Moritz, 2005). Although all the interviews were carried out in different locations in London, due to practical reasons, the participants involved, including the authors, possessed in-depth experiences from various positions related to practicing service design in healthcare from the UK, Scandinavia and from North America as a context.

3.2.1 Narrative inquiry unpacking healthcare service design experiences

Derived from a Deweyan pragmatist ontology of inquiry, narrative inquiry was conceptualised as a methodology at the end of the twentieth century, building on earlier scholarly attention to narration and focusing on studying experiences as they are expressed through storytelling (Chase, 2011; Clandinin et al., 2007; Clandinin & Rosiek, 2006). Concerned with the depth of particularities in a certain context, narrative inquiry requires embracing the dynamic relationship between the researcher and researched as participating in a joint learning process of bringing forward nuance to a subject matter from a variety of knowledge perspectives (Pinnegar & Daynes, 2006). Attention to the temporality of stories, the sociocultural and physical context that they are told in and the ways a merger of multiple dialogues are done to present a combined narrative and plot are central aspects in using narrative inquiry (Haydon et al., 2018). As part of this research, narrative inquiry was used as a methodology, helping to open up understandings of the experiences that healthcare service design practitioners have had related to working in healthcare as a context.

Although more dedicated educational programmes within the field of healthcare service design have emerged as of late, most of today's practicing healthcare service designers do not hold a formal educational background that covers healthcare and service design specifically. These first-generation practitioners have typically come to work in the intersection of service design in healthcare from other design disciplines as a background or, in some cases, from nondesign backgrounds by accruing knowledge and know-how in practicing service design. Through practice, they have helped in shaping the emergent subfield of healthcare service design by learning through exploration (Schweitzer et al., 2016) and coping with the inherent tensions that are manifested inside the complexities of the sector. Exposing the narratives associated with emergent practices are important to further develop the growing subfield of healthcare service design through descriptions of contextually situated real-life experiences (Gubrium & Holstein, 2008). Uncovering the experiences and situated knowledge of these pioneer

practitioners' approaches, served as a mean to address the first research subquestion of the current study and provide a backdrop for conducting the four action research interventions. The intention was to explore the experienced complexities and tensions faced by service designers working in healthcare through narrations. Narratives are an appropriate way of shedding light on complex matters because they allow for accessing experiences on important aspects on many levels simultaneously. Three broad frames of reference (Kvale, 2008) were followed to guide the conducted narrative inquiry. Derived from the articulation of the 'radical's dilemma' (Mulgan, 2014b), experiences related to the position of service design practitioners, the degree of change that they were engaged with and the socio-organisational direction of influence that they were posing were made the subject of dialogue.

The inquiry was done by combining the narrations from five practicing healthcare service designers with reflexive autoethnographic accounts (Ellis & Davis, 2008) from the coauthors' own experiences. The included partitioners represented diverse experiences from various healthcare service design settings from the UK, Scandinavia and from North America. The work is included as the first publication of this study, which was published as a book chapter in: Service Design and Service Thinking in Healthcare and Hospital Management -Theory, Concepts, Practice, edited by M. A. Pfannstiel and C. Rasche, published by Springer. The title of the chapter is 'Investigating the "In-betweenness" of Service Design Practitioners in Healthcare'. The study helped addressing the first research subquestion of the current study: What are the tensions faced by service designers when working in the complexity of healthcare? The inquiry sheds light on the compound approaches that enable healthcare service design practitioners to flexibly identify connections through sensemaking across and in-between healthcare complexities.

Using narrations as a source for knowledge creation has its limitations. For example, there might be differences between what people say and what they do. The stories that look back on practices may be influenced by the way questions are raised and other subjective aspects of the storyteller or the listener. Further, narrations are hindsight accounts on experienced pasts that are shared through language, providing mediated insights to embodied experiences. To mitigate these limitations and get more direct and embodied understandings of working inside the complexities of healthcare, action research was used as a complementary approach to narrative inquiry as part of the present research.

3.2.2 Action research by design

Aligned with pragmatism and the work of Jane Addams, action research has developed as 'a family of practices of living inquiry that aims, in a great variety of ways, to link practice and ideas in the service of human flourishing' (Reason & Bradbury, 2008, p. 1). Originated from the emancipatory social work of Kurt Levin (1890–1947), action research is used to explore and generate knowledge through active participation of those who are affected by the exploration itself (Adelman, 1993). Further developed and founded on pragmatism as a philosophical stance, action research brings together professional experience and social scientists into collaborative relationships, which is also referred to as 'cogenerative inquiries', in a joint commitment for the benefit of all involved participants (Levin & Greenwood, 2011). Action research is an approach that 'seeks to create participative communities of inquiry in which qualities of engagement, curiosity and question posing are brought to bear on significant practical issues' (Reason & Bradbury, 2008, p. 1). The approach involves collective investigations to conceptualise and improve an object of study by using systematic and recurrent cycles of planning, acting, observing and reflecting on action (Reason & Bradbury, 2006, 2008). In all the interventions carried out as part of this research action, research cycles were used as follows: During the planning phase of each cycle, different activities were organised and initiated. Further, data capturing techniques were discussed. The acting phase of each cycle consisted of practicing service design in healthcare inside a service design lab. During the observing part of each cycle, the codesigning coresearchers were engaged with collecting qualitative data and gaining first-hand experiences by being embedded in the field. Each cycle was concluded by an audio-recorded reflexive focus group session, where data and experience were shared and discussed. Figure 8 shows a schematic overview of the action research cycles that were carried out during each service design lab intervention as part of this research.

The main benefit of using action research as an approach is that research activity is linked closely with practice and activity, which enables reaching a productive balance between rigour and relevance with strong transformative and applicable potentials. Action research may produce 'significant generalisations, methodological developments, and empirical findings' (Levin & Greenwood, 2011, p. 29). Action research is conceptually divided into first-, second- and third-person inquiry modes (Chandler & Torbert, 2003). The first-person mode of action research addresses an inquiry on the researcher's own dynamic world of practice and life, providing behavioural insights on foundations of disciplines and practice. A second-person action

research mode addresses collaborative inquiries done through the face-to-face activities of a mutual concern such as the improvement of services or a professional practice. Based on interpersonal dialogue, second-person action research includes the development of the inquiring communities themselves as learning organisations. The third-person mode of carrying out action research aims to extend relatively small-scaled interventions to impact a subject matter more widely. This type of action research usually includes a series of action research interventions that are interconnected as part of an inquiry, here with the goal of inspiring social movements or providing social capital (Chandler & Torbert, 2003).

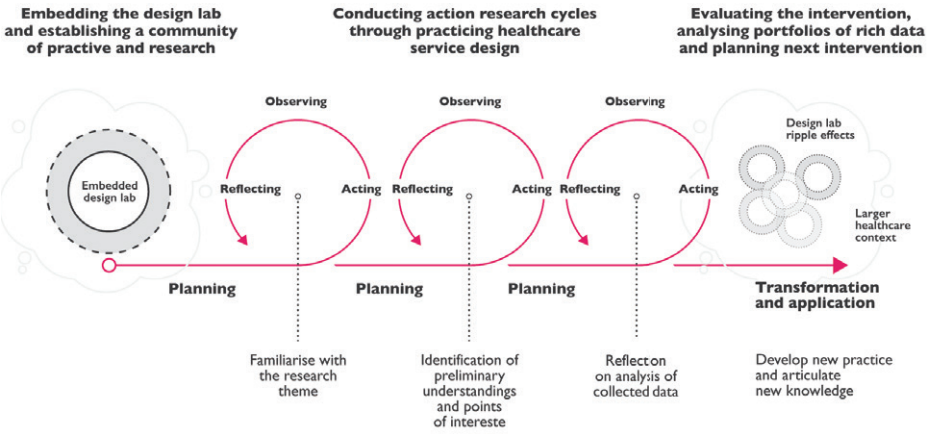


Figure 8: Action research cycles conducted during one service design lab intervention.

The most enduring and compelling ways of using action research is by engaging with all three action research modes of inquiry in parallel (Reason & Bradbury, 2008, p. 6). During the current study, we were privileged to be able to engage in action research on all three modes of inquiry, with an emphasis towards the second- and third-person inquiry modes. From a first-hand perspective, each design researcher involved in this study, including myself, were critically reflecting on—and to some extent changing—our own service design practice through the interventions. Groups of design researchers were engaged in each intervention through service designing and with the collection and analysis of empirical data through reflexive dialogue and collective learning processes in a second-person mode of action research. A third-person mode was made possible by conducting four design lab interventions inside three different hospitals, allowing the research to capture experience on practice across various interventions, events and in different

contexts. This multimodal approach allowed for the articulation of situated and embodied knowledge that was triangulated from our own reflections, cyclic reflections of participant others and across interventions and events.

Action research and the engagement of communities of practice and research have been identified as useful in conducting practice-led design research because the nature of both traditions are well aligned with each other (Crouch & Pearce, 2012; Swann, 2002). To direct the current action research towards healthcare service design practices inside service design labs, approaches of research through and by design were used (Fallman, 2008; Frayling, 1993; Jonas, 2007a; Sevaldson, 2010). According to Jonas (2007), the idea behind research through design is based on a concept of different knowledge domains that follow the logic of creating the artificial world and on a generic structure of learning and/or designing derived from practice. Research by design is an approach that values the use of design practice as a mean to support a research purpose. Sevaldson describes research by design as 'a special research mode where the explorative, generative and innovative aspects of design are engaged and aligned in a systematic research inquiry' (2010, p. 11). As part of this particular research, research by design was used as an approach to design capturing tools for collecting qualitative data by coresearchers and during the process of analysis by applying design techniques for assessing, linking and making sense of the data; this will be explained in more detail later in section 3.3 of this chapter.

Most of the critique towards action research as an approach is directed towards a lack of appropriate combinations between the relevance of the problems that are addressed and a solid theoretical and methodical agenda (Levin & Greenwood, 2011). In this section, I have tried to align and explain the use of philosophy, theory and methodology as they are related to the emergent nature of healthcare service design as a practice and the relatively new phenomenon of using design labs as supportive spaces. The relevance of the problem that is investigated in the current research, relates to supporting the adaptability of healthcare systems in Europe and other Western countries. The research agenda of the present study is to explicate and develop service design praxeology supported by design labs within the context of healthcare service systems. At the same time, the interventions themselves are making a change on the ground, here based on the problems and aspirations rooted in real-life situations and needs of each of the engaged hospitals. The four embedded service design lab action research interventions that were carried out as part of this research are described in more detail in chapter 4.

3.2.3 Context of research

This research was carried out as a part of the C3, a research centre hosted by the OUH. C3 is a centre for research-based innovation that is supported by the Research Council of Norway. The main objective for the centre is to enhance the capability of organisations to innovate by focusing on long-term research goals while building close alliances between research-intensive enterprises and prominent research groups. Established in 2015, C3 seeks to bridge clinical knowledge, research and technology to jointly shape value-oriented new health services and accelerate the adoption of integrated patient-centric services. C3 brings together different actors from public healthcare, such as municipality care units and hospitals, academic research groups and actors representing the medtech industry, to research and bring forward new knowledge, infrastructure and patient-centric healthcare services.

The Scandinavian healthcare systems are built on the principles of universalism, meaning that they strive for providing an 'equal access to services regardless of social class, income, or place of residence' (Magnussen, 2009, p. 68). Similar to the other Scandinavian countries, healthcare in Norway is mostly provided as a public welfare service financed through taxes; this means that in most cases, treatments are almost free of charge for patients. The Norwegian healthcare system is divided into primary care that the municipalities are responsible for and specialised care that is organised under the Ministry of Health and Care Services through four regional healthcare authorities. In each of these regions, several hospitals provide specialised in- and outpatient healthcare services in collaboration with their associated municipalities (Lindahl, 2015). Three large hospitals are engaged as partners in C3. These hospitals were chosen as the context for each of the embedded service design lab interventions. This choice was made partly because of practical reasons but mainly because hospitals are conceived of as a stronghold for the provision of specialised healthcare services and are connected to several municipalities and primary healthcare units. Another important reason is that all three hospitals have established innovation units as part of their organisations that could provide support for the interventions. The next section describes the research methods used for data collection as part of the current research.

3.3 Research methods for data collection

A blend of research methods was used to collect the qualitative data related to the research questions of the current investigation. These methods were chosen and combined as a collage (Yee & Bremner, 2011) to complement and triangulate each other and provide a more holistic picture of the healthcare service practices investigated. Table 1 provides an overview of the methods used in the current study. Further, it highlights the purpose of using each method and the context of use during the current research (marked with dark dots).

Method	Purpose of use	Context of use	
		Narrative inquiry - publication 1	**Action research interventions -** publications 2-4
Semi-structured interviews	Backdrop for the interventions. Exploring subjective narrations from pioneer healthcare service designers.	●	
Autoethnographic accounts	Adding multivocality as supplementary reflections during this study.	●	●
Participatory observations	Getting an in-depth embodied experience of practicing healthcare service design inside labs.		●
Research diaries and posters	Collecting semi-structured qualitative data throughout the interventions.		●
Contextual photography	Adding situated records of material reality for reflections and analysis on the experience of practice.	●	●
Focus group	Reflecting on activities during the interventions and for evaluating the interventions carried out.		●

Table 1: The methods used for data collection during this research.

Next, a short description of each of these methods is provided and supported by examples.

3.3.1 Semistructured interviews

Semistructured interviews are designed to explore the subjective responses from respondents about a phenomenon or situation they have experienced. It uses a schedule or interview guide to support a recorded conversation (McIntosh & Morse, 2015). As part of the narrative inquiry initially performed, five in-depth semistructured interviews (Kvale, 2008; Mishler, 1986) were conducted and audio-recorded in different locations in London in June 2017. The participants, including the authors, were all pioneer practitioners within healthcare service design, and their perceptions of this new practice were important to better understand. Each interview lasted for between one and one and a half hours. Open-ended probing questions were used to inspire reflections and narrations on experience from the participant healthcare service design practitioners. Visual interview guides (Gubrium & Holstein, 2008) were made available during the interviews, inviting the respondents to write notes and sketch out diagrams to further explain and express their narrations visually. Additionally, contextual photographs (Holm, 2008) were taken to capture circumstantial impressions and assist in the process of data analysis with a situated backdrop. Figure 9 shows an example of one such contextual photography taken during an interview with Lenny Narr, a design strategist at the Helix Centre, which is located inside St Mary's Hospital in London. On the table next to the laptop, the visual interview guide is depicted.

Figure 9: A contextual photograph taken during one of the semistructured interviews at the Helix healthcare design lab. Photo: Jonathan Romm.

3.3.2 Autoethnographic accounts

Autoethnography is the integration of the researcher's own life experiences and relations as part of a study (Spry, 2001). Although the subjective is incorporated into the research, the analysis of these accounts is carried out as if studying any other source of data. The method was developed partly to legitimise the researcher's voice by exposing the author's perspective but also as a way to achieve multivocality—by including the voices of the authors with other research participants (Ellis & Davis, 2008). In the current research, autoethnographic accounts were used to add multivocality as supplementary reflections during the conducted narrative inquiry because both authors were practicing as healthcare service designers themselves. Autoethnographic accounts were also used as part of the embedded service design lab interventions. Here, written accounts were kept during each intervention to document the backdrop, goals, processes carried out and outcomes of each intervention.

3.3.3 Participatory observations

Participatory observation is often used in qualitative research and anthropology to gain an intimate in-depth understanding of the social interactions of people and their practices through involvement (Randall & Rouncefield, 2016; Robben & Sluka, 2007). In the present research, a practical approach to participatory evaluation was applied (Cousins & Whitmore, 2004). This means that participatory observations were primarily used to broaden situated understandings of problem solving and decision making by practicing service design inside embedded service design labs in the context of healthcare. The accuracy and validity of the accounts from participant observers have been a subject of intense debate and critique among scholars regarding the hidden effects of power relationships, overall political standpoints and grand narratives skewing the accounts of social scientist (Erickson, 2011). As a way to navigate these tensions, Bent Flyvbjerg (2001) argues for using qualitative participatory observations to address local and detailed accounts, bringing forward action-oriented knowledge on value and power that may be relevant and applicable to practitioners, decision makers and policy makers. In the case of the current research, these aspects were covered by making accounts on the ways healthcare hierarchies were dealt with and involved as part of the included interventions.

All codesigning coresearchers who were participating in this research were involved in participatory observation by taking an active part in the service design process of each of the embedded service design lab interventions. Reflexive participatory evaluations were carried out among the codesigning

coresearchers by using focus group evaluations addressing the findings related to utilisation, organisational learning and change (Cousins & Whitmore, 2004). Participatory observations are appropriate for getting an in-depth embodied experience of a practice. In the case of an evolving practice, the embodied experience is critical because advancements of the practice may occur as part of the research process itself.

3.3.4 Research diaries and posters

Research diaries are simple and useful annotation tools helping researchers become more reflexive as part of an investigation (Nadin & Cassell, 2006). Experiences regarding thoughts, decisions and feelings from the past are easily forgotten. Research diaries serve as capturing devices and, thus, may act as a reflexive supportive scaffold that can be used as a catalyst for more aware discussions as an integral part of knowledge creation. Diaries may also serve as a repository of empirical data and can contain sets of more or less structured qualitative records that can become the subject of analysis and a source of verification through triangulation (Engin, 2011). Previously, research diaries have been used to collect qualitative data from patients as part of action research inquiries to inform healthcare service development efforts with a patient perspective (Elg et al., 2012). In the case of the current study, diaries were used to collect the experiences of the service design practices carried out inside the labs in the context of healthcare.

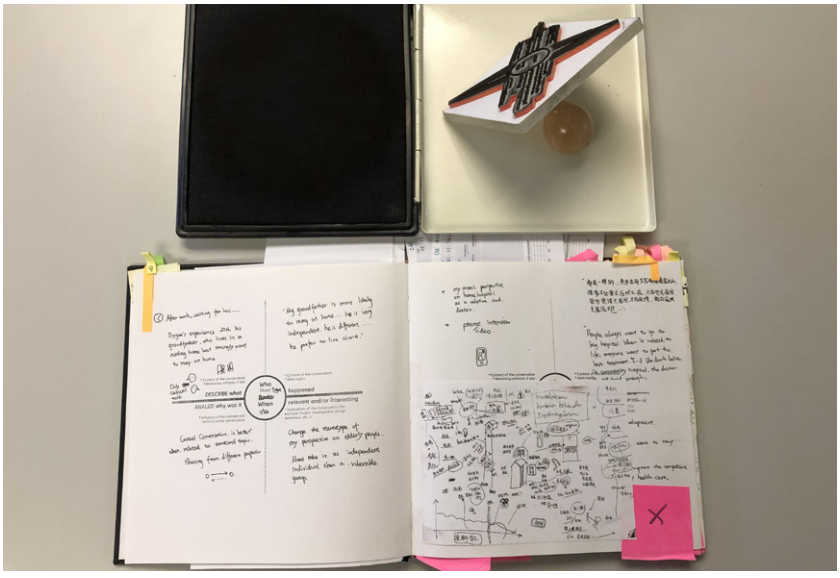


Figure 10: Notebook stamp tool that was developed as a template to capture qualitative data (above) and an example of one research diary entry (below). Photo: Jonathan Romm

During the action research cycles carried out as part of the interventions, the students were using research diaries to make daily diary entries. Each student kept their own research diary, adding notes, descriptions, photographs and sketches throughout the process. By including simple templated annotations, each time a diary entry was made, using a notebook stamp, the students could add semistructured data directed at specific themes of inquiry into their diaries and could do in a consistent way. For example, when tracing design conversations as part the first and second interventions, data on when conversations took place during the design process, the knowledge gained from each conversation and the use of mediating artefacts were templated into each diary entry. Figure 10 shows the notebook stamp tool developed as a template to capture qualitative data (above) and an example of a research diary entry (below).

The use of research diaries helped the codesigning coresearcher reflect on the experiences they had, detecting recurring issues and identifying patterns. Towards the end of each intervention, each student was asked to develop a research poster that included a short written analytic reflection on each research diary collection, including a summary and visual representation of their findings. Figure 11 shows a student presenting her research diary and summarising poster at the final reflexive session of the third embedded service design lab intervention included in this study.

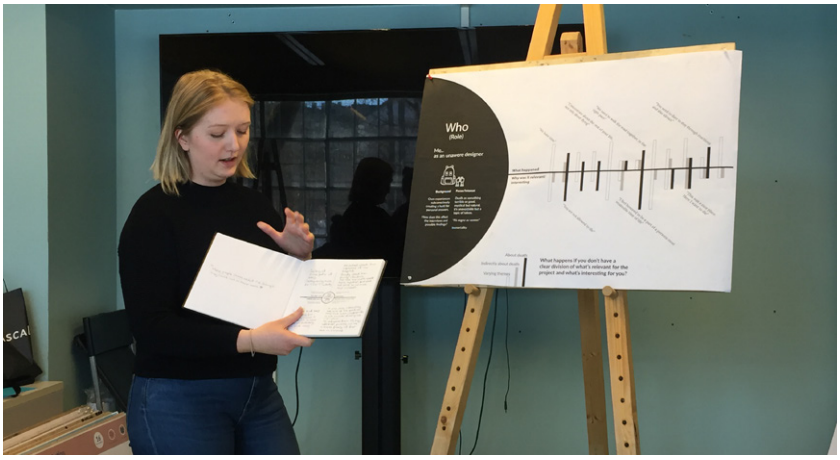


Figure 11: A coresearching student presenting her research diary and summarising poster. Photo: Jonathan Romm

3.3.5 Contextual photography

Different from other capturing methods, photography provides specific and contextual qualities that are difficult to capture in codified written

accounts. Although dependent on the observer's filtered attention and choice, contextual photography may support anthropological research by adding a strong sense of material reality that is precisely recorded in a certain context and time (Collier & Collier, 1986). Photographs taken by participants during action research cycles provide additional insights into the lived experiences of the participants that can be combined and used with other data sources, such as observations and interviews. Further, photographic insights as part of action research may be used to empower reflexivity, encourage dialogue and knowledge transfer among participants and highlight issues across power positions (Holm, 2008).

Throughout the current research, contextual photography was used as a method to add situated records of material reality for reflections and analysis on the experience of practice. During the conducted narrative inquiry, photographs were taken by the researchers and used as additional material to situate the collected narrations in a certain context, hence supporting the process of the following coanalysis. During the interventions, contextual photographs were taken by all codesigning coresearchers. They were used to support reflection on action during the action research cycles and the process of analysis of data portfolios carried out by the coauthors of the resulting publications. In total, about 1,500 photographs were taken during the current research. Figure 12 shows an example of a contextual photograph where an elderly patient was asked to provide feedback and advice on a service proposal during the Ahus intervention.

Figure 12: An example of contextual photography. Photo: Ester Kaasa.

3.3.6 Focus groups

Focus groups were used as a method to help groups of people exchange, unpack and clarify their views in ways that are more difficult to access through an interview. The method is appropriately used by asking open-ended questions and prompts that encourage a group of research participants to explore a subject matter of collective importance by using their own language and by generating additional questions and raising critiques. Focus groups allow participants to pursue their own priorities while developing a shared understanding of experience. If well conducted, focus groups may help a research take new and unexpected directions through dialogue (Kitzinger, 1995). Including multivocality into research, through the use of focus groups, may support researchers to become more informed, mitigating issues of subjective research interests or bias (Denzin & Lincoln, 2011).

In the present research, focus groups were used as part of research cycle reflections and to evaluate each embedded service design lab intervention. During each intervention, the codesigning coresearchers, including the academic staff, were engaged in four audio-recorded focus group sessions reflecting on activities while consulting with the collections of diary entries. Further, about three to six months after each intervention was carried out, the coordinators from the innovation sections of each hospital, which were closely involved during the interventions themselves, were invited to an audio-recorded focus group session. The responsible tutors, representing the involved students, were also invited to participate. The focus groups covered three main aspects: 1) voicing the story of how the embedded service design lab intervention came about and the preparations carried out to arrange the intervention; 2) reflections about the embedded service design lab in general and specifically about the activities that took place (such as conversations, workshops, decision making, etc.); and 3) reflections on how the embedded service design lab might be improved in the future. Insights from these evaluations helped improve the embedded service design lab regarding forthcoming interventions and was used as empirical data for the second and third publications included in this study. Figure 13 depicts one of the evaluation focus groups held after the intervention at Sunnaas Hospital.

3.4 Analysis

Because of the compound nature of the object of study, a blend of analytic approaches was used to address the main research question. The first study carried out, which focused on individuals as the unit of analysis, investigated

the challenges faced by individual-practicing service designers in healthcare settings. This analytical focus helped explore the first research subquestion. The second study focused on artefacts as a unit of analysis to explore multiactor facilitation by looking at contextually designed facilitation tools. The third study used the social interactions taking place during the action research interventions as a unit of analysis for studying design conversations. Both studies were used to explore the second research subquestion. The fourth study employed an oscillating analytic focus of the embedded design lab as a geographical unit, the social interactions taking place inside and around the lab and the anticipatory process taking place in groups envisioning future states. This compound analytical foci provided the basis for exploring the third research subquestion.

Figure 13: Example of an evaluative focus group. Photo: Bendik W. Hegna.

A mix of analysis methods were used to gain an understanding of the collected data and bring forward new knowledge. To analyse narrations, meaning condensation was used as a main method by the coauthors of the first publication. During the four embedded service design lab interventions, reflexive focus group sessions were used as part of the action research cycles to analyse experiences of practice, the research diary data collections and the students' research posters. After each intervention different qualitative data were collected and systematised into rich data portfolios. Using an inductive approach, the portfolios of data were analysed iteratively by the coauthors, resulting in the second, third and fourth publications. During the analysis phase of each publication, a visual analysis was used through concept mapping to combine insights and make new knowledge visually accessible and comprehensible.

3.4.1 Narrative analysis

A thematic narrative analysis approach was used as part of the initial narrative inquiry. This approach is useful for conceptualising across cases and for identifying the common thematic elements expressed by different research participants. Because the main focus of the analysis was on the content of the stories told, interpretations were concerned with what practicing healthcare service designers said and the underlying meanings (Reissman, 2005).

More specifically, meaning condensation (Kvale, 2008) was used as method for analysing the participants' narratives. By decontextualising and extracting text from the transcribed interviews into thematic sequences, new meaning relations surfaced across the practitioners' stories. For example, it was discovered that service design practitioners are sensitive to hierarchies of healthcare organisations and that they are engaging in dialogues with both the top and bottom organisational levels simultaneously. The construed thematic sequences were then sorted under higher-level themes aligned with the three broader frames of reference. The identified issues under each broader theme were then articulated as statements and reflected upon by using our own experiences.

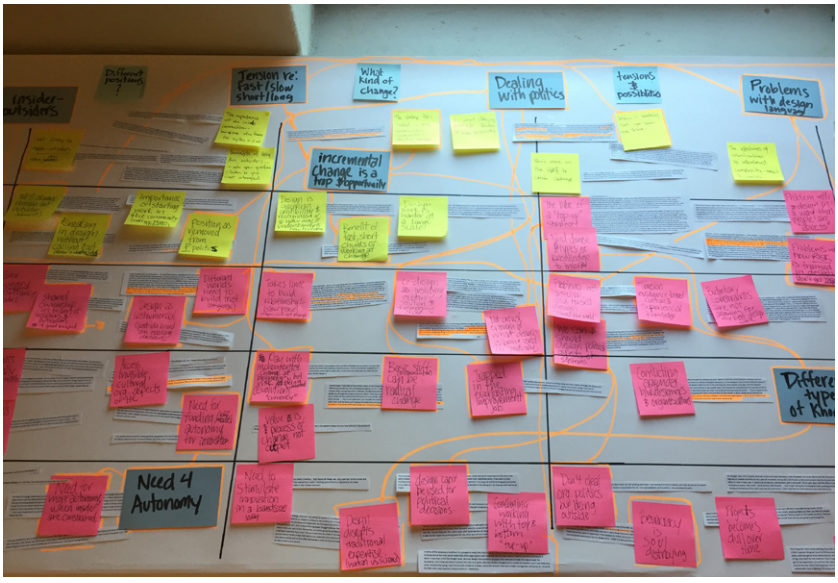


Figure 14: A section of a map used to analyse the narrations of practicing healthcare service designers. Photo: Jonatan Romm.

Finally, the extracted meanings and articulations that were brought forward through the analysis process were validated by the participating practitioners to

ensure that our interpretations of their narrations were accurate. Figure 14 shows a section of a map used during the process of decontextualising extractions from transcripts and mapping out and linking themes to one another by using meaning condensations on sticky notes.

3.4.2 Reflection in and on action

Reflexivity is a central part of the Deweyan pragmatist theory of inquiry, relating 'reflective though' with the notion of inquiry (Dewey, 1938; Rylander, 2012). Reflection may be done in action as an explorative and creative process (Schön, 1983) or on action as part of the analysis process.

As part on the narrative inquiry initially performed, autoethnographic reflections on the action of the coauthors were used to compare their own experiences with the narrations of participating practitioners. Further, reflection in and on action was done as part of focus group sessions, involving the codesigning coresearching students and academic staff during action research cycles as part of the embedded service design lab interventions. Figure 15 depicts one of the reflexive focus group sessions held during the second embedded service design lab intervention at OUH.

Figure 15: An example of a focus group conversation. Photo: Jonathan Romm

Each reflection session lasted between two and three hours and was held every second week at the end of each action research cycle. Initially during these sessions, each student was asked to individually go through their

research diaries to recall the activities and notes that were taken. Then, each student was asked to share their reflections in action derived from their diary entries and on their experiences of activities done and actions taken. After each individual reflection, the focus group participants were encouraged to ask questions and add their own reflections and engage in a conversation. All reflective sessions were audio-recorded and later transcribed. Furthermore, the coauthors of each of the publications included in this thesis were all engaged in reflection on action as part of the analysis process of the rich data portfolios because all the coauthors were participating as codesigners in the interventions they were analysing.

3.4.3 Inductive analysis of rich datasets

After each embedded service design lab intervention, the collected data containing the students' research diaries, their research posters, the transcribed action research cycle analysis focus group sessions, the transcripts of the evaluation focus group sessions, the written reports describing each intervention and the contextual photographs were systematised into a rich data portfolio. The portfolios consisted of digital repositories containing all the above-mentioned data collections in a systematised order. These portfolios provided the basis for using an inductive analytic approach (Gioia et al., 2013) to analyse the generated data from each embedded service design lab intervention.

These analyses were carried out collaboratively through two to three analysis workshops involving the coauthors of the included publications. First, the workshops were held to identify and code the first-order concepts derived from the fieldwork data (Van Maanen, 1979). After this, workshops were held for reflecting on and categorising the initially identified concepts, forming and formulating second-order, theory-centric themes. Finally, several smaller iterations of collaborative reflexive meetings were held among the authors to pinpoint, discuss and articulate findings as part of the analysis process.

During some of these analysis workshops, design inquiry techniques were used for sensemaking, such as using rich design research space (Sevaldson, 2008), where datasets from the rich data portfolios were printed out and hung up in the locations where the analysis workshops were held. This made it easier for the coauthors to assess the collections of data and link data to one another and identify patterns in the raw data. Figure 16 shows the collected data that were distributed spatially as part of an analysis workshop of the collections of data from the embedded service design lab intervention at Sunnaas Rehabilitation Hospital.

Figure 16: Example of a rich design research space used during an analysis workshop. Photo: Jonathan Romm.

3.4.4 Visual analysis

Visualisation and the activity of visualising are terms that refer to researchers' modes of representing sensemaking and concept formation grounded in knowledge derived from analytical processes (Prosser, 2011). In all the analytical processes of this research, visual analysis was used through concept mapping. Concept mapping links components to one another visually, creating relationships and hierarchies between and across these. Concept maps make it possible to explore relationships visually by drawing direct and indirect connections and highlighting matters by using a variety of illustration techniques such as colour, shape and scale (Kolko, 2010).

In all of the analysis workshops, for examining the rich data portfolios from the interventions, visual analysis was used as part of reflexive discussions between the coauthors. Here, diagrams were sketched on paper or whiteboards to explore links, clarify understandings and illustrate the compound concepts derived from reflections on our own experiences and from the collected data. Figure 17 depicts a quick visual sketch of a concept map drawn during the analysis workshop of the embedded service design lab intervention at Sunnaas Hospital.

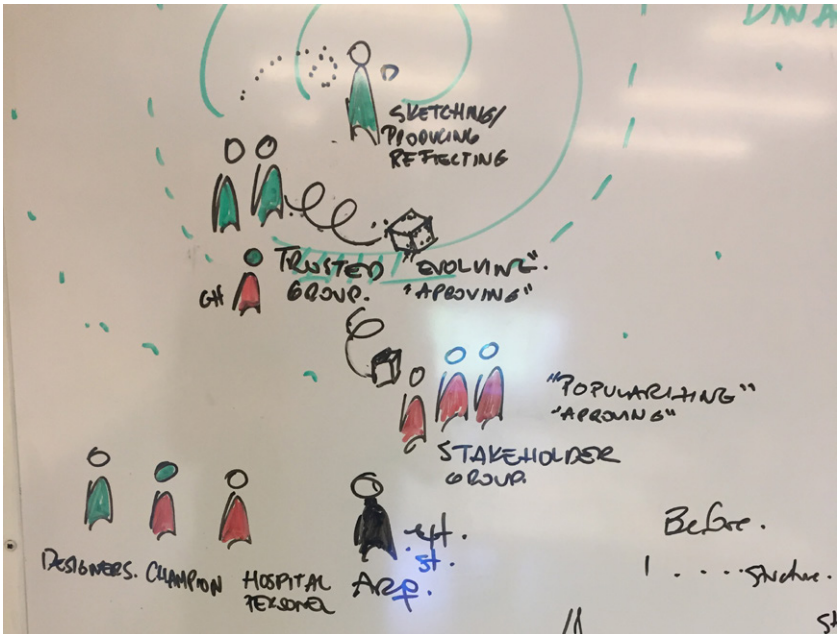


Figure 17: An example of a visual sketch analysing actor interactions. Photo: Jonathan Romm.

Many of these sketches provided the basis for developing the figures that were later integrated into the included publications. In some cases, giga-mapping (Sevaldson, 2011) was used as a technique to support the analysis process by integrating and linking multilayered data sources visually. Figure 18 shows an example of a giga-map that was used as part of the analysis process of the Akershus University Hospital and the OUH interventions.

3.5 Ethical considerations

Healthcare research and development is a challenging domain when it comes to complying with the strict ethical norm and regulations that apply in such settings. Ensuring the privacy of participants and safe handling of data is a matter of great concern. Although most service design efforts include collecting generalised data related to the service experience of the participants, excluding personal health-related data or biometric data, measures were taken to ensure a high level of sensitivity by the codesigning coresearchers regarding ethical issues. However, it is important to note that in almost all of the interactions throughout this research, the participants expressed a positive attitude and were surprisingly engaged. In many cases,

participants such as healthcare professionals and patients felt empowered and pleased in contributing to improving the involved healthcare services. Further, almost all the participants agreed to be included and photographed while engaging in the interviews and workshops as part of the interventions.

During the process of preparing the action research interventions, all students were obliged to take onboarding courses concerning ethical issues of interacting with vulnerable patients and following the strict policies and norms regarding patient privacy at hospitals. Before moving into the embedded service design labs inside the hosting hospitals, the students were informed that they were participating and contributing to this research. All students agreed to engage and participate in this research by signing written consent sheets. To moderate issues of power inequality between the students and academic staff, measures were taken to ensure that the research design supported involving students equally as coresearchers. These measures included that all research tasks and criteria for evaluating the students' contributions as part of the embedded service design lab interventions were made subject to open discussions with the participating students and were adjusted several times throughout the intervention process. Further, all participating students were free to choose subjective topics of interest to follow as part of their research contributions related to the general themes of reference. Furthermore, all participating students were invited to engage in coauthoring the publications that followed each intervention that they took part in.

Figure 18: An example of a giga-map that was constructed and used during the analysis process.

Healthcare service designers interact with patients and other actors that sometimes are in the middle of a life crisis and are abstaining from doing what they prefer to do. Some of them also suffer from pain. In contrast to service design in other sectors, where good user experiences are the focus, the characteristics of healthcare service design often concerns making user experiences less poor. Working inside healthcare means being exposed to

illness, pain and bad experiences that may provoke emotional reactions among the codesigning coresearchers. To support the participating students, debriefing sessions were scheduled and held in small groups, allowing the students to share feelings related to their experiences of working in healthcare as a context. The responsible coordinators from each hospital offered the students the possibility of having one-to-one debriefing sessions in case any student felt uncomfortable or needed emotional support.

Participants such as patient representatives, caregivers, healthcare staff, academic staff, service design practitioners and the students all accepted to participate by signing an informed consent. All participants were informed of and accepted that photographs could be taken of them to document the process. Despite this, all the photographs that were taken were later anonymised prior to their publication, apart from the photographs depicting the students and academic staff from AHO. All audio-recordings of the interviews and focus groups were carried out with the agreement of the participants. The quotes extracted from the transcribed audio-recorded interviews of the initial narrative inquiry were all validated and approved by the informants. Audio-recordings from focus group sessions during the interventions have all been anonymised. When using quotes from the participants of the focus group sessions, details and information that may expose the identification of the informants have been excluded. The current study was disclosed to the Norwegian Regional Committees for Medical and Health Research Ethics (REK). Because the committee did not regard this study as a medical or healthcare professional research, the project fell outside the legal requirements of the Health Research Act. The local data protection officers of each of the involved hospitals approved the interventions and study carried out. The intervention carried out at OUH was additionally approved by the Norwegian Centre for Research Data (NSD).

3.6 Reflections on my own position

In qualitative research, the recognition of the researcher's subjective self as a salient part of the inquiry process itself is evident (Spry, 2001). To address my own position, this section offers reflections on professional and personal matters of importance that have influenced this research.

I am trained as an industrial designer with a specialisation in design management. As a designer, I have been exposed to and followed the changes and expansions that the field of design has gone through. I started

as an industrial designer working with furniture and product design before moving to interaction design and eventually working with service design and systems-oriented design as my main professional focus. Before entering the PhD programme at AHO, I worked as a design manager at Halogen, a 60-person-large design consultancy based in Oslo. At Halogen, I have been responsible for knowledge management and competency development internally, for managing and leading the four design studios at the company and for the delivery of project outcomes. This has taught me how to plan and execute large design projects while simultaneously steering multiple streams of design productions and ensuring high-quality deliveries. At Halogen, I have been responsible for several clients and projects that the company runs within the healthcare sector. While carrying out this research, I was also engaged in a 50 % position, working as a senior designer at Halogen while being engaged with several healthcare service design projects. Working with designing healthcare services and medtech solutions has given me insight into the fascinating world of designing for care. I have a good understanding of the interlinked and complex nature of the sector and how both patients' and providers' aspirations, needs and challenges, alongside innovative opportunities, may be translated and transformed into coherent and desirable service propositions.

In parallel with my job in the design consultancy industry, throughout my career, I have been engaged in academic work at the Oslo Schools of Architecture and Design (AHO). At AHO, I have had several positions, such as vice rector, head of the Institute of Design (IDE) and teacher for the master-level service design course. Teaching design has trained me to quickly see the potential in other people's work and ways of thinking, in addition to learning how to mentor and give constructive feedback. During my period as the head of the IDE, I have taken the initiative to establish and launch the Centre for Design Research at AHO. I have also been managing and participated actively in several funded research projects at the institute. Through these projects, I have been engaged with cross-disciplinary collaborations and gained experience with the development and implementation of research strategies alongside administrating project-based inquiries into and through design. I have always had a deep respect for and fascination of the researchers involved in these projects and the work they were engaged with. This motivated me to further develop my own research competencies and engage in doing research work myself, resulting in my application for the AHO PhD programme and pursuing the current research. These experiences and insights made it possible for me to connect teaching and research as a basis for arranging the interventions that were carried out as part of this study.

During these interventions, I was actively engaged in planning and coordinating the activities in close collaboration with the appointed innovation champions from the hosting hospitals. My work included arranging and participating in planning meetings, where the interventions' purpose, goals, activities, milestones and desired participants were made the focus. I spent about two to three days each week working as a codesigning coresearcher together with the students inside the service design lab during each intervention. Here, my engagement was initially focused on onboarding students onto preplanned activities and discussing the overall service design and research objectives. Once the students got involved, my engagement turned towards supervising the student groups to collaboratively prepare codesign events, make sense of insights and develop their different service design proposals. My active involvement allowed me to gain an embodied first-hand experience of working as a healthcare service designer inside embedded service design labs. By acting as a guiding codesigner, I helped to enrich the students' service design and design research work. Simultaneously, I learned a lot from working with the participating students because they provided me with a 'fresh-eye' while feeding back a large amount of reflections on the actions taking place inside the lab. The iterative knowledge exchanges taking place between me as a researcher, the other tutors and the students provided vital inputs to both moving practical matters forward and to the research carried out. Beside my professional background and active involvement during the research interventions, the below four matters have had an impact on who I have become as a person, influencing the foundational viewpoints that I have taken as a researcher.

The first matter affecting my personal understandings is diversity. I was born in Jerusalem in 1968 to a Danish mother and an Israeli father. My best friends and childhood playmates came from various backgrounds: Morocco, Germany, Iran and the USA. Growing up in Jerusalem, one of the most diverse cities on the planet, made me realise that we live in a world of many worlds, where no single person is able to fully understand the multiplicity of perspectives that are at play in any given social situation. Further, coming from a Jewish background and growing up in the Middle East made me realise that conflict and tension is not a given contextual condition but rather something that is actively produced by people with bounded mindsets who view themselves as oppressed victims and, therefore, as being justified to sovereignty and the (mis)use of power. In line with the Jewish Israeli writer Amos Oz (2018), I believe that human interaction that bridges across worldviews through curiosity, empathy, recognition of experience and the

willingness to compromise is key for any effort concerning sociocultural and political advancement.

A second personal attention that affected this research are my interests in artistic expression. My way into design as a field was through a personal and deep interest in art and human artistic expression. As a young adult, I thought I would pursue an artistic career, first as a musician playing the guitar, then as a fine artist and later as a theatre actor. Much of my own personal development has been through self-reflections as part of embodied contacts with and through the manipulation of materials and rehearsing of expressive artistic techniques. This includes the recognition and experience of trial and error, alongside external and self-criticism as the basic condition for learning and moving forward. I have always been fascinated by the disruptive and emotionally moving capacities of artistic expression and delivery of messages through mediated storytelling. I have been lucky to grow up with a sister and brother who both ended up pursuing artistic careers. Combining artistic expression in mundane everyday settings through designing has been one of the greatest pleasures I have enjoyed during my years of practicing as a designer.

The third experiential awareness that has had an influence on the current research is leadership. After moving to Norway in 2006, I was granted the position of institute leader at the Institute of Design at AHO. Even though at that point I had experienced diverse experiences working as a designer in a small consultancy, in a large commercial company and in the public sector, no single career move has had a greater impact on my personal development than becoming a leader. Taking responsibility as a leader was like crossing a magical threshold of suddenly gaining a formally recognised power position to influence change. I quickly learned to realise that being in a position of power can also be challenging and that triggering change relied on my abilities of building relationships: inside the institute, at AHO and outside of the school. Change management, which involves working with democratic and inclusive academic environments, is hard to achieve, and it takes time. Often, several possible ways forward are available, and all of these alternatives include pros and cons making it difficult to take decisions. I also learned that the privileges of being in position in many cases also comes at a cost. The responsibilities and endless amount of work that potentially follows ambitious leaderships are personally exhausting in the long run, and it almost burned me out. These experiences have taught me to be humble to leadership, particularly towards leadership that values change and development as part of their identity and responsibility.

A fourth influential aspect is my personal relationship to healthcare. I am luckily married to a psychiatrist who has years of experience in medicine and medical research. Her views include a basic belief in human capacities and resources and the fact that these resources may be of use, no matter what condition one is in. Her medical orientation combines both the use of medication with psychosocial treatments of people experiencing severe mental illness. For many years, our professional worlds were separated, though I have always been fascinated by medicine, perhaps because several of my ancestors were medical doctors. Having followed my wife's medical education and career and being surrounded by family friends who practice medicine has given me a deep and personal insight into the many perspectives, complexities, responsibilities and daily matters of working in a healthcare context. At a certain point, when working in Halogen, I got involved in a growing number of healthcare-related service design projects. This triggered a dialogue between me and my wife about the role and use of service design to support healthcare—a dialogue that we've been engaged in for almost 10 years now. Besides sharing three wonderful kids, we now also share parts of our professional worlds. The current research has undeniably been influenced by my close and personal relationship to a healthcare researcher and practitioner.

My personal experience regarding diversity may have skewed my attention towards particularly attending to the differences of perspectives of the involved actors. However, systems theory and the S-D logic axioms emphasise the cocreated and networked characteristics of services, integrating various perspectives through actor interactions in such processes. My personal interest for artistic expression has inherently affected the current study. Nevertheless, because the present research uses artistic techniques as part of its methodology and because service design practice makes extensive use of representations and visualisation techniques, this attention seems natural and purposeful. My experiences from leadership may have focused my attention towards top and middle management struggles and the support for them. Having said that, management and leadership is an important factor in all change processes, providing critical support to the use of service design practice and for building design capabilities inside healthcare organisations. When it comes to my personal insights and relationship to healthcare as a profession, I may have attended more towards physicians and the responsibilities that they have or the psycho-dynamic elements of illness and care. On the other hand, I consider the direct access to medical knowledge and insights into the responsibilities of leading healthcare professions, as well as understandings regarding healthcare research, as being extremely valuable

for carrying out the current investigation. Although I believe that my personal position and subjective experiences mostly had a positive impact on this research, it may also have skewed some of the actions that I have taken, as well as the analytical views applied as part of the current investigation.

3.7 Evaluation of the current research

Despite the fact that my position and personal experiences have inherently influenced the current empirical study, measures were taken throughout the process to support the precision, validity and credibility of its presented findings. To strengthen the empirical findings, this next section reviews the research to assess its validity and transferability of its contributions.

3.7.1 Validity

To mitigate personal bias and influence, several forms of triangulation were employed to add rigour and support the comprehensiveness of the study's interpretations and understandings. Triangulation is used as a strategy to enhance the quality of qualitative research by adding different examinational approaches to a subject of study (Flick, 2018; Thurmond, 2001). Triangulation can be performed in four main levels: 1) methodological level through the use of different methods, 2) at the level of a variety of data sources, 3) research perspective level by involving various perspectives into the research and 4) a theoretical level, applying different theoretical perspectives to a qualitative inquiry (Flick, 2009). In the current study, all four levels of triangulation were applied, including triangulations in and between the methods used through data diversity and by linking multiple investigator perspectives and through informing the study from different theoretical viewpoints.

Triangulations between methods were used to approach the issues studied from different angles to allow for the assessment of empirical data from several perspectives (see Table 1). During the narrative inquiry, three different methods were used, including semistructured interviews, contextual photography and autoethnographic accounts, hence adding richness and rigour to the practitioners' narrations. During the embedded service design lab interventions, six different methods were used to generate a variety of data types that were then used during the process of analysis in action and on action. Triangulations were also done using each method, for example, related to the interviews of the participants during the narrative inquiry; inputs from the respondents were collected through audio-recordings,

through visual annotations and later through verifications of the interpreted meanings that were condensed from the stories told. Another example is the way research diaries were used, allowing for both consistent annotations of specific matters across diaries and for adding individual annotations, including text, diagrammatic sketches and contextual photographs. Along with this, the visual posters summarising each student's research diary collection added an in situ analysis of each of the codesigning coresearching student's diary collection.

Data diversity is concerned with deriving insights based on a collage of various data sources (Denzin & Lincoln, 2011). In the current study, different study groups in different locations were involved systematically and purposively in various local and temporal settings to ensure variation of the data subtypes (Flick, 2009). Within each of the conducted interventions, data richness through multiple sources and compilations and assessments of rich data portfolios ensured triangulation across the diversity of data included. Also, across the four interventions held, diverse sets of data were generated, adding more rigour to the study. This is perhaps most evident in the analysis done to bring forward the third publication of the current study, which combines datasets from two interventions to explore design conversations in healthcare service systems.

Concerning triangulation through the multiplicity of investigators, the current research involved many coresearching voices. This was done both as part of the narrative inquiry, where the coauthors knew little of each other's work and approach to start with. Most evidently, however, was the inclusion of multiple investigators as part of the embedded service design lab interventions. Here, 32 codesigning coresearching students were involved in participatory observations and in several reflexive focus groups. In addition to this, three of the coresearching students and one tutor were later involved in coauthoring two of the included publications. The diverse perspectives of observations and analysis included in each diary collection and research poster that were developed as part of this research were of great importance to guiding the coauthors' attention to both unexpected directions and common matters.

When it comes to theoretical triangulation, although the current research is positioned within pragmatism as its main philosophical frame, it has been informed by several theoretical perspectives to strengthen its validity. This is mirrored in the discussions in the various publications, including this exegesis, where perspectives from service marketing theory, systems theory

and design theory are included. This complementary blend of theory act as various supportive perspectives to the analysis and contributions provided and thus making the current research more robust.

Throughout this research, I have developed an in-depth, first-hand experience and understanding of practicing service design in healthcare. However, to secure the accuracy of specific research findings, all the publications were circulated with and verified by the involved healthcare innovation coordinators of the interventions. Further and more broadly throughout the period of study, the involvement of my fellow PhD colleagues and supervisors provided recurring critical feedback. In addition, two of the included publications went through a thorough double-blinded peer review process, while the others were the subject of the critique of editors, scholars and practitioners through presentations at conferences and PhD seminars, strengthening the robustness of the findings.

3.7.2 Transferability

Generalisability is often used as a criterion for evaluating the applicable of the breadth of findings, conceptions and theory related to a particular study (Schwandt & Gates, 2018). However, in qualitative research, generalisability is seldomly seen as the main aim of the research (Creswell & Creswell, 2018). Instead, 'transferability' has been highlighted as the effect that many qualitative researchers are aiming to achieve (Dahler-Larsen, 2018). Transferability is understood as the interpretative parallel to generalisability, referring to the ability of findings and results from qualitative research to be transferred to other settings and interpreted in useful ways by others (Bitsch, 2005). Transferability is an orientation that values the type of knowledge in the space between the particularities of a certain cases and formal generalisation (Dahler-Larsen, 2018). The way qualitative researchers facilitate transferability is through judgements of the potential uses of the research, 'through "thick description" and purposeful sampling' (Bitsch, 2005, p. 85). This means that researchers need to provide appropriate information on both the research context and its informants so that readers may assess the results' capability of being transferable to their context.

Throughout this research, I have strived to include a sufficient granular level of detailed description of the context in which the interventions took place, the processes carried out, the participants involved and the results of the specific investigations. The intention is to give readers enough insights through thick descriptions, enabling them to extract the results and findings of the current research in ways that seem relevant to be transferred to their own

context. I envisioned both service design researchers and healthcare service design practitioners as potential users of the current research findings and knowledge outcomes. At the same time, I also regard healthcare innovators and leadership as potentially interested readers who may transfer parts of the current research results to their own contexts.

The contributions of the current research have partly emerged from analysing the experiences of healthcare service design practice internationally. Further, this research draws on a variety of different types of service design projects carried out in different hospital settings in the Oslo region. These factors increase the likelihood of the ability of the results to be transferable to similar service design settings in Scandinavia but also more broadly. Simultaneously, I hope that the current research will become part of an international body of knowledge and discourse on healthcare service design praxeology and on service design labs as supportive structures for healthcare service design.

3.8 Summary

Exploring how service design practices can be supported by design labs in the complexities of healthcare, this chapter presented how pragmatism was used as the main philosophical frame for carrying out this qualitative practice-led research as an inquiry using reflection on experience. It then described the mix of methodological approaches applied, combining a narrative inquiry with a design-supported action research approach. Accordingly, data collection methods and methods of analysis were described and exemplified. Further, this chapter explained the ethical considerations and measures taken during this research. It highlighted the important aspects related to my position as a researcher and reflected on how this position may have influenced the current research. Finally, a short evaluation of the research was made in terms of measures taken to ensure its validity and transferability to other similar settings and more broadly. The next chapter presents the four action research interventions carried out as part of the current study framed as the embedded service design lab interventions.

4

EMBEDDED SERVICE DESIGN LABS

This chapter provides an overview of the empirical context of the current research. It first describes and defines the concept of embedded service design labs and illustrates how they are envisioned. Then, it provides a general description of how the embedded service design lab interventions were initiated and carried out as part of the current study. After this, it describes each of the four interventions carried out in detail while showing a collage of images to illustrate some of the activities that took place. Finally, the effects that the interventions had on the participants are reflected upon.

4.1 What are embedded service design labs?

Originating from economic sociology, embeddedness is a concept exploring how systems of social relations influence the ways that individuals and institutions define purposive action (Granovetter, 1985). To avoid the chaotic processes of organisational decision making in complex settings, an embedded temporal structure may guide and channel organisations towards taking action (Dacin et al., 1999). Organisational networks are viewed as constantly and dynamically changing. Structured embedded interactions within networks allow individuals to mediate and trigger change inside networks (Halinen & Törnroos, 1998). Temporal embeddedness suggests

that during such processes, organisations are bound to modes of time, including the past, present and future. Organisational networks 'have their own histories during which they have evolved; they are also in the midst of their own present, in which they are currently functioning; and they have objectives and expectations about the future which affect their present decisions and actions' (Halinen & Törnroos, 1998, p. 195).
In line with the concept of temporal embeddedness, the model of the embedded service design lab was conceived to create close social relations and influence the ways to explore practice, develop new knowledge and bring forward future service propositions collaboratively in a certain context and time. Embedded service design labs are understood as temporal entities within organisations that utilise service design knowledge and capacity to support change and innovation processes. The embedded service design lab is a temporal setup that adapts itself to a given suitable space inside the context that it seeks to support; it may operate as a temporal unit inside a larger healthcare organisation, such as a hospital, acting as a pop-up service design studio that supports the establishment of a community of learning and practice (Wenger, 1999). The embedded service design lab helps catalyse predefined strategic commitments or larger innovation programmes consisting of several linked developmental streams. More specifically, the embedded service design lab supports the processes of collaborative learning and decision making on acting, hence affecting parts of the ecosystem that its participants represent, which may cause ripples that impact the healthcare system more broadly.

Lundin and Söderholm (1995) developed a theory in use of temporary organisations, emphasising time, task, team and transition as the central aspects. Similarly, the embedded service design lab operates within a limited time frame. It focuses on resolving a defined complex task involving several interlinked developmental tracks. It assembles a dedicated cross-functional team to engage in a design process and cocreate and conceptualise resolutions by bringing forward new service propositions. These propositions aim to support a transition towards a desired future state of service delivery. Further, the embedded service design lab is similar to what Pelle Ehn (2008) refers to as meta-design (Fischer & Giaccardi, 2006), which is a social infrastructure that supports community building through mediated communication assisted by artefacts and designed materials. By linking people with mutual interest together over a period, the embedded service design lab may create shared understandings, a consensus on the ways forward and a sense of agency in situ towards sparking change through acting. In the current project, the embedded service design lab interventions served as an action research

site where designing researchers were engaged in cycles of semistructured qualitative data collection, observations and analysis through reflection on action. Figure 19 illustrates the embedded service design lab as a collaborative temporary site of engagement where multiple actors are involved in healthcare service design and research activities.

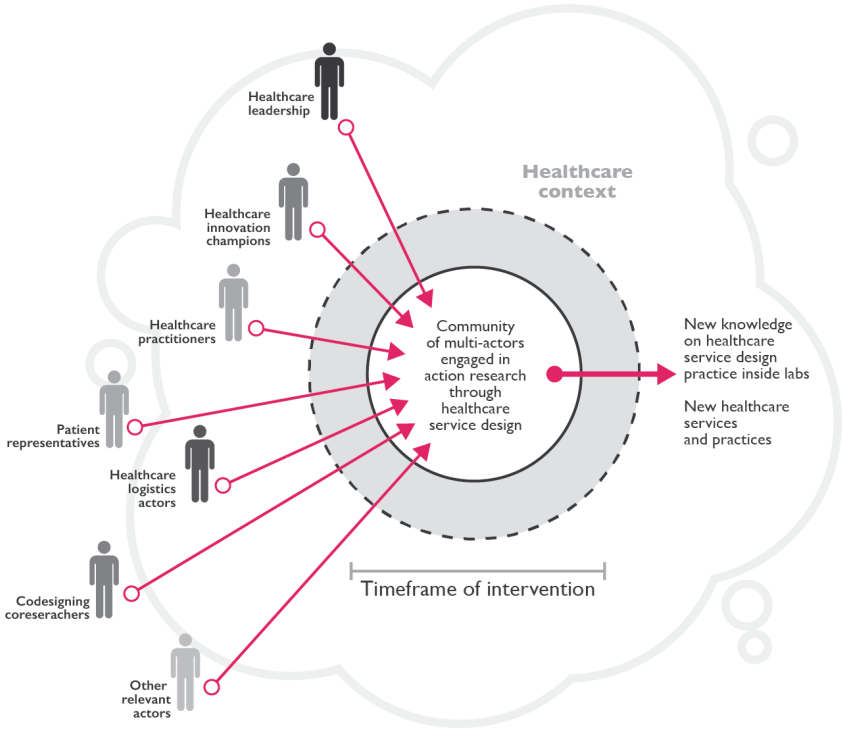


Figure 19: The embedded service design lab as a temporary supportive space for collaborative research engagements and service design practice in the context of healthcare.

4.2 The way interventions were carried out in this study

Each embedded service design lab intervention was established through a process of dialogue, primarily with the innovation units of each hospital. All the interventions were supported by appointed members of the hospitals' innovation units taking the role of innovation champions. Innovation champions are individuals within organisations who have the role of actively promoting innovation processes and providing the operational support to keep developmental processes alive (Howell & Higgins, 1990; McDermott & O'Connor, 2002). Preparations for each intervention were done during autumn

over a period of six month to ensure that the interventions could be carried out during the springtime. The reason for this was to coordinate the interventions as part of the academic semesters at the Oslo School of Architecture and Design, allowing for the inclusion of Master of Design students in their second semester studying service design. This made it possible to invite the students as groups of codesigning coresearchers supporting each embedded service design lab intervention. About three months after each intervention was terminated, a formal focus group interview with the involved coordinators from the hospitals and tutors was conducted to evaluate the process and its outcomes. All participating codesigning coresearchers, including the students and academic staff, were formally temporarily employed as unpaid affiliated student researchers at the hospitals during the intervention periods. All the codesigning coresearcher participants were screened for resistant bacteria (methicillin-resistant Staphylococcus aureus, MRSA) and, before the interventions, had to go through obligatory onboarding e-learning modules about working at the hospital, hygiene and safety routines and ethics concerning working with patients. In addition, they had to sign a general agreement of confidentiality and nondisclosure.

During these interventions, we were fortunate to engage in a variety of service design–related projects providing a broad range of experiences related to the evolving field of healthcare service design. During the first and second interventions, areas such as digital services, internal organisational service reconfigurations, service logistics, sociocultural services, preventive care services and service information touchpoints were developed. During the third intervention, the work was directed at service scenario building and speculative service design. During the fourth intervention, we worked to develop working environments to support service delivery. Next, a detailed description is provided to explain the context, goals and outcomes of each of the embedded service design lab interventions that were carried out as part of this research. The chronological sequence of the described interventions has been changed to make it easier for the reader to follow the analytical line of the thesis.

4.3 Intervention 1: Centre for Elderly Medicine

The first intervention involved embedding a design lab at the Akershus University Hospital (Ahus) in 2018. Located in the suburbs of Oslo, Ahus is one of Norway's largest public hospitals. The hospital holds a capacity of approximately 1,000 beds, covering a population of around 500,000

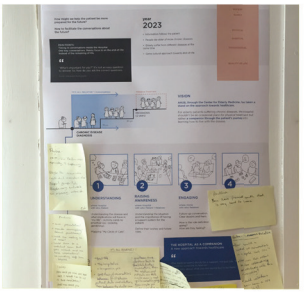
persons, and is run by about 9,000 employees. Ahus's strategy was to develop and launch a Centre for Elderly Medicine as a response to the need for the renewal of services and their supportive institutional arrangement to confront a growing elderly population in the region (Schultz et al., 2016). The goal of the embedded service design lab intervention was to support the early establishment stages of the centre. Over the course of 10 weeks, the lab worked to support the development of three new service initiatives for the elderly: 1) palliative care services to provide support in the final stages of life, 2) specialised healthcare services provided at the homes of the elderly and 3) the establishment of an interdisciplinary outpatient clinic to provide multiple healthcare services for the elderly during a single hospital visit.

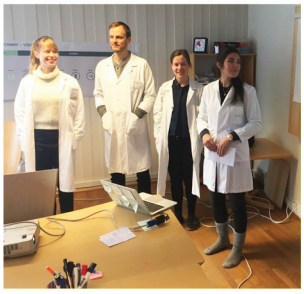
The entire intervention was coordinated by a project leader who was assigned by Ahus to lead the formation process of the Centre for Elderly Medicine, here taking the role of an innovation champion. Acting as a codesigning and coresearching unit, eleven Master of Design students, one tutor and one researcher from the Oslo School of Architecture and Design were embedded into the service design lab at Ahus. The lab was established physically in a project space placed at the Ahus campus with three large rooms for teamwork equipped white boards and a small kitchen. A temporary printing space containing a large plotter and printer was established in the hallway of the lab to support the codesigning coresearching teams during their engagement. Around 25 participants representing various actors were gathered to support working with the assigned service design initiatives of the intervention and to take part in five preplanned multiactor codesign events. Apart from these events, the researching design teams were involved in extensive field work during the first weeks of the intervention. Figure 20 provides a general impression of the embedded service design lab at Ahus.

The intervention resulted in four service propositions related to the three above-mentioned initiatives: 1) a home-based digitally supported care service for elderly; 2) a multidisciplinary outpatient service where elderly could get coordinated treatments of several conditions during a one-day visit to the hospital; 3) a death-cafe theatre event to change the way people are relating to and talking about death, and 4) a service that encouraged families to discuss 'What is quality of life?' when an elderly family member is diagnosed with a chronic condition.

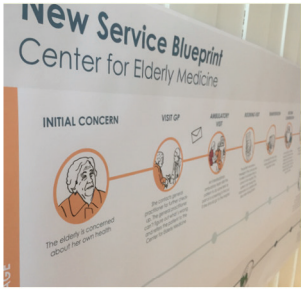
The research goal of the intervention was to shed light on the

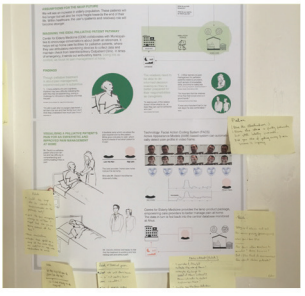
Figure 20: Images from the embedded service design lab intervention at Ahus. Photographs: Alex Assensi and Jonathan Romm.






AHUS · DESIGN
LAB


New Service Blueprint
Center for Elderly Medicine
INITIAL CONCERN
VISIT GP
The elderly is concerned about her own health



conversations that were taking place during the intervention. Three action research cycles were conducted during the intervention. During these two-week-long cycles, research diaries were used to annotate contextual observations from the specific design-oriented conversations taking place. Research posters that were made by the design researching students were used to analyse each research diary collection. During the process, contextual photographs were taken to provide a visual situated record of the activities taking place. The process of research and data collection on the design conversations was repeated during the second intervention as a basis for addressing the second research subquestion of this study: How do service designers facilitate fruitful interactions among multiple actors in healthcare? The resulting research publication of the intervention—exploring design conversations in healthcare systems—is summarised at the end of the description of the next intervention.

4.4 Intervention 2: Hospital-at-Home Services

OUH provided the context for the second embedded service design lab intervention. Serving the whole capital city of Oslo, OUH is one of Scandinavia's largest hospital organisations, consisting of five large hospital sites. The hospital has a capacity of about 1,900 bed units and provides around 1.2 million treatments yearly through 14 medical divisions involving 24 000 employees. In the near future, OUH is planning to enlarge its home care service offerings because home hospitalisation has been identified as a promising care model because it may provide better patient experiences while lowering the treatment costs (Levine et al., 2019). For 12 weeks in the spring season of 2019, a design lab was embedded into OUH at Ullevål Hospital. The lab was located inside a centrally placed building regularly used for staff training. The embedded service design lab consisted of two large workspaces in addition to a space used to simulate patient homes; it had access to a nearby kitchen facility. The lab was also equipped with white boards, mounting boards and printing and plotting facilities. The aim of the intervention was to support three hospital-at-home services initiatives: 1) create a future vision for hospital-at-home care services delivered by OUH; 2) develop home services for children needing specialised treatment; and 3) develop services for home isolation and recovery treatments of severe blood disorder patients.

Three innovation champions were appointed to coordinate the intervention from the innovation section at OUH. The design lab was embedded into

the hospital; this was assisted by eight service design students, one service design tutor and one researcher from the Oslo School of Architecture and Design who was acting as a codesigning coresearching unit. A mixed group of about twenty participants from six hospital units were allocated to support the intervention process, all of whom came from different professional backgrounds, by participating in four planned codesign events. During the intervention, the designing researchers were engaged in fieldwork explorations, observing and conversing with patient representatives, nurses, doctors, healthcare leadership and other associated actors. Figure 21 depicts the photographs of typical situations from the embedded service design lab intervention at OUH.

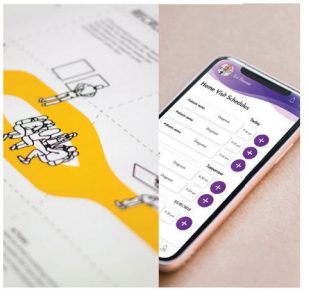
The intervention resulted in several service proposals: 1) an onboarding service for healthcare staff learning about working at the hospital-at-home care unit; 2) a digital service concept proposed to coordinate home visits more effectively and provide remote access for updating medical records; 3) a service to support hospital-at-home recovery for patients going through a stem cell transplantation treatment; and 4) an exhibition concept of the hospital-at-home model that was proposed to spread the care model internally at OUH. Later, the exhibition concept was further developed and exectuted at OUH as part of their 20-year anniversary. In addition, a short movie was delivered, picturing future potentials and challenges of the hospital-at-home care model, which was presented as part of a debate at a policy symposium in the city of Arendal in 2020.

Similar to the research goal of the first intervention, the intervention at OUH explored design-oriented conversations and the ways service designers were helping to change conversations during the intervention. Through three action research cycles, reflections on practice were done recursively by using research diaries and posters and contextual photographs to collect data. One master student from the OUH intervention and one from the previous intervention at Ahus were engaged in the analysis process of both interventions. The work resulted in a plenary session at the annual international Relating Systems and Design Thinking symposium (RSD9): Systemic Design for Well-being: From Human to Humane, which was held from October 9 to October 17, 2020, and that was hosted by the National Institute of Design, Ahmedabad, India. Later, it was developed into a working paper published in the RSD9 conference proceedings with the following title: ‘Design Conversations in Healthcare Service Systems’. The second publication is included in the current thesis.

Figure 21: Images from the embedded service design lab intervention at OUH. Photographs: Jonathan Romm.


31
A


Home healthcare:
A meaningful transition



Intervention 3: The Patient in Year 2025

The third embedded service design lab intervention was carried out to support the early formation of C3 as a research and development centre by envisioning future patient-centric services that were imagined as taking place in the year of 2025 as its first work package. During this process, four large-scale codesign events were carried out. The events were carefully planned and designed to offer inspiration, social interactions and exchanges between multiactor participants to shape a shared sense of identity and create a future vision for C3. When planning for the events, in the fall of 2015, no formal organisational structures for C3 were in place. Partnerships and projects were not yet settled, and many of the participants were unfamiliar with each other. The participants of these events were primarily from C3, but affiliated healthcare professionals and patient representatives were also included. During these events, the participants were invited to share viewpoints, identify and discuss future drivers of change, review socioeconomic healthcare scenarios, experience future healthcare service enactments and evaluate how these shared future visions could affect the innovation strategy of the newly established research centre.

The four events were facilitated by researchers, tutors and service design master's students from AHO and were labelled as follows: 1) a future drivers' event, where about 80 participants were engaged in a 2-day symposium discussing and prioritising drivers of change affecting the healthcare system in January 2016; 2) a scenario review event, where 4 different scenarios were presented, exemplified and discussed with about 30 participants in February 2016; 3) 'Experimentarium event', where speculative future service moments were enacted and discussions about C3s vision was discussed with mixed groups of about 30 participants in April 2016; and 4) a closure event, where around 40 participants were discussing strategies for C3 in September 2016.

To prepare and facilitate the 'Experimentarium event', seven service design MA students were embedded into the OUH. The lab was established in the management building of OUH, which was allocated to host the C3 centre and which consisted of five workspaces connected by a long corridor. Three of these spaces were used as workspaces by the codesigning coresearchers; one room was used as a joint meeting space and one room as a prototype workshop with printing, plotting and mounting facilities. During a six-week-long period, the students were working inside the embedded service design lab. The goal of the embedded service design lab intervention was to support the design process and demonstrate six speculative scenario-based future

healthcare service moments that were enacted as if they were delivered in the year 2025; this was labelled as the 'Experimentarium event'. Figure 22 shows images from the embedded service design lab intervention that supported this first work package of C3.

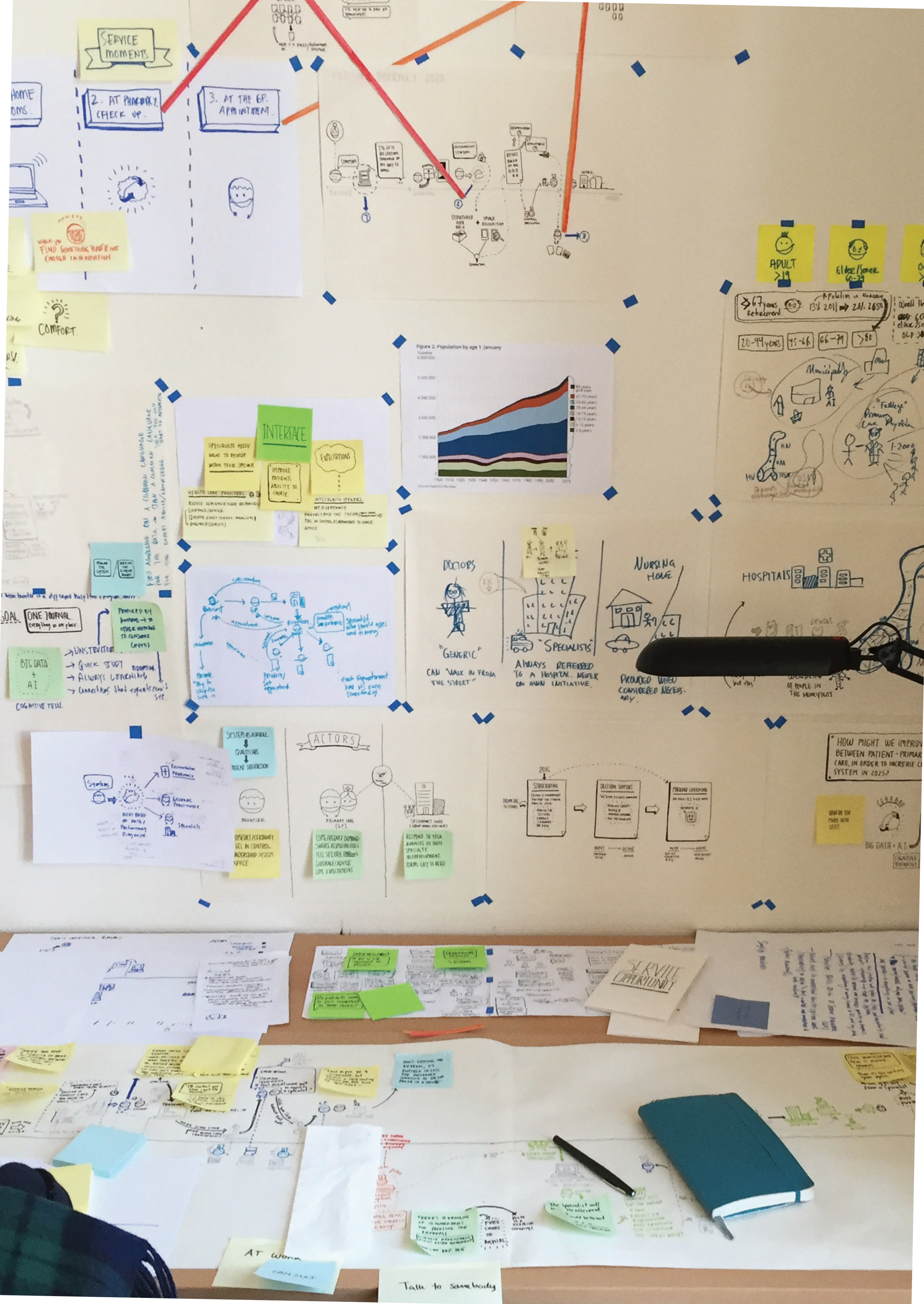
Throughout these codesign events, data were collected in the form of contextual photographs (Holm, 2008), participatory observations and semistructured interviews. These were later analysed using data visualisation to explore the facilitation practices of multiactor codesign events. Besides kicking off the collaborations in C3, the intervention helped in addressing the second research subquestion of the current study: How do service designers facilitate fruitful interactions amid healthcare complexity? The intervention was used as one of two cases developed into a conference paper analysing design facilitation practices in complex settings; this was presented at the Relating Systems Thinking and Design Symposium (RSD5), which was held from October 13–15, 2016, in Toronto and that was hosted by OCAD University and MaRS Discovery District. Later, the publication was further developed and published in She Ji: The Journal of Design, Economics, and Innovation, titled 'Design facilitation as emerging practice: Analyzing how designers support multi-stakeholder co-creation', the third publication included in the current study.

Intervention 4: The rehabilitation-hospital of the future

The fourth embedded service design lab intervention was carried out at Sunnaas Rehabilitation Hospital (Sunnaas) in the spring of 2017. Sunnaas is the largest hospital in Norway and specialises in rehabilitation treatments and physical medicine. Sunnaas provides healthcare services for patients with complex functional impairments caused by an illness or injury through the engagement of multidisciplinary rehabilitation teams. The hospital is currently planning to renovate parts of its old buildings and build a new 5,000-square-metre hospital wing because of a general need for renewal of the hospital site. By upgrading its built environment, the hospital aims to strengthen its position as one of the leading rehabilitation hospitals in Northern Europe, hence increasing patient satisfaction.

The goal of the fourth design lab intervention was to support the early stage of this process. Over a period of 12 weeks, from January until April, the design lab was embedded into Sunnaas to carry out a service design process, helping to conceptualise and aid the renovation process.

Figure 22: Images from the third included embedded service design lab intervention. Photographs: Niklas Schmidt, Alex Assensi and Jonathan Romm.



SERVICE MOMENTS
2. AT PHARMACY CHECK UP.
3. AT THE GP APPOINTMENT
COMFORT
ADULT >19
INTERFACE
EXPECTATIONS
Figure 2. Population by age 1. January
DOCTORS
"GENERIC"
CAN WALK IN FROM THE STREET
"SPECIALISTS"
ALWAYS REFFERED TO A HOSPITAL. NEVER ON OWN INITIATIVE.
NURSING HOME
HOSPITALS
ONE JOURNAL
BIG DATA + AI
ACTORS
SERVICE OPPORTUNITY
AT WORK
Talk to somebody

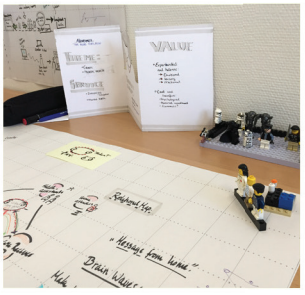














More precisely, the task included 1) identifying stakeholder needs by mapping out central activities at the hospital; 2) articulating developmental issues and future projections to inform decision makers; and 3) deliver support that could be used while approaching and briefing the architects of the renovation project. The embedded service design lab was centrally placed in the middle of the lower ground level of Sunnaas Hospital, which is located next to a corridor leading to the main hospital auditorium, where people would occasionally pass by. The lab consisted of a large workspace containing a white board and a nearby room with plotting and printing facilities.

The intervention was endorsed by the top management CEO level at the hospital. Two staff members from the innovation unit at the hospital were appointed to coordinate the process, acting as innovation champions. The responsibility of the coordinators was divided so that one coordinator was supporting the designing researchers by outreaching to leadership, while the other coordinator worked to secure access to participants, such as patient representatives, frontline personnel, logistics and others. The designing researching team involved six Master of Design students from the Oslo School of Architecture and Design who were supported by one tutor in architecture, two tutors in service design and one design researcher. Further, a resource group of 22 people were assembled to support the intervention and take part in five preplanned codesign events. The resource group members also supported the design researchers in carrying out fieldwork explorations during the initial research phase of the intervention. As the process went on, more actors were dynamically included into the process as new themes of importance were identified. Figure 23 shows a collage of images from the embedded service design lab intervention that took place at Sunnaas.

The intervention resulted in the design of five illustrated conversations supported by illustrated folders covering central important themes related to how the hospital is envisioned when it comes to delivering rehabilitation services in the future and how these are associated with the renovation plans. The conversations were designed to be used in planning meetings with architects and with the staff of the different units at the hospital, as moderated by appointed agents from the hospital.

The research goal of the intervention was to shed light on service design practices related to the making use of space inside design labs. Through four 2-week-long action research cycles, the codesigning coresearchers were engaged in recurring reflexive dialogues on their experiences of practicing

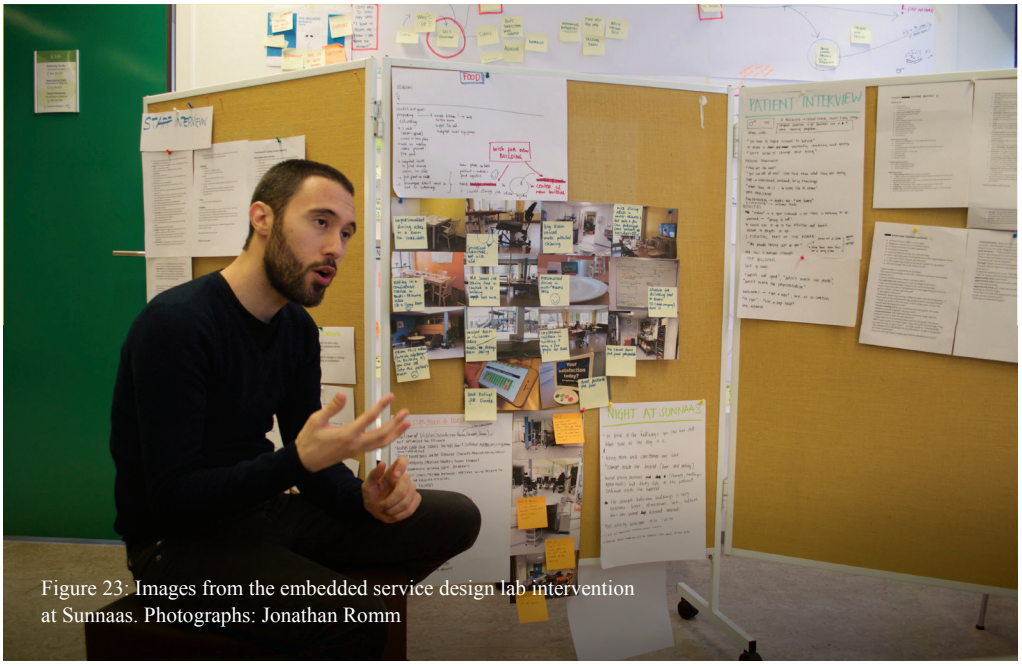
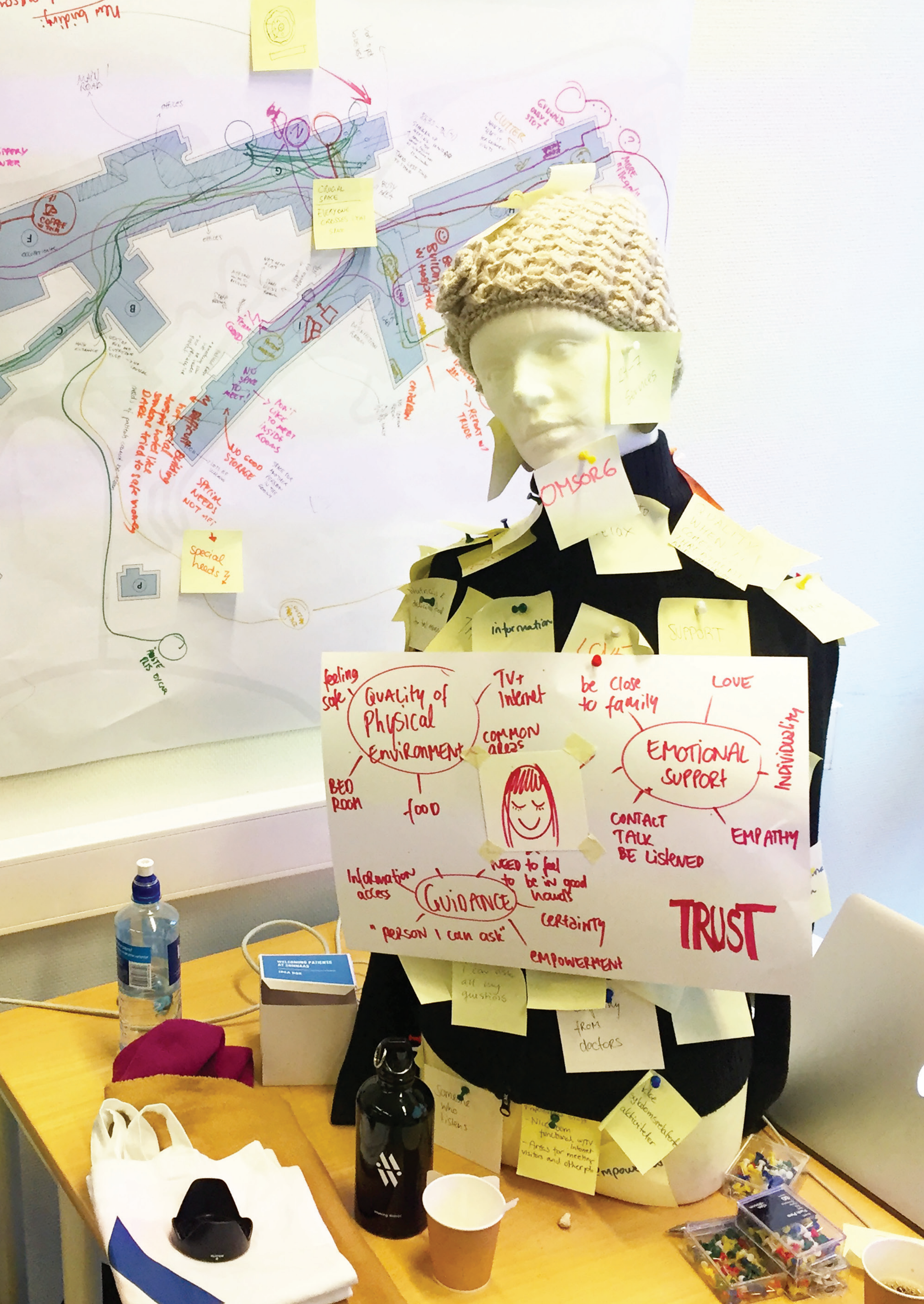
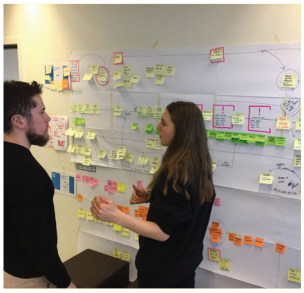
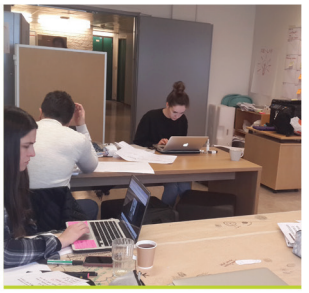


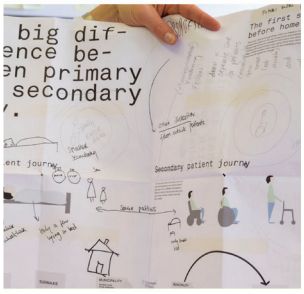
Figure 23: Images from the embedded service design lab intervention at Sunnaas. Photographs: Jonathan Romm

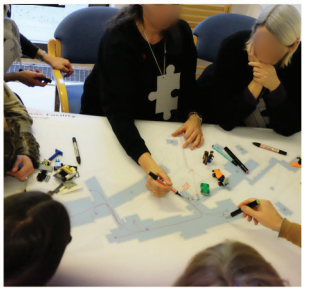

Quality of Physical Environment
feeling safe
TV + Internet
common areas
BED ROOM
food
be close to family
LOVE
EMOTIONAL SUPPORT
Individuality
CONTACT
TALK
BE LISTENED
EMPATHY
NEED to feel to be in good hands
Information access
GUIDANCE
"person I can ask"
certainty
EMPOWERMENT
TRUST
OMSORG
information
special needs
from doctors
WELCOMING PATIENTS AT SUNNAAS




What is unique in a rehabilitation hospital like Sunnaas?
How can healing environments contribute to rehabilitation?
Thinking rehabilitation beyond therapy.
How can we articulate people and spaces in order to build a more patient centered organization?
How can we enable a better transition between Sunnaas and what comes after?
Register the conversations. Its key moments, arguments or decisions.




big dif-
ence be-
en primary
secondary
Secondary patient journey




F 3


Ergoterapi

healthcare service design, here related to the making use of materials and the lab space inside the hospital. Contextual observations annotated inside research diaries (Engin, 2011; Nadin & Cassell, 2006) alongside contextual photography (Holm, 2008), and foldable research posters were used as methods to collect qualitative data during the observation stages of each action research cycle. After the intervention, the collected data portfolio was analysed, which involved a student and one of the tutors who took part in the intervention as coauthors. The intervention helped address the third research subquestion: How can healthcare design labs act as supportive spaces for service design practices? The work resulted in the fourth publication, a journal article published in Artifact: Journal of Design Practice with the following title: 'Shaping Physical, Social, and Imaginary Spaces in Healthcare Design Labs'.

4.7 The effects of the interventions on participants

The interventions that were carried out as part of the current research were both affected by and had an effect on many people. In total, during these four interventions over a hundred participants were involved from different healthcare contexts and were engaged in a range of service design activities aimed at cocreating new healthcare services. These interventions were supported by a total of seven innovation champions from the three hosting hospitals that were all heavily involved in preparing and carrying out each intervention. The four embedded service design lab interventions were facilitated by thirty-two service design students in total and supported by seven members of the academic staff from the Oslo School of Architecture and Design.

Apart from contributing to the specific developmental programmes of the explored themes, these interventions helped in introducing service design practice to a large number of healthcare professionals and other affiliated actors. The champions were especially exposed to and involved in practicing service design. All of these innovation champions have used service design techniques—and some of them have commissioned service designers—to engage in specific tasks after the interventions took place.

The interventions also provided educational value by involving the service design students and giving them an immersive and situated experience of working with healthcare service design in real-life settings. Further, by being invited as coresearchers, all the involved students gained insights in

conducting practice-led research through collecting and analysing empirical data from the fieldwork. Three of the invited students chose to take part in coauthoring two of the publications included in the current research and later further engaged in design research work at AHO. Furthermore, two PhD research fellows from AHO who were affiliated with C3 used the embedded design lab interventions to conduct explorations and collect data that were used as part of their own research. The next chapter describes the research findings derived from the embedded service design lab interventions and the initial narrative inquiry carried out as part of this study.

5

RESEARCH FINDINGS

This chapter brings together the findings of the research. It presents the findings related to the compound ways that healthcare service designers are negotiating and dealing with the inherent tensions arising in healthcare as a context. Further, it exposes the nature of the design conversations and the way in which contextually designed facilitation tools are used to support multiactor interactions. Zooming out to the lab itself, the chapter reveals the findings regarding the ways service designers make use of physical, social and imaginary lab spaces to support their practice. Finally, the chapter presents the findings related to how design labs safeguard the facilitated micro interactions taking place inside the lab while acting as amplifiers of a new discourse outwards, causing ripples in the healthcare system more broadly. It is important to note that the offered figures illustrating the findings of the current research are heavily simplified to provide a clear and abstracted understanding of the line of argument. In real-life settings, these matters tend to be dynamically evolving and, in many cases, in a messy way. However, the simplifications offered in this chapter are meant as a synthesis highlighting the central aspects of embedded service design labs and to offer conceptual building blocks that may be transferrable to similar settings.

5.1 The tensions faced by service designers working in healthcare complexity

The first study included as part of the current research found that healthcare service design practitioners are forced to navigate between three main tensions amid the complexities of healthcare service systems: First, they need to negotiate their position. Second, they must resolve the degree of change that they can stimulate. Third, service designers need to navigate their ability to influence. Table 2 lists the compound approaches used by healthcare service designers to cope with the tensions manifested in the contextual complexities of healthcare.

The next three subsections contain a short summary describing each of the three compound approaches used by healthcare service designers to navigate tensions amid healthcare complexities.

5.1.1 Healthcare service designers negotiating their position as outsiders

First, we discovered that the service designers needed to negotiate their position as outsiders. Inherently, service designers bring an outsiders' perspective into healthcare contexts. The position they hold is the view of a generalist facilitator, approaching these contexts with relatively little specific domain knowledge on the subject matter. Even though in some cases healthcare service designers may have a repertoire of experience from previous healthcare change efforts, their innovation perspective means that, to some degree, they are always an outsider. Maintaining an outsider position was found to be beneficial because it allows service designers to sense the context as a whole, without being entangled in the established cultural norms, the ways things are done and the existing hierarchies and structures. At the same time, the current research found that service designers need to dive deeply into the contexts they are faced with to obtain a granular sense of the situation at hand, the risks involved and the motivations and possibilities for change. To counter their outsider position, service designers immerse themselves into the context by exposing themselves to a range of impressions and diversity of human experiences to help them enact an insider–outsider position. Further, the current research found that on the one hand, enacting an insider–outsider position offers healthcare service design practitioners a multiperspective understanding of a specific health context. On the other hand, this compound position enables them to maintain a distanced and critical perspective of it while facilitating novel incremental or radical changes to influence a certain

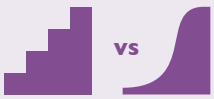
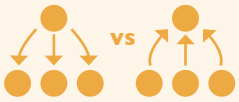
Tensions facing service designers amid the complexities of healthcare	Compound service design approaches	Summary
Position		
Inside vs Outside 	Enacting the insider-outsider position	Service design practioneers take an outsider view. Immersion into the field is necessary. Maintaining an outsider position is beneficial. Blending insider and outsider perspectives is essential.
Degree of change		
Incremental vs Radical 	Creating radical-incremental change	Healthcare gravitates towards incremental change, and service design practioneers may easily get trapped in incremental change only. Hence, service designers tussle to propose radical change as part of improvement efforst in the context of healthcare.
Ability to influence		
Top-down vs Bottom-up 	Catalysing top-up dynamics	Internal champions provide vital support for change. There is a need for both top-level leadership support and bottom-up co-creation movements. Acknowledging the inherent politics is important.

Table 2: The compound approaches used by service design practitioners while facing the inherent tensions of healthcare complexities. Adapted from (Romm & Vink, 2018).

healthcare context. It is important to note that navigating these contradictions is demanding, especially in healthcare, which is focused on hierarchies, specialisation and where people without a health professional background may be less valued by clinicians. Therefore, it demands a negotiation based on building an alliance by being able to communicate how the outsider perspective may be beneficial for the healthcare providers and for the patients.

5.1.2 Healthcare service designers negotiating possible degrees of change

Second, the current research found that healthcare service designers must sense the degree of change that they seek to inspire. The service design practitioners highlighted that there is a strong gravitation towards working with incremental improvements of healthcare services. The complexities manifested in such settings usually expose a range of basic service issues that needs attention and renewal. These efforts typically include improvements of service interfaces, in many cases through digitalisation, hence attending to the information and communications offered through specific touchpoints in an efficient and consistent way. In-house healthcare service designers reported that there is a risk of getting trapped in working with incremental improvements only because these issues are often easier to identify and fix and because they provide quick wins for the embedded service designers. However, given the magnitude of the pressures and drivers of change affecting the healthcare system, the service designers were aware that in many cases, a more radical change is needed. Hence, this research found that healthcare service designers tend to seek to inspire more radical change proposals during processes initially targeted towards more incremental change. These proposals typically include new care concepts, different collaborations or introducing technologies that require significant behavioural changes. For example, one practitioner expressed this tendency by stating, 'The real work of the design artefact is not in solution or the final output, but in the systems change that you have affected in the process of designing. The leap is all about context. It may look like an incremental shift, but actually the contrast is pretty stark, given the healthcare system' (Romm & Vink, 2018, p. 128). The service design practitioners were found as mavericks within their given mandates, carefully negotiating the opportunities for stretching ambitions towards causing more radical change. Despite the outspoken aims for incremental improvements that are often expressed by people working inside the healthcare context, service designers work to simultaneously catalyse more fundamental shifts during service design processes.

5.1.3 Healthcare service designers negotiating their ability to influence

Third, this investigation found that service designers working inside healthcare need to negotiate their ability to influence the inherent hierarchies of these healthcare systems. An important discovery was that support from innovation champions and sponsors from within the healthcare system was critical. Innovation champions can help service designers manoeuvre through the intricate hierarchic dynamics of cultures, professions, organisational

levels and healthcare politics. The current research found that healthcare service design practitioners pay particular attention to both the top-level leadership and actors working at the frontlines or the organisational bottom level. The top-level focus is initially concerned with supporting leadership to set clear goals without prescribing how these could be achieved as open-ended outlets of departure. Then, attention can be turned to collaboratively figuring out how to reach these goals through bottom-up interactions with multiple actors. Further, the current research found that during the service design process, middle- and top-level management are usually involved to enrich the codesign process, assess proposals and provide support for decision making. Healthcare service design work was found as entailing a combination of both catalysing bottom-up change movements involving many actors and top-level leaderships to provide a mandate for change and secure organisational power and support for making change.

5.2 The way service designers facilitate fruitful interactions among multiple actors in healthcare

The second study included in this research found that at the core of service design efforts facilitating multiactor interactions are design conversations. The phrase design conversations denotes ‘conversations that are planned, facilitated and used by service designers as part of the design processes carried out inside service systems’ (Romm, Dudani, & Prakash, 2020, p. 2). Conversational interactions were found as taking place as part of fieldwork explorations, during reflexive conversations among participants or as part of codesign events. Further, the healthcare service designers used mediating artefacts and facilitation tools to influence design conversations both in general and, more specifically, during codesign events involving many actors representing the different parts of the healthcare ecosystem.

5.2.1 Healthcare service design conversations

By analysing 204 nonexhaustive descriptions of conversations collected during the Centre for Elderly Medicine and the hospital-at-home services action research interventions, the types of design conversations taking place during such service design processes and the influences that service design practitioners bring to conversations were exposed. These design conversations and the ways they are influenced by service designers are unpacked in detail in the third publication, ‘Design Conversations in Healthcare Service Systems’ (Romm, Dudani, et al., 2020).

The study found that during design conversations, the level of attention may change its scope and perspective. For example, a design conversation among actors may be guided towards discussing the issue on a macro level regarding the purpose of healthcare, national policies and other overall influential factors. It then may be facilitated towards addressing a meso-level perspective going through a patient journey, hence allowing for assessing and rearranging a service flow. Finally, it may end up addressing specific micro-level exchanges through certain touchpoints, such as information carriers or face-to-face interactions during treatments. Zooming in on these design conversations, the current research identified five different levels of design conversations taking place and as helping service designers gain insights and spark change amid the complexities of healthcare (Figure 24).

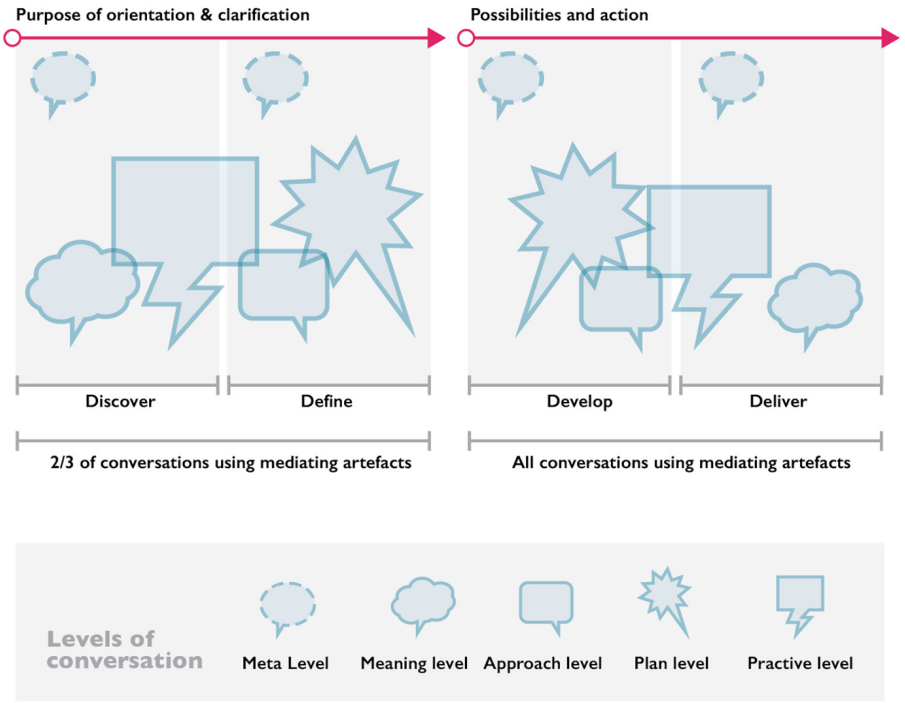


Figure 24: Different levels of conversations taking place during healthcare service design processes amid the complexities of healthcare (adapted from Romm, Dudani, et al., 2020).

Meta-level conversations (dashed bubbles) were identified as the interactions referring to the intervention itself; these were concerned with framing goals, who to include as participants and figuring out the means of moving

the process forward. *Meaning-level* conversations (cloudy bubbles) were found as interactions about ethics, treatment philosophies and the purpose of healthcare; these conversations provided a sense of the 'overall picture' or the meanings behind appearances. Approach-level conversations (bubbles with rounded corners) were the interactions focused on long-term issues, such as healthcare policies or the healthcare system and its desired outcomes. Approach-level conversations can help clarify higher-order issues and identify large-scale possibilities. *Plan-level* conversations (spiky speech bubbles) were concentrated around the delivery process of care and the involved supportive resources. Finally, *practice-level* conversations (sharp-cornered zig-zag bubbles) were found as focusing on short-term matters such as decision making, manoeuvres and more detailed procedures related to the delivery of specific healthcare services.

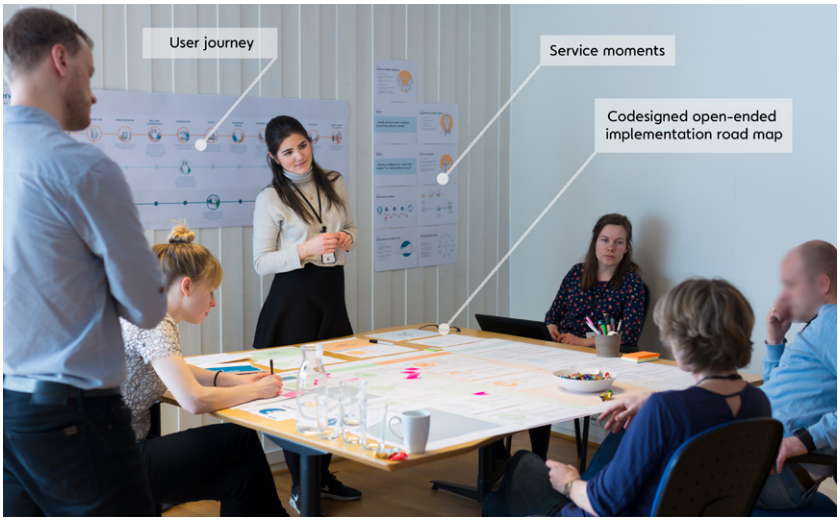


Figure 25: An example of a facilitated and mediated conversation during the embedded service design lab intervention at Ahus. Photo: Alex Assensi

Most conversations were identified as directed at the plan and practice levels, as indicated by the approximate size of the different speech bubbles in Figure 24. Further, the current research found that most conversations during the early stages of problem discovery and definition had the purpose of clarification and orientation supporting a collaborative learning process. Conversations taking place during the later stages of development and delivery were found as being used for identifying possibilities and proposing action (red arrows above the speech bubbles). Around a third of the early-stage conversations were found as being mediated using artefacts, while

during the later stages, nearly all conversations were found as being supported by mediating artefacts. Furthermore, service design practitioners were found to be influencing these conversational interactions through linking design conversations to one another, by raising fundamental questions, by highlighting overarching objectives, by reframing language and by creating and using mediating artefacts and facilitation tools. Figure 25 provides an example of a typical design conversation that was supported by the mediating artefacts taking place at the Ahus embedded service design lab intervention. Here, a proposed user journey including illustrated service moments (mounted on the walls) and a map (on the table) supported the participating actors to suggest ways forward regarding implementing the new healthcare service.

This study found that these design conversations helped renew the discourse, thus shaping new mental models among the participants. Further, the renewed discourse that was created during design conversations and that occurred through small-scale actor interactions caused ripples that chained change processes on larger scales. By spreading these new mental models to other parts of the healthcare system, sociomaterial was affected more broadly, leading to new collaborations and wider system adaptations. Hence, this research highlights that design conversations are a central service design material for carrying out service design processes inside complex healthcare service systems. The use of artefacts in design conversations also seemed to impose new ways of communication about change processes inside the system because these were adopted by staff to help them convey new important information in a manageable way.

5.2.2 Service design facilitation tools used in codesign events

Further, in exploring the ways service designers can facilitate fruitful interactions among multiple actors in healthcare, the third study included in this research found that besides using generic facilitation tools such as sticky notes, white papers and so on, service designers produced specific contextually designed facilitation tools.

Three facilitation dimensions were found to be used to create these contextually designed facilitation tools as part of preplanned tasks and phases in codesign events. Using the third embedded service design lab intervention as a case together with a case done in a similar complex setting, sixty contextually designed facilitation tools that were created and used by service designers during nine codesign events were analysed. The two cases and use of these facilitation

tools are described in more detail in the third included publication (Aguirre et al., 2017). In analysing these tools, three dimensions used to create design facilitation tools were found: human perspective, experiential and creative dimensions. The contextually designed facilitation tools were found to be used as part of codesign events to help bring forward various actors' perspectives on a subject matter, illustrate and evoke sensorial experiences and promote creativity. Table 3 lists the three dimensions used to create the contextually designed facilitation tools found as part of this research.

Human perspective	Prompts empathic insights and embodies relational perspectives
Experiential perspective	Use immersive, multisensorial aesthetic interactions
Creative perspective	Promote lateral thinking and produce novel design material

Table 3: The three dimensions found to be used to create contextual design facilitation tools (adapted from Aguirre et al., 2017).

The human perspective dimension of such design facilitation focused on exposing and appreciating a diversity of actor perspectives—an attention rooted in the tradition of human-centred design—a central approach used in service design practices. The dimension of experiential design facilitation helped in creating aesthetic and extraordinary interactions among participants using multisensorial influences. These types of facilitation tools are typically designed to evoke emotional reactions and trigger humour and playfulness through unexpected uses of symbols and metaphors. Finally, the dimension of creative facilitation tools helped in supporting activities intended to inspire abductive and lateral thinking, which aided participants in generating ideas and conceptualising and creating novel design inputs and materials.

Figure 26 shows an example of a flow of one codesign event taking place at The Patient in Year 2025 embedded service design lab intervention, which was supported by various contextually designed facilitation tools (marked with red circles) to support multiactor interactions. The coloured fields above show how the tools that were used to support perspectivation (orange), experiential (blue), and creative (purple) interactions among participants during the event.

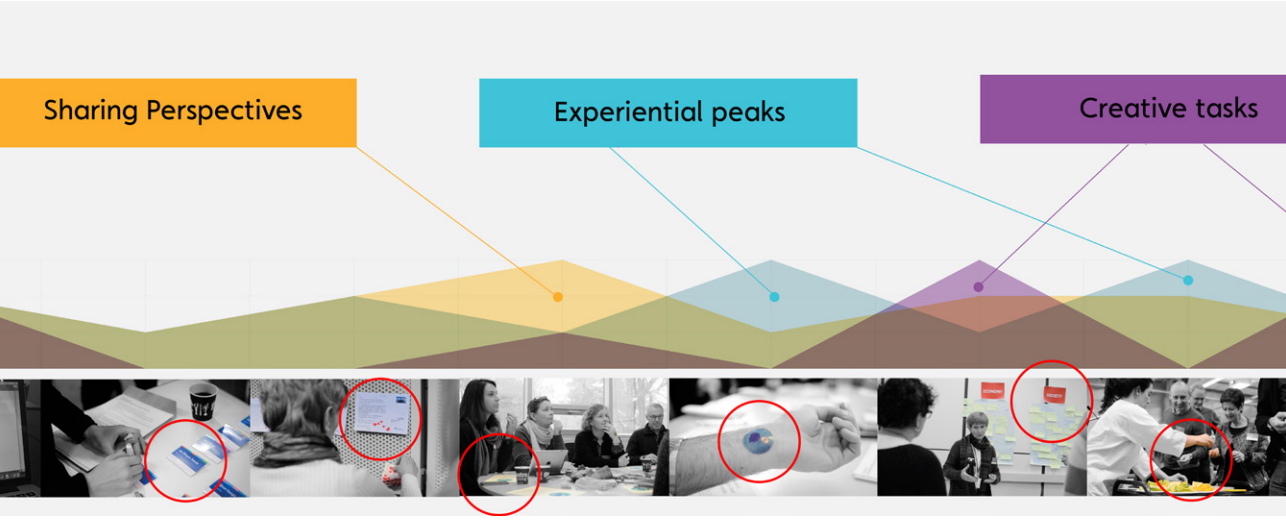


Figure 26: Facilitation tools used in one codesign event promoting perspectivation, experiential and creative multiactor interactions (adapted from Aguirre et al. 2017).

These design facilitation tools, which were created and used by service designers, were found to be acting as mediating artefacts to support and guide both design conversations in general and conversations taking place in preplanned codesign events

Figure 27 summarises the findings of this research related to the ways service designers facilitate fruitful interactions among multiple actors in healthcare. The design conversations taking place during service design processes are shown as speech bubbles in the middle of Figure 27. The design facilitation dimensions that were used by service designers to support multiactor interactions during conversations and codesign events are shown inside the inner circle surrounding the speech bubbles. All these interactions were supported by the embedded service design lab, creating an arena for these interactions to take place (grey circle) within the complexities of healthcare.

5.3 Supportive spaces for service designers amid the complexity of healthcare

The fourth study of the current research found that embedded service design labs represent multiple spatial dimensions. First, these labs are tangible and experienced physical spaces in a certain period of time. Second, the labs are manifested as social arenas encompassing a shared sense of belonging

and purpose among different actors. Third, the lab was found representing a mental imaginary spatial dimension where the envisioning of situations and activities of the future was cultivated. Aligned with the concept of codesign space (Sanders & Westerlund, 2011), these physical, social, and imaginary spaces, manifested as part of the embedded service design labs, were found supporting the collaborative change and innovation processes that were taking place inside these complex healthcare contexts. The making use of physical, social and imaginary spaces inside healthcare service design labs are made explicit and delineated in the fourth publication included in this study (Romm, Agudelo et al., 2020). Figure 28 illustrates the physical, social and imaginary spatial dimensions that are at play supporting service design practices inside embedded service design labs amid healthcare (coloured areas inside the grey circle).

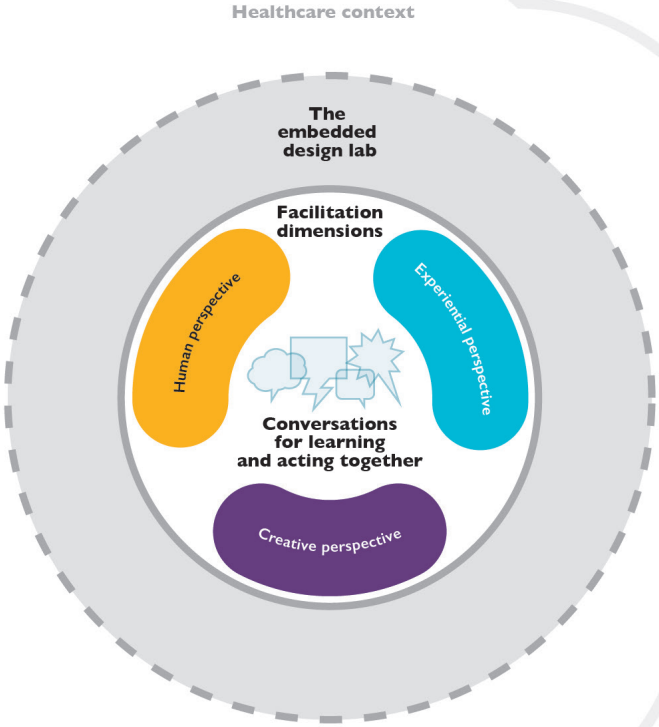


Figure 27: The dimensions used to create facilitation tools guiding multiactor interactions.

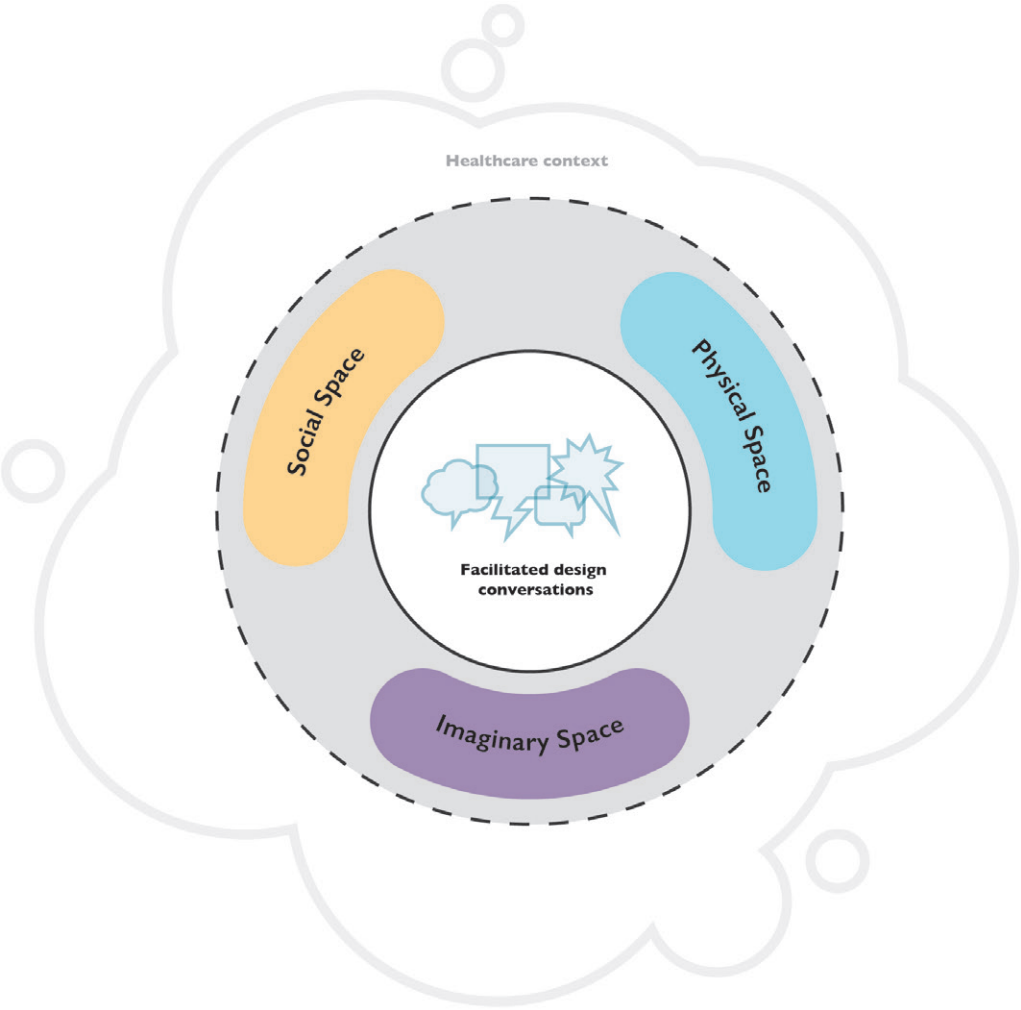


Figure 28: The physical, social and imaginary embedded design lab spaces supporting facilitated design conversations.

Next, a summary of the main findings related to the multiplicity of embedded service design lab spaces is given.

5.3.1 Physical, social and imaginary spaces supporting healthcare service design efforts

To increase accessibility, a close proximity to frontline services was found as useful when locating a physical space for the design lab. We found that nearness to the frontline made it easier for service designers to immerse themselves into the context, engage in fieldwork explorations and quickly establish relationships with healthcare actors. Further, when establishing the lab, functional issues related to equipment and creating an inviting

atmosphere were important to consider. The physical lab space was found to support the display of different configurations of representations that assisted in collective planning, learning together through sensemaking and exhibiting innovative proposals and practices. Figure 29 depicts the physical space of two of the embedded service design labs used as part of this research.

Figure 29: The physical space of the service design labs that were embedded into Sunnaas (above) and at OUH (the two photos at the bottom). Photo: Jonathan Romm

The social spaces helped in promoting participation and multiactor interactions through back-and-forth coassessment and codesign activities through conversations and codesign events. The social space of embedded service design labs helped in creating a shared sense of belonging and collaborative engagement to help resolve future-oriented service propositions. Furthermore, because the lab was embedded into the healthcare context, it was easier for the participants to take ownership over the process and its outcomes. Figure 30 provides an example of the use of space in supporting socialisation to create a shared sense of belonging, ownership and purpose inside the hospital-at-home services intervention carried out at OUH.

Figure 30: An example of the social space inside the embedded service design lab.
Photo: Jonathan Romm

The social space of the embedded design lab was divided into subspaces where back-and-forth codesign interactions among actors were taking place at different intensities (Figure 31). The service design students socialised by acting as a core design team. Here, frequent interactions, which are illustrated with red arrows in Figure 31, were happening to exchange ideas, make sense of empirical findings and iterate on quick sketches. Refined materials from these interactions were then discussed with the extended codesign group, which consisted of the appointed champions from the hospital and academic staff. After several internal iterations, reworked concepts and representations were presented and used in preplanned larger social spaces, such as during

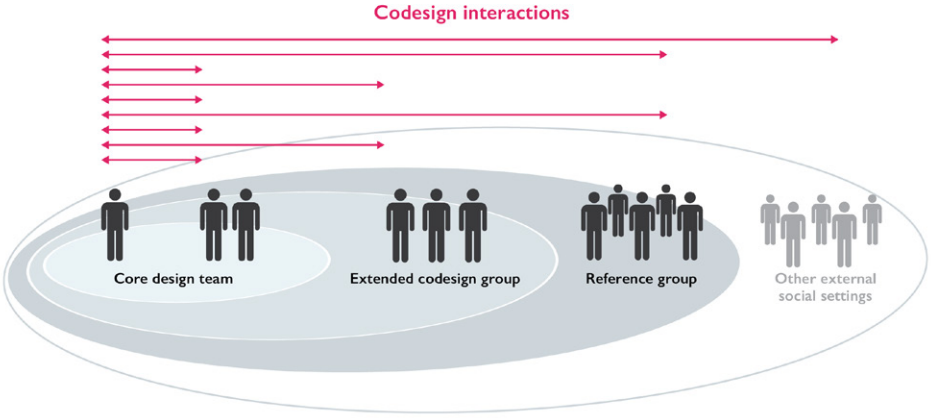


Figure 31: The different social subspaces that were used inside the embedded service design lab (adapted from Romm, Agudelo, et al. 2020, p. 15).

codesign events with the assigned reference groups. In addition to these subspaces of social interactions, elements such as concepts, representations and propositions were also used and discussed externally in presentations and workshops outwards, as shown in Figure 31.

Further, the current research found that the embedded service design labs supported the cultivation of shared imaginary spaces, helping participants to frame, envision and take ownership of the proposals of future-oriented service designs and formation of new institutional configurations. Figure 32 provides an example of an imaginary space enacted in one of the events supported by the embedded service design lab at OUH. Here, A group of participants enact and discuss an imaginary situation where a parent, holding his unwell child, is contacting a healthcare service providing medical advice through video consultations.

Figure 32: Example of an imaginary space inside the embedded service design lab. Photo: Jonathan Romm

5.3.2 The interlinked dynamics of lab spaces

The current research found that a multiplicity of spaces was at play, here triggered by the embedded design lab. For example, the physical, social and imaginary spaces were found as influencing each other bilaterally. Further, all three spaces converged to create synergies during codesign events. Furthermore, service design labs acted as a focal space that promoted and

were affected by several other external codesign activities taking place in other parts of the healthcare system, such as in related projects in other parts of the involved hospitals and as spin-offs caused by the interventions themselves. Throughout the service design process, the content from all these other codesign activities was brought back and used as feedback and inputs to the activities taking place inside the lab. During several occasions, compilations and reflections from these external codesign activities were found being echoed back from inside the service design lab, feeding content into new codesign activities outside the lab space or being presented outwards to broader audiences.

5.4 Embedded service design labs supporting service design practice inside the complexities of healthcare

This section offers a synthesis of all the findings from the current research. Its main purpose is taking a step back and providing the links and connections between the different substudies that were carried out, hence offering a compiled frame of understanding. One such understanding is the supportive qualities that the physical, social and imaginary spaces offer while at play in embedded service design lab settings. First, these spaces supported the micro interactions taking place between actors inside the lab. At the same time, they helped service designers in navigating the tensions they are faced with amid the complexities of healthcare. Figure 33 illustrates how lab spaces act as supportive spaces for service designers amid the complexities of healthcare, helping service designers navigate central tensions while simultaneously supporting the mediated interactions and conversations taking place inside the lab.

The physical lab space (blue area on the grey circle in Figure 33) supports enacting the insider–outsider position (light blue area outside the grey circle) by embedding the service designers into the healthcare context so that they can temporarily become a part of the milieu. At the same time, the physical space supports making use of the experiential facilitation tools and mediating artefacts (dark blue area inside the grey circle) to provide tangible and sensorial support in design conversations and during codesign events. The social lab space (orange area on the grey circle) helped service designers navigate through the hierarchies of healthcare and to do so in close collaboration with internal innovation champions, hence catalysing higher levels of influence (light orange area outside the grey circle). The social space also supported making use of human perspective facilitation tools (dark

orange area inside the grey circle) to enable plurality in conversations and multiactor interactions.

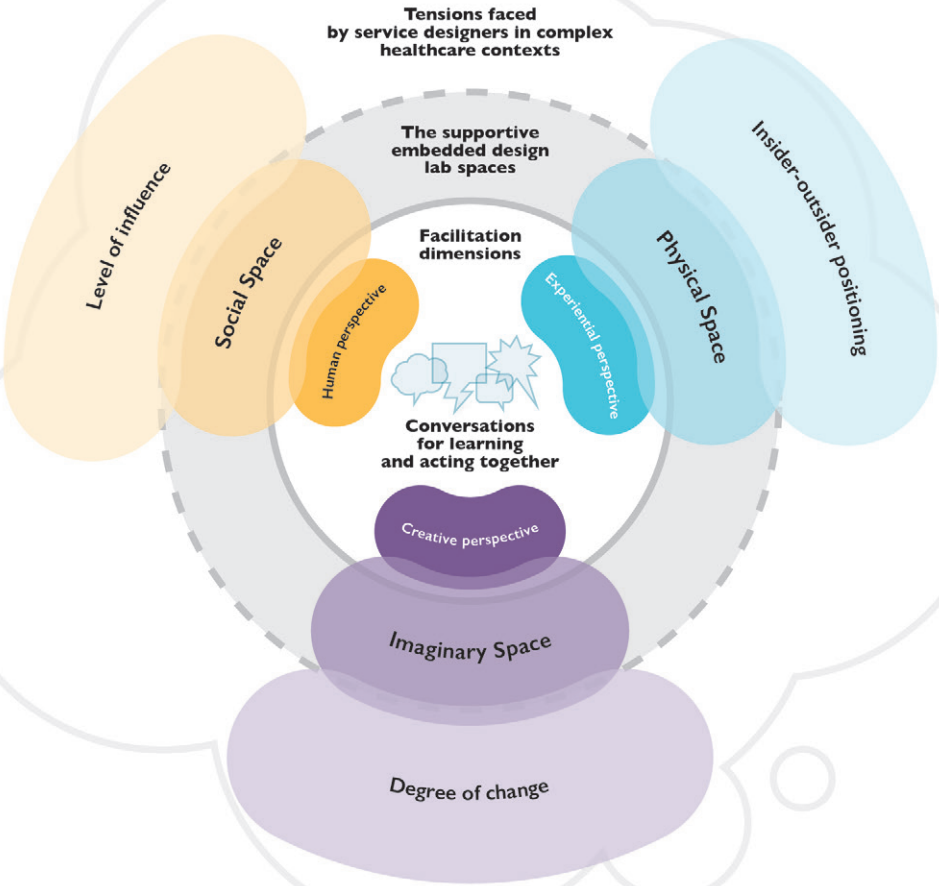


Figure 33: Physical, social and imaginary spaces supporting healthcare service design practices.

The imaginary lab space (purple area on the grey circle) helped resolve the degree of change (light purple area outside the grey circle) that the service designers were able to promote when it came to combining both incremental and radical proposals of change during the intervention processes.

Simultaneously, it supported the service designers in making use of creative facilitation tools (dark purple area inside the grey circle) to identify possibilities and collaboratively envision potential futures.

Embedded service design labs built on the premises of the physical, social and the imaginary space act as temporary structures that safeguard multiactor interactions working to meet changes and exploit innovations. At the same time, they act as amplifiers that support the spread of new mental models and push change efforts outwards to their surroundings. By establishing and utilising the dynamics of linked physical, social and imaginary spaces, service design labs help assemble a diverse group of people who represent different and sometimes conflicting views on the healthcare system and its provided services. Once gathered, the embedded service design labs support service designers and innovation champions in facilitating mediated learning processes involving lots of design conversations and a series of codesign events to jointly make sense of the status quo, envision possible ways forward and agree on taking action to make change.

The current research found that these processes caused ripples through a renewed discourse that affected change processes at larger scales inside the healthcare system, leading to new collaborations and wider system adaptations. Here, several examples of new collaborations and engagements were registered as the aftereffects of each intervention. For example, as a spin-off from the embedded service design lab intervention carried out at Ahus, a joint project with the municipality of Ullensaker was formed to develop digitally supported home care services for chronic patients. Another example is the long-term effects of the intervention at Sunnaas Hospital. Here, the space where the embedded service design lab was located inside the hospital is now called the ‘Sunnaas Idea Lab’. More than three and a half years after the intervention took place, it is still used by the innovation unit at Sunnaas as a codesign space for collaborative service developments inside the hospital. Figure 34 illustrates how the embedded service design lab supports broader change processes inside the complex healthcare systems by zooming in and out.

The left side of Figure 34 zooms out on a macro level to look at the picture before the interventions took place. During this stage, the actors gathered to take part to respond to the drivers of change pressuring the system and desires to harvest the benefits from innovative potentials, which are marked by red arrows on the left side. This is also the stage where the objectives and process milestones are codeveloped. Zooming in on the activities taking

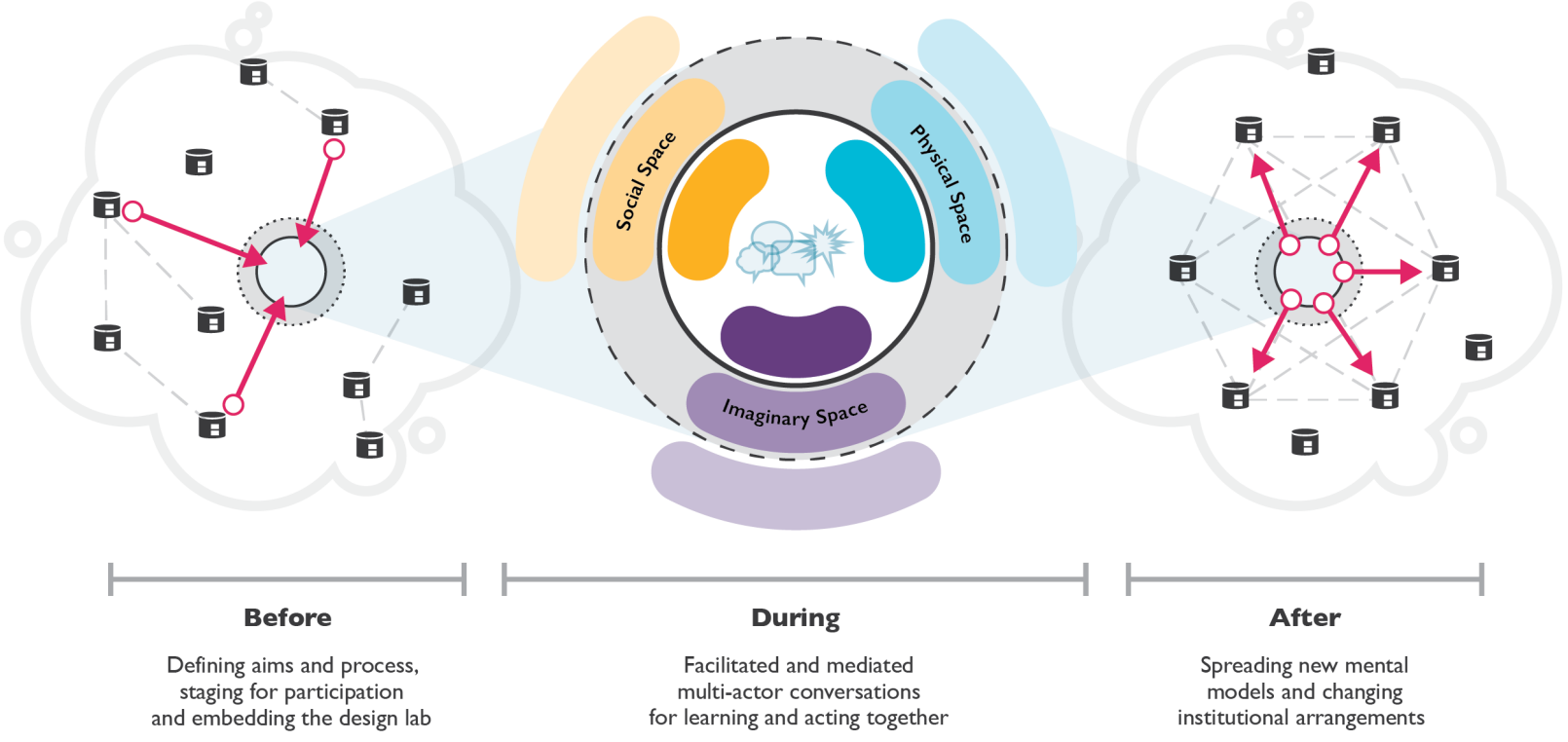


Figure 34: The way embedded service design labs facilitate change and innovation processes by affecting wider healthcare service system adaptations.

6

DISCUSSION

The objective of the current thesis was to explore the support that a service design lab may offer to the practice of healthcare service design to drive forward change and innovation processes inside complex healthcare service systems. Because the exploration involved both examining the currently evolving healthcare service design practices and making use of service design labs as emergent supportive spaces, a pragmatist approach of practice-led action research was applied. Building on Dewey's theory of inquiry (1934), the implications of this research are derived from collaboratively constructed knowledge through embodied experiences and analytical processes by consciously questioning the meaning of such experiences. In a time where the field of service design is expanding its theoretical foundations and purpose towards creating more long-term impacts on service systems (Sangiorgi et al., 2017; Vink et al., 2020), this research emphasise that practice-led inquiries in complex settings are especially needed in service design. Such inquiries may produce new knowledge and practice through situated collaborations in making to help advance or explicate current theories and provide practical guidance for practitioners. Further, more in-depth practice-led research on service design carried out in healthcare specifically may eventually provide the basis for strengthening healthcare service design as a subfield.

The present research conceptualises service design labs as meta-designs (Ehn, 2008; Fischer & Giaccardi, 2006), hence supporting design-for-service work (Kimbell, 2011; Meroni & Sangiorgi, 2011; Wetter-Edman, 2014)

in complex settings. Additionally, the current study envisions these infrastructures as temporal and embedded into a particular context. They support programmes that combine several developmental streams—a metaphor used to highlight going beyond the notion of projects. These developmental streams involve organisational networks that have a history before these meta-designs came about and are always further developed after they have provided their support, propelling them forward or leading them to new directions (Halinen & Törnroos, 1998). The way these streams are reinforced is through design conversations and multiactor interactions in codesign events that are facilitated by service designers.

Further, building on the concept of codesign space (Sanders & Westerlund, 2011), which consists of the physical, social and imaginary dimensions, the current research delineates the main supportive elements offered by these meta-designs or infrastructures, which are commonly framed as design labs. These contributions may serve as conceptual building blocks or frames of reference that can be used to advance service design and the design lab discourse on the infrastructures needed to support design-for-service work in settings such as healthcare.

The practical contributions of the current research focus specifically on embedded healthcare service design labs, meaning the temporal entities within organisations that utilise external service design knowledge and that have the capacity to support change and innovation processes in healthcare settings. Establishing and using embedded service design labs in healthcare involves practical considerations, actor commitments and investments. Making both theoretical and practical knowledge accessible, this study may inform healthcare reformers regarding how to establish appropriate supportive infrastructures to better integrate service design capabilities as a developmental capacity (Malmberg, 2017). At the same time, it offers practical knowledge to healthcare service design practitioners to do their job in a more aware and informed way in such settings.

6.1 Theoretical contributions

Because of the combined nature of the object of study of the current research and because it was explored in the making and through reflection on action, the contributions reflect different foci of attention. The theoretical contributions are discussed by following each research question, hence offering contributions to the following topics:

1. Conceptualising service design labs as embedded and temporal meta-designs supporting design-for-service work.
2. Explicating the valuable in-betweenness of healthcare service designers.
3. Identifying design conversations as a central material and design facilitation as a central practice in healthcare service design.
4. Explicating the multiplicity of spaces that are enabled by service design labs, creating long-term sociocultural impacts in healthcare.

Table 4 provides a summary of the theoretical contributions and implications derived from the main research question and subquestions articulated to guide this study.

Contributions to theory	Theoretical implications
Main research question: How can service design practices be supported by design labs in the complexities of healthcare?	
Conceptualising service design labs as embedded and temporal meta-designs (see 6.1.1)	• Service design labs support the creation of new service offerings, shaping the conditions for value cocreation and new institutional arrangements. • Several related developmental streams may be supported simultaneously inside service design labs to create synergies. • Service design labs are meta-designs, consisting of the physical, social and imaginary dimensions. • Service design labs are designs-for-design-for-service inside service ecosystems. • Envisioning such supportive meta-structures as temporal entities allow for more flexible and direct applications of service design labs.
Research subquestion 1: What are the tensions faced by service designers working in the complexity of healthcare?	
Explicating the valuable in-betweenness of healthcare service designers (see 6.1.2)	• Working and navigating among the contradictions across domains is an inherent part of healthcare service design practice. • The in-betweenness of healthcare service designers brings value to change and innovation processes by providing a perspective that bridges across hierarchies and by negotiating the degrees of possible changemaking.

Contributions to theory	Theoretical implications
Research subquestion 2: How do service designers facilitate fruitful interactions among multiple actors in healthcare?	
Identifying design conversations as a central material and design facilitation as a central practice in healthcare service design (see 6.1.3)	• Design conversations are a central service design material supporting social structure formation and reformation. • Service ecosystem design is conversation centric. • Utterances and linguistic framings in design conversations may change mental models. • Renewed mental models and discursive ripples have the potential to affect the healthcare system more broadly. • Service design facilitation practices support multiactor interactions in a series of codesign events that promote generative emergence inside complex service systems.
Research subquestion 3: How can the design lab space be made use of to support healthcare service design practices?	
Explicating the multiplicity of space of service design labs in creating long-term sociocultural impacts in healthcare (see 6.1.4)	• Service design labs are a space of many spaces that are linked to one another and to other codesign spaces. • Service design labs support service design practice by providing physical, social and imaginary spaces. • Making a combined use of these types of spaces to support service design practice may act as vehicles for changing cultural patterns, social activity and institutional arrangements.

Table 4: Theoretical contributions and implications of the current research.

6.1.1 Conceptualising service design labs as embedded and temporal meta-designs

Exploring the main research question on how service design practices can be supported by design labs in the complexities of healthcare, the current research identifies the following: the physical, social and imaginary spaces act in combination as potential supportive meta-design building blocks for making use of service design labs in complex settings. The current research suggests adapting a multiple orientational view on the purpose of service design labs as supportive spaces. Although they focus on design-for-service work, they simultaneously support the creation of service design proposals (Mager, 2009), mobilise design-for-service movements beyond specific

proposals (Kimbell, 2011; Meroni & Sangiorgi, 2011; Wetter-Edman, 2014) and trigger service ecosystem design ripple effects (Sangiorgi et al., 2017; Vink, 2019; Vink et al., 2020). In other words, they simultaneously support the developments of new specific service offerings, help create the conditions for further joint developments and facilitate new forms of value creation through new institutional arrangements. The emphasis on these orientations may vary depending on the combinations and types of developmental programmes that they are intended to support. In line with the notion of designing for social infrastructures (van der Bijl-Brouwer, 2017), these meta-design lab spaces are set up to support adaptations and the continuous improvement of healthcare practices coproduced by care providers and health seekers through service touchpoints.

Service design labs act as supportive spaces for what Ehn (2008, p. 94) describes as constructing meaningful sociomaterial assemblies 'for and with participants' of healthcare service design processes. Inside such assemblies, several developmental streams that are related to one another may be supported, explored and developed simultaneously, enabling the harvesting of synergies across developmental streams by exchanging experiences on the processes of inquiry, including collaborative learning and making change. At the heart of these explorations are multiactor design conversations and the interactions that occur during a series of codesign events and that are facilitated and mediated by service designers. This is similar to pragmatist meliorism, which holds that actors can create 'better worlds and selves' through inquiries (Koopman, 2006, p. 107). Further, the idea resonates with recent feminist pragmatist conceptions of inspiring social movements through 'co-transformative, relational meliorism' (Lake, 2020, p. 39): a situated collaborative commitment involving responses to difficult challenges that moves in-between and across divides to create a space for new understandings, future realities and coalition-building.

Service design labs support such processes by providing a codesign space (Sanders & Westerlund, 2011) consisting of a physical presence and workspace, social constructs of communities of practice (Wenger, 1999) and mental space for cultivating collective imaginaries and the intentional shaping of institutional arrangements (Vink et al., 2020). The main proposition that the current research makes is that if constructed and used with the physical, social and imaginary dimensions in mind, service design labs may act as supportive spaces for carrying out service design practices. As such, service design labs can be conceived of as a meta-design (Ehn, 2008; Fischer & Giaccardi, 2006) consisting of the physical, social

and imaginary dimensions. This mindset includes attending to creating the sustaining mechanisms for coevolutionary processes after the codesigning phase (Fischer & Giaccardi, 2006) and the mechanisms and means by which the diffusion of a new discourse in different systemic contexts may be accelerated. Similar to the concept of design-for-design (Björgvinsson et al., 2012; Ehn, 2008), service design labs may be seen as supportive infrastructures for service design practices to handle the complex and wicked nature of change and innovation work carried out inside service ecosystems, such as in healthcare. Service design labs are designs-for-design-for-service, which may help position service designers as facilitators and support diverse communities of practice to physically engage in renewal processes, envision future possibilities and negotiate resolutions through social interactions and collaborations on making change.

Embedded service design labs are temporal sociomaterial meta-designs supporting the continuity of service development and value creation. Thinking about service design labs as situated and temporal opens up for a whole range of possible configurations to deal with the expansion of service design moving into more complex domains (Sangiorgi et al., 2017). The notion of temporality aligns well with the pragmatist view of George Herbert Mead, which states that the 'social act' itself is, in its basic form, inevitably both temporal and interactional (Simpson, 2009). Perhaps, it is time to acknowledge the notion of temporality as part of the design lab discourse and to not see labs being closed down, like in the cases of MindLab or the DHW healthcare lab in 2018, as failures. In any case, whether being intended as temporal spaces or more permanent structures, service design labs are likely to engage in temporal programmes consisting of several parallel developmental streams. Envisioning such meta-structures as temporal entities—more like pop-up service design studios—may allow for more flexible and direct applications of such meta-designs by embedding them into the specific contexts that are placed and framed strategically inside larger service ecosystems to boost change and innovation processes.

6.1.2 Explicating the valuable in-betweenness of healthcare service designers

The first research subquestion explores the tensions faced by service designers working in the complexity of healthcare. The exploration exposed the central integral tensions manifested in healthcare service design settings. The study found that healthcare service design practitioners are creatively blending and strategically leveraging these contradictions. Navigating these contradictions with the support of a variety of participating actors helps enable healthcare

service designers to identify possibilities, frame new concepts and cocreate new value propositions. While working inside complex healthcare service systems, these approaches are used by healthcare service designers to gain an informed but critical position and resolve the combinations of changes that can be achieved in a given context. Concurrently, healthcare service designers seek to influence different levels of the healthcare system in different ways: both top down and bottom up. In contrast to previous research, these articulations help bring a more nuanced understanding of healthcare service design practice beyond the ex-house versus in-house discourse (Freire & Sangiorgi, 2010; Sangiorgi, 2015) or having to use 'either/or' strategic choices for creating incremental or radical change (Mulgan, 2014b) in healthcare settings. Contradictory qualities are linked to the paradoxes across domains and uncertainties as natural features of complex and dynamic systems (Khan et al., 2018; Luscher et al., 2006). In complex healthcare service system settings, accepting the compound nature of practicing healthcare service design may be advantageous and help better explain the value that designers bring into these contexts. This resonates well with radical pragmatist approaches and the practices of social reform driven by the in-betweenness of social groups, as exemplified by the Hull House work of Jane Addams (1860–1935) in Chicago, a space built on the vision of community, renewal of ideas, diversity of thought and interactions across domains to promote healthy societies (Lundblad, 1995). By being able to work and navigate in-between spaces and knowledge domains, service designers flexibly help support healthcare system adaptability while facilitating change and innovation processes inside healthcare service systems.

6.1.3 Identifying design conversations as material and design facilitation as a central practice

Addressing the second research subquestion on how service designers facilitate fruitful interactions among multiple actors in healthcare, the current research has identified design conversations as a central material that can be shaped, supported and influenced by service designers. Design conversations are those that are planned, facilitated and used by participating actors as part of change and innovation processes. In service design processes carried out in complex settings, design conversations become central because of the many actors involved and the wicked nature of the problems that often transpires in these settings. The attention to design conversations expands the current discourse on service design materials beyond representations of service flows, touchpoints, process tools and repertories (Blomkvist et al., 2016). In line with Vink (2019), the emphasis on conversations as a central service design material embraces viewing the process itself as the main value of service

design. Further, it acknowledges the importance of social structure formations (Yee & White, 2015) that take shape through conversational interactions as a service design material in complex settings. In line with conversation theory (Pask, 1976), the current investigation has found that design conversations can create new understandings and shape new mental models through the sharing and manipulations of concepts. The linguistic framing and reframing happening in design conversations may change mental models, renew discourse and cause ripples that affect the system more broadly (Vink et al., 2019). Hence, service ecosystem design is identified as being conversation centric because design conversations mark the specific act taking place in the physical enactment of institutionalised social structures.

Further related to the second research subquestion, the present study identifies design facilitation practices as central to service designers. To move the process forward, service designers orchestrate multiactor engagements through codesigning events in complex settings, such as in healthcare. Healthcare service design practitioners need to carefully consider how these facilitation practices may support specific actor interactions in a series of codesign events to make sense of complexity and promote generative emergence during change processes. The current research makes the tacit knowledge of 'staging iterative codesign events and activities' (Sanders, 2020, p. 66) in healthcare service design explicitly available; it identifies how contextually designed facilitation tools are made use of to provoke the sharing of human perspectives, evoke experiences and afford creative exchanges in preplanned event flows and across events. Further, by delineating key design facilitation dimensions, the investigation can help service design practitioners in planning and orchestrating codesign events more deliberately and with more awareness.

While planning codesign events, healthcare service designers need to carefully anticipate the needed conversational interactions of its actors during each phase of an upcoming event. Then, these intentions are materialised by contextually designed facilitation tools that are planned for use as mediating artefacts during these events. Facilitation tools that are specifically designed for working with certain healthcare contexts are beneficial because they allow the participants to identify with and recognise their own complex worlds more easily, adding specificity and granularity to conversations. As the events are carried out, the intentions of these precrafted facilitation tools are met with different interpretations and can trigger different associations among the participants in real-time interactions. These guided social dynamics promote generative emergence (Lichtenstein, 2014) and feedback through multiactor

interactions that typify the service design facilitation practices taking place inside complex settings, such as in healthcare.

6.1.4 Explicating the multiplicity of service design lab spaces in creating long-term sociocultural impacts in healthcare

The third research subquestion explores how the design lab space can be made use of to support healthcare service design practices. Related to this, the current study contributes to theory by explicating and delineating the concept of codesign space (Sanders & Westerlund, 2011) and linking it to service design labs in healthcare; this research challenges the skewed knee-jerk focus on physical spaces (e.g., Kinugasa-Tsui, 2018) in the design lab discourse. The present research argues for the importance of simultaneously making use of the physical, social and imaginary dimensions of the lab space. Further, service design labs were found to be affecting and affected by several other codesign spaces taking place inside the healthcare system. Therefore, the current investigation argues that we need to envision service design labs not as a space (Mulgan, 2014b; Torjman, 2012), but as a space of many spaces that are linked to other codesign spaces. Furthermore, the current research highlights the spatial capacities of service design labs as being vehicles for changing the cultural patterns of purposeful meaning and social activity (Folkmann, 2011). In line with critical views on social innovation labs (Kieboom 2014), this study emphasises the need for moving beyond thinking about service design labs as supporting specific projects or service value propositions only. Service design labs need to concurrently be viewed as supportive infrastructures that facilitate deeper cultural changes in affecting more long-term impacts on institutional arrangements in healthcare ecosystems.

6.2 Practical implications of using embedded service design labs in healthcare

Derived from the experienced insights and new knowledge gained through the current study, the following section offers a guide, followed by short discussions, on the main practical concerns that may arise when considering making use of embedded service design labs in the context of healthcare. All, these considerations are linked to the use of embedded service design labs as a meta-design that can support design-for-service engagements consisting of the physical, social and imaginary dimensions. It aims to delineate the central practical matters regarding establishing and using embedded service design labs that may be transferable to comparable complex healthcare settings. These are matters that may help in dealing with the thresholds described

in section 2.3 on the particular circumstantial healthcare issues that challenge healthcare service design practice and efforts. Although these practical matters are discussed in the context of establishing and utilising temporal embedded service design labs, some of the implications may be transferrable to other forms of collaboration between healthcare reformers and service designers.

Establishing and utilising embedded service design labs inside healthcare—on the premises of the physical, social and imaginary—requires close collaboration between service designers and healthcare reformers. Here, the term 'healthcare reformers' refers to innovation champions, sponsors and other people with the responsibility of making change inside healthcare systems. To ensure inclusive and productive physical, social and imaginary lab spaces, healthcare reformers and service designers need to consider the processes of preparation and formalisation, or what is referred to as engaging in infrastructuring (Björgvinsson et al., 2012; Ehn, 2008). There are a number of formalities that need to be handled, such as ethical approvals, collaboration agreements and funding mechanisms, as a basis for embedding service design labs into large healthcare organisations. In the case of the interventions carried out as part of this research, each of these processes took around six months to design and prepare before the labs could open their doors to service designers and their allied codesigning multiactors. During this period, meetings were held approximately every two weeks between the academic staff and innovation champions from the involved hospitals to divide tasks and propel issues forward. On several occasions, members in leadership positions were invited to take part in these meetings to ensure proper stakeholder support and help make decisions. In the case of the present study, access to service design capacity and formalities regarding issues such as property rights and confidentiality were handled through preformalised consortium agreements facilitated by the Centre for Connected Care. However, if such processes involve initiating formal procurement procedures of commissioning service designers or initiating innovative partnerships, it is likely that more time for preparation and infrastructuring would be needed.

A major practical feature of using impermanent embedded service design labs is that they open up for engaging external service designers to facilitate change and innovation processes, for example, by commissioning service designers or through collaborations with academic institutions, as in the case of the current research. Including service designers from outside may help in maintaining a more radical perspective on change as part of such processes. An outsider service design perspective opens up for

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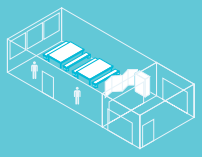
conversations that can reveal ignored fundamental issues and influences not directly dependant on the existing hierarchies and power dynamics that are often manifested inside healthcare settings. The downside of using outsider service designers is that it places a greater workload on healthcare reformers to facilitate the immersion processes of these outsiders into the healthcare context and secure good handover processes towards the end of the intervention period and through follow-up initiatives and service design roadmaps (Almqvist, 2020).

Working as an outside healthcare service designer inside embedded service design labs demands attending to and making use of the supportive physical, social and imaginary dimensions during the design process, which should be done in close collaborations with these healthcare reformers. Working with multiple actors in providing sources of empirical data, the current research highlights the complexities that outsider service designers are being exposed to as part of such collective learning and change process in the context of healthcare. For example, these forms of exposure may include getting in touch with emotions such as human pain, anxiety, relief and recovery and focusing on making user experiences less bad. Further, they may include exposures to the work–life, know-how and attitudes of healthcare professionals, as well as overall care approaches, leadership matters, organisational aspects, policies and care paradigms alongside ethical and philosophical viewpoints. Although the linking and sensemaking of insight become a major concern for healthcare service designers, the real challenge is to facilitate collective processes of envisioning, framing and resolving ways to move forward that generates social momentum and sparks change.

To handle these emotions, the volume of insights and dilemmas that they may reflect and to find ways of moving forward, the current research suggests establishing and using an extended codesign team to support the embedded service designers through frequent back-and-forth interactions. In the case of the current study, these extended codesign teams consisted of three to five persons, including the innovation champions and academic staff. The experience gained through the current study stresses that making use of such extended codesign groups in the context of healthcare may provide vital support for embedded outside service designers who are working inside healthcare service design labs. Table 5 is a guide highlighting the needed practical considerations and attention derived from this research.

Main considerations	Practical implications
Establishing and utilizing physical space	
Locating an appropriate physical space (see 6.2.1)	• Prioritize nearness to front-line care sites to provide easy access for participants. • Ensure a workspace that allows for flexible groupwork and for arranging joint meetings and presentations. • Check large pin-up surfaces to ease overviewing collections of data and for exhibition purposes. • Include printing and prototyping facilities. • Create a convivial and inspiring atmosphere.
Handling complexity by using the physical space (see 6.2.2)	• Distribute collected information systematically onto the physical lab space. • Use the physical space for coordination purposes. • Attend to the space being open and inviting for visitors. • Exhibit the process, work in progress and outcomes in a vibrant and engaging way.
Construction and using social spaces	
Ensuring proper representation and participation (see 6.2.3)	• Gain support from leadership and middle management. • Set ambitious goals and formulate open-ended challenges. • Frame a connected program of several developmental streams (or open-ended projects). • Create a flexible rough plan supporting collaborative learning and change processes using series of codesign events. • Secure access to frontline personnel, patients and other relevant actors and commitments (including leadership) to participate in codesign events.
Shaping social structures (see 6.2.4)	• Consider the types of design conversations needed throughout the process and how to support conversations. • Be curious and question the meaning behind appearances by asking open questions and through using active listening. • Define ways of collecting, analysing and sensemaking of content from design conversations. • Be self-critical – pay attention to transparency, partwicipation and bias in conversational settings. • Use perspectivation, experience and creativity as building blocks for orchestrating and planning codesign events involving multiple actors. • Be sensitive to group dynamics during codesign sessions – highlight common goals and reinforce mutual interests.

Main considerations	Practical implications
Framing and cultivating imaginary spaces	
Supporting sense-making and forward-thinking (see 6.2.5)	• Brief the outsider service designers about the current situation, the goals and the plan. • Identify drivers of change, developmental trajectories and innovative examples from other similar settings. • Prioritise initial areas needed to be explored based on existing knowledge and data. • Assess findings and support sensemaking processes. • Help frame and promote propositions that are challenging but achievable.
Finding the edge of the box and stretching the system (see 6.2.6)	• Carry out ethnographic inquiries to understand everyday life, important subjects of matter and to detect problematic issues. • Conduct design conversations with the purpose of identifying possibilities and taking action. • Use lingual framings of findings and concepts as discursive provocations. • Use analogies to evoke reactions and shape shared mental models. • Use representations to make complex matter easy to understand, create ownership to possible ways forward and to seed agency for making change. • Consider how incremental and radical changes may support each other concurrently and how this can be communicated.

Table 5: Practical guide for making use of embedded service design labs in healthcare settings.

Healthcare reformers and outside healthcare service designers may use this guide to establish and run embedded service design lab interventions that are supported by the physical dimension marked in blue, the social dimension in orange and the imaginary dimension in purple. Accordingly, each of these considerations are discussed and explained in more detail below.

6.2.1 Locating an appropriate physical space

Based on the current research, several aspects have to be taken into consideration when planning to provide an appropriate physical lab space and ensure the necessary equipment. Locating the physical lab space in proximity to the frontline, where the healthcare services are coproduced, should be a priority. A nearness to service production areas makes the lab site more easily accessible for care actors, including health seekers, to engage in activities. At the same time, it makes it easier for service designers to get out of the lab

space and immerse themselves into the field while carrying out field work explorations (Segelström et al., 2009) and other actor interactions. It also familiarises the frontline staff with the designers, so a good working alliance is easier to establish.

Further, functional aspects need to be considered regarding the physical workspace. An open space that allows for flexible groupwork (of both large and small groups) and for arranging joint conversations and presentations for all participants is a priority. Ensuring that the physical space provides large pin-up surfaces is critical because these allow for distributing and making sense of large amounts of insights, for planning activities and for exhibition purposes. Further, the physical space needs to support the production of mediating artefacts and facilitation tools. Therefore, equipping the lab with printing and prototyping facilities is a must. For example, the current research ended up renting a plotter and A3 printer during each intervention to provide direct and quick access for the service design students to printing facilities, bypassing the typically hard-to-access network infrastructures of the hospitals.

Expanding on Reay et al.'s (2017) observations that the physical lab space should be conceived of as open to provide easy access for participants, the current study underlines the sincere attention to detail needed to curate invitingness. This means that issues related to creating a convivial and inspiring atmosphere inside the lab should be considered. During the interventions, clear observations regarding the fine-tuned attention needed for creating both inviting and stimulating spaces were made. Initially, to ensure a good atmosphere inside the lab spaces, the service design students were given limited budgets to furnish the labs during the first days of each intervention. Different from the elaborate design aesthetics commonly used in more permanent design labs, elements such as sitting arrangements, places for serving snacks and beverages, lighting, plants and so forth are some examples of elements included as part of creating a convivial physical lab space atmosphere.

6.2.2 Handling complexity by using the physical space

One major observation is the feeling of overwhelmingness of making sense of multiple data sources, such as reports, observations, conversations and inputs from codesign events while practicing healthcare service design. Initially, the engaged outside service designers felt 'lost in the woods' and exposed to the complexities of the healthcare system and vast amount of possible improvements from a service designer's point of view. This makes

it challenging to systematise the empirical insights and findings and prioritise attention to matters that may provide leverage for making desirable changes and cause progressive systemic ripple effects. In line with the concept of a rich design research space (Sevaldson, 2008), the current research shows how the labs' physical space may allow for displaying collected empirical insights to offload participants' cognitive demands (Blomkvist & Segelström, 2014; Lucero et al., 2012).

Moreover, the physical space may allow for exhibiting inspirational material to stimulate shared forward-looking mindsets. Using the physical lab space for systematising collections of inspirations and insights will significantly ease collaborative sensemaking processes (Kolko, 2010) and priority decision making. In addition, the use of the physical space for supporting coordination purposes are suggested. Furthermore, the potential of using the physical surroundings of service design labs in ways that exhibit service design practice as it unfolds is important. Empirical materials distributed onto the physical space should ideally be accessible and understandable for passers-by. Exhibiting such processes as they emerge in a vibrant and engaging way helps promote an innovative culture inside healthcare organisations that may trigger more long-term cultural change processes.

6.2.3 Ensuring proper representation and participation

Although the physical environment plays an important part of embedded service design labs, the most attention is needed regarding community building and creating social spaces. This is in line with the findings of Yee and White (2015) and is closely related to the concepts of staging for participation (Bjögvinsson et al., 2012; Sanders, 2020). To begin the staging process, the most important considerations are gaining support from leadership and middle management from different parts of the healthcare ecosystem. To ensure proper representation and participation capacity, it is vital to collaborate closely with leadership to receive inputs and foster ownership on the intensions and themes of exploration addressed during an intervention. During these early interactions with leadership, there should be a focus on setting ambitious goals, followed by formulations of open-ended challenges and discussions about how to provide decision support. The current research emphasises the importance of involving leadership along the way to provide motivation for actors and as a basis for supporting more long-term commitments. Therefore, giving leaders a voice during process milestones should be made a priority. Furthermore, pointing leaders' attention to the commitment and support needed in the follow-up process after the intervention is over is essential. Doing this may

include supporting initiatives and implementation efforts by, for instance, considering setting up feedback loops and incremental improvement cycles.

One of the most powerful advantages that embedded service design labs offer is their ability to facilitate entire change programmes, which consist of different streams (or open-ended projects) developed in parallel. Hence, framing a portfolio of linked service development objectives—a connected programme of developmental streams—is a major consideration. Experience from the current research suggests using overall strategic schemes and national policy incentives as a basis for identifying, linking and prioritising projects into coherent portfolios of programme initiatives. In the case of the current study, three to five developmental streams were handled in parallel during each intervention.

Further, the current research provides practical insights for how to define activities such as planning for codesign events and across developmental streams during interventions. Plans may be constructed to follow the purpose of design conversations during the intervention process (orientation, clarification, possibilities and action) by using divergent and convergent mindsets to define the various phases (Design Council, 2007). The most important knowledge related to planning the intervention process is to balance processes in a way that allows for external service designers to immerse themselves into the context by engaging in conversational fieldwork explorations. In parallel, the plan needs to ensure enough time to facilitate joint learning and change processes through a series of codesign events. On that note, it is important to treat such process plans as flexible and open-ended guides because they may change as the intervention unfolds. Conducting repeating meta-conversations throughout the whole intervention can help address and adjust goals and process plans.

Apart from securing leadership support and developing open-ended-process plans, the current research highlights the importance of staging for multiactor participation (Ehn, 2008; Sanders, 2020). Involving actors and creating ownership among participants is a main concern that demands specific attention from the involved service designers and healthcare reformers. Securing access to frontline personnel, patients and other relevant actors and their commitments to participate in codesign events is a vital precondition for conducting fruitful service design processes when using embedded service design labs in healthcare settings. As a part of the current research, several invitational presentations were made to clinical staff, patient representatives and other important actors to evoke interest and create engagement before the interventions. In addition, in presenting the goals and

processes of these interventions and the reason behind them, estimations on the needed engagement time from invited participants were put forward and discussed to manage expectations upfront and ensure commitments. In all of the interventions carried out as part of the current research, innovation champions were made responsible for handling communications with the appointed reference groups of participant actors.

6.2.4 Shaping social structures by crafting conversations

To promote fruitful actor interactions to take place inside healthcare service design labs, the current research found that service designers take on the role of process facilitators (Tan, 2012). The current research identifies design conversations and the ability to create a link between such conversations as the material that provides the basis for service designers to gain propositional leverage as facilitators. Hence, service design practitioners working inside complex healthcare systems need to carefully consider what kind of design conversations need to be taken throughout the process and how to support these conversations in becoming sincere and productive. They also need to agree on efficient ways of collecting and sharing conversational insights.

During design conversations, unexpected outcomes or tensions are likely to surface because of their fluidity and the diversity of the involved actors. This demands that outside healthcare service designers use a curious, open and an active listening attitude. Gaining a deep contextual and situational awareness and an understanding of what motivates change may help service designers bridge across organisational silos and mitigate potential tensions. Further, because healthcare service designers are influencing these design conversations through their involvement and facilitation, the present research highlights that a self-critical attention to ethical issues, such as transparency, participation and bias, in conversational settings needs to be taken. Here, multiactor interactions and codesign events may help moderate bias and promote transparency.

In the case of the current study, each codesign event took between one and two weeks to plan and prepare for. The current research suggests considering crafting these events by promoting perspectivation, experience and creativity as the dimensional building blocks for outlaying event flows and as guides for making facilitation tools. During codesign events, service designers need to be sensitive to group dynamics and highlight common goals to reinforce mutual interests and mitigate the tensions between representatives from different ecosystem parts. It is important to note that the emergence of new insights and ideas that are likely to take place both during and in-between these events may change the focus or even purpose of the entire

intervention. Debriefing sessions including meta-conversations after each codesign event may be used to adjust objectives and define the means for moving the process forward.

6.2.5 Supporting sensemaking and forward thinking

Although cultivating a shared imaginary space among participants is mainly carried out through the collaborative process itself, some practical preparations can be made. Experience from the current investigation point towards the importance of healthcare reformers supporting healthcare service designers by prioritising the initial areas to be explored and that are related to each stream of development. Further, collecting existing knowledge may be of great value initially. Here, the drivers of change, developmental trajectories and innovative examples from other similar settings may be considered, collected and discussed initially. Furthermore, early briefings about the current situation with the involved service designers for discussing problematic issues and the overall goal of the intervention may guide points of departure of fieldwork explorations. Healthcare reformers may need to provide support for coordinating ethnographic inquiries to understand everyday life matters and uncover problematic issues. As empirical insights from these explorations are collected and sorted out, healthcare service designers face the challenge of making sense of it all by finding saturation points, using triangulation and the identification of patterns in the raw empirical data. In the case of the current study, assessing findings through sensemaking processes (Kolko, 2010) in close collaboration between the engaged service designers and the extended codesign team provided major support.

6.2.6 Finding the edge of the box and stretching the system

Essential to cultivating mental imaginary spaces is finding a proper fit between a given situation in a certain context and time and how it might change to become better in the future (Reay et al., 2017). The first aspect is covered by carrying out ethnographic inquiries to understand everyday life and the specific subjects of matter and to identify problematic issues. The second aspect is cultivated through design conversations that are intended to change or identify possibilities and help in taking action. Such conversations may be inspired by future scenarios to spark the participants' imaginations. These conversations may also be directed towards framing and reframing processes (Dorst, 2011), which can help shape and evaluate different mental models to direct creative attention towards desirable conceptions as a basis for developing new service propositions.

Service designers need to consider using analogies and lingual framings of findings and concepts, which can act as discursive provocations to evoke reactions, gain feedback and convince participants during design conversations (Romm, Dudani, et al., 2020). For example, embedded service designers may use analogies that ask how a healthcare service would look like if provided as a hotel service, as an airport service or as inside a big department store. Making the imaginary collaborative means making complex matter easy to understand, creating ownership of the possible ways of moving forward and seeding agency among actors to make change. To support such processes, the current research emphasises service designers should consider using representation techniques, such as service flows, touchpoints and enactments (Blomkvist, 2014), to illustrate imagined desirable future situations, hence making these more tangible and accessible for the participants.

In line with Mulgan (2014b), the current research highlights that outsider service designers need to be sensitive towards improvement work or incremental changes going on inside healthcare systems without losing attention to the possibilities for making more radical shifts. Proposals that may seem incremental for outsider service designers may be perceived as radical for the participating actors. In the context of healthcare, incremental and radical changes often need to support each other, are required and are considered concurrently as part of the design-for-service work (Samuelsson et al., 2019). For example, service designers may consider demonstrating combinations of incremental improvements as part of envisioned larger and more radical changes. Additionally, it is important to consider how these combined proposals can be effectively communicated and diffused more broadly in the healthcare system to create ripples.

The imaginary capabilities of design are commonly described as the ability to ‘think outside the box’ (Bono, 1992). Here, outsider service designers have a positional benefit. Being able to experience and view the contextual circumstances from a more distanced perspective allows the temporally embedded service designers to see and propose new ways of service provision. In healthcare settings, the main imaginative challenge for service designers is getting a good understanding of the box itself and its edges so that they can jointly frame a proposition space boundary that fits into a given context and time. Then, within these conceptual framings, the service design facilitation task stretches the ecosystem to move jointly towards making the most radical changes possible, going beyond the edges of the box. Here, healthcare reformers may consider taking an active role to help identify and

influence the level of possible organisational elasticity. Afterwards, healthcare reformers may consider supporting the involved service designers in framing an appropriate proposition space boundary, stretching the organisation to change—but not too far—so that the proposed degree of change is challenging but still perceived as achievable.

6.3 Limitations and benefits of the study

In this section, the limitations and benefits of the current study are discussed and reflected upon; they address the way knowledge production was performed using an action research by design approach, the limitations and benefits of being surrounded by specific contexts and the limits and benefits of involving students as codesigning coresearchers. My personal acknowledged potential professional and cultural bias and limitations and benefits related to these are left here because they are described in detail in section 3.6.

6.3.1 Researching by designing

The current study has focused on expanding the understandings of how healthcare service design practices may be supported by embedded service design labs through making a reflection on and in action, here in the spirit of pragmatist theory of inquiry (Dewey, 1938). Using action research as an approach inherently positions the researchers inside the object of study (Reason & Bradbury, 2008). In the case of the current study, the involved design students and academic staff were all regarded as being coresearchers, codesigners and, to some extent, cosubjects of the current research at the same time. However, these circumstances also include integral limitations. First is related to the results being laden with subjectivity, meaning that personal biases have a tendency to come into play in the analysis of the findings (Kock, 2005). To mitigate this factor, the current research was carried out collaboratively, involving many different participants to take part in data collection and analysis activities and through the coauthoring of publications. Further, my personal professional background in becoming a designer is provided as an acknowledgement of the aspects that may have coloured—but at the same time also informed and strengthened—the validity of the viewpoints taken during this study (see under section 3.7).

A second limitation regarding the choice of method relates to the vulnerability to pressure because action researchers often depend on an organisational setting. In such settings, power relations may complicate

the conduct of research, skewing researchers to alter the findings that suit the organisations objectives (Baskerville & Wood-Harper, 2016). Using service design and embedded design labs in healthcare is a relatively new and emerging phenomenon. Some of the hospitals that acted as hosts for the embedded design lab interventions may have had an interest in positioning themselves as innovative organisations in engaging with the current research. This may have affected the viewpoints of the researchers involved by seeing embedded service design labs as an innovative way of working to support change efforts in such settings. However, none of these hosts were invested or interested in promoting service design in particularly to support their innovation work. Because the object of study focuses on healthcare service design practices as they are carried out inside embedded lab settings, there is little reason for why the organisations involved would have any interest in altering their results.

The third integral limitation of using action research and research by design as methodologies is that they are time-consuming (Reason & Bradbury, 2008). The data were mainly generated during the specific time frames of the action research interventions. This limited the ability to systematically collect data on the long-term effects that these interventions had and their systemic ripple effects. Conducting longitude studies on the effects or tracing the diffusion of mental models or innovations that were developed as part of embedded service design lab interventions, in parallel with carrying out the action research, was unfortunately out of the scope of the current investigation because of time limitations. However, because design practice and the way it may be supported was the major concern, the benefits of using an action research by design approach were that they helped expose the researchers to the granularities of understandings of the practices involved that are hard to view from a more distanced position (Sevaldson, 2010). In other words, the approach helped the researchers explicate situated knowledge and articulate embodied conceptions from first-hand, real-life experiences.

6.3.2 Contextual complexities affecting the study

The circumstantial complexities affecting each of the interventions had an inherent effect on the research outcome. However, the strength of repeating the interventions four times over a period of six years helped filter out some of the circumstantial specifics and compare the experiences across these different interventions and their hosting hospitals. Nevertheless, articulations of the findings regarding healthcare design practice are influenced by these specific contexts and also because the research was done as part of

C3. The affiliation with C3 was beneficial because it provided access to a large network of healthcare actors and experts, to other researchers with intersecting interests and to the hospitals where the interventions took place. However, this affiliation may also have caused limitations by defining the scope of participant institutions and through the different research interests of its partners. For instance, despite the ambitions of involving commercial partners more closely into the interventions, access to the affiliated commercial partners was limited because of a managerial decision initially made. A closer collaboration with commercial actors would have increased the level of complexity of the interventions, perhaps affecting the practice of the involved service design students.

The affiliation with C3 also posed geographical limitations because all the interventions were done in a Norwegian context in Oslo. Here, the initial visits to design and innovation labs in Sweden, UK and USA and the narrative inquiry combining narrations from Scandinavia, UK and North America helped provide a broader view on matters concerning the intersection between service design and healthcare. Many of the involved students were exchange students from other Scandinavian countries, Europe, the Middle East, Asia and South America. Although some of them shared their thoughts about the differences of the Norwegian healthcare systems and systems they knew from home, these differences were not apparent during the action research cycle reflections or in convivial conversations among the students. Further, some of the participating students expressed that similar healthcare service design interventions would be useful if carried out in the countries where they had come from.

Additionally, the choice of working with hospitals specifically, which represent specialised care, affected the results. Especially the fact that all these hospitals are large organisations containing innovation units with dedicated innovation champions affected the outcomes by providing additional capacity and support. Even though two of the interventions included representatives from the municipalities affiliated with the hospitals as part of the reference group, it is likely that the embedded design labs would have played out differently if the interventions were carried out in a municipality care setting. Despite these contextual limitations, the results may still include knowledge with transferrable qualities, for example, related to the tensions faced by service designers, the use of contextually designed facilitation tools and the central role of design conversations in service ecosystem design.

6.3.3 Service design students as coresearchers and cosubjects

The embedded service design lab interventions that provided the empirical basis for this research were all conducted in collaboration with a service design MA course at the Oslo School of Architecture and Design, hence involving service design students. The fact that these interventions involved students might have created fewer tensions than in other similar cases. For example, all the involved hospitals hosting the interventions were university hospitals with clear and relatively easy-to-use routines regarding involving students as part of their operations. Involving professional designers through commissioning, for example, would perhaps be more difficult. Also, the level of investments and expectations might differ when involving students compared with professional designers.

Working with students representing service designers meant that they were all entering the healthcare context as outsiders; this had a direct effect on the dynamics of the interventions and experiences they generated. However, the notion of inevitably being an outsider alongside the challenges and benefits this position provided was also clearly raised by the practitioners during the narrative inquiry. Further, the design students were all in a learning situation with little time or budgetary constraints. Also, the students may have needed more time practicing service design than more experienced designers would have. On the other hand, the academic setting was also beneficial because it allowed for taking a more explorative approach towards healthcare service design as a practice and making use of the space inside embedded design labs.

Another limitation is the fact that the collections of data performed by the service design students through research diaries were nonexhaustive and varied in quality. This may have skewed the type of raw data included for analysis. However, the volume of data generated and collected provided a significant benefit for the current study adding richness and granularity to the data portfolios. Additionally, the fact that these collections were carried out by several students simultaneously helped compensate for possible skewed individual foci and for differences of data quality that were generated, collected and analysed.

6.4 Future research

More research is needed on flexible and temporal meta-designs that can provide infrastructure and support for facilitating design-for-service

work in complex settings. Here, the research attention could be on the conditions that allow for engaging service designers and multiple actors to become codesigners or the design that happens before design-for-service interventions. This is similar to what is described as 'making explicit the often hidden performative "protocols of design" initially' (Ehn, 2008, p. 93) and setting the stage for service design activities to play out. Further, more research is needed on how such temporal meta-designs may facilitate 'co-evolutionary processes and co-creative behaviours' (Fischer & Giaccardi, 2006, p. 453) to be better sustained over time in complex service system settings. Furthermore, embedded service design labs (or pop-up service design studios) that can provide temporal and situated support for collaborative learning and changing the processes on specific and strategically combined project programmes may be explored in a range of different contextual settings, in various configurations and during different timespans. This may, for example, include a series of studies evaluating the embedded service design lab in different contexts in an innovation setting and using different configurations of in-house and external service designers. Additionally, the subject of suitable timespans of such temporal embedded labs to provide adequate support and impact may be further explored.

Another possible future research area derived from the current study is the need for assessing and exploring the effects of embedded service design labs in complex settings over time. A better understanding of such effects and the diffusion mechanisms that arise from facilitated multiactor interactions in complex settings can provide a needed supplement to the current research and is likely to provide feedback and extend knowledge on design-for-service practices. This knowledge may help to advance our understanding on the transitions from value cocreation in designing to value cocreation in use and to value cocreation of new possibilities, providing a basis for new service design efforts (Wetter-Edman, 2014). Additionally, the use of embedded service design labs and similar supportive meta-design infrastructures may be explored further in other complex settings, both in the healthcare sector and elsewhere, to provide a broader contextual nuance. Such explorations may eventually provide the basis for performing a comparative analysis of such supportive meta-designs to extract the overall characteristics and for further developing design-for-service and service ecosystem design practices.

Additionally, more research is needed on how embedded supportive meta-designs may facilitate collaborations between leaderships, internal innovation champions, in-house service designers and external service

designers, particularly in the public sector, which is currently exploring new innovation practices (Bason, 2010; Sangiorgi, 2015). Here, there may be different configurations for setting up such partnerships to obtain a productive balance between insider and outsider service design contributors to promote realistic incremental-radical shifts in viable and feasible ways. For example, by exploring the costs and benefits of collaborations between insider and outsider service design contributors in different developmental stages. Furthermore, a relevant trajectory of research would be to explore the potentials of such temporal supportive structures and their altered dynamics of involving external professional service designers, here piloted towards facilitating collaborations between commercial actors and the public sector. The reason behind this is that in some cases, the private sector is moving faster to support the necessary developments than the public sector is able to.

Derived from the above discussed limitations, the current practice-led research suggests further theoretical founding and systematic literature reviews on design conversations, design facilitation and codesign space to advance and substantiate its empirical findings. For example, there is a whole range of related literature, such as in material culture, urban and future studies, that may inform and advance the notion of the physical, social and imaginary acting as supportive spaces for introducing change and innovation in complex settings. Similarly, there is a need to better link theory to the role of design conversations and dialogue in the developmental processes inside service ecosystems by, for instance, drawing on the literature from domains such as applied linguistics, social anthropology, social psychology and others.

When it comes to research trajectories that may build further on the findings of this study, the following exploration possibilities are suggested: Related to design facilitation and the orchestration of a series of codesign events as part of design-for-service efforts, the suggested ‘five-level typology’ that relates tools, activities, event phases, events and series of events requires further exploration and detailing (Aguirre et al., 2017, p. 208). This may expand our knowledge and develop practices on how to better plan specific codesign events and orchestrate a series of events in a more informed way. More research is suggested to better understand how the different levels of codesign events interrelate and how the processes and work ‘in-between’ codesign events is handled.

Related to further possible research on design conversations, using more exhaustive data collection methods such as audio-recordings of

conversations and more direct data sources is needed. Better records of design conversations may reveal more accurate overviews of the levels and purposes of design conversations taking place during such processes and their distribution over time. These data could then be analysed and compared with current design thinking patterns or models of design processes. It may also help to further verify whether the current model described in this research illustrates the actual social activity taking place.

Further, more research is needed related to ethical issues regarding the influences of service designers shaping and facilitating design conversations. For example, how do service designers work to ensure a proper range of perspectives to be included into design conversations? How are these different perspectives affecting the involved service designer's abilities to make sense of conversational insights? Additionally, more research is needed on issues of transparency regarding service designers' propositional powers and influences in discursive settings to mitigate the alternations of hidden agendas. For example, to what extent are service designers self-aware or explicit about their underlying political motives? In relation to this, there is a need to develop service design practice in design conversational settings that are concerned with outbalancing skewed influences and ways to mitigate bias. There is a need to develop the frames, methods and tools for verification and formative and summative evaluations of healthcare service design processes in general and in codesign events in healthcare more specifically.

7

CONCLUDING REFLECTIONS

The concluding reflections provided in this chapter are structured into third-, second- and first-person reflections, following the strategic levels of action research inquiries (Reason & Bradbury, 2008, p. 6). The third-person reflections provide thoughts on wider impacts, the second-person reflections address issues of mutual concern and the first-hand reflections relate to foundational practice and everyday activity of the involved actors. Although stemming from the experiences from the current action research, these reflections are to be read as open-ended lines of thoughts, feeding forward ideas and asking questions about the future of healthcare service design practices and how they may be supported. The third-person reflections relate to the growing need for service design to tackle complex challenges in ways that may impact large service ecosystems to take shape or change remarkably. The second-person reflections address developing healthcare service design as a specific subpractice and how it may be supported by establishing a network of situated, temporal and embedded lab spaces in healthcare. Finally, the concluding first-person reflections offer perspectives for innovation champions and service design leads, hence opening up questions on their role in shaping the conditions for design for healthcare service.

7.1 Systems-oriented healthcare service design

In a time where we need to tackle ever more complex issues, my hope is that the current research will inspire others to engage in more practice-led

research and development by using service design as an approach to facilitate desirable changes in complex settings. There is a need to develop more theory, methodology and praxeology for handling systemic service design challenges. This includes both dealing with top-down policy developments across public sectors or inside specific sectors, such as in healthcare, across systemic divides and in bottom-up anticipatory developments and engagements that chain larger systemic shifts. Based on this research, service designers working in healthcare could benefit from a more thorough understanding of systems theory and systemic design practice. Such theory needs to be better connected to service design operating at this level of complexity. Good examples of such initiatives can already be found in the service design literature (e.g., Aguirre, 2020; Jones, 2013; Sangiorgi et al., 2017; Vink, 2019; Vink et al., 2020), but there is a need to further consolidate theory and translate such conceptual contributions into healthcare service design practice.

The current research sheds light on the role and value that service designers bring into developmental efforts in complex healthcare settings, operating in-between organisational silos and systemic divides while facilitating collaborative learning and change processes. Increasingly engaged with supporting shifts at scale inside large healthcare service systems, service designers have no choice but to embrace and deal with this complexity. Without acknowledging these complexities, service design in healthcare is more or less destined to lack long-term gains because the system will suffocate the options that come to the table. Service designers will need to adapt a service ecosystem design view (Vink et al., 2020) and be concerned with upholding a macro-perspective while supporting change. Yet from a design-for-service perspective (Wetter-Edman, 2014), making change on the ground is mostly driven by actors interacting and making micro-level decisions, which is limited to certain ranges of control. Nevertheless, the ability of such actors to influence through renewed discourse may have a broader outreach. In healthcare settings, the present research observed how service designers need to combine a macroscopic change mindset while supporting actor interactions in the learning and decision-making processes that are manifested in specific microscopic spans.

Sparking local improvements that catalyse larger shifts becomes a focus for healthcare service design practice. Service designers need to become better at creatively traversing the value tensions that arise, for example, between standardisation and agency to exercise discretion, between specific and collective interests and between thinking in the short and long term in

healthcare settings. Because these processes are done through community building—involving many actors—they will most likely find themselves holding conflicting views and opinions on such matters. Working hands on with resource integration (Chandler & Vargo, 2011) addressing different levels of attention and handling opposing conceptions simultaneously often imply navigating paradoxes articulated as 'being in-between' (Romm & Vink, 2018). In line with pragmatist meliorism (Koopman, 2006; Lake, 2020), the current research highlights valuing and supporting the 'in-betweenness' of service designers who are helping bridge across silos (Fenwick et al., 2009), mitigate friction and facilitate fruitful collaborations inside healthcare service ecosystems. Although brought forward by focusing on healthcare as a specific context, such compound designerly approaches are most likely transferable to other complex service system settings.

7.2 Developing the practice and its supportive infrastructures

When this research started in 2015, the awareness of what service design could offer the healthcare sector was limited. Six years later, service design has become more widely recognised as a valuable approach for supporting improvement and innovation work in healthcare. Further, during this period, the literature and reports addressing healthcare service design approaches, practices and impacts have been published (e.g., Mager et al., 2017; Pfannstiel & Rasche, 2019; Tsekleves & Cooper, 2017a). Still, it is important to acknowledge that service design in general and healthcare service design in particular are very young disciplines. Because healthcare service design as a subfield spans over a wide range of applications, there is a need to develop more dedicated higher educational programmes for those design students interested in healthcare service design as a specific subspecialty. Developing more specific healthcare service design knowledge and know-how is crucial to further advance this subfield. During the research, I have gained a firm belief in the advantages of bringing service design thinking into the healthcare sector. It is my hope that the current research will inspire more people to engage in research on and through healthcare service design practice, hence making the scientific ground more robust and easier to implement as a natural part of healthcare improvement and innovation work.

The present research highlights the importance of attending to temporal and situated supportive infrastructures for practicing service design in healthcare settings. In public organisations, 'dominant cultures will always condition

the emergence of new practices' (Aguirre, 2020, p. 219), and systemic change efforts will most likely cause violations to existing values. Hence, a precondition for practicing healthcare service design becomes the healthcare organisation's ability to question their current ways of working and practices. Given the technological developments that we are currently witnessing and the rising needs to tackle compound and complex challenges, empowering self-questioning and encouraging explorations into healthcare renewals becomes a matter of great concern. What political instruments and incentive models can be developed to support raising critical questions on current practices and promoting the collaborative processes of renewal?

To facilitate such processes, a single service designer—or even groups of service designers—greatly depend on support and setups that provide them with the space to navigate in-between paradoxes and tensions. Such setups may grow from the bottom up, as in self-organised movements, or may be deliberately designed or infrastructured (Ehn, 2008). Attending intentionally to such temporal and situated supportive infrastructures for service designing with multiple actors in healthcare settings to support larger shifts is one of the main contributions of the current research. Perhaps because of some strong and effectively branded lab examples, at some point, service designers got stuck in the mental model of more permanent and well-positioned labs. When seeking to support design-for-service more broadly in healthcare systems, service meta-design should be at the centre, here without not getting trapped inside impressive labs that risk becoming yet another silo. Reay et al. (2017) use the metaphor of a Trojan horse to describe a healthcare design lab penetrating the institutionalised hierarchies of healthcare. I see healthcare service design labs less as arrangements for fighting a battle from within and more like a fleet of imaginary expedition vessels that are set to travel and explore new possibilities. On this journey, the lab will act as a supportive vehicle, equipped with the necessary navigation tools, and its accessible and inviting appearance should welcome actors onboard to gain new insights and ponder how to best steer forward.

Temporal situated supportive service meta-design spaces that are connected to other service meta-design spaces may offer an alternative way of providing a more distributed infrastructure of support. The idea is similar to the structural conceptions raised by Gray and Vander Wal (2012), which are framed as the connected company, consisting of smaller units or 'pods' that are cross-functionally assembled. Is it possible to envision creating a 'podular' or a 'labular' mesh of supportive embedded service design labs placed inside different parts of the healthcare systems? I believe the

transparency gained through the use of embedded design labs contributes to an increased ownership and trust related to the propositions it results in. Connecting such supportive developmental spaces in a network may allow for addressing larger systemic transformations in a distributed and situated way. As an example, OUH is currently in a process where they will merge their five hospitals into a major hospital called 'The New OUH'. This is an extremely complex and difficult process. However, it would make a suitable case for considering embedding several networked embedded service design labs in strategic parts of the organisation. One might speculate if this would have ensured broader stakeholder participation during the planning process and, ultimately, could have worked as a common ground to play with ideas, discuss problematic issues and increase the sense of involvement and ownership.

7.3 Inside healthcare design labs

Finally, a concluding remark is offered about the people who are positioned to engage in opening up and embedding such supportive spaces for service designers who are coming from the outside into the healthcare context. During our research, we were guided by internal leadership, innovation officers and innovation champions. Under other circumstances, the lead of the in-house service design unit may have been the person we would lean on. These are important people. Regarding the political agenda pointing to innovation and change as one of the major contributions to the future of healthcare, one of the things that surprised me when starting this research was how small the innovation units of these large hospitals were. Even though the innovation unit at OUH has grown from two and a half job positions to about six job positions during the six-year period of this research, it is still incredibly small given a hospital with twenty-four thousand employees and countless care services that depend on innovative collaborations across organisational and systemic divides. One may argue that such small innovation units support the decentralisation of these processes—developing technologies at the front end of specialised branches or in the commercial sector instead of dealing with this octopus. However, although both commercial actors and healthcare research groups are preoccupied with addressing current pressing issues by developing specific technological innovations, no technology can ignore the human factors, the need for collaboration or need for addressing power dynamics or promoting cocreation. Perhaps, there is a need for extending the capacity of these units to facilitate such interactions inside healthcare systems.

Moreover, although many healthcare professionals and other civil servants working with care may acknowledge the need for change and are enthusiastic about incorporating new technologies into their practices, they often lack the basic know-how or have no agency to contribute to such processes. There is a need to spread know-how and build service design capabilities more broadly into healthcare and as part of the regular implementation work. Raising the level of knowledge and practice of service design in healthcare in general will probably cause better and more effective codesign processes and strengthen improvement efforts, hence creating more value. Perhaps, it would be worth considering including service design literacy into educational programmes in healthcare to increase developmental capabilities as an integral part of the professions themselves.

My experiences gained through conducting this research suggests that healthcare reformers, innovation champions and service design leaders should pay particular attention to shaping the conditions for design-for-service. A number of questions then need to be addressed. How should we spread service design literacy and know-how into healthcare organisations? How should we prioritise and shape the programmes of connected developmental streams? Where should we open up appropriately situated physical, social and imaginary spaces, and how and when should we celebrate closing them down? What platforms and routines are needed to connect these lab spaces to one another and promote learning across them? How should we integrate research, trace ripples, measure results and communicate activities? The current research provides specific guidance regarding some of these matters, though more development is needed before such conditions and the practices they involve are better understood.

My belief is that in the future, more spaces supporting healthcare service design will materialise, become alive and connect. Such distributed and flexibly scalable meshes of embedded service design labs may come to support growing what Sanders (2020, p. 69) describes as a healthcare codesign culture through a connected care infrastructure boosting design-for-service programmes. It is my hope that the current research will inspire healthcare reformers to engage in creating these conditions and open up spaces for service design practices to flourish in healthcare settings, helping to question the existing ways of working and finding new ways to move the sector forward.

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ANNEXES

PUBLICATION 1

Investigating the "In-betweenness" of Service Design Practitioners in Healthcare

Romm, J., & Vink, J. (2018). Investigating the 'in-betweenness' of service design practitioners in healthcare. In M. A. Pfannstiel & C. Rasche (Eds.), *Service design and service thinking in healthcare and hospital management - Theory, concepts, practice* (pp. 117–135). Springer.

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Investigating the 'In-betweeness' of Service Design Practitioners in Healthcare

Jonathan Romm & Josina Vink

Abstract

In recent years, there has been a growing investment in service design to transform healthcare. While existing literature describes several trade-offs related to catalysing change in complex settings, there has been little understanding to date of how practicing service designers in healthcare respond to these choices. There is a need to learn more about how these practitioners navigate their positioning, achieve change, and influence healthcare organizations. Bringing forward the situated and contextual knowledge of practitioners about their approach is critical for advancing the emerging practice of healthcare service design. This chapter explores and weaves together the narratives of seven practitioners who employ service design within the healthcare context. What is revealed from this exploration is an "in-betweeness" – where practitioners cope with and make use of contradictions through three compound approaches in healthcare service design. We have labelled these approaches: 1) enacting the inside-outsider; 2) creating radical-incremental change; and 3) catalysing top-up dynamics. The dialogue that emerges through this chapter deepens the understanding of how service designers approach their work within the existing dynamics of social and organisational hierarchies while co-creating change with and within healthcare organisations. Through reflection on the composite nature of healthcare service design approaches, this research offers a grounded perspective on service design practice in healthcare and sheds light on possibilities for future research.

1 Introduction

While design has a long history of working on projects related to health (Tsekleves & Cooper, 2017a), in recent years, there has been a global rise in the use of service design within healthcare (Mager et al., 2016; 2017). Within the healthcare context, there is increasing recognition of the need to shift toward a more co-creative approach (McColl-Kennedy et al., 2012; Sharma & Conduit, 2016) and service design is positioned as a contributor to this paradigmatic shift (Cottam & Leadbeater, 2004; Freire & Sangiorgi, 2010). Existent research describes how service design is being taken up in different healthcare contexts (e.g. Carr et al., 2009;

Donetto et al., 2014; Iedema et al., 2010; Szücs Johansson et al., 2017), but there remains little research on the practice and approaches of healthcare service designers as they do this work. Learning from the frank accounts of service design pioneers, who have gained substantial experience working with and within healthcare, can help us to understand how this work is practiced and aid in advancing this subfield by making tacit knowledge explicit.

While early research has emphasised the potential of service design in healthcare (Cottam & Leadbeater, 2004; Jones, 2013), this study aims to shed light on the dynamics of the practice of healthcare service design from the perspective of practitioners themselves. Our exploration is guided by three themes of inquiry: 1) **the position of practitioners** in relation to healthcare organizations; 2) the **degree of change** that service designers catalyse; and 3) their **direction of influence** within healthcare organizations. Through a process of blending narratives with reflexive auto-ethnography, this chapter integrates the stories and reflections of seven practitioners, including the authors, revealing the compound approaches of healthcare service designers related to the above-mentioned themes. In doing so, this study sheds light on the applied approaches of practicing service designers working to support change within healthcare and helps to inform healthcare innovators about the dynamics of working with healthcare service designers.

To begin, we briefly introduce healthcare service design and review the trade-offs service designers must face as they aim to support change processes amid the complexity of healthcare. Next, we explain the methods we have used in this research and introduce the healthcare service design practitioners that have contributed to understanding the applied dynamics of this practice. We then present our findings and weave together stories and perspectives on the 'in-betweeness' and compound approaches that are being used by healthcare service designers. Finally, we bring forward questions associated with these approaches and suggest possibilities for further research.

2 Background

Before delineating the details of our study, we position our work within existing literature. In this section, we briefly describe healthcare service design, the pioneering designers doing this work and the trade-offs faced when working towards organisational change in healthcare.

2.1 The Rise of the Healthcare Service Designer

Service design is a collaborative and iterative approach to innovation that supports service development through a variety of creative methods (Stickdorn & Schneider, 2011). Engaging with complex issues, such as policy making, patient

centric culture, cohesive service delivery, co-production, increasing efficiency, improving service quality and the integration of technology in healthcare, the emergent practice of healthcare service design is gaining increasing recognition (Mager et al., 2017; Tsekleves & Cooper, 2017b). Systemic design efforts are often embedded into this practice, due to the complexity of healthcare service ecologies and the desire to support change across scales - including developing specific healthcare service offerings, supporting organizational change, and catalysing systems transformation (Jones, 2013). In this research, we use the terms 'service design' and 'service designers' in a broad manner, to describe this practice that includes systems and policy design and the associated practitioners.

In recent years, more specialized educational programs have been launched, such as the Design for Health master program at OCAD University in Toronto and the Healthcare and Design research master at the Royal College of Art in collaboration with Imperial College London in London. However, most of the first generation of healthcare service designers, including those we talked with and ourselves, did not have specific formal education at the intersection of healthcare and service design. These pioneers typically come from a background in other design disciplines and other sectors, while some have worked themselves from positions within healthcare innovation or healthcare policy development towards design. Through exploration and learning by doing (Schweitzer et al., 2016), and coping with the inherent trade-offs, these practitioners have helped to shape the practice of this emergent subfield.

2.2 The Trade-Offs in Healthcare Service Design

Existing literature suggests that the practice of healthcare service design must confront some strategic trade-offs. It is well known that change and transformation in organizations and social systems is embedded in contractions and compromises (Luscher et al., 2006; Rittel & Webber, 1973). We use the term 'trade-offs' to describe choices that practitioners face, based on the literature, while constructing and engaging in service design projects within the context of healthcare.

One such trade-off is brought forward by Mulgan (2014a) through the notion of 'the radical's dilemma' that links the practitioners' position, inside or outside the system, to the degree of change, incremental or radical, that they might be able to support. Similarly, in healthcare service design literature, the trade-offs between inside and outside positioning are reinforced suggesting that service design practitioners can: 1) work inside healthcare organisations to propose novel service configurations, or 2) work outside healthcare organisations to explore radically new solutions (Freire & Sangiorgi, 2010). Working on healthcare service design from the outside often refers to the dominant approach of commissioning service design consultancies to provide expertise for healthcare organisations on specific projects. While there are recognizable benefits of an outside perspective, this model is often

criticised for high costs and issues with sustainability. In contrast, the model of embedding service design capacity within healthcare organisations aims to support a long-term approach, but may be challenged by internal organisational power dynamics, hierarchical structures and political barriers (Mulgan 2014b; Snook & Design Managers Australia, 2014).

Connected with the trade-offs between an outsider and insider position, is the choice between working toward incremental or radical change. Incremental and radical change have been linked to different modes of design thinking (Buchanan, 2010; Norman & Verganti, 2014). These modes have been described as creative problem solving and concept development or "frame creation" (Dorst, 2011, p. 521). Creative problem solving is related to quality improvement, which has been emphasised within healthcare in the last 25 years (NHS Department of Health, 2005). However, by using service design to enable incremental improvements in services, tensions can emerge in relation to the parallel goals of service design to support radical new ways of working (Szücs Johansson et al., 2017). Radical innovation is described as the "application of significantly new concepts or technologies that were previously non-existent or that require dramatic behavioural changes" (McDermott & O'Connor, 2002, p.424). According to Dorst (2011), new frames that support radical innovation might be introduced by gaining new perspectives from outsiders or developed by insiders through thematic exploration.

Working with both incremental and radical change has been associated with organisational hierarchies, whether its involving users to inform incremental developments (Norman & Verganti, 2014) or recognizing the role of leadership, champions and informal networks to support radical innovation (McDermott & O'Connor, 2002). One other trade-off that is often highlighted in existing literature is the contrast between top-down or bottom-up directions of influence in organizations. Healthcare is often positioned as a top-down hierarchy with entrenched and formalized ways of operating (Oliveira et al., 2005; Wang et al., 2015). However, in contrast to the traditional healthcare hierarchy, co-creation is an approach that service designers encourage by supporting the involvement of a variety of stakeholders (Polaine et al., 2013; Stickdorn & Schneider, 2011) and acting in ways that are more aligned with bottom-up social movements (del Castillo et al., 2017). Working with and within healthcare organisations, service designers must mediate between organisational layers, hierarchies, as well as "strategic, tactical and operational levels" (Clatworthy, 2013, p.19).

While there is recognition of the contradictions between insider and outsider positioning, incremental and radical change, as well as top-down and bottom-up processes of change, there is little understanding to date of how service designers in healthcare navigate these trade-offs. In the following section, we describe the methods we used to understand how practitioners deal with these inherent trade-offs.

3 Methods

In the following section, we describe the methods we used to understand how practitioners deal with the inherent trade-offs. First, we detail our approach to narrative inquiry. Then, we describe the process of data collection and introduce the practitioners involved. Lastly, we outline our process of data analysis.

3.1 Narrative Inquiry

Located in the tradition of qualitative research (Denzin & Lincoln, 2011), this study combines narrative inquiry (Smith, 2007) with reflexive autoethnography (Ellis& Davis, 2008) to gather insights from experienced practitioners working at the intersection of service design and healthcare. Through the use of contextual interviews, a common component of an ethnographic approach (Randall & Rouncefield, 2016), we worked to uncover rich, nuanced and situated accounts of service design practice in healthcare to understand the diverse, yet related, professional practices and contexts. Narratives related to emergent practices are important to advance the maturing sub-field of healthcare service design since they contain descriptions of real-life experiences that are influenced by their given context (Gubrium & Holstein, 2008).

By analysing narrative accounts, we unpack the situated and contextual knowledge that was expressed through dialogue with practitioners within their everyday professional work settings. Embedded in the stories shared by practitioners are insights that are often overlooked, such as the experienced qualities of the practice, the contextual constraints and possibilities, as well as the dynamics of working in the healthcare sector. In related healthcare service design research, such an approach to qualitative inquiry has mainly been used to evaluate specific design techniques or cases (e.g. Locock et al., 2014). However, since service design in healthcare is an emerging sub-field, descriptions that bring forward the lived experience from those practicing service design are limited. Situated knowledge from within the healthcare service design community can aid in making sense of the complexity of service design practice and inform a wider understanding of how to support desired changes within the sector.

Inspired by Mulgan's (2014a) articulation of the 'radical's dilemma', we followed three central themes to guide our narrative inquiry: 1) position of practitioners, 2) degree of change and 3) direction of influence. These themes served as what Kvale (2008) calls 'broader frames of reference' (p. 108) for our study. Narratives and insights related to these themes were then collected by interviewing practitioners of healthcare service design in their everyday settings. We then reflected on the narratives gathered, comparing them with our experiences as service designers within healthcare. To highlight these personal insights, we offer reflections from our own experiences based on the issues that surfaced from analysing the narrative accounts of those we interviewed (Roth, 2012). In doing so, we position ourselves

3.2 Data Collection

Qualitative data was collected mainly by conducting narrative interviews (Kvale, 2008; Mishler, 1986) with five experienced practitioners doing service design within healthcare in the United Kingdom. The focus on the United Kingdom was chosen because of its early and extensive development of healthcare service design within the European context (Cottam & Leadbeater, 2004; Moritz, 2005). This perspective was complemented by the fact that two of the participants involved and the authors' have had extensive experiences in healthcare service design in Scandinavia and North America. Audio-recorded, in-depth interviews lasted between one and one and a half hours and took place in June 2017. Probing questions were used to draw out stories and reflections related to the guiding themes. The interviews were left open-ended to allow for practitioners' stories, reflections and experiences to be articulated.

Further qualitative data was collected during the interviews by using visualised interview guides that participants were invited to draw and write on (Gubrium & Holstein, 2008). Contextual photography (Holm, 2008), carried out by the two researchers was also used to capture the environments of practitioners and support a situated approach to data analysis. Figure 1 shows an example of a contextual photograph taken as Liz LeBlanc was using the visual interview guide during her interview at Livework's studio in London. Furthermore, since both authors also practice as designers within the field of healthcare service design, supplementary data was generated through auto-ethnographic accounts that involved reflecting on our own experience from practice (Ellis & Davis, 2008; Spry, 2001).

3.3 Practitioners Involved

This study draws on the perspectives of seven service design practitioners working in the healthcare context, including five practitioners who were working in the United Kingdom and the two authors. The practitioners were chosen for their diverse backgrounds as well as experience as design leadership, in-house designers and design consultants. Below is a short description of the practitioners we visited and interviewed:

- *Jocelyn Bailey* was a Senior Consultant at Uscreates studio in London at the time of the interview where she was involved in a range of systemic projects for clients such as the British Council, the Health Foundation, and the Cabinet Office. Jocelyn previously worked for the Westminster think tank Policy Connect and the cultural consultancy BOP. She is currently doing her PhD on design in policy.
- *Aviv Katz* is an independent Service Design Consultant. He previously led the design studio at Innovation Unit, a social enterprise working with innovation in education, healthcare and local government in the UK. Before that Aviv worked as a consultant for Engine, a service design firm in the UK and at the UK Design Council.
- *Halima Khan* is the Executive Director of the Health Lab at Nesta. Halima has spent more than fifteen years working with and in both local and national governments in the UK. Although she does not have any formal design education, Halima has extensive experience working with the design of healthcare policy and services.
- *Liz LeBlanc* is the Associate Head of Design at Livework studio in London. She previously worked as a Service Designer at the Mayo Clinic Centre for Innovation (CFI) in Rochester, U.S. and at EGGS Design, a consultancy in Oslo, Norway.
- *Lenny Narr* is a Design Strategist at the Helix Centre. Lenny previously worked with numerous design consultancies, including Pentagram, SYPartners and Smart Design, in New York, San Francisco and London. He also worked with Healthagen with a focus on bringing health technology innovations to market.

Since we position ourselves as co-subjects of this inquiry, below is a summary of our own related experience:

- *Jonathan Romm* is a Service Design Consultant specialising in healthcare at Halogen, a design consultancy based in Oslo, Norway. He is also a doctoral researcher at the Oslo School of Architecture and Design (AHO) exploring how embedded design labs may support the early stages of healthcare service design and innovation.
- *Josina Vink* is a Designer and Researcher at Experio Lab, an embedded design group in the Swedish healthcare system. Josina previously worked

as a consultant at SHS Consulting in Toronto as well as an in-house designer at the Mayo Clinic Center for Innovation in Rochester and at the Centre for Addition and Mental Health (CAMH) in Toronto.

3.4 Data Analysis

In trying to understand the interviews we had transcribed, we toggled between reflecting on and interpreting the narratives and stories that were shared with us while preparing for the analysis. To support the process of analysis, a two-day intensive analysis workshop was carried out in October 2017. During the session, we established a 'rich design research space' (Sevaldson, 2008), such as is commonly used in design-based inquiry, where the collected materials were organised and displayed spatially. This made all the gathered material, such as the contextual photographs, the visual interview guides and the transcribed interviews, accessible during data analysis. This also helped us to explore emerging concepts, detect patterns, reflect on our own practice and converse while referring to the collected data.

We used meaning condensation (Kvale, 2008) as our method for analysing the interviews. This allowed us to interpret the expressed meanings behind the narrative accounts of the practitioners interviewed. Through a process of de-contextualisation, the transcribed interviews were broken down into coherent thematic narrative sequences. Related to the themes of inquiry, a subset of seventy-four of the most relevant narrative sequences were identified. These narratives were then mapped out and categorised within a matrix with each interviewed person forming a row and categorizing their narratives under five main thematic columns, such as practitioner identities, tensions, future of the practice, and so forth. Collaboratively, we discussed and analysed each narrative in the matrix and summarizing the narratives into short interpretative descriptions of the expressed underlying meaning.

Using the matrix, new meaning relations that were not apparent immediately in individual interviews began to emerge based on connections between practitioners' stories. The narrative accounts and their interpreted meanings were then re-categorized into higher level themes related to the three broader thematic frames of reference. Emerging issues related to each broader theme were then captured in summary statements and compared with our personal stories and experiences in relation to each of the themes of inquiry. To confirm our interpretations, a draft of the text of this chapter was send out to all participants allowing them to comment and suggest corrections. The following section lays out the summary statements and narratives relating to healthcare service design practitioners' positions, the degree of change that they sought to create and their direction of influence in healthcare organisations.

4 The Compound Approaches of Service Designers in Healthcare

Three compound, in-between approaches to service design in healthcare became apparent through analysis: 1) enacting the inside-outsider position, 2) creating radical-incremental change, and 3) catalysing top-up dynamics (Table 1). These approaches reveal both complementary and contradictory elements in how these practitioners respond to the trade-offs within each of the themes of inquiry. The first theme refers to the inherent and beneficial outsider position, the risks it entails and the necessity of blending insider and outsider perspectives. The second theme reveals the delicate dance of service designers between incremental and radical change. In the third theme, the focus is on how practitioners navigate within the hierarchies and dynamics of healthcare organisations.

Table 1. Approaches of healthcare service design practitioners relating to each thematic frame of reference

Thematic frames of reference	**Trade-offs**	**Summary statements from the condensed meanings of narratives**	**Practitioners' compound approaches**
Position of practitioners	Inside versus outside	Service design practitioners have an intrinsically outsider perspective. There are benefits in maintaining an outsider positioning. There are risks associated with the outsider perspective. Blending insider and outsider perspectives is a necessity.	Enacting the inside-outsider position
Degree of change	Incremental versus radical	Healthcare tends to focus on incremental change. It is easy for service design to get trapped in incremental change. Working towards radical change requires trust and autonomy. Incremental change can be radical in the context of healthcare.	Creating radical-incremental change
Ability to influence	Top-down versus bottom-up	Internal champions are key to gain access and influence. There are different approaches to engaging with the inherent politics. There is a need for both leadership support and bottom-up co-creation.	Catalysing top-up dynamics

Below we weave together the interpreted meanings and short excerpts of the narratives from the practitioners we interviewed with our own perspectives in relation to the identified approaches. We highlight experiences, lessons learned, ways of coping and how practitioners leverage the contradictions amid the trade-offs of working to create change in healthcare.

4.1 Enacting the Inside-Outsider Position

During our interviews, practitioners reflected on the inherent outsider perspective that they brought into healthcare contexts through service design. Liz articulates it as follows: "designers are very much generalists, […] a sort of professional amateur. […] We are in-between spaces". She explains further, that as a service designer "your job is just to be a coach or facilitator". Reflecting on her experience at the Mayo Clinic, she sees that it is not possible to acquire the expertise of every healthcare specialization. Halima reinforced this by stating that, "we think of ourselves as inside-outsiders or outside-insiders - as different parts of our work has different relationships to the system that we're trying to influence. But our innovation perspective means that, at some level, we're always an outsider. We're not health specialists". This outsider position is regarded by practitioners as a strength in the context of healthcare. Halima explains further that effective innovation "… doesn't work if everybody has a health speciality […because it]..ends up being focused on itself and talking to itself". Liz reflects on the outsider power of being a consultant by describing what she recently heard from one of her clients: "Nobody has listened to us. We've been complaining about this exact problem, but when you say it, he [the manager] listens. […] Suddenly, these outside consultants come in, and oh, this must be the case because they've found this".

In contrast to this view, practitioners' reflections suggested that the naive outsider perspective can create unintended consequences in the healthcare context, particularly related to language differences. Jonathan recalls that service design words, such as 'concept' or 'prototyping', have often been questioned or misinterpreted by his healthcare clients. It was also suggested that service design language around the importance of failure in design work may prove to be counterproductive in a medical context that is significantly risk averse. Halima explains how some innovation practitioners talk about failure in an unhelpful way, "I'm sort of staggered actually, when design innovation people sit on a stage and say 'it's really important that we take risks, we fail fast, we take more risks, more failure'. Because that shows, more than anything, that they've never been on the other side of the table, experiencing the responsibility of running public services. We talk instead about testing and iterating in ways that mitigate and manage risk".

In addition to issues around language, practitioners also noted risks associated with not adequately including healthcare specialists within service design processes.

Lenny told the story about one project where his team "underestimated the complexity of the system and the clinical risk of discharging patients too soon, because we didn't include as much knowledge as we needed to". Lenny also reinforced the importance of focusing on specific conditions as problems arise when a general approach is taken. Most practitioners seemed to agree that, in the practice of service design for healthcare, incorporating domain specific skill sets, knowledge and terminology is key for building trust and contributing to positive changes within the system.

Describing an ideal service design project set-up, practitioners reinforced the importance of combining insider and outsider perspectives within a close team environment. Jocelyn explains what model she has found to work most effectively: "projects that do work well, is where there is a shared ownership over the project and what you are doing. [...] If you can make it feel like one team, then that's definitely the most productive way of working". This effectiveness of combining insider and outsider perspectives was also emphasized by Liz, "my favourite is when there is a core internal team and then there is another group of three to five consultants coming in almost on the same team. […] You speak the same language – design – but you have an external viewpoint. […] So, they [the core internal team] understand the process, they speak the language and they know… 'yep, this part is going to be scary and fuzzy and weird.' […] They have access to the company history, to the internal things. […] They know all these nuanced things, but then when you get the added outside consultant things, then you can move a lot faster."

In discussing the issue of positioning, we have begun to see the inside-outsider role of service designers working in healthcare as an approach that practitioners enact to varying degrees in different situations. Being an inside-outsider offers service design practitioners both a better understanding of the health context and simultaneously a distanced, critical perspective on it. This compound position helps designers to gain a deep understanding of healthcare service system dynamics, while developing novel incremental or radical propositions to influence change within the healthcare system.

4.2 Creating Radical-Incremental Change

The narratives we collected indicate that service design practitioners are sensitive to the type of change they are engaged in within healthcare systems. In contrast to the tradition of incremental improvements in healthcare, the expectations of service designers were often aligned with more radical change, causing different cycles of disappointment and acceptance within a project process. Aviv mapped the common cycle within some of the teams that he has been a part of: "projects tend to have this cycle where you start off with very high energy levels, all the opportunities and the excitement. What can we do to change the world? And then, […] there is a

have done all the exploring and it's the crunch time. Are we just going to go through the motions and get through this, or are we really going to make a difference?" Questions about the type of change and level of impact seem to haunt service designers in their project processes.

From the practitioners' narratives and the authors experience, there was a sense that there is a strong gravitational pull in healthcare toward incremental change. Josina reflects on her frustrations at Mayo Clinic feeling as though she was spending most of her time fixing a broken system, working toward goals of efficiency and improved patient experience, rather than addressing fundamental issues that would enable radical new ways of working. However, there were differing opinions among practitioners about whether radical change should be the focus of service design efforts in the healthcare system. Liz suggested that most of the need is for incremental change: "I think problems in healthcare are much about really basic service stuff. It's communication. It's information. It's bringing out what do I know when. It's helping people make decisions".

Others acknowledged the possibility of getting trapped in only doing healthcare improvement work. Lenny explains this further: "there is the paradox of the quick-win in the beginning. You need to very quickly build a portfolio of things that have had an impact in the hospital. […] There is a lot of low hanging fruit in large health care systems, particularly around communication which digital health often lends itself to do really well. But that low hanging fruit can, I think, build the wrong perception of what design is". Lenny's reflections suggest that a close association between service design and incremental change may trap the potential of service design practice. That said, Lenny suggested that radical changes may be inserted through service design processes that were initially aimed at more incremental change. "The real work of the design artefact is not in solution or the final output, but in the systems change that you have affected in the process of designing". He goes on further to say that sometimes an incremental change can be radical because of the context: "the leap is all about context. It may look like an incremental shift, but actually the contrast is pretty stark, given the healthcare system".

In working to secure a mandate for more radical change, practitioners discussed their efforts to build long-term relationships and gain trust overtime with their partners and clients. Jocelyn exemplifies this sentiment in a story of her work with one healthcare client at Uscreates. "They are starting to trust us a little bit more. […] At the beginning, we had no leverage at all to challenge what they thought about this stuff". Other statements reinforced the need for autonomy to support more radical change. Lenny suggested that making space for innovation outside existing healthcare systems could help catalyse long-term, radical change. "When the funding comes from the host organization […] and the innovation has the autonomy to operate outside the organization - I think it works".

Similarly, Aviv also described how he negotiated to operate as an independent consultancy within the system to help secure autonomy and create a more radical impact. “The risk is that we will end up doing the PowerPoints and workshops and maybe some research, but the real strategic decision making, how the project is planned, which clients we work with, will exclude the design team. So, I said, ‘I want the studio to bring in its own business and be its own cost centre’. A business within a business and that was accepted”. At Experio Lab in Värmland, Sweden, Josina has seen how shifting from a project with outside funding and significant autonomy to an embedded design lab built into the organizational hierarchy has limited the scope of projects and hampered some practitioners’ desires for more radical change.

The narratives we gathered, related to level of change indicated that practitioners were mavericks within their mandates. They negotiated opportunities for more radical change or worked to catalyse more fundamental shifts in service design processes despite, or perhaps sometimes even in spite of, the goals for change articulated by their partners working within the healthcare context.

4.3 Catalysing Top-Up Dynamics

To facilitate the process of change, the need for service designers to collaborate closely with internal healthcare innovation champions and sponsors became apparent. From the narratives, it became clear that internal champions supported service designers to navigate through the complexities of healthcare cultures, units, organisational levels and politics. Liz reflects on this aspect from the experience she had working at the Mayo Clinic: “The biggest help for us [designers] was the innovation coordinators. […] We had Amber, who was great and she, I think, knew everybody at the Mayo Clinic. You couldn’t walk down the hall with her without her saying hi to at least five different people and she had worked in seven departments in seven years. […] She had a lot of different roles and she just knew the whole system and without having that you wouldn’t be able to navigate at all!”

Lenny also described the importance of working with engaged champions at the Helix Centre. In relation to how they selected their projects he said, “people ask us, how do you pick the projects you are working on? And it is like, who is the most engaged? [Who will] stand up for design? And if we don’t have that person we are just going to fail”. The importance of supporting champions resonated well with Jonathan’s experience. In Spring 2017, Jonathan was organising an embedded service design lab innovation project in Norway’s largest rehabilitation hospital. Evaluating the intervention, it became clear that one of the most critical success factors was the strong support of internal champions. During the intervention period of twelve weeks, two internal champions actively helped the project to secure leadership support and engage frontline caregivers in co-design activities. Without their efforts, influencing change would not have been possible.

While recognizing the importance of partnering with internal champions, the interviews indicated that service design practitioners tended to pay attention to both the top and bottom of healthcare organizations. Practitioners reflected on the importance of having a strong mandate, relationship with leadership, and access to traditional forms of organisational power. Aviv emphasized his own approach to working with top-level sponsors in healthcare service design because of their vital role and influence. In his narrative, Aviv shared that for him it was not only important to work with hospital leadership, but also those commissioning healthcare services that hospital management reports to. Halima elaborates on the dynamics of working with both top-level leadership and stakeholders on the frontlines: "we work with the leaders and support them to take a little bit of a shift to their own attitude to leadership. […] What we try and get them to experiment with is a mode of leadership where they set a clear goal, […] but they don't prescribe exactly how the frontline team should achieve that. And so, what you get is a completely different dynamic between the leadership and the frontline of that system".

The narratives also revealed that access to front-line actors and informants also plays a central role in service design processes. Halima explains further how this is managed saying, "once we've supported the leaders to move to that space then we work with the front-line. And the front-line teams are in effect virtual teams that represent the whole system. Each team is made up of members from a lot of different organisations, […] from different parts of the NHS, acute, but also primary care, different parts of social care and different parts of the voluntary sector". Then she describes how those teams are engaged in co-creation to contribute to meeting the goals that were set by leaders.

With regards to working with leaders, what emerged from the interviews with practitioners were opposing viewpoints in relation to dealing with political agendas and influencing healthcare policy. Some practitioners suggested that service design efforts should focus on *how* political decisions should be realized, not influencing the ideological decisions themselves. Aviv expressed it this way: "there are areas in which, I just think design is a waste of time… I think there are areas where the human experience of the user or the patient doesn't have any bearing. Largely, I am thinking about a large scale, jurisdiction-level, state-level policy." In discussion about high-level policy decisions in healthcare, Aviv goes on to say, "I don't know if that is a design question. I could go out and do ethnography and prove to you both ways. I think it is an ideology. It is a political question. Once you have decided on that, designers can help you with how to do it well".

On the other hand, some practitioners expressed concern with service design being used as a political instrument, for example, by only focusing on getting individuals to change behaviour amid a broken system. Jocelyn pointed towards the potential of working with such political aspects: "there is opportunity for innovation

everywhere, including in political aspects, but we often restrict ourselves to 'who these people are', 'their behaviour' and 'how can we make them behave differently'. Actually, there's lots of research that says people behave in certain ways because of the environment they're in and the conditions that are around them. Maybe we need to just change that." In that vein, in the Swedish healthcare system, Josina has seen how service design has played a role in realizing national policies related to patient-centred care and a new patient discharge policy. While in these cases, it seemed that the driving political agendas that guided service design efforts were generally positive, Josina sees a strong need for a critical discussion around the role of service design in policy and the inherent politics of what service design seeks to do with healthcare.

To avoid political barriers, Halima expressed how Nesta works across political boundaries and focuses on offering solutions: "Some immediate political debates can be unhelpfully zero-sum – so we try to contribute differently, by setting out a positive future and how to get there". There seemed to be a general sense among practitioners that the work entailed both catalysing a bottom-up movement for change and tapping into top leadership to ensure the mandate for change. Further, the political tensions in navigating these power dynamics were palpable and many practitioners acknowledged the need to be conscientious about the role of the practice in this context.

5 Discussion

In this inquiry, we addressed a core question: how do healthcare service design practitioners approach their position, the degree of change that they seek to catalyse and their direction of influence? What we found was that practitioners apply compound and sometimes contractionary approaches to support transformation in healthcare.While existing literature tends to depict healthcare service design as choosing between "either/ or" strategies, such as working inside or outside the healthcare system (Freire & Sangiorgi, 2010) and creating incremental or radical change (Mulgan, 2014b), our research suggests that service designers creatively blend and strategically leverage these contradictions.

Regardless of whether a practitioner's formal position is inside or outside thhealthcare system, service design practitioners intentionally, and perhaps inevitably, end up straddling the inside-outside boundary. Service design practitioners adopt and perform a hybrid identity, enacting and positioning themselves as insider-outsiders of healthcare to maintain a fresh perspective while influencing long-term change. In relation to the degree of change they seek to create, service design practitioners strategically wander between the incremental and the radical, with at times different implicit and explicit goals. They are sensitive to the inertia of the

healthcare system that tends to support only slow improvements, but they sometimes sneak in radical new ways to address and advance long-term issues. Supported by internal champions, service designers work to enable and facilitate co-creation within the complex political hierarchies of healthcare systems. They aim to influence change simultaneously at different organisational levels, by stimulating a combina- tion of top-down and bottom-up pressures for change.

As the field of healthcare service design expands (Mager et al., 2017; Tsekleves & Cooper, 2017a), the situated knowledge and voices of service design practitioners help to build a more nuanced understanding of the practice beyond the in-house versus ex-house debate around healthcare innovation (Mulgan, 2014b; Snook & Design Managers Australia, 2014). The contradictory and complementary qualities of the practice discussed here are important to acknowledge within the strategy development of the healthcare service design collaborations and labs that are pop- ping up around the globe (Mager et al., 2017). In studying change in complex organisations, Luscher et al. (2006) discuss how contradictory qualities are linked to paradoxes and that these paradoxes are a natural feature ofdynamic systems. They reinforce that "paradoxes of organising may benefit from acceptance" (p. 499). Our study helps to dive further into the paradoxical nature of organisational change that is prominent within healthcare service design practice. By exploring these issues, the contradictory of this work can be better understood, accepted and utilised within the strategies of practitioners and organisations working at this emerging intersection.

5.1 Future research

The nuanced understanding of healthcare service design practice developed through this research illuminates several important questions for future research. What organisational models can best support the hybridity and "in-betweenness" of service design practice in healthcare? What supports can be put in place to aid service designers in healthcare settings and help them to understand the risks of their outsider perspective without compromising it? How can healthcare service designers better respond to the demands for incremental improvements without jeopardising their creative potential or reaching stagnation? How can healthcare service designers best facilitate multi-stakeholder interactions that foster co-creative emergence among healthcare professionals at various organisational levels while recognising the inherent power and politics at play?

In addition to these related issues, future research into the political and ethical issues concerning the instrumental role of service design within the healthcare system is needed. We believe that more research about healthcare service design as a practice together with designers' situated and embodied approaches (Kimbell,

2009) may support the development of this evolving subfield. Through further qualitative studies of healthcare service design as a practice, this emerging subfield can cultivate enhanced reflexivity, continue to refine its approaches to catalysing healthcare transformation and better prepare service design practitioners entering into and working at this intersection.

6. Conclusion

Interested in the emergent practices of service design in healthcare, this study constructs and uncovers the "in-betweenness" and compound approaches of service designers in healthcare. By unpacking the experienced contradictions of catalysing change amid the complexities of healthcare and the ways these contradictions are leveraged by practitioners, this research offers a more nuanced and granular understanding of the dynamics of healthcare service design as a practice. This study found that practitioners working at the intersection of service design and healthcare are operating in the space in-between the inside and outside, the incremental and the radical and the top and bottom of healthcare organisations. These compound approaches enable practising service designers to flexibly make sense of new connections across complexities. These connections are then used to conceptualise new frames, identify new possibilities and co-create new value propositions. One service designer, Liz, summarised this notion very clearly by stating that "the flexibility that design can bring to that space [healthcare] is really what it needs, because the world is moving so fast and is so complex and it's just getting more and more and more. I think that adaptability and being able to work in-between spaces is what we bring to it".

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PUBLICATION 2

Design Conversations in Healthcare Service Systems. In Relating Systems Thinking

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Design Conversations in Healthcare Service Systems

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Abstract

To support change processes in complex healthcare service systems, the field of service design has been evolving to develop new approaches and ways of working. These developments include expanding the purpose of service design as a practice beyond the development of specific service offerings, instead moving towards shaping the conditions for the emergence of new forms of value creation. One way of meeting this challenge is by facilitating interactions within a diverse group of actors with multiple perspectives who can collaboratively propose new structural resolutions for service system developments. Despite the fact that most stakeholder interactions are done through conversations, little attention has been given to how designers are influencing conversations while working inside healthcare service systems. More explicit knowledge is needed on design conversations to ensure a more impactful outcome of systemic change processes. By using action research as an approach, we explore the 'design conversations' that took place during two embedded design lab interventions in two hospital settings. Our research reveals how designers use conversations to gain influence in change processes while working inside healthcare service systems. This inquiry highlights the importance of attending to conversations as a central systemic service design material. Further, we argue that more deliberate practical attention to conversations throughout the entire design process may increase the likelihood of emergent novel service propositions, helping shape their supportive social structures over time.

Introduction

Western healthcare systems have been under increasing pressure from several strong drivers of change, such as rising costs, new technological developments, and increasing expectations of service quality (Proksch, Busch-Casler, Haberstroh, & Pinkwart, 2019). Innovations and renewal are needed to uphold a more sustainable and efficient healthcare system that can also support a well-coordinated high-quality service delivery. Globally, using service design to facilitate healthcare change processes has been an increasing phenomenon over the past few years (Mager et al., 2017, 2016). Service design offers an alternative approach to healthcare service development and includes cocreative and explorative ways of working (Donetto, Pierri, Tsianakas, & Robert, 2015; Jones, 2013; Vink, 2019). The purpose of service design has earlier been described as 'to ensure that service interfaces are useful, usable, and desirable from the client's point of view and effective, efficient, and distinctive from the supplier's point of view' (Mager, 2009, p. 34). To tackle service development efforts in complex settings such as in healthcare, recent service design studies have suggested expanding this understanding of purpose (e.g., Kimbell, 2011; Sangiorgi, Patricio, & Fisk, 2017; Vink, Koskela-huotari, Edvardsson, & Wetter-edman, 2020), challenging the field to move beyond the development of new service offerings towards creating the conditions for value in use and to facilitate the emergence of new desired forms of value creation.

All design activities are pragmatically guided by communication intended to change a situation (Jones, 2010). Design efforts that are targeted more towards systems change seek to expose the different positions, relationships and contributions of the various stakeholders that represent the different parts of the ecosystem (Jones, 2018). The expanded understanding of the purpose of service design in complex healthcare service system settings and the increased focus on multiple actor interactions challenges practitioners to develop new strategies and ways of working (Freire & Sangiorgi, 2010; Sangiorgi, Patricio, & Fisk, 2017). Design-driven multistakeholder interactions are used to support interdependence, participation and the emergence of propositions (Sangiorgi et al., 2017), with the intention being to add value to organisational processes and service outcomes. Hence, these processes focus heavily on enabling productive conversations with and among multiple actors. In the current working paper, we use the phrase 'design conversations' to describe conversations that are planned, facilitated and used by service designers as part of the design processes carried out inside service systems. However, despite the fact that conversations are central to these processes, limited attention has been given to the role and nature of the conversations taking place during the change processes facilitated by service designers. Further, there is currently a limited understanding on how service design practitioners are influencing these conversations to support systemic change. This kind of knowledge may enhance the potential of service design to support healthcare system change processes more broadly.

To guide our exploration on the conversations in healthcare service design, we ask the following research question: How are embedded service designers influencing conversations to support change processes in healthcare service systems? By using action research as a methodology, two design labs were embedded inside two Norwegian hospitals to explore these conversations in situ and the ways designers are influencing conversations through a number of parallel service design processes. Using an inductive analytic approach, this practice-led research unpacks the nature of the conversations taking place during service design processes, revealing how service design practitioners use conversations as a design material to influence healthcare service development. Our findings illustrate how service design practitioners are influencing the course of action of the intervention processes themselves through reoccurring meta-conversations. Further, we expose how designers are helping question ignored fundamental issues and gain propositional leverage by collecting and through making sense of conversations occurring at different levels. Furthermore, we unpack the ways designers are using mediating artefacts to support conversations, how they create bridges among subsystem actors through conversations and how they influence the shaping of new mental models by reframing language. Based on our findings, we discuss the theoretical implications of these conversations as a central systemic service design material. Further, we offer guides for practising healthcare service designers on how to make use of conversations to influence systemic change while cocreating propositions inside healthcare service systems. Finally, the present research highlights the need for further developments and research on conversations in the field of service design to gain a systemic impact.

Background

To provide a background for our research, we first review the literature on the complexities of healthcare service systems as a context for carrying out service design processes. Then, we describe how the field of service design is challenged to expand to tackle some of these contextual complexities. Towards the end, we highlight existing literature that addresses multiple stakeholder interactions and conversations as part of the service design processes that facilitate systemic change. Finally, we describe

how conversation theory relates to design in complex service system settings and the significance of this line of research.

Healthcare organisations as complex adaptive systems

In contrast to earlier views on healthcare systems as being controllable machines with designed parts that process inputs and create outcomes (Morgan, 1997), healthcare organisations are increasingly recognised as complex adaptive systems (CASs). CASs are envisioned as living ecologies of networked entities or as a mesh of dynamically linked but independent subsystems with the capacity to learn and respond to circumstances (Begun, Zimmerman, & Dooley, 2003). CASs are inherently characterised by having fuzzy boundaries and by being fluid; these characteristics complicate development processes and may lead to uncertainty and unexpected reactions to pressures (Plsek & Greenhalgh, 2001). Adaptability is a central feature in a CAS, which is known here as the responsive potential of a system to transform as a reaction to drivers of change (Holland, 1995). Innovation inside a CAS is characterised as emergent, meaning that higher-order systemic novelty is achieved through the interactions and relationships between lower-order system parts or actors (Lichtenstein, 2014). Adaptations through actor interaction may lead to the emergence of new behaviours, norms and systemic patterns (Khan et al., 2018). In healthcare systems, actors may be connected to numerous subsystem networks.

Such subnetworks are often affected by what has been termed a 'silo mentality' (Fenwick, Seville, & Brunsdon, 2009; Kaufman et al., 2014)—divisive mindsets of individuals and groups within and across organisational divides. Manifested as barriers of communication, silo mentalities may often lead to disjointed and disadvantageous ways of working (Fenwick et al., 2009). Creating bridges across these social divides may reinforce the ties among actors (Granovetter, 1973), increasing the likelihood of a renewal of discourse and, thus, the emergence of new ways of thinking and acting. Bridging across siloed networks happens through both structured arrangements and by self-organised interactions (Rouse, 2008). Hence, both prearranged and self-organised actor interactions are ways to promote adaptability and innovation in CASs. Therefore, service design processes that are nested inside complex healthcare systems need to support adaptability through actor interactions as a way to promote the emergence of desirable transformations.

Moving towards systemic healthcare service design

Increasingly, service design is involved in facilitating the efforts of healthcare service innovation by conveying both creative and analytical knowledge to help healthcare organisations bring forward value propositions. Through structured processes, service design simultaneously attends to both the client's and provider's perspectives (Mager 2009). More specifically, service design focuses on both 'experiences that happen over time and across different touchpoints' (Clatworthy, 2011, p. 15) and the 'transformative effect on organisations and communities' (Junginger & Sangiorgi, 2009, p. 4340) that these changes may imply. Service design simultaneously influences organisations on the strategic, tactical and operational levels by applying a cross-functional approach (Clatworthy, 2013). The attention towards organisational transformation is essential in service design because these arrangements create the foundation for enacting different service touchpoints and exchanging value with clients at the frontline, where services are coproduced (Kurtmollaiev, Fjuk, Pedersen, Clatworthy, & Kvale, 2018). However, structural change and organisational transformations are difficult to accomplish in the complexities of healthcare because of the inertia related to reformations of institutional arrangements (Oliveira, Magone, & Pereira, 2005) and organisational cultures with strong norms and strict routines

(Wang, Lee, & Maciejewski, 2015). Because of these circumstances, many service design propositions are stranded before being adapted and implemented into the system, failing to create long-term impacts and catalyse service transformations (Almqvist, 2020; Overkamp, 2019).

These circumstantial challenges push forward the need to extend the field of service design, expanding it with equivalent theories and ways of working to tackle more systemic issues (Jones, 2013; Sangiorgi et al., 2017). Recent expansions include the conceptual frames that involve moving the field from focusing on the design *of services* (Mager, 2009; Shostack, 1982) towards design *for service* (Kimbell, 2011; Meroni & Sangiorgi, 2011; Wetter-Edman, 2014) and further on towards *service ecosystem design* (Vink et al., 2020). Here, service ecosystem design is defined as 'the intentional shaping of institutional arrangements and their physical enactments by actor collectives through reflexivity and reformation to facilitate the emergence of desired value cocreation forms' (Vink et al., 2020, p. 2). Service design as a practice is expanding to include practices of systemic design, focusing on resource integration and going beyond organisational boundaries to support actor-driven adaptations of service systems (Sangiorgi et al., 2017).

More specifically, these developments affect service design as a practice by situating the design processes as parts of larger reformations, introducing new design materials and extending the role of the designer. The understanding of service design materials is broadened from process tools, representations of service flows, touchpoints and repertoires (Blomkvist, 2014; Blomkvist, Clatworthy, & Holmlid, 2016; Clatworthy, 2011) towards more abstract understandings of service design materials, such as social structures and institutional arrangements (Vink et al., 2020). The objective of what is designed then shifts towards creating value relations '[...] within a socio-material configuration involving diverse actors including people, technologies and artifacts' (Kimbell, 2011, p. 41). Further, this expansion affects the role of the service designer, extending the service designer from acting only as a design expert to also enacting the role of a facilitator of participatory design events (Body, Terrey, & Tergas, 2010; Sanders & Stappers, 2008; Tan, 2012), hence becoming a catalyst for systems-oriented change (Aguirre & Vink, 2013; Romm, Paulsen, & Sevaldson, 2014; Sevaldson, 2011). Increasingly, healthcare service designers engage in orchestrating and facilitating multiple actor interactions through a series of codesign events to support generative emergence in complex settings (Aguirre, Agudelo, & Romm, 2017). During these codesign events, the interactions among multiple actors are facilitated through conversations. In many cases, the mediating artefacts are developed and used as conversational enablers in different stages of the design process (e.g., Aguirre et al., 2017; Brandt, Messeter, & Binder, 2008; Clatworthy, Van Oorshot, & Lindquister, 2014; Rygh, 2018).

Conversations in healthcare service design

Conversations in healthcare interventions are broadly defined as 'a collaborative process in which meaning, and organisation are jointly created' (Jordan et al., 2009, p. 2). During service design processes, a variety of issues are discussed with different actors, exposing needs, desires and different perspectives of future possibilities. Conversations may take place as part of ethnographic explorations during early service design process stages (Segelström, Raijmakers, & Holmlid, 2009), reflexive inner conversations may take place among designers as they are designing (Glanville, 2007; Schön, 1992), or conversations may be held as part of codesign activities with other actors (Eriksen, 2012; Sanders & Stappers, 2014). Similarly, the early stages of service design processes are usually focused on learning and sensemaking, while the latter stages centre around the cocreation of concepts, demonstration of service value propositions and implementation of supportive backstage arrangements (Van Osterom, 2009). From a pragmatic perspective, design is inherently a communicative practice because 'design

activities enact the creation of a linguistic system of meanings applicable to a problem in context' (Jones, 2010, p. 71). Through such conversational interactions, the participants may learn to shift their own beliefs and assumptions by creating new mental models that hold the potential to impact organisational developments and institutional arrangements more broadly (Vink et al., 2019). Conversations are appropriate to both explore the possibilities that emerge during design activities and to generate those possibilities intentionally (Jones, 2010) through the enactments of discursive provocations and directive *speech acts* (Austin, 1962; Winograd, 1986). Hence, designing in service system settings may be perceived broadly as a conversational process for learning together and as a basis for others to hold conversations, to learn and to act (Dubberly & Pangaro, 2015).

A design perspective on learning and acting through conversations

Conversation theory (Pask, 1976) is founded on the idea that learning happens through conversations about a subject matter, here by sharing concepts between two or more actors to explicate knowledge. Understanding is facilitated by explanations and explicit manipulations and through utterances and speech acts, which influence the views on the subject matter at hand. Pask claimed that conversations may be conducted at different levels, such as general discussions, discussions on a specific subject matter and discussions about learning and the language of learning itself. Further, Pask identified different learning strategies, such as sequential and structured learning strategies, holistic learning strategies concerned with the relations of higher-order and versatile learning strategies of combining perspectives through contextual awareness—a strategy that he exemplified as often used by designers (Pask, 1988). Winograd (1986) developed a language/action perspective on design for digital systems of cooperative work. Interested in socio-organisational activity, Winograd (1968) identified four main purposes of conversations: First, conversations may provide an *orientation*—a general backdrop for other conversations or a sense of the 'total picture' and related anecdotes. Second, conversations may hold the purpose of acting as *clarification*—to interpret or negotiate the specific conditions related to a shared background. Third, conversations may help to identify *possibilities*—to construct a new understanding and explore novel propositions. Finally, conversations may afford *action*—as embodied utterances with the capacity to move a person or group towards doing (Winograd, 1986). Hence, 'a conversation design perspective can enhance our coordination of attention as well as action' (Jones, 2010, p. 75).

Despite these conversational potentials and the central role that conversations play in service design, little attention has been given to the ways service designers enact and influence conversations in practice. A better understanding of conversations in service design and the lever they offer for designers may improve the practice of facilitating interactions among actors, thus better supporting service system adaptability and broader change processes.

Methodology

To shed light on the role of conversations and the way service designers are influencing conversations in service systems, we applied a qualitative research approach. Our practice-led research combines methodologies from action research (Heron & Reason, 1997) and research by design (Frayling, 1993; Jonas, 2007; Morrison & Sevaldson, 2010). Action research is a cooperative exploration that uses systematic cycles of planning and observations to reflect on action. The motivation of using action research is to investigate and understand a subject of study through action—in this case, the conversations in service design. Further, the current study uses the approaches of researching through design (Fallman, 2008; Frayling, 1993) and by design (Jonas, 2007; Morrison & Sevaldson, 2010).

Research by design is a mode of enquiry that uses explorative and generative design practice with a research purpose (Sevaldson, 2010). The authors of the present research are positioned inside the object of study, acting simultaneously as coresearchers and cosubjects (Denzin & Lincoln, 2011). This particular position of conducting research by designing exposes researchers to levels of understanding that are hard to access from observational and more distanced standpoints (Sevaldson, 2010).

Embedded design lab interventions

To investigate design conversations in a multidisciplinary service design setting (Yu, 2020), two design labs were embedded inside two large hospitals. Embedded design labs are temporary design interventions adapted to a certain context over a period of time to orchestrate an appropriate design process. They can be seen as 'pop-up design studios' established as safe spaces for experimentation inside complex organisations—such as inside hospitals—working to support innovation from the inside while maintaining a critical outsider perspective (Mulgan, 2014; Romm & Vink, 2018).

The first embedded design lab intervention was carried out at Akershus University Hospital (Ahus) in 2018. Ahus is a Norwegian public hospital located in the outskirts of Oslo. The hospital covers a population of approximately 500,000 people and has a capacity of around 1,000 beds and 9,000 employees. As a response to a growing elderly population and the need for innovation to tackle these developments (Schultz, André, & Sjøvold, 2016), a design lab was embedded inside the hospital to support the establishment of the Centre for Elderly Medicine at Ahus. More specifically, for 10 weeks, the lab facilitated the development of three healthcare service initiatives for the elderly: 1) palliative care to support final stages of life, 2) hospital-at-home services and 3) an interdisciplinary outpatient clinic for the elderly.

The lab was established and run by 11 master of design students together with one researcher and one teacher from the Oslo School of Architecture and Design. The whole intervention was initiated and coordinated by an innovation champion (McDermott & O'Connor, 2002) who was appointed by Ahus to lead the establishment process of the Centre for Elderly Medicine. A cross disciplinary group of about 25 participants were assembled to support the three service design initiatives. During the intervention, the design teams were engaged in extensive design ethnographic field work and were conversing with a variety of actors, such as elderly patient representatives, nurses, doctors, leadership and other relevant actors. In addition, the design teams conducted five multidisciplinary codesign events during the intervention. To provide a general impression, Figure 1 contains the photographs of some typical conversations that took place during the Ahus intervention; the photographs depict healthcare professionals passing by and discussing ideas with the designers at the embedded design lab (above left), design students inviting elderly into conversations as part of field work at the hospital lobby (above right), a typical conversation held in a codesign session (bottom left) and a presentation setting of sharing learnings and proposing new service ideas and concepts (bottom right).

Figure 1: Images from the embedded design lab at Ahus. Photographs: Jonathan Romm (above) and Alex Asensi (bottom).

The second design lab intervention took place inside the Oslo University Hospital (OUH). OUH is Scandinavia's largest hospital, serving the entire capital city of Oslo and providing about 1.2 million treatments annually. Divided into 14 medical divisions, the hospital has about 23,000 employees and 1,900 beds. OUS is looking to expand its home care services. Recently, the model of home hospitalisation has been flagged as promising because it may reduce treatment costs while providing better service experiences for patients (Levine et al., 2019). During a 12-week period in the late spring of 2019, a design lab was established to support three main hospital-at-home initiatives: 1) an overall vision of hospital-at-home services at OUH, 2) an advanced hospital-at-home service for children, and 3) hospital-at-home services for patients with blood disorders.

The intervention was coordinated by three innovation champions from the innovation unit at OUH. The lab was facilitated by eight master of design students, along with one researcher and one teacher from the Oslo School of Architecture and Design. About 20 participants with different disciplinary backgrounds from six different hospital units were assigned to support the design teams. During the intervention, four codesign events were held, including a kick-off event, an ideation workshop, a proposal review session and a handover workshop. In between these events, as part of field work explorations, the designers were engaged in conversations with patients, nurses, doctors, leadership and other relevant actors. Figure 2 depicts some typical conversational situations that were taking place

during the OUH intervention: a conversation in a multiactor road-mapping session (above left), a conversation during field work in a patient home visit (above right), a conversation among different actors during the ideation workshop (bottom left) and a conversation during the handover workshop (bottom right).

Figure 2: Images from conversations at the embedded design lab at OUH. Photographs: Jonathan Romm.

Data collection and analysis through action research cycles

Apart from working with these service design initiatives, the two labs acted as *rich design research spaces* (Sevaldson, 2008) and as communities of inquiry and practice (Heron & Reason, 1997). In both interventions, qualitative data were generated and collected by the students and academic staff through action research cycles that consisted of planning, acting, collecting data, observing and reflecting (Crouch & Pearce, 2012). Each cycle lasted for a period of two to three weeks. During each intervention, three research cycles were carried out (Figure 3). The first cycle focused on becoming familiar with conversations and the capturing tools, along with sharing preliminary reflections on conversations. The second cycle was conducted with the intention of identifying individual themes of interest related to conversations. The third cycle was used to analyse data and produce a poster presentation containing the findings from each students' individual explorational trajectory involving conversations.

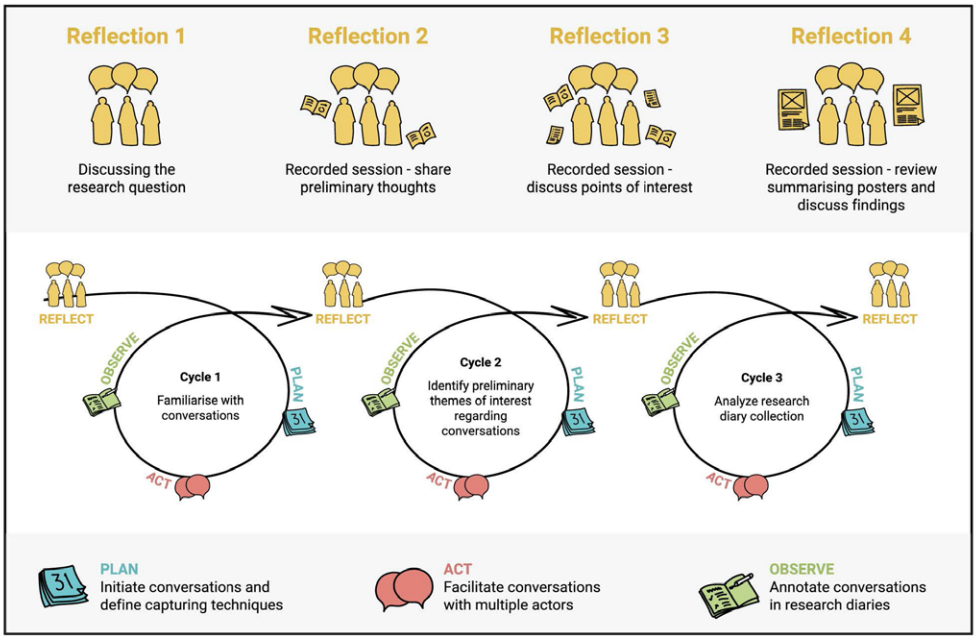


Figure 3: Three action research cycles of planning, acting, observing and reflecting used to collect data during the interventions. Illustration: The authors.

During each cycle, student research diaries (Engin, 2011; Nadin & Cassell, 2006) were used to collect annotations, descriptions, photographs and diagrams of conversations. By using a simple notebook stamp and template tool, the students could document the conversations they had during the interventions, including information such as when conversations happened during the design process and the learnings they gained from each conversation. Further, students were asked to note what kinds of mediating artefacts were used to support each conversation and mark out the thematic level of each conversation by using three categories: 1) macro-level strategic conversations, 2) meso-level tactical conversations and 3) micro-level operational conversations (Clatworthy, 2013). In total, 204 nonexhaustive descriptions of conversations were collected during both interventions (Figure 4).

The diaries helped the students reflect on the conversations they had and detect recurring issues while identifying emerging patterns. Reflection sessions were recorded at the end of each research cycle and later transcribed. In addition to this, photographs documenting activities during both the interventions and posters summarising each student diary were developed and collected. Based on the analysis, the qualitative data were gathered and systematised into a rich data portfolio.

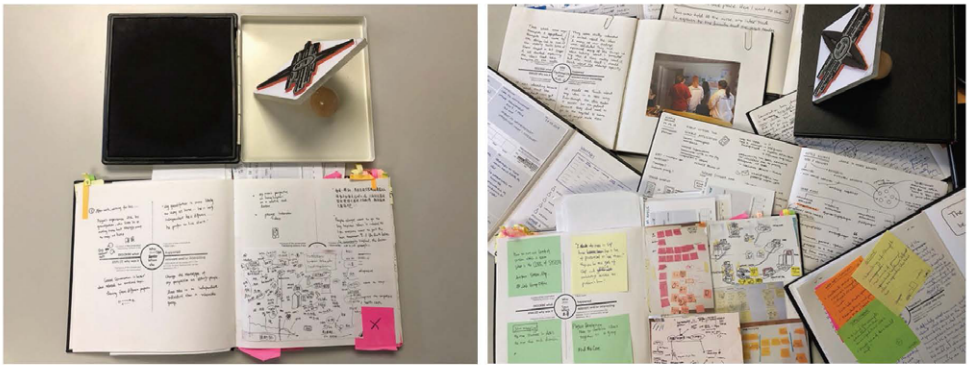


Figure 4: The notebook stamp tool that was developed to capture the essence of conversations in research diaries (left) and a collection of diaries showing annotations, diagrams and photo arrangements as diary entries (right). Photo by Jonathan Romm (left) and Palak Dudani (right)

Analysis of the rich data portfolio

After the interventions, three iterations were done using an inductive approach; this was done as part of the analysis of the collected data portfolio (Gioia, Corley, & Hamilton, 2013). During the first iteration, the research diaries were sorted and tagged to identify preliminary first-order concepts derived from the raw data and field observations (Van Maanen, 1979). All diary entries of each student diary were analysed and arranged sequentially under four typical design phases: research, ideation, design and delivery (Design Council, 2007). To contextualise the sorted collections of conversations, a collage of the pictures from each phase in both interventions were added (Figure 5).

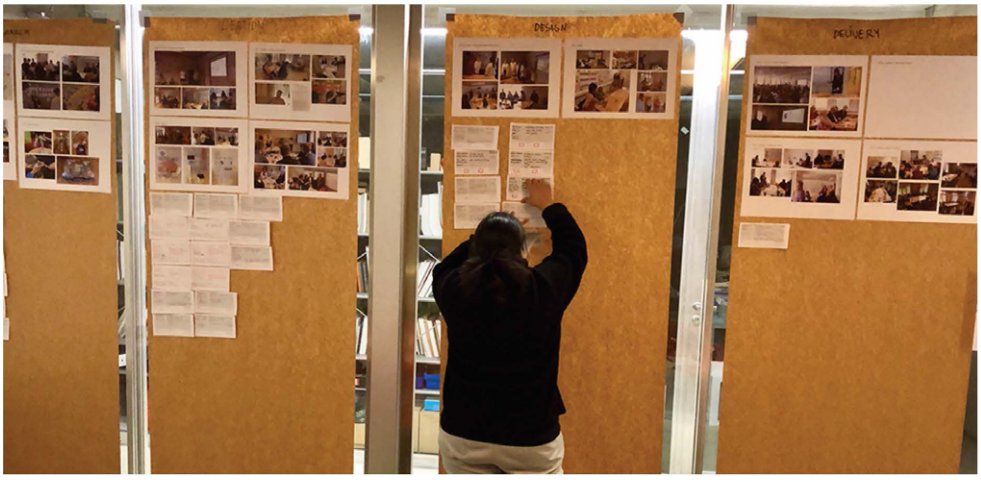


Figure 5: First analysis iteration of the sorting and tagging of the collected annotations of conversations.
Photograph: Jonathan Romm

The use and types of mediating artefacts were marked for all conversations. The purpose of each conversations was tagged, here using orientation, clarification, possibilities and action as categories - following the language/action perspectives developed by Winograd (1986), as described above. For example, a conversation that was held with a leader at OUH about the principles of home care services, the role of leadership and about future potentials, was classified as having a purpose of orientation and possibilities. Further, under each design phase, the conversations were arranged into thematic levels. By sorting out the levels of conversations, new levels surfaced besides the three levels that were initially annotated inside the diaries. This first iteration provided a sorted overview of first-order concepts of the types and purposes of the collected annotations of conversations as they took place throughout the intervention process and the mediating artefacts used to support these conversations.

Second, an analysis workshop was arranged to reflect on our own conversational experiences during the interventions and to relate these experiences to the observations and identified emergent patterns in the sorted and tagged collections of conversation annotations, here starting from the first iteration. Further, all the summarising posters with the students' observations and articulated findings were reviewed and discussed among the authors. Towards the end of the workshop, a preliminary list of identified second-order, theory-centric themes were created. During this phase of the analysis, we used giga-mapping as a technique to display, tag and visually rearrange compilations of from the rich data portfolio, hence being better able to share thematic reflections and articulations on an online collaborative board (Figure 6). Giga-mapping allows for the integration of rich multilayered design artefacts as a way of understanding a complex field (Sevaldson, 2011).

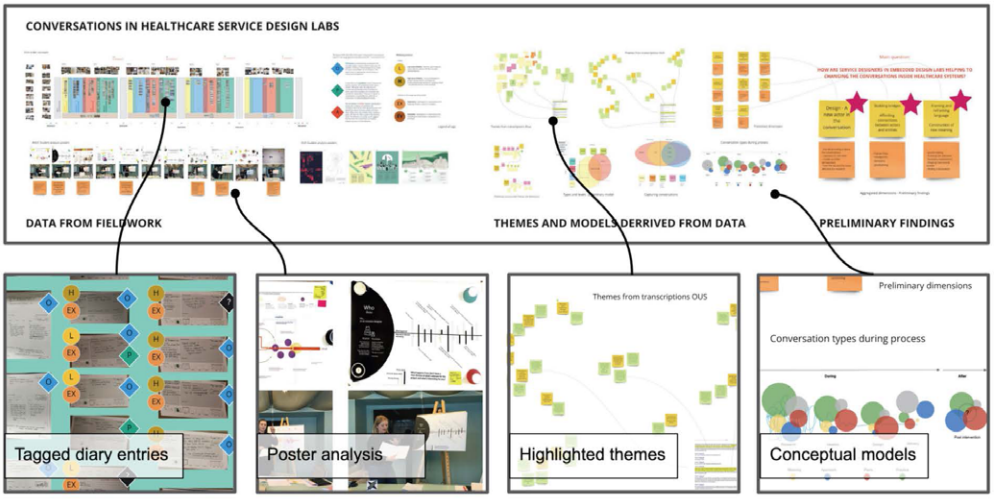


Figure 6: An overview of the analysis giga-map, with examples of tagged conversations, poster analysis, thematic categorisations of reflections from research cycles and preliminary thematic models. Illustration: the authors.

Third, to identify the ways designers are influencing conversations, an analysis of the transcribed reflection meetings from each research cycle was carried out. Quotations of interest were pulled out and annotated using meaning condensation (Kvale, 2008), where the interpreted meanings behind the

expressed accounts from the reflections were shortly described. The interpreted quotations were then grouped to form themes that were compared and combined with the themes that surfaced from the analysis workshop. During this process of analysis, new thematic relations began to emerge based on the sorted collections of annotated conversations, the students' own analysis posters and the themes that were condensed from the reflection meetings. Finally, these combined thematic relations were articulated as findings that revealed six dimensions of influence that embedded service designers pose on the conversational interactions during service design processes.

Findings

Five different levels of conversations were articulated (Figure 7): meta-conversations (marked as grey speech bubbles in Figure 7) were interactions among actors and that referred to the intervention itself, here with the purpose of taking action. Meta-conversations were concerned with defining the aims of the intervention, identifying appropriate participants and finding the best means of designing during each step of the design process. Meaning conversations (yellow bubbles) were philosophical interactions in which ethics, paradigms and the purpose of healthcare was made subject. Meaning conversations were orientational with the purpose of providing a shared sense of the 'total picture' or the underlying value behind appearances. Approach conversations (blue bubbles) were interactions focusing on long-term issues, such as interpretations of general healthcare policies, the desired outcomes of the healthcare system as a whole and the institutional arrangements that are involved in supporting these goals. In most cases, these conversations had the purpose of clarification and identifying possibilities at a high-order level. Plan conversations (red bubbles) were concerned with the organisation of the health care delivery process and the related supportive resources at play. Finally, the level of practice conversations (green bubbles) was identified; these were interactions regarding short-term decision making, procedures and manoeuvres related to carrying out and coproducing the healthcare service. Many conversations were touching on several levels at the same time. The size of the speech bubbles indicates the approximately number of conversations that were collected at each level and illustrate their thematic overlapping.

Throughout the intervention processes, conversations on all levels were held although most were on the plan and practice levels. The main purpose of conversations taking place during the early stages was to provide clarification and orientation, which is shown as arrows above the speech bubbles in Figure 7. During the initial stages of the intervention, about a third of the gathered conversations were supported by mediating artefacts such as sketches, ideograms, illustrations of touchpoints, open user journey maps and similar items. Many of the initial conversations were related to design ethnographic fieldwork, such as collecting observations, lived experiences from actors and frank opinions on the subject. In general, less conversations were registered during the later design and delivery phases. Most of the conversations in the later design phases had the general purpose of addressing possibilities and proposing action. Further, during the later phases of the interventions, almost all conversations were supported by mediating artefacts.

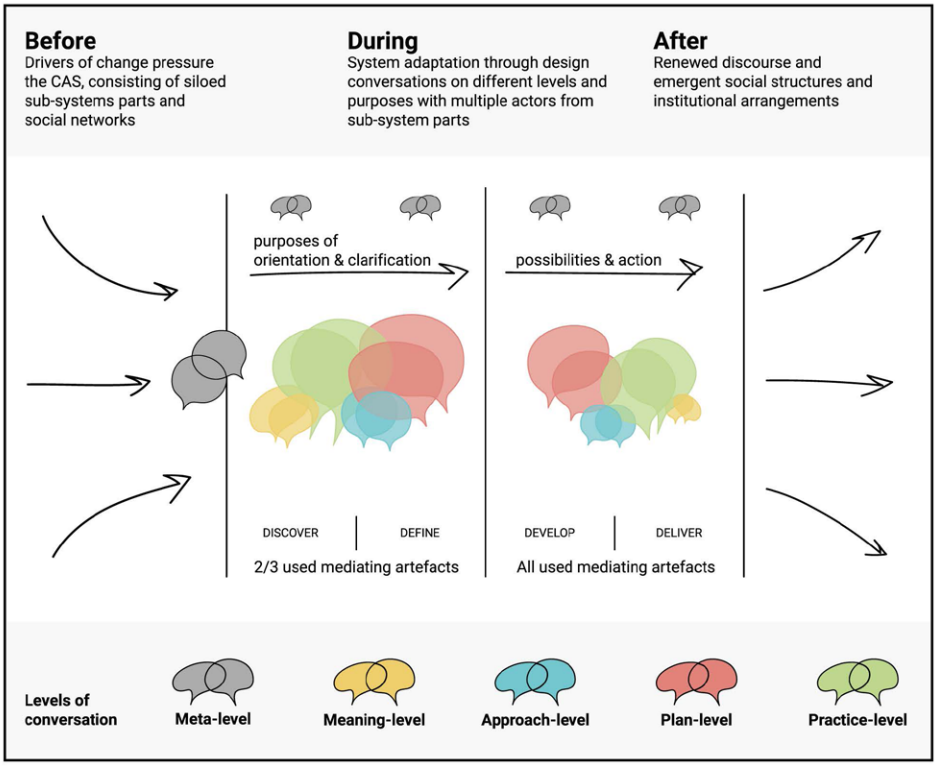


Figure 7: Distribution of the conversations, purpose of conversations and use of mediating artefacts during the interventions and the dynamics at play before, during and after the interventions took place. Illustration: The authors.

Further, we found that the conversations that took place during the interventions caused discursive ripples in the wider social settings several months after the interventions were over (marked as diverging arrows on the right side in Figure 7). Even though many of the silos that existed before the intervention are still present at both hospitals, new social groupings have emerged and are now collaborating. For example, a joint project with Ahus and the municipality of Ullensaker was launched to develop and test remote digital home care services for patients with chronic illness, here inspired by the dialogues that took place during the intervention. Further, Ahus and the municipality of Skedsmo are collaborating to support 'quality of life conversations' for elderly with chronic conditions. Furthermore, the 'quality of life conversations' service concept was picked up, adjusted and tested out by the dialysis unit at Ahus, a unit that did not take part in the intervention process. At OUH, a joint exhibition of hospital-at-home service cases was launched by engaging their emergent hospital-at-home innovation network. The intervention created a lasting commitment for developing similar services in other parts of OUH and a top-level strategic decision that was made to support all hospital-at-home service initiatives. Subsequent conversations at the hospital are still referring to the intervention, almost two years after it took place. Our findings indicate that design conversations hold the potential to become adaptation

vehicles that can move towards taking action in wider social constellations and for shaping new institutional arrangements in complex service systems, such as in healthcare hospital settings.

The ways designers help changing conversations

A remarkable observation was the fact that the designers who initially knew very little about the cases and the complex contexts they were surrounded by gained lots of attention by leadership, middle management and healthcare staff after only a few weeks of the interventions. Gaining a propositional power position was found to be achieved through six specific ways of influencing conversations posed by the designers to support the change processes inside the healthcare service systems that they were embedded into:

1. Defining action through reoccurring meta-conversations
2. Linking conversations to gain discursive propositional leverage
3. Revealing ignored fundamental issues through inquisitive conversations
4. Highlighting the overarching objectives between subsystem actors
5. Reframing language and shaping new mental models
6. Inspiring conversations by creating and using mediating artefacts

Next, we elaborate on each of the identified influences and provide examples from the interventions.

1) Defining action through reoccurring meta-conversations

Recurring meta-conversations were taking place during the entire intervention process. Before the interventions kicked off, the hospital champions and academic staff were engaged in several meta-conversations to define a point of departure. These initial influences were expressed as a design brief that was shared with the students and participating actors. Throughout the process, almost on a weekly basis, these objectives were made a subject for further discussions and were adjusted iteratively. In this way, the design teams were able to agree on how to move forward with actions throughout the intervention. For example, during the research phase at the Ahus intervention, the designing groups were discussing how to get access to and meet elderly patients both inside the hospital and elsewhere so that they could better understand these older patients' experiences, needs and wishes. Besides meeting elderly patients at the hospital, a decision was made to also visit a nursing home nearby and hold conversations with elderly family members. Another example of a meta-conversations happened during the latter stages of the OUH intervention: the participants were discussing whether it would be useful to prototype a patient home at the lab to enact how a home visit may play out. Throughout the process, meta-conversations were notably influencing the entire process and its outcomes. Meta-conversations helped define where to start and in iterative assessments and adjustments of the ongoing intervention process as a response to the issues and opportunities exposed along the way.

2) Linking conversations to gain discursive propositional leverage

The structured capturing of the essence of conversations through simple templates clearly helped the designers learn rapidly, identify issues and construct meaning. By collecting, annotating, sensemaking and reflecting on the variety of conversations that took place, the designers could extract compound and critical insights. For example, one of the students explained the process of collecting insights from conversations in the following way: 'We were all interested in documenting discoveries or when something very unexpected came up in a conversation and see if that actually pushes you in a different direction [...] of making an important shift in the project'. By documenting these discoveries and through linking conversations to one another, the designers gained a position where they could trigger

conversational provocations and propose directions for further exploration and development, which here was derived from multilevel conversational insights. Figure 8 depicts a typical conversation that happened at the Ahus intervention; it shows a team of designers discussing their observations—displayed on the walls in the back—on palliative care with patient representatives, hospital staff and representatives from the municipality care units.

Figure 8: Designers discussing their collections of conversational insights with the participating actors at Ahus. Photo: Palak Dudani.

The notable lever that the designers gained through linking conversational insights positioned them as broadly informed outsiders with the power of proposing ways forward to resolve compound system service issues.

3) Revealing ignored fundamental issues through inquisitive conversations

On a philosophical level, several conversations were held about the fundamental meaning behind why things are done the way they are. These meaning conversations helped question the root causes and expose current paradigms. During the early stages of the intervention, the designers entered the conversations as outsiders with little domain-specific knowledge. One of the students expressed her feelings of being new to the context at the very beginning of the intervention at Ahus: 'We did not know how to talk about the topic at all. We were fumbling so much'. Trying to cope with understanding the situation, the designers tended to raise questions about the fundamental aspects of the issues that they

are faced with; they questioned the root causes behind why conditions had developed in certain way and the basics of how and why treatments are done the way they are. Our inquiry exposes that these types of meaning-driven conversations are often ignored or taken for granted by different healthcare actors while they are engaged in their daily work. Besides informing the designers, lifting up these conversations allowed the actors to stop, reflect and express opinions on current paradigms and treatment philosophies, helping clarify the basic approaches with colleagues and other actors who represented the wider parts of the ecosystem.

For example, at one of the first workshops of the Ahus intervention, when confronted with the question of why elderly patients are treated at the intensive care unit, the intensive care nurse shared his worries that his efforts in many cases actually caused more pain than good for his elderly patients—especially at the end-of-life stages. His experience made everyone reflect and converse about these situations more critically—on the meaning of providing intensive care for the elderly. Following this, the discussion went on about how patients seldomly get the chance to speak with their families about these scenarios beforehand, which in many cases led to overtreatment and regret. Even though most of these meaning conversations happened at the first stages of the intervention, revisiting these fundamental issues was also helpful later on as the process evolved. For instance, as the process went on during the OUH intervention, conversations were held to unpack the core values behind the hospital-at-home service and how those values could support onboarding of new health personnel. Although the ward was subconsciously bringing certain values into play, they had not had the chance previously to surface them collaboratively and agree on how they could be framed. Figure 9 shows a moment in a workshop with actors from OUH, where the champion from the innovation unit jotted down the collectively defined core values of the 'hospital-at-home' service offering for people who suffer from blood disorders.

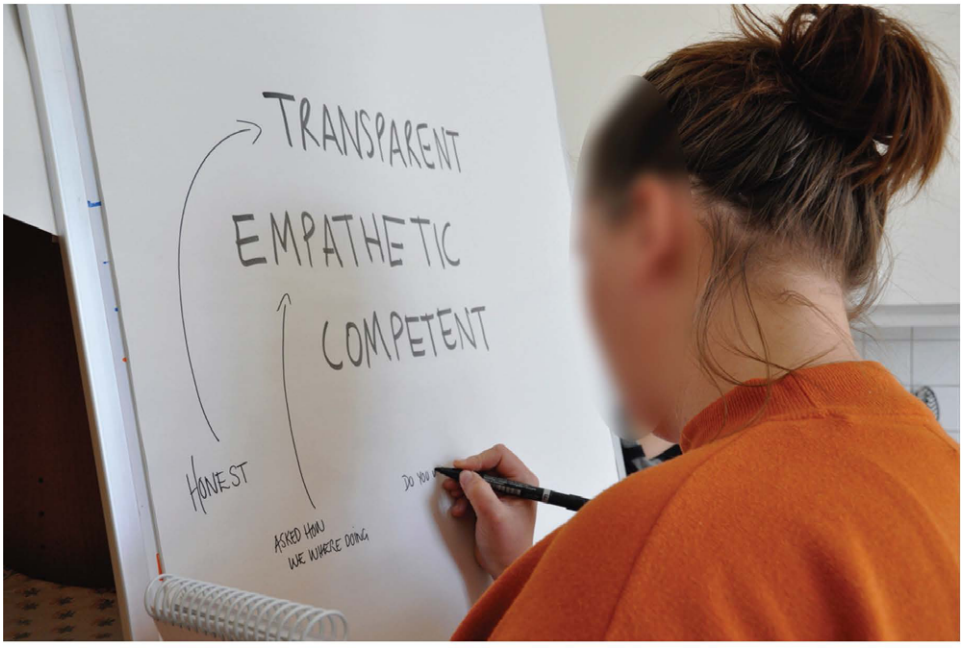


Figure 9: Codefining the underlying values of the 'hospital-at-home' service delivery guidelines for blood disorder treatments at OUH. Photo: Shivani Prakash

4) Highlighting the overarching objectives between subsystem actors

By lifting up the overarching objectives during conversations, the designers were seeking to create a bridge between actors across organisational divides. The designers' position as outsiders and their focus on user experience more broadly allowed them to maintain a mental distance apart from the specific interests and strains of subsystem parts. By highlighting common goals, the designers were able to influence the conversations directly while facilitating interactions among the actors to explore new possibilities of collaborations. In many cases, codesign workshop session tasks were shaped to deliberately create a basis for such explorations. An example of one such bridging happened when the representatives from the information, communication and technology department were able to talk with the nurses directly during a workshop at OUH, as depicted in Figure 10. In this particular case, the designers prompted a conversation by sharing their observations of the inefficient routines of updating medical records that was done by home-visiting nurses at the end of each day, highlighting the impact this has on the overall treatment capacity. This triggered a discussion exploring the possibilities of how to gain secure access and make it possible for nurses to update digital medical records while visiting patients at their homes or in between home visits from their cars.

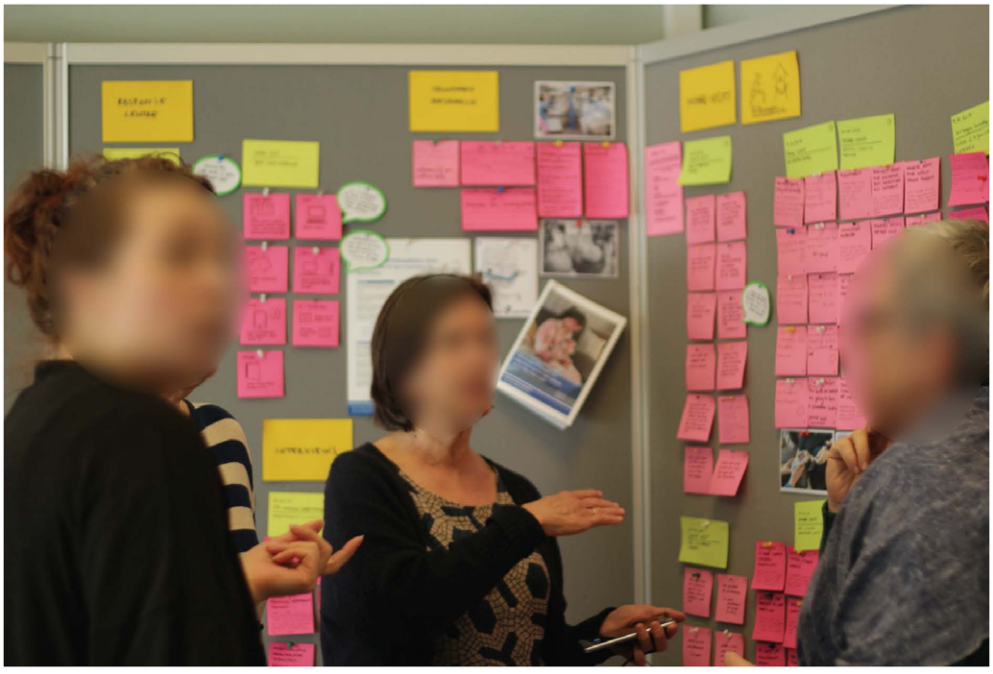


Figure 10: A conversation exploring the ways to access medical records during home visits; the conversation was carried out among different actors in a workshop held at OUH. Photo: Shivani Prakash

4) Reframing language and shaping new mental models

Designers were influencing conversations by nudging actors towards responding to their insights by subtly trying out different new ways of reframing the language used to describe the subject matter at hand. Suggestions of lingual reframing affected the ways the participants were talking and thinking about how services may take shape in future situations. During the interventions, we observed that the language used to frame service offerings was changing. This helped inspire new mental models and vice versa—suggested conceptions were affecting the language used. Through changing lingual expressions deliberately, the designers were able to subtly test out their ideas to verify compiled insights and substantiate their evolving service propositions. One of the participating design students shared the following reflection about how language influenced the development of shared conceptions and mental models: 'Being able to articulate things, use language as a bank or as a resource is incredibly important for a designer [...]. I put a lot of emphasis on using conversations and using language. [...] I remember for instance, there were particular ways of saying things that we were questioning along the way, that had a huge conceptual impact on how we perceived things'. To exemplify this influence, through one example from the Ahus intervention, we observed a clear shift among the participants from talking about 'palliative care' and 'end-of-life support' towards a broader discourse on 'the quality of life' of frail elderly patients. The attention towards quality of life highlighted by the designers had a substantial impact on the design of the service. Because of this shift, the mental attention and service proposals started to be initiated at a much earlier stage of the patient journey—encouraging families to address these matters when the chronic conditions were first diagnosed. Further, the proposed service was provided by both the specialised and primary healthcare system in joint partnership. Within the OUH intervention, the term 'hospital at home', which describes the care model as a whole, was discussed. The designers began to talk and think of it more as 'care at home' to highlight the patient's experience more clearly. This mental shift brought forward service offering proposals that included support for transitioning into home isolation, including cleaning services and guidance for simple and temporary refurbishing of the patient homes, such as moving the couch closer to a window. This meant that when the recovery process was over, the families could restore their homes back to how they used to be. After the intervention, the entire hospital reframed the way this model is labelled, now calling it 'OUH at home', thus opening up the care model for a range of associated care services provided by the hospital.

5) Inspiring conversations by creating and using mediating artefacts

One direct influence the designers had on conversations was creating and using mediating artefacts such as prompts, guides and scaffolds. Visual representations, such as of the system as a whole, its parts, user journeys, specific service touchpoints and encounters of service moments, were created or used in most conversations. Mediating artefacts were created both as quick sketches during conversations to verify understandings or prompt verbal exchanges for clarifying specific matters. Mappings were used extensively to help the discussions during codesign sessions, creating shared overviews and allowing the participants to fill in blank spots and elaborate on the specifics regarding deferent annotated features. In other cases, the mediating artefacts were carefully crafted to prepare for conversations and used as visual references to afford and provoke a certain discourse. Figure 11 depicts a conversation from the Ahus intervention that was supported by a user journey and that illustrated service moments (mounted on the walls) and an open map, hence allowing actors to fill in suggestions for how to engage in the process of implementing the new service proposal (on the table).

Figure 11: A conversation among the different actors during a workshop at Ahus using mediating artefacts.
Photo: Alex Asensi

A surprising observation was that some of the conversations were reported as more fruitful when they were less planned for and carried out without using mediating artefacts. These were typically conversations held as part of field work, mostly in the earlier stages of the process. Conversations about lived experiences on the meaning level were reported as being the most productive without using the mediating artefacts and while carried out in informal settings. For example, in several cases, these conversations were reported as happening serendipitously, for instance, during workshop breaks, in car rides between visiting patients or in situations where the prepared questionnaires and mediating artefacts were left aside, leaving space for the conversions to flow more naturally and informally.

Discussion

Our inquiry provides new insights into the conversations taking place during service design processes in complex settings, such as in healthcare. Through analysing the design conversations taking place as part of change processes in healthcare service systems, the nature of these conversations and the lever they offer for service designers are highlighted. Based on our study, we claim that conversations are a central service design material when designers are working inside complex service systems because of the networked interactions involved in such processes. Further, our research offers practice-based knowledge to support service designers to more thoughtfully use these conversations while working to support the change processes in service system settings.

Conversations as design material

The current research expands the current understandings of service design materials beyond representations of touchpoints, service flows, process tools and repertoire (Blomkvist, Clatworthy, & Holmlid, 2016), including conversations as a central service design material. We claim that through shaping conversations, as a design material, service designers facilitate the emergence of a new discourse that holds the potential to change mental models (Vink, Edvardsson, Wetter-Edman, & Tronvoll, 2019) and create the basis for new social structures and institutional arrangements inside service ecosystems (Vink et al., 2020). Our claim builds on our findings regarding lingual framing and reframing of the subject matter, creating novel conceptions through the conversations taking place during both interventions. As an example, one service proposition concept—an offspring from these conversations—traversed more broadly across the hospital and was picked up by a unit that did not take part in the intervention as in the case of the dialysis unit at Ahus.

This research extends and explicates current research on how service design changes mental models through linguistic framing, here as part of facilitated conversational interactions; this comes with the potential of shifting beliefs, changing assumptions and creating new mental models. Based on our findings, we argue that there is a mutual connection between lingual reframing that is enacted as discursive moves or provocations in design conversations and the process of shaping new mental models and conceptions. The participants, including the designers, use discursive provocations through utterances and speech acts (Austin, 1962; Winograd, 1986) that include propositions for how services may be envisioned in future situations and vice versa—new conceptions of future services are influencing the way they are pitched and expressed verbally. For example, questioning the term 'hospital at home' at OUH led to framing the service more broadly as 'care at home'—a term that opened up for associations inspiring a whole new range of possible service offerings to be envisioned. The ontological nature that the conversations can have on creating new understandings and mental models through sharing and manipulation of concepts (Pask, 1976) is particularly important in settings where many actors need to learn and act together (Dubberly & Pangaro, 2015). Hence, service ecosystem design is conversation centric. As such, service ecosystem design can be viewed as an ongoing process of the streams of the evolving discourse about learning and acting together as a systemic adaptive response to the drivers of change. Increasingly, such processes are supported or facilitated by service designers who are offering their working models, skills and influences, which is in line with the ways service design is evolving as a field (Vink et al. 2020).

The ways designers shape, facilitate and support conversations becomes central within service ecosystem design. Perhaps instead of only thinking of design as a reflective conversation *with* materials (Schön 1992), service ecosystem designers need to think about the conversations themselves as *the* material. In some cases, the staging for new conversations may even become the main and deliberate outcome of such processes. Crafting contextually aware and situated conditions for fruitful conversational interactions to take place over time and among actors from different parts of an ecosystem is a complex task. The fluidity of the social material involved—which in some cases may cause unexpected outcomes or hold tensions—demands knowledge about what motivates conversations and about conversational dynamics. Further, because service designers are influencing ecosystems through facilitation and involvement in conversations, there is a need for more careful attention to the ethical issues related to transparency, participation and bias in conversational settings.

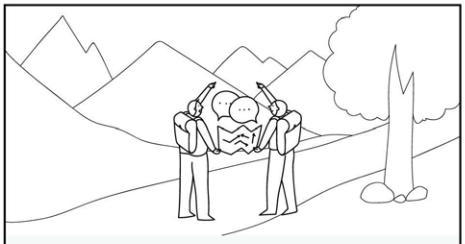
Conversational guides for service design practitioners working in CASs

To help service design practitioners working inside CASs to better attend to the conversations as a design material, we offer practical guidelines derived from our findings. Conversations may be shaped towards specific areas of attention or subject matter. Here, considerations such as framing conversational themes, group dynamics, timeboxing and mediating artefacts are important aspects to consider. At the same time, conversations are inherently improvisational and may go in different directions, which may naturally and positively deviate from an underlying plan or an intended subject matter. Excellent facilitation skills are needed, including applying an active listening attitude and a fine-tuned awareness to group dynamics during the conversations, to navigate through and maintain fruitful actor interactions. In addition, the ways conversational insights and discursive triggers are documented, collected and linked to one another becomes central for practitioners. For example, service designers working within the area of service system developments should ask themselves how they might capture insights from conversations in an effective way during the processes and how they will share and link insights from conversations. Simple routines, tools or templates may help collect, share and reflect on the many conversations that often take place during such interventions (see Figure 4 as an example of a tool to capture the essence of conversations during service design interventions). Further, to verify sensemaking across conversations and moderate anchoring bias, service designers may consider including critical feedback loops to challenge their own assumptions during actor interactions.

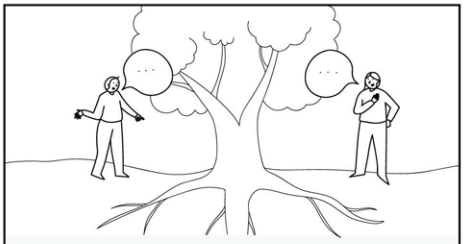
To influence change more thoughtfully in such settings, we offer a set of guidelines for service design practitioners towards handling conversational situations and to make use of these conversations as a service design material in complex settings, such as in healthcare. Being embedded inside healthcare as a context was conceived of as a journey into the complexities of healthcare by the participating service designers. Therefore, we use the metaphor of a hike to represent typical conversational intervention moments during such a journey. Through six framed illustrations, Figure 12 illustrates how service designers may make use of and influence design conversations to gain propositional leverage. Each frame relates to the conversational influences that were revealed in the current research. Service designers finding themselves in similar contexts may use these guidelines for planning and carrying out service design processes to attend more intentionally to conversations. If crafted and used in the right way, design conversations may act as a powerful social material during the service design efforts carried out inside complex service systems. More awareness and better use of conversations as a material may help service designers increase their propositional power during service design interventions. When conversations are well-shaped, virtuously enacted and linked with other conversations, they hold the potential to change mental models and spark action that, over time, may form new social structures inside service ecosystems more broadly.

Limitations and further research

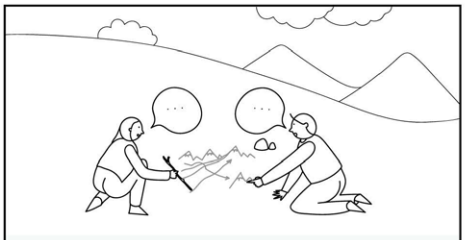
The current study focuses on expanding the understandings of the role and nature of conversations as part of the emerging practice of service ecosystem design. Our practice-led exploration helps explicate tacit knowledge and build a granular understanding of how designers influence and use conversations in practice to catalyse systemic change. However, there is a large body of literature related to the conversations and dialogue affecting innovation processes that was not in the scope of the present empirical inquiry (such as in sociology, social psychology, social anthropology, applied linguistics and more). There is a need for a supplementary systematic review on the associated theories that link knowledge about conversations to service ecosystem design.



Check the map together. Enact recurrent meta-conversations throughout the process and in process milestones to collectively decide where to go, who will join and how to get there.

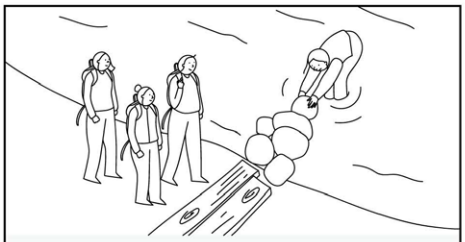


Be curious about underlying matter. Use your position as an outsider to discuss fundamental issues with multiple actors. Question the root-causes and the underlying meaning of why things are the way they are.

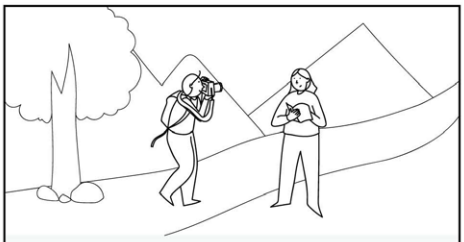


Draw new pathways in the sand. Attend to making use of mediating artefacts before and during conversations. Consider the level of openness and detail that would be most fruitful to use as conversational triggers. Experience and meaning conversations may flow more naturally and become better without mediating artefacts.

Use language to describe the patterns you see. Consider the ways findings, contextual understandings and concepts are framed lingually. During conversations, encourage active lingual reframing to help explore, test out and verify understandings of conceptual directions.



Help travelers to identify and navigate obstacles. Keep a mental distance apart from specific interests and strains of sub-system parts. Highlight common goals, while facilitating interactions among actors to create bridges across agents representing different ecosystem parts.



Take pictures or write a travel log during your journey. Define how to document insights from conversations. Decide how to share and link conversational insights as part of sensemaking. Use combined conversational insights as a basis for creating mediating artefacts or as discursive moves to trigger new conversations.

Figure 12: Guides for making use of conversations as part of practising service design processes inside complex service systems. Illustrations: Shivani Prakash

It is important to note that the empirical insights of the present research are based on two interventions carried out inside two Norwegian hospitals. Our articulations of the findings regarding design conversations may have been influenced by the specific contexts of these interventions and the involved circumstantial complexities. Further, the collections of conversations in the present study were nonexhaustive and may have affected the type and number of conversations collected. For example, during the later design phases, time pressure may have affected the amounts of entries done by the students. Furthermore, the actual content description of each conversation may have been skewed because the research diaries represent the students annotated interpretations. The recordings from the conversations or other more direct data sources may reveal more precise overviews of the distribution, levels and purposes of the conversations compared with a typical design process or other thinking models used by designers. We believe that there is a need to conduct more research on design conversations in similar contexts to expand, compare and validate our findings more broadly. Furthermore, we have limited data on the ways that new language and mental models were spreading inside the hospitals and other more long-term cultural effects of design conversations. There is a need to more thoroughly assess and evaluate the eco-systemic influences of design conversations over time and trace how a renewed discourse and new mental models are diffused and may be supported to cause changes in complex service systems.

Finally, there is a need to deepen our knowledge and practice related to ethical issues and the influences that service designers are posing through shaping and enacting conversations. For instance, more research is needed on how to ensure a proper inclusion of voices to take part in design conversations and the ways these perspectives affect the designer's understandings and abilities to explore and link conversational insights. Further, service designers need to acknowledge their own influences, develop transparent attitudes towards their propositional powers and become more self-aware and critical about it. Also, there is a need to develop techniques and a practice that more thoughtfully mitigates bias and balances out skewed influences in design conversational settings.

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PUBLICATION 3

Design Facilitation as Emerging Practice Analyzing How Designers Support Multi-stakeholder Co-creation

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Design Facilitation as Emerging Practice: Analyzing How Designers Support Multi-stakeholder Co-creation

Abstract Designers increasingly find themselves facilitating large-scale design events. Yet few have explored design facilitation as an emerging practice. This article examines the design facilitation practices used in two Norwegian case studies of multi-stakeholder events. We focus on the contextually designed tools designers create to help them facilitate. We then explore some critical dimensions of design facilitation. When used as visual overlays, facilitators' explicit knowledge of these dimensions can improve their capacity to analyze, evaluate, and plan how to design and use contextual tools during design events. By plotting how designers use facilitation tools sequentially during events, we render the flow of design facilitation practice visible and accessible. We suggest that an explicit awareness of these dimensions and flows can enable designers to build more inclusive and inspiring tools, orchestrate the flow of long-term participatory processes more deliberately, and better equip participants to work with complex systemic change.

Keywords
Design facilitation
Systemic design practice
Multi-stakeholder co-creation
Participatory events

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Introduction

As the field of design moves into the higher order, complex domains of organizational and social transformation, designers are increasingly obtaining input from a wide variety of stakeholders.[1] When designers and diverse stakeholders take on large-scale processes of change together, design facilitation plays an important role.[2] Facilitation is especially vital to the emerging fields of systems and service design, as the practice enables teams to "dive into the ecologies of services, into the world of needs and experiences of users and providers … [and] visualize, formulate, and choreograph solutions to problems that do not necessarily exist."[3] Service design must be coupled with systemic design approaches[4] if designers are to cope with the intricacies of service ecologies. Facilitation has been studied in soft systems thinking[5] and operations research,[6] but when it comes to systemic service design, few understand the importance of design facilitation. According to Lauren Tan, design facilitation is one of the seven emerging roles for designers working for the social good.[7] However, as Tan also points out, "in the field of design, the role of the designer as facilitator is commonly acknowledged; but the limitations of the design literature are that they do not elaborate on this role, nor explore its practices."[8] Some key questions arise when designers approach their role as facilitators: Where and how to start? How should we plan and execute stakeholder meetings? What kind of facilitation tools – props, activities, and content, for example – should we use? How can we sustain momentum over long-lasting design processes? What can we design, and what is emergent?

The last question merits closer scrutiny. Emergence, as a phenomenon, is present in most systems, be they biological, social, or technological. Simply put, emergence is higher-order novelty that results from interacting, lower-order parts.[9] Consider the synchronized flocking of birds: the interaction between the birds in motion creates emergent compositions, and no single bird orchestrates the flock's movements independently. In social systems, "large social networks display emergent qualities that cannot be designed or planned in the absence of large numbers of active participants."[10] When a large number of people with varying responsibilities and concerns gather, the designer/facilitator becomes one more flocking bird. However, designers fly in complex patterns – they act as both participants and facilitators. In the latter role, they must foster participant interactions that generate emergent material. Such emergence is "brought into existence by the way a whole [event] is bound together by substance and order through relationships and connections."[11] The focus of this study is design practice wherein the designer performs as a participant-facilitator. In this context, how can designers facilitate participatory, multi-stakeholder sessions in ways that foster co-creative emergence among fellow participants? In this article, we will explore the practice of design facilitation through two research-by-design case studies, and propose an analytical model to assess the facilitation tools designers develop across six dimensions.

Methods

Research by Design

Research by design is the foundation of our methodological approach. According to Birger Sevaldson, research by design is "a special research mode where the explorative, generative and innovative aspects of design are engaged and aligned in a systematic research inquiry."[12] An inquiry is reflexive – it takes a first-person viewpoint – and is usually supported by a blend of methods for systematic data collection, synthesis, and analysis that builds new and robust knowledge.[13] We three co-authors all acted as co-designers, co-facilitators, and co-participants, and

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3 Birgit Mager, "From the Editor: Health and Service Design," *Touchpoint: The Journal of Service Design* 1, no. 2 (2009): 6–7, available at https://www.service-design-network.org/touchpoint/touchpoint-1-2-health-and-service-design/letter-from-the-editors.

4 Peter H. Jones, "Systemic Design Principles for Complex Social Systems," in *Social Systems and Design*, vol. 1, ed. Gary S. Metcalf (Japan: Springer Verlag, 2014), 91–128, DOI: https://doi.org/10.1007/978-4-431-54478-4_4.

5 Annemarie Groot and Marleen Maarleveld, "Demystifying Facilitation in Participatory Development," (working paper, International Institute for Environment and Development (IIED), Gatekeeper Series, no. 89, London), http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/6163/Demystifying.pdf.

the research by design approach allowed us to "access the deeper layers of interpretation that would be inaccessible to distant observation."[14] The study presented here examines two research by design case studies, as it would be nearly impossible to investigate the phenomena associated with design facilitation in practice independent of a context.[15] Also, case studies are appropriate when blending diverse methods during study of complex and contemporary phenomena.[16] The two cases helped us to cover the contextual conditions of facilitation in practice, and enabled us to understand how design facilitators orchestrate participatory events more generally.[17]

The first case illustrates design facilitation practices among participants of a Norwegian network of hospitals and academic, public, and private actors that make up the Centre for Connected Care (C3). C3 is a center for innovation founded by the Research Council of Norway. C3's primary mission is to adapt and diffuse patient-centric innovations in the Norwegian healthcare system. In total, this study involved individuals from seventeen organizations who engaged in four events over a ten-month period.

The second case involves design facilitation practices among the participants of a design-driven migration activist movement supported by the Norwegian Parliament. The purpose was to explore potential changes to welfare programs and opportunities for asylum seekers to contribute meaningfully to Norwegian society. The activist network, called Guts to Change, joined participants from the public and private sectors together with asylum seekers. In total, this practice study included two hundred volunteers who took part in four events over six months.

We chose these two cases for the advanced systemic design practices they followed. Even though they are different, both involved designers facilitating large-scale events for multiple stakeholders. To understand the transferable aspects of design facilitation practice, we studied two case studies as opposed to focusing solely on one. (See Table 1.)

Table 1. Two cases of socially-complex design facilitation practice.

	Case 1: Centre for Connected Care (C3)	Case 2: Guts to Change
Network Type	Formal network for healthcare innovation	Informal network for social self-mobilization
Partners	17 institutions (public, private, and academic, bounded to healthcare service design and innovation)	200 individuals (mixed sectors, unbounded boundaries)
Duration	10 months	6 months
Purpose	Diffuse; adopt patient-centric innovations	Reframe a "crisis" into an opportunity for welfare transformation
Event Scope	4 participatory events (January–September 2016)	4 participatory events (November 2015–May 2016)

Case 1: Imagining the Patient of the Future: A Formal Network for Healthcare Innovation

Our study focuses on the design facilitation practices employed during four large-scale events organized by researchers, teachers, and master's students from the Oslo School of Architecture and Design (AHO). The participants were mainly from Norway's Centre for Connected Care (C3), but the group also included healthcare professionals and patient representatives. We invited the participants to exchange viewpoints, discuss trends, identify future drivers, review scenarios, experience

6 Ann Taket, "Facilitation: Some Contributions to Theorising the Practice of Operational Research," *Journal of the Operational Research Society* 53, no. 2 (2002): 126–36, DOI: https://doi.org/10.1057/sj/jors/2601209.

7 Tan, "Understanding the Different Roles."

8 Ibid., 180.

9 Benyamin B. Lichtenstein, *Generative Emergence: A New Discipline of Organizational Entrepreneurial, and Social Innovation* (New York City: Oxford University Press, 2014), DOI: https://doi.org/10.1093/acprof:oso/9780199933594.001.0001.

10 Jones, "Systemic Design Principles," 117.

11 Harold G. Nelson and Erik Stolterman, *The Design Way: Intentional Change in an Unpredictable World*, 2nd ed. (Cambridge, MA: MIT Press, 2014), 97.

12 Birger Sevaldson, "Discussions & Movements in Design Research," *Form Akademisk—Research Journal of Design and Design Education* 3, no. 1 (2010): 11, DOI: https://doi.org/10.7577/formakademisk.137.

13 Andrew Morrison and Birger Sevaldson, "'Getting Going'—Research by Design," *Form Akademisk—Research Journal of Design and Design Education* 3, no. 1 (2010): 1–7, DOI: https://doi.org/10.7577/formakademisk.136.

14 Sevaldson, "Discussions & Movements in Design Research," 16.

15 Pamela Baxter and Susan Jack, "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers," *The Qualitative Report* 13, no. 4 (2008): 544–59, available at http://nsuworks.nova.edu/tqr/vol13/iss4/2/?utm_source=nsuworks.nova.edu%2Ftqr.

16 Robert K. Yin, *Case Study Research: Design and Methods*, 5th ed. (Thousand Oaks: Sage Publications, 2014).

17 Baxter and Jack, "Qualitative Case Study Methodology," 544–59.

future healthcare services, and evaluate how these shared future visions could affect the current work at C3. The four C3 events this study examines are 1) Future drivers, in January 2016; 2) Scenarios, in February 2016; 3) Experimentarium, in April 2016, and 4) Closure, in September 2016.

These four events took place to facilitate early-stage formation of the C3 network as a research and development center. No formal organizational structures were in place, nor partnerships and representatives yet settled when planning for the events began in the fall of 2015. Participants were unfamiliar with each other. We developed the events successively through iterative discussions with the leadership at the center, academic staff, and students. We used generic facilitation tools – rolls of paper, sticky notes, whiteboards, and the like – to plan events. We carefully designed each event to offer space for inspiration, social interaction, and exchange among the participants. We created a detailed facilitation plan for each event outlining the schedule and responsibilities of fellow facilitators. We also designed some tailor-made tools to break the ice among the participants, create a shared identity, and support the overall goal of creating a shared vision for patient-centric future projects.

Case 2: An Informal Network for Social Self-Mobilization Identifying Collective Opportunities

The second case studied the design facilitation practices deployed across four large-scale events organized by design volunteers from a collective called Guts to Change. Participants at these events were mostly professionals addressing migration from the public, private, and academic sectors, together with asylum seekers and members of Parliament. We invited them to detect opportunity areas that they had identified after collaborating with multiple actors and then transform these opportunities into collective actions. The four Guts to Change events this study examines are 1) Design-driven volunteer events, November–December 2015; 2) Collective opportunities: The Parliament event, January 2016; 3) a Co-design event with asylum seekers, May 2016; and 4) Co-creation of possibilities: the Follow-up Parliament event, May 2016.

As this was an emergent, self-organizing network whose reputation was being spread mainly through word of mouth, we convened in impromptu meeting spaces such as an unoccupied Kindergarten during weekend hours. Under these conditions, we used readymade tools – big paper rolls, sticky notes, and marker pens – to facilitate the conversations and structure the output of the collective dialogue. When we were planning large-scale events, we integrated the contextual knowledge we had into the activities. We always knew who was participating, had details about the physical space, and – ideally – had visited the space before the event. We paid particular attention to the details – everything from the way we grouped the participants to the smooth transitions we orchestrated between event phases. For each of these considerations, contextual tools were developed by several individuals – the participatory design facilitators – to combine and coordinate multiple ideas and expectations.

Tools as Units of Analysis

When analyzing the design facilitation practices employed in both case studies, our focus was on what Kimbell[18] describes as design-as-practice, which she grounds on a practice theory perspective.[19] Design-as-practice relates what designers think, say, and do by looking holistically at their bodies, minds, routines, and embodied and situated patterns of behavior. According to Kimbell,[20] artifacts play an essential role in the study of how designers work. As we were all involved in both case studies – we took turns as co-facilitators, co-designers, and co-participants – we

18 Lucy Kimbell, "Design Practices in Design Thinking," paper presented at the European Academy of Management, Liverpool, UK, 2009: 1–24, available at http://www.lucykimbell.com/stuff/Practicedesignthinking.pdf.

19 Andreas Reckwitz, "Toward a Theory of Social Practices: A Development in Culturalist Theorizing," *European Journal of Social Theory* 5, no. 2 (2002): 243–63, DOI: https://doi.org/10.1177/13684310222225432.

20 Kimbell, "Design Practices in Design Thinking," 1–7.

Figure 1 Analyzing both cases using a blend of photographic storyboarding and data visualization methods. These methods helped overlay key design facilitation dimensions by sequentially highlighting individual tools for facilitation in their context of use.

were mainly preoccupied with what Kimbell[21] calls designs-in-practice, and thus the organic enactment of design while designing.

To address the complexity that designing-in-practice entails, we limited the unit of analysis to the material practices of design, and, more specifically, to the tangible tools designers create and use dynamically while facilitating. We adopted a broad understanding of what a tool could be, based on Elizabeth Sanders, Eva Brandt, and Thomas Binder,[22] who define tools as "material components used in PD [participatory design] activities." By this definition, components are any kind of physical element – the physical space, props, visual language, narrative, and tone of voice, for example. At their core, tools for design facilitation are aesthetic experiences intentionally crafted by design facilitators that can be seen, smelled, touched, heard, or tasted by participants.

We collected, organized and analyzed the data we gathered using six key methods: documentation, participatory observation, qualitative interviews, photographic storyboarding, data visualization, and evaluation criteria. Figure 1 shows an example combining photographic storyboarding and data visualization.

- **Documentation:** sixty core photos and twenty-six contextual videos shot during the events
- **Participatory observation:** Each of the authors was either a co-designer, co-facilitator, or co-participant during the eight large-scale events studied. We coordinated and contacted the stakeholders for each event, which included more than one hundred and fifty individuals in each case study. We also co-designed the general intent of each event, including relevant activities, tools, and facilitation guidelines for fellow facilitators.
- **Qualitative interviews:** We interviewed twenty-six design facilitators about their roles at the events.
- **Photographic storyboarding:** We sequenced photographs of the sixty facilitation tools we used during the events chronologically. Then we reflected upon each tool's design intent, how it was used, and the effect it had had on the participants.
- **Data visualization:** Once we had defined several key design facilitation dimensions – after several rounds of iterations – we developed a model to visually overlap these three dimensions upon each tool for facilitation.
- **Evaluation criteria:** We developed a set of criteria to evaluate the degree – high, medium, low, or no – to which a tool satisfies the definition of each dimension.

We used these methods to cluster the tools by context and by the effect they had on participants. From these clusters, design facilitation patterns began to emerge. After sharing our reflections, we created a preliminary set of design facilitation dimensions. We then iterated upon these in relation to the photographic storyboards – our conversation with the materials of the situation.[23] We further validated the refined dimensions during two workshops with designers and design

21 Ibid.

22 Elizabeth B.-N. Sanders, Eva Brandt, and Thomas Binder, "A Framework for Organizing the Tools and Techniques of Participatory Design," in *PDC '10: Proceedings of the 11th Biennial Participatory Design Conference* (New York: ACM, 2010), 196, DOI: https://doi.org/10.1145/1900441.1900476.

23 Donald A. Schön, "Designing as Reflective Conversation with the Materials of a Design Situation," *Knowledge-Based Systems* 5, no. 1 (1992): 3–14, DOI: https://doi.org/10.1016/0950-7051(92)90020-G.

researchers. Furthermore, the photographic storyboard and the evaluation criteria allowed us to overlap the intensity of the design facilitation dimensions of each individual tool sequentially over time.

Analysis

Contextually Designed Facilitation Tools

We identified three types of facilitation tools: *readymade*, *templated*, and *contextually designed*. Readymade facilitation tools are material components used in participatory design activities that lack specificity and are typically off-the-shelf products – sticky notes, big paper rolls, permanent markers, whiteboards, and flipcharts. Design facilitators mainly use these tools either to plan and analyze events, or spontaneously during events. Templated facilitation tools are also material components used in participatory design activities. Their predefined formats enable users to organize information in useful ways – business model canvases, service blueprints, or SWOT analyses, for example. Contextually designed facilitation tools are uniquely tailor-made activities – they are ultimate particulars[24] that pay careful attention to the holistic orchestration of participants in time and space. The designers mainly made use of contextually designed facilitation tools in the large-scale events we studied. We have chosen to make contextually designed tools our focus in this article.

Core and Designerly Facilitation Tools, and Their Characteristic Dimensions

Core facilitation entails explicitly considering the participants attending the event and any operational and functional logistics. Without core facilitation tools in place – things like scheduling, site logistics, lists of invitees, and so on – designerly facilitation can rarely occur. For example, it would make no sense to discuss ways to enable participants to share diverse real-life stories during an event without first defining a clear intent for that event, allocating a suitable space, and fixing the number and type of participants. Once the facilitation core is secured, *designerly facilitation* tools can create contextual experiences, make use of the diverse human perspectives the participants bring along with them, and elicit participants' creative potential. Core facilitation tools (PIF) have three dimensions: participatory (P), intentional (I), and functional (F). Designerly[25] facilitation tools (HEC) have three dimensions: human-perspective (H), experiential (E), and creative (C) (Figure 2). In this study, we focus primarily on designerly facilitation tools, as these were the kind that the designer facilitators used in the cases we studied.

The H dimension of designerly facilitation is concerned with exposing and valuing diverse human perspectives. Although they may seem similar, it differs from the P (participatory) dimension in PIF as it does not deal with the politics of whom to invite – it empathizes with the diversity of existing participants. The H dimension has its roots in human dignity as the pillar of human-centered design

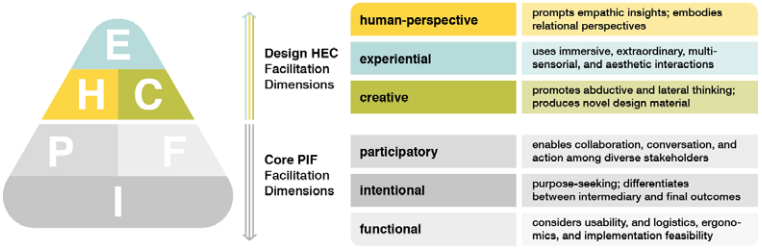

Figure 2 The six dimensions of design facilitation tools. Left: the hierarchical dependency between the core PIF dimensions and the designerly HEC dimensions. Right: descriptions of the dimensions as they relate to facilitation. HEC dimensions are represented in color. Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

24 Nelson and Stolterman, *The Design Way*.

25 We borrowed the term "designerly" from Nigel Cross, "Designerly Ways of Knowing," *Design Studies* 3, no. 4 (1982): 221–27, DOI: https://doi.org/10.1016/0142-694X(82)90040-0.

(HCD),[26] and facilitators mediate human perspectives during design-related activities. To emphasize its systemic-relational nature, we refer to H as human-perspective dimension rather than human-centered.

The E dimension is about creating and using immersive, extraordinary, and multi-sensorial interactions that participants can see, feel, hear, taste, and smell. Such interactions may involve facilitation tools that deploy emotional experiences, humor, playfulness, symbols, metaphors, and surprises. These aesthetic experiences are culturally and socially sensitive, and designers are professionally trained to develop them.

Finally, the C dimension represents activities intended to inspire the kinds of abductive and lateral thinking needed to create to novel design ideas and materials.

The HEC Analytical Model

Practicing a designerly approach towards facilitation means crafting immersive, multi-sensorial experiences that bring out the creative potential of diverse human perspectives. We developed an analytical model (Figure 3, right) that visualizes the degree to which a designerly facilitation tool covers each HEC dimension.

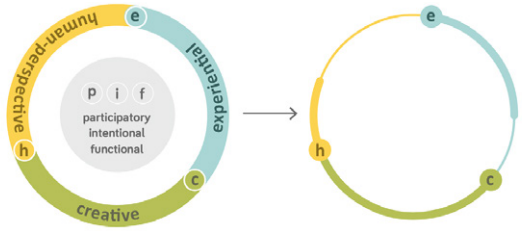

Figure 3 Left: The core PIF and designerly HEC dimensions in relation to each other. Right: The HEC analytical model visualizing the extent to which HEC dimensions are represented in an activity. In the model shown, the tool is low in H qualities, medium in E, and high in C. Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

Degrees of HEC Dimension Coverage

Is the facilitation high in human-perspective-building qualities? Is it low in experiential attributes? Does it elicit a medium degree of creativity – or no creativity?

Because contextually designed facilitation tools can cover the HEC dimensions to varying degrees, to further define their qualities we developed a set of criteria designers can use to classify and describe the degree – high, medium, low, or no – to which the tool covers or elicits the qualities we associate with that dimension. Figure 4 details these criteria.

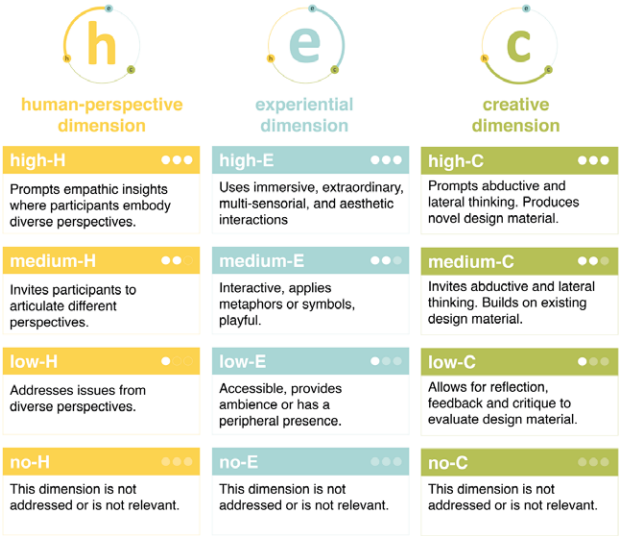

Figure 4 Criteria to evaluate the degree to which a dimension is exploited by HEC facilitation tools. Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

26 Richard Buchanan, "Human Dignity and Human Rights: Thoughts on the Principles of Human-Centered Design," *Design Issues* 17, no. 3 (2001): 35–39, DOI: https://doi.org/10.1162/074793601750357178.

To illustrate, we have selected two HEC facilitation tools from each case study and applied the criteria to assess them (Figure 5). All four of these tools were contextually designed.[27]

Group identity tattoos were rub-on tattoos that each participant in a group received. This highly experiential tool facilitated identity formation among participants that were new to each other. This tool ranked low in human-perspective as it clustered participants into pre-defined themes that did not necessarily represent the diversity of the group. The creative dimension was not present, as this tool did not prompt participants to generate ideas nor any novel design material.

The *reflection room* was also a highly experiential tool that facilitated slow thinking and informal reflection. The reflection room immersed participants in an extraordinary, candlelit sensorial space dotted with comfortable beanbags for participants to nap on. The facilitator, dressed in a beautiful Japanese robe, invited participants to relax and close their eyes in a soft voice. As a facilitation tool, the reflective room was low in human-perspective qualities, as it did not prompt empathic insights. This tool also demanded little in the way of creativity, despite the calm yet structured post-relaxation reflection session (prompted by the facilitator) that generated rich, respectful dialogue.

27 The *group identity tattoos* and *reflection room* tools were created for the Centre for Connected Care case, and the *superpowers* and *journey map* tools were created for the Guts to Change case.

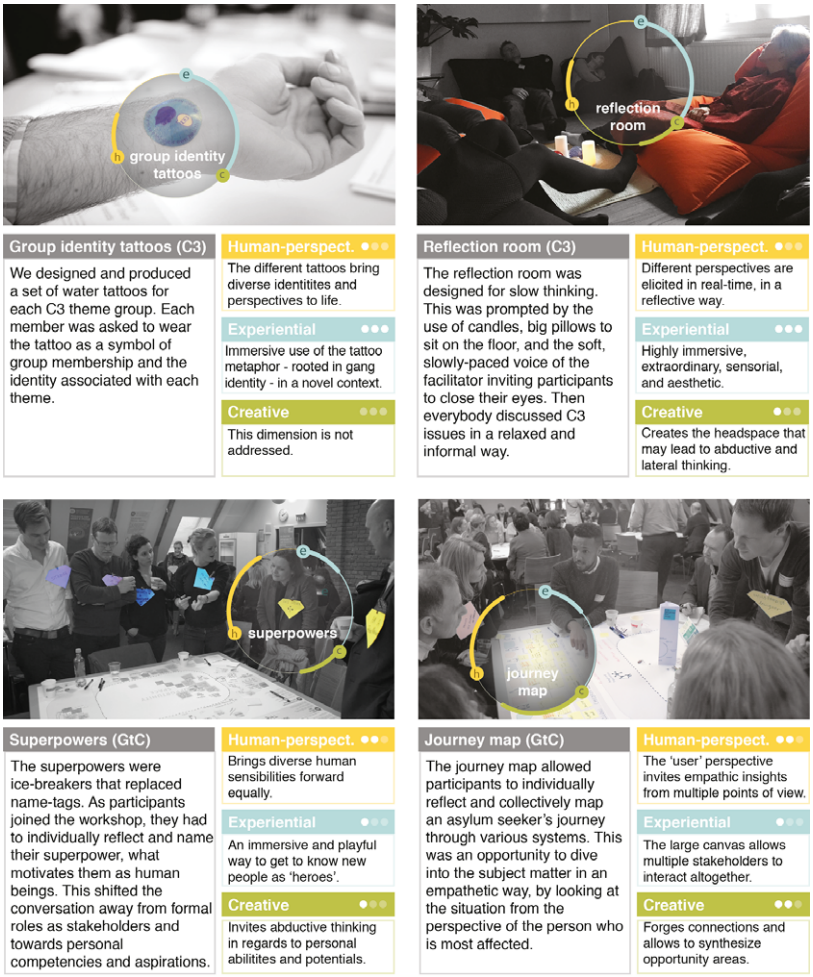

Figure 5 Four contextually designed facilitation tools that exemplify how the HEC evaluation criteria can be applied in practice. Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

Figure 6 A design facilitation flow can become visible by plotting the HEC designerly dimensions of each contextually designed facilitation tool sequentially. In this particular event, the design facilitation flow shows an experiential start and end and two creative peaks. Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

The *superpower tool* helped participants get to know each other in a playful, informal way. Instead of their profession, participants were invited to invent a secret superpower and write it on their nametags. This tool represents the human-perspective dimension to a medium degree, as it encouraged participants to display their diversity and be empathic towards others. The superpower tool was low in experiential qualities – it used humor, playfulness, and the superpower metaphor to invite discussion about the participant's intrinsic motivations and under-utilized skills. It was also low in creativity, as this tool did little to facilitate creative insights that led to new design material.

The *journey map* tool asked participants to think about an asylum seeker's journey from multiple perspectives. This designerly facilitation tool represented both the human-perspective and creative dimensions to a medium extent. It asked participants to look at a very complex situation, over time, from the perspective of the person most affected by it – the asylum seeker. It also allowed participants to synthesize opportunity areas grounded in a more holistic understanding of the situation at hand. The journey map tool was not very experiential. We asked participants to map the journey on a large canvas that covered the whole table, and invited them to write down their insights in a horizontal, non-hierarchical way.

We have only described and analyzed the human, experiential, and creative dimensions of isolated tools up to this point. However, because facilitators use different tools during an event, we wanted to explore the flows of these dimensions – via the sequences of activities facilitated by the tools – during the various events we studied. Next, we will review a conceptual understanding of HEC dimensional flows.

The Flow of Design Facilitation

Plotting the human-perspective, experiential, and creative dimensions of an event's contextually designed facilitation tools reveal the flow of design facilitation practice (Figure 6). Looking back on a particular event from the Guts to Change case, we identified an experiential rise at the beginning and end of the event, and two creative peaks. The initial intent was that the output from the first creative peak would serve as input for the second creative session. In reality, the timing did not allow for both tasks to be carried out, and proposing two creative activities in quick succession proved to be cognitively overwhelming. Most of the event facilitation we analyzed had a similar flow – they were high in experiential qualities at their start and finish. At the beginning of these events, experiential facilitation tools may have been used to create momentum among participants. And when events were close to finishing, experiential tools were likely used to support the participants' collective

memory and shared sense of accomplishment. We believe that plotting the dimensional flows of an event can provide facilitators with a useful, informative perspective on their planning. Visualizing the flow of design practice in terms of the three core and three designerly dimensions can help facilitators adapt, improve, or streamline the overall flow of an event in ways that foster emergent material.

Discussion

The Emergent Practice of Facilitation

Let us return now to our central research question. From a service systems design perspective, how can designers facilitate participatory, multi-stakeholder sessions that support co-creative emergence among fellow participants? Design event facilitators act primarily as participatory orchestrators. They orchestrate diverse participants (P), intents (I), functions (F), human-perspectives (H), and experiences (E) in ways that they expect will stimulate co-creative emergence (C). They do this by designing specific facilitation tools. In terms of our earlier bird flocking metaphor, design facilitators are not just flying alongside fellow participants. Before they join the flock, they carefully anticipate the detailed patterns of the flock's movements during the upcoming event. They also materialize their intent through contextually designed facilitation tools. But during the event, the earlier intentions implicit in their pre-crafted facilitation tools meet the different interpretations of their fellow participants in real-time. This dynamic allows for the kind of emergent co-creation that characterizes systemic service design facilitation practice. Analyzing dimensional flows before or after events may offers designers a gateway into a deeper understanding of the emergent practice of facilitation, and, possibly, into emergence itself.

Core and Designerly Dimensions: Planning and Evaluation

Revealing how the core and designerly dimensions interrelate and play out over time during events may allow design facilitators to more effectively catalyze emergent material from interacting participants.[28] After sharing and refining the qualities of these dimensions with senior designers from two notable Norwegian design agencies,[29] one team used the PIF/HEC dimensions to inform a planning session. Here is how one team member described their use of the dimensions:

> "[We used them] to rethink how to make [the event] slightly more experiential, and sense-check that 'low to medium creativity' was in fact what we wanted to achieve. However, we spent most of the sixty minutes tweaking the functional setup, and ensuring we had a realistic plan with a small number of rewarding tasks."[30]

These insights suggest that design facilitators can become better at orchestrating design events if they keep the core and designerly facilitation dimensions in mind before an event takes place. However, it is important to note that plotting HEC dimensions alone may mask other important facilitation considerations. The main contribution of our approach is that we have made the dimensions of design facilitation practice explicit, and provided an evaluative tool that can help design facilitators orchestrate events more deliberately.

Future Research

When examining more closely at the relationship between individual contextually designed facilitation tools and the flow of an entire design facilitation event, we realized that there could be similar degrees of designerly craft involved both at the micro-tool level and at the macro-event level. To understand the interdependencies

28 Jones, "Systemic Design Principles," 91–128.

29 Livework Studio and Designit (Norway).

30 This quotation was taken from the feedback given by Anders Kjeseth-Valdersnes, who works at Livework Studio, Oslo.

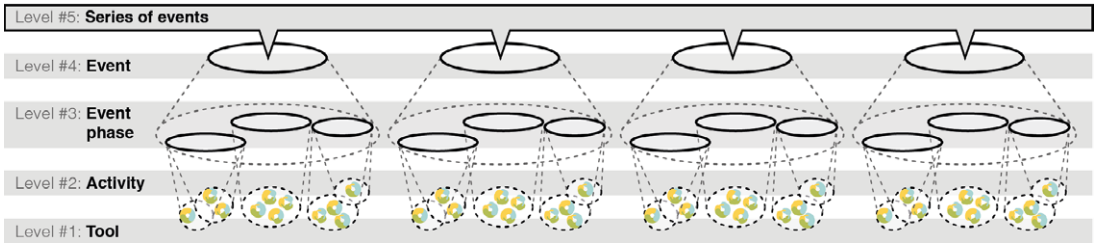

Figure 7 The five-level typology that relates tool (level 1), activity (level 2), event phase (level 3), event (level 4), and series of events (level 5). Copyright © 2017 Manuela Aguirre, Natalia Agudelo, and Jonathan Romm.

between these levels, we have conceptualized a five-level typology (Figure 7). This typology relates tools (level 1), activities (level 2), event phase (level 3), event (level 4), and series of events (level 5). *Tools* are material components used in participatory design activities. *Activities* are individual and collective exercises that support an event phase. *Event phase* is the overarching theme of a series of activities. An *event* is an entire participatory session. A *series of events* is the sequence of multiple events over time.

The typology itself requires further detail; more research is needed to understand better how the different levels of the typology interrelate, for example. We believe that more research is also necessary to understand better the spaces "in-between" events in a series – contextually designed facilitation tools could potentially be used to invite participants and sustain momentum among participants between events, for example – and across large-scale change processes more generally.

We argue that making these six key dimensions explicit will advance designers' understanding of design facilitation practice. We also submit that making use of this awareness can contribute positively to the planning and orchestration of complex events.

Conclusion

Even though service designers are increasingly acting as design facilitators, design facilitation practices remain largely unexamined. This practice-based study focused on systemic service design facilitation and identified six key dimensions to event facilitation. These dimensions offer a new, more explicit perspective on design facilitation that captures the importance of contextually designed facilitation tools. Contextually designed tools are different from generic readymade and templated tools in that they are instances of the designer's unique approach to facilitating emergence. After examining our experiences of complex participatory event facilitation, we proposed a new analytical model that makes design facilitation visible and accessible in a way that it has not been before. We indicate that visualizing event facilitation dimensional flows over time can enable designers to orchestrate complex events and series of events more efficiently, and plan for co-creative emergence among multiple stakeholders more deliberately. These findings position facilitation as a critical part of designers' overall ability to address participatory and systemic processes of change.

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Shaping physical, social and imaginary spaces in healthcare design labs

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Shaping physical, social and imaginary spaces in healthcare design labs

ABSTRACT

The use of service design to support healthcare innovation has increased over the past decade. Recently, a growing number of design labs have been established to facilitate service design processes inside healthcare organizations. There is a growing need to gain a deeper understanding of how to set up and work within these spaces so that they live up to their promise of healthcare innovation and do not become a hype that fades out over time. Despite a growing body of literature on design labs, little attention has been given to the role of the lab space and how space may be 'made use of' to support healthcare service design. To examine the practice of making use of space, action research was conducted by embedding a design lab inside a hospital. Through empirical observations, we unpack three spatial dimensions that are made use of inside healthcare service design labs: (1) physical spaces *supporting sensemaking and promoting innovation as culture; (2)* social spaces *facilitating and encouraging interactions among*

KEYWORDS

service design
design labs
service innovation
healthcare innovation
codesign
space

stakeholders; and (3) imaginary spaces *challenging mental models and shaping propositions collaboratively. This extended understanding of lab space challenges existing research priorities, suggesting practical implications for using space more purposefully within design labs.*

INTRODUCTION

Rising costs related to healthcare service delivery, new technological developments and higher expectations of service quality are some of the key factors pushing forward the need for innovation in healthcare (Proksch et al. 2019). Over the past few years, interest in using service design to support change processes in healthcare has increased globally (Mager et al. 2017, 2016). The evolving practice of healthcare service design challenges practitioners to explore new infrastructures, strategies and ways of working inside these complex service systems (Freire and Sangiorgi 2010; Sangiorgi et al. 2017).

Linked to the growing interest in service design and the need for developing new working strategies, numerous design labs have emerged around the globe as designated spaces to facilitate service design processes across the public sector and in healthcare more specifically (McGann et al. 2018; Molloy 2018). Design labs are intended as safe spaces for ideation, problem solving, experimentation and the demonstration of solutions related to social needs (Mulgan 2014; Torjman 2012). Related to the emergence of design labs, the importance of understanding and making use of these new infrastructures becomes central. In this line of research, the phrase 'making use' refers to the dynamics and interconnections of both constructing and utilizing space in design lab settings. Failing to understand how service design practice makes use of lab spaces may create false expectations, poor exploitation of the potential of labs, or failure of the lab model itself. Bringing forward applied knowledge related to the capabilities and challenges involved in working within lab spaces may help advance service design as a practice in healthcare. Despite the general notion of space as being a central part of healthcare design labs, little attention has been given to researching what constitutes these spaces and how space is made use of to support service design practice in such settings.

Sanders and Westerlund (2011) stress the importance of *codesign space* as a concept, suggesting that space – both as a physical entity and an abstract notion, such as a shared space of social practices and the perceived space of imagined conceptions – may impact codesign processes considerably because it is accounting for the 'collaborative creation of knowing that constitutes codesign activities' (Sanders and Westerlund 2011: 5). Building on these conceptions, the term space in the current research is perceived broadly, both as physically experienced sites in a certain time and also as the social constructs of groups that interact and share a sense of belonging and purpose. Furthermore, space is understood as a mental construct that allows for an envisioning of future situations and activities in different settings.

To explore how service design practice makes use of lab spaces to support healthcare service development, we use an action research methodology in the context of an embedded design lab in a Norwegian hospital. During the

spring of 2017, a design lab that applied service design as an approach was embedded into Sunnaas Hospital to inform an ongoing renovation process inside the hospital. Simultaneously, the lab was used to explore the making use of codesign space as part of a healthcare service design process carried out inside a lab. We explore the following research question: How can space be made use of to enable service design practices inside healthcare design labs? Our inquiry aims to expand knowledge about the making use of codesign space and to add a practice-based perspective to the emergent conversation about healthcare design labs. Our research presents an integrated model showing how service design practice can shape codesign spaces dynamically in the context of healthcare design labs. Further, we discuss three implications derived from our inquiry: (1) the importance of thinking beyond the physical manifestation of labs by attending to the social and imaginary spaces; (2) challenging the boundaries of lab spaces by understanding their interconnections to other codesign spaces; and (3) moving the lab discourse beyond the creation of specific value propositions towards an emphasis on the infrastructures for long-term cultural impacts. Further, our contributions support healthcare service designers and innovators in making use of space more thoughtfully as part of service design practices carried out inside labs.

BACKGROUND

Service design allows for the transfer of both analytical and creative knowledge to support innovation of service provision. The purpose of service design is 'to ensure that service interfaces are useful, usable, and desirable from the client's point of view and effective, efficient, and distinctive from the supplier's point of view' (Mager 2009: 34). In healthcare, service design supports a shift towards a more explorative and cocreative approach to service development (Jones 2013; Vink 2019; Donetto et al. 2015). Healthcare organizations may benefit from developing coproductive attitudes and practices (Batalden et al. 2015; Sharma and Conduit 2016) by using service design because it incorporates person-centric, community-oriented, holistic and preventive approaches to healthcare innovation (Tsekleves and Cooper 2017). Hospitals and other healthcare organizations consist of interlinked and dynamically independent subsystems that are constantly learning and reacting to circumstances (Begun et al. 2003). Innovation inside complex systems is characterized as emergent, where novelty is attained through the interactions and relationships between subsystems and agents (Lichtenstein 2014). Hence, public healthcare service design efforts focus on bringing forward resolutions that are nested in complex sociotechnical contexts (Jones 2013). In such settings, service designers are challenged to bring forward situated value propositions inside ecosystems that provide care (Vink 2019; Vink et al. 2020). These circumstances force healthcare service design practitioners to explore new arenas, strategies and ways of practising (Freire and Sangiorgi 2010; Sangiorgi et al. 2017).

The role of space in healthcare service codesign

In the current article, we use the term 'codesign' to highlight the practices that are used in social settings and that are related to the participatory processes of designing services. Participatory design is perceived as an evolving family of design practices rooted in ideas from the 1960s and 1970s, a time when leading design communities were arguing for the inclusion of workers and other representatives in large design and planning processes (Brandt et al. 2012).

Codesign activities allow for both reflexive inner conversations among designers (Glanville 2007; Schön 1983) and for conversations with multiple actors with no formal design background; these activities then work to assess issues and develop propositions (Eriksen 2012; Sanders and Stappers 2014).

In service design, codesign activities are characterized as open-ended, enabling critical assessment and further development (Eriksen 2012). During codesign processes, the participants gain a common understanding so that they can cooperate and determine their collective actions (Steen 2013). Codesign in complex settings, such as in healthcare service design, is done through conversations and facilitated events involving multiple stakeholders (Aguirre et al. 2017). These diverse communities may be assembled to form cross-functional codesign teams or to participate in design workshops in different developmental stages as the process evolves. Identifying which participants to include and when is a difficult task (Jones 2018), especially when it comes to speculations regarding various political agendas that may create tension and expose contradictions (Donetto et al. 2015). This is similar to what Björgvinsson et al. call *staging* or *infrastructuring* design activities, which is described as 'the considerations of conditions that enable proper and legitimate user participation' (2012: 103). Codesign seeks to value a variety of perspectives pragmatically and to see them as equally important (Steen 2013). In contrast to this, healthcare organizations are characterized as hierarchical (Oliveira et al. 2005; Wang et al. 2015) and may not be comfortable or familiar with such ways of working. These aspects pose challenges for healthcare service designers in creating suitable circumstances for using a codesign approach (Donetto et al. 2015).

The literature on codesign and service design provides a general theory about the spatial elements that influence codesign activities, underlining space as an important factor. Related to codesign processes, space as a physical location is emphasized as important: 'Inherently, the physical and spatial location plays a role in codesigning, and can also be delegated an explicit role in a specific codesign situation' (Eriksen 2012: 231). Codesigned artefacts may represent both whole service systems and their experienced parts (Blomkvist 2014). Spatial arrangements combining such representations act as creative conversational enablers that distribute cognition to support understanding and dialogue in service design settings (Blomkvist and Segelström 2014). Distributed cognition is concerned with the process of off-loading cognitive demands by distributing information into the environment through social interactions and by using artefacts (Hagberg 1995; Rogers and Ellis 1994). As stated by Hollan et al., '[w]hen space is used well, it reduces the time and memory demands of our tasks and increases the reliability of execution and the number of jobs we can handle at once' (2000: 190).

Sanders and Westerlund (2011) introduce the concept of *codesign space*, highlighting three important aspects that are at play during codesign sessions: (1) the experienced physical space, (2) the space of participants' activities and (3) the envisioned spaces of desired future situations. They encourage scholars to make use of codesign space by attending to all of these aspects simultaneously. Further, they highlight the need for a deeper understanding and a discourse linking space to codesign activities and to service design more specifically to learn more about how to plan and conduct codesign activities.

Because service design is challenged to develop new ways of working while moving into the healthcare domain, the arrangements for opening up suitable spaces where codesign activity may take place has become a focus

of many practitioners. One way of meeting this challenge is by establishing design labs to support healthcare service developments.

Design laboratories as emerging spaces in healthcare

Design labs, also referred to as innovation labs, innovation hubs, or change labs, are currently being used in industry, in the public sector and in research (Fuller and Lochard 2016; Mager et al. 2016; McGann et al. 2018, 2019). Design labs focus on integrating a diversity of perspectives and skills into codesign processes to address sociotechnical challenges (Tõnurist et al. 2017). Most of the literature on design labs addresses theory, management issues, and the overall characteristics of such labs, mainly on a government and policy level (e.g. Fuller and Lochard 2016; Mager et al. 2016; Mulgan 2014; Tõnurist et al. 2017). Inspired by the trend of establishing design labs in the public sector, a growing number of healthcare design labs have emerged around the globe (Molloy 2018). Some examples include the Helix Centre[1] in London, United Kingdom, Experio Lab[2] in Sweden and the Health Design Lab[3] in Philadelphia, United States. Because healthcare design labs are an emerging approach with limited academic research, there is a need to further expand the understanding of how service design practice makes use of lab spaces to support healthcare service development.

Only a few studies have explored space in the setting of healthcare design labs. For example, Reay et al. (2017) explored a case of prototyping an embedded hospital codesign space within a hospital in Auckland, New Zealand: the Design for Health and Wellbeing (DHW) Lab. Concerned with the manifestation of the lab space to demonstrate and gain support for introducing a new approach to healthcare service development, political tensions and organizational priorities are exposed. These scholars metaphorically describe the lab as a 'Trojan horse' penetrating 'an institutional context often characterised by hierarchies of clinical expertise and bureaucracy' (Reay et al. 2017: 9). The design lab's distinctiveness is characterized by its location and hybridity – an open space inside the hospital that responds dynamically to facilitate for collaborative improvements of healthcare services, systems and products. By embedding codesign approaches inside the hospital space, the DHW lab helped challenge existing conceptions and drew attention towards both what *is* and what *could be*.

Another example of exploring space in healthcare is the research of Saidi et al. (2017), which looks at 'innovation hubs' in healthcare organizations, here described as 'spaces for purposeful human interaction' that promote innovation processes (Saidi et al. 2017: 38). Their study builds on the literature from the sociology of space (Foucault and Miskowiec 1986; Lefebvre 1991) and is supported by empirical examples from the Innovation Hub at Groote Schuur Hospital in Cape Town. They argue that designated innovation spaces inside healthcare hold the potential to support the building of social innovation networks and promote innovation as culture across professional and organizational divides. Further, they emphasize the need to substantiate and unpack their literal claims with more empirical research on innovative spaces in healthcare.

Because the concept of space is central to both codesign and the emergent phenomenon of establishing design labs, it is necessary to advance the discourse on codesign space in the context of healthcare service design labs. Specifically, there is a need to deepen our practice-based understanding

1. The Helix Centre is a collaboration between Imperial College London and the Royal College of Art and was established in 2014. Mixing design and healthcare methods to innovate, the lab operates in the middle of St. Mary's Hospital in London, United Kingdom: https://helixcentre.com/. Accessed 23 November 2020.
2. Established in 2013, Experio Lab is a collaboration between several Swedish regions; it uses service design as a method and approach in regional healthcare: http://experiolab.com/. Accessed 23 November 2020.
3. Since 2016, the Health Design Lab has been based in Thomas Jefferson University in Philadelphia. The lab is a space where design and healthcare meet to create new healthcare services and products: www.healthdesignlab.com. Accessed 23 November 2020.

of how healthcare lab spaces can be made use of to facilitate fruitful codesign activities.

METHODOLOGY

Seeking to explore and explicate the making use of space inside healthcare design labs, we applied an action research approach using qualitative methods (Adelman 1993; Heron and Reason 1997; Reason and Bradbury 2008). Action research is a cooperative inquiry that seeks to explore, understand and improve a subject of study through systematic cycles of reflection on action. Further, along with using action research, the current practice-based study is located within the tradition of research through and by design (Fallman 2008; Frayling 1993); this is an approach where design practice in itself aids a research purpose through 'explorative and generative actions' (Sevaldson 2010: 13). The authors of the present research consist of a researcher, a teacher and a Master of Design student. All three authors took part in planning, designing, analysing data and writing the article. This allowed us to make observations, reflect on our experiences and share learning from different perspectives. The transformative epistemological nature of this inquiry implies that the authors are situated inside the object of study, acting both as cosubjects and coresearchers (Denzin and Lincoln 2011). Such an action-based *research by design* approach allows researchers to reach levels of understanding that are difficult to access through more distant observations (Sevaldson 2010).

The Sunnaas design lab intervention

Sunnaas Hospital is Norway's largest specialized hospital in physical medicine and rehabilitation. The hospital provides multidisciplinary rehabilitation for patients who have complex functional impairment following an illness or injury. Because of a general need for renewing the built environment, the hospital is planning to build a new 5000 m^2 hospital wing, including the renovation of some of its old buildings (Figure 1). Through this renewal process, the hospital aims to increase patient satisfaction and strengthen its role as being among the leading rehabilitation hospitals in Northern Europe.

As part of the early phase of this process, a design lab was embedded into the hospital. In a twelve-week period between January and April 2017, the design lab was engaged in an exploratory service design project, supporting the early conceptualization and planning of the renovation process. More specifically, the task included mapping out central activities and stakeholder needs to inform internal decision makers, making it easier for them to approach and brief architects who would later develop the renovation project.

The design research team consisted of six Master of Design students who were supported by one design researcher, two service design tutors and one architecture tutor. Further, two hospital staff members were allocated to coordinate the process and take the role of innovation champions (McDermott and O'Connor 2002). One coordinator was mainly supporting the designers by reaching out to leadership, while the other supported the team by securing access to frontline personnel and patients. Furthermore, a cross-functional resource group of 22 people, representing health professionals from different clinics, logistics, leadership and patients at the hospital, was established. The group's main task was to support the intervention by participating in five preplanned milestone workshops; they were also asked to inform the designers and support them with carrying out ethnographic explorations

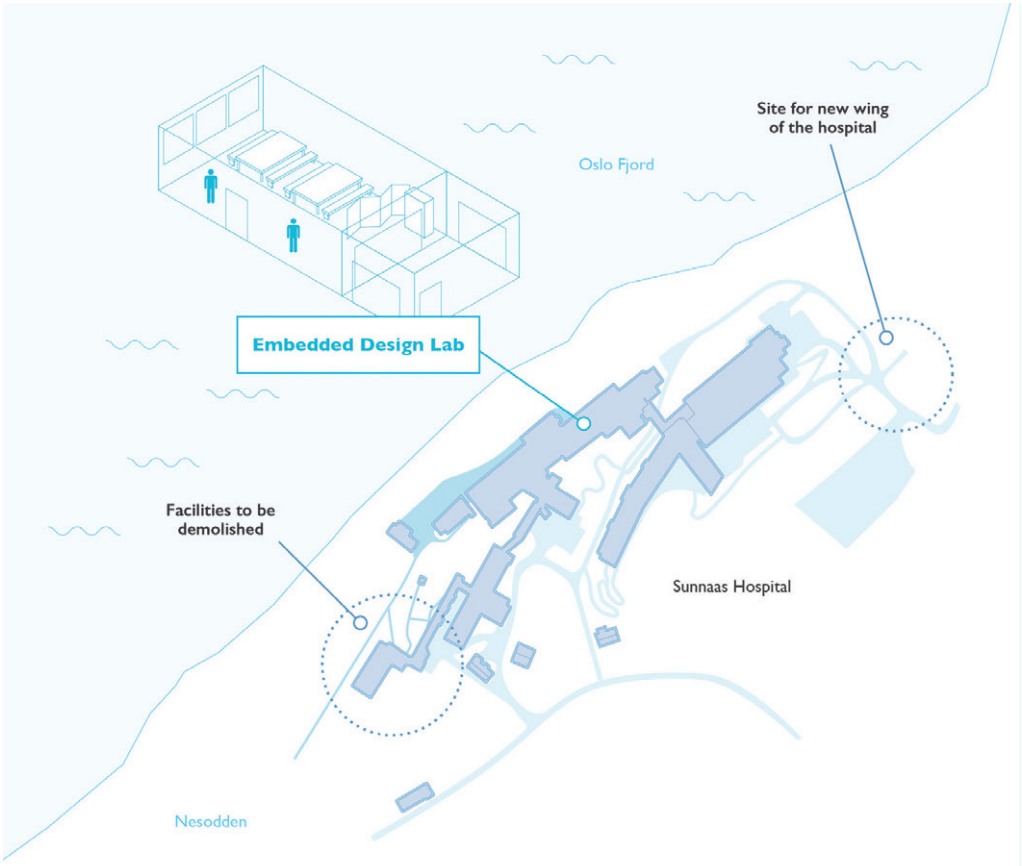

Figure 1: Overview of the Sunnaas Hospital site, facilities planned to be demolished, the site for the planned new hospital wing and the location of the embedded design lab.

throughout the initial four-week-long research phase. During the process, more stakeholders were invited to take part as new issues of importance were unfolding.

Data collection

The design lab intervention allowed for establishing a community of inquiry and practice (Heron and Reason 1997). The lab acted as a *rich design research space* (Sevaldson 2008) where qualitative data was produced and collected. To generate site-specific data, four action research cycles were used (Crouch and Pearce 2012), where the research participants were iteratively engaged in two-week-long cycles of planning, acting, collecting data, observing and reflecting.

During these cycles, data was collected using the following methods: (1) The participating design students made daily diary entries using *research diaries* (Engin 2011; Nadin and Cassell 2006). Tracing the theme of service design materials, the students took notes, made sketches and added photographs into their separate diaries. In total, the students made 108 diary entries

during the intervention. (2) At the end of each action research cycle, *reflexive conversations* with the students and the academic staff were held and recorded. The design students displayed their collected data and discussed the phenomenon of material creation and its use in the context of the lab (Lincoln et al. 2011). (3) At the end of the intervention, each design student developed *a short folder* that included a written reflection on their data collection process and a visual representation of their findings. (4) Alongside the diary collections, *photographs* were taken by the students and the academic staff; these were collected systematically to visually document the activities that happened inside the lab, at the hospital and elsewhere. (5) *A written record* was developed by the academic staff during the intervention to document the intervention background, objectives, processes carried out and outcomes. (6) After the design lab was taken down, a recorded *focus group evaluation* was conducted with the champions from the hospital and the academic staff. The evaluation was held as a semistructured focus group (Kitzinger 1995), where issues related to the intervention, such as preparations, operationalization, value and impact, were discussed and evaluated. To prepare for the analysis, all the recordings of the reflexive conversations and the focus group evaluation were transcribed. These collections of data formed a rich portfolio of qualitative data used as a basis for the analysis.

Analysis

The portfolio of rich data was analysed using an inductive approach (Gioia et al. 2013). By learning from experience, the research team moved from specific field observations towards articulations of themes that were found to be aligned with the codesign space concept. Initially, a data coding workshop was held to identify first-order concepts derived from the ethnographic investigation (Van Maanen 1979). The coding was done with an interest in the use of space and how design materials were translated into future service propositions through interactions among the participants. Photos and illustrations were arranged sequentially to highlight the different activities that happened during the intervention. Schematic sketches of the configuration of the spaces used during the intervention were constructed. The collected material was shared and discussed among the authors using a design review technique, where extracted citations, photos and illustrated folders were displayed to gain an overview of the data portfolio. The recorded reflections on action after each cycle and the six illustrated analysis folders made by each participating student were also evaluated. The material was assessed and discussed, allowing the authors to explore and code common, central or significant early concepts that were embedded in the raw data (Patton 1990). At this stage, observations were condensed and systematized from specific photographed situations, recorded reflections, diary entries and the designed outcomes.

To evaluate and expand the initially identified first-order concepts, a second analysis workshop was held. First, by reflecting on our own experienced actions during the intervention, the first-order concepts were assessed and expanded. Second, the concepts were explored graphically through concept mapping (Kolko 2010), where diagrams were sketched out to explore and illustrate how the identified concepts could be linked to one another. During this process of organizing and reflecting on the initially identified concepts, second-order, theory-centric themes began to form. Further, through several iterations of articulation, including consolations with the literature and review meetings among the authors, the emerging concepts and themes were further

refined and found to be aligned with the concept of *codesign space* (Sanders and Westerlund 2011). Furthermore, the coded data was transformed into a framework, grounding the understanding on making use of the codesign space concept in the context of healthcare service design labs (Figure 2). Finally, by zooming out and reflecting on the framework as part of the entire intervention, models describing how these spatial dimensions are interconnected and mutually affecting each other were analysed.

FINDINGS

Through the analysis, several themes related to how space is made and used across the three spatial dimensions surfaced. First, our exploration reveals how the making use of *physical spaces* in healthcare design labs can allow for displaying representations in different configurations to support collaborative planning, learning and sensemaking and for exhibiting innovation. Second, we expose that the making use of *social spaces* can support participation and productive interactions among stakeholders through iterative codesign and coassessment activities. Third, our inquiry highlights the making use of shared *imaginary spaces*, which help participants envision and take ownership of future service design proposals. Further, our analysis reveals how the making use of physical, social and imaginary spaces is dynamically interlinked. Finally, we expose the dynamics of the multiplicity of codesign spaces that are at play during such processes, both inside the lab and elsewhere, and how they influence one another.

1. Establishing and utilizing physical space

We use the term physical space when referring to the tangible environments where a service design activity takes place. For example, the walls, floor, windows and interior of the lab are all parts of the physical lab space. In addition to the considerations for locating an appropriate lab place inside the hospital, our inquiry found three uses of physical space supporting service design, as illustrated in Figure 3: representing context (highlighted in blue); supporting process (marked as red) and exhibiting design and innovation practice (shown in green). Next, we elaborate on each of these themes by providing examples from the lab intervention.

1.1. Locating an appropriate lab place

Because available space is limited at the hospital, finding an appropriate physical space for locating the lab was given attention prior to the intervention. During early planning meetings, accessibility and proximity to frontline services were made a priority. Further, functional issues were considered regarding the workspace, wall space and printshop area. Finally, issues related to equipment and the atmosphere were addressed.

During the intervention, service design activities occurred mostly inside the lab at its temporary physical workspace in the middle of the lower ground level of the hospital. The lab was located centrally next to a corridor where people were passing by on their way to the main hospital auditorium. This made the lab scenery accessible and transparent for patients, staff and other people passing by. However, several other physical locations were made during the intervention to facilitate larger codesign workshops and during other sessions. In all these cases, the materials produced during these sessions were brought back to the lab to be displayed and reflected upon.

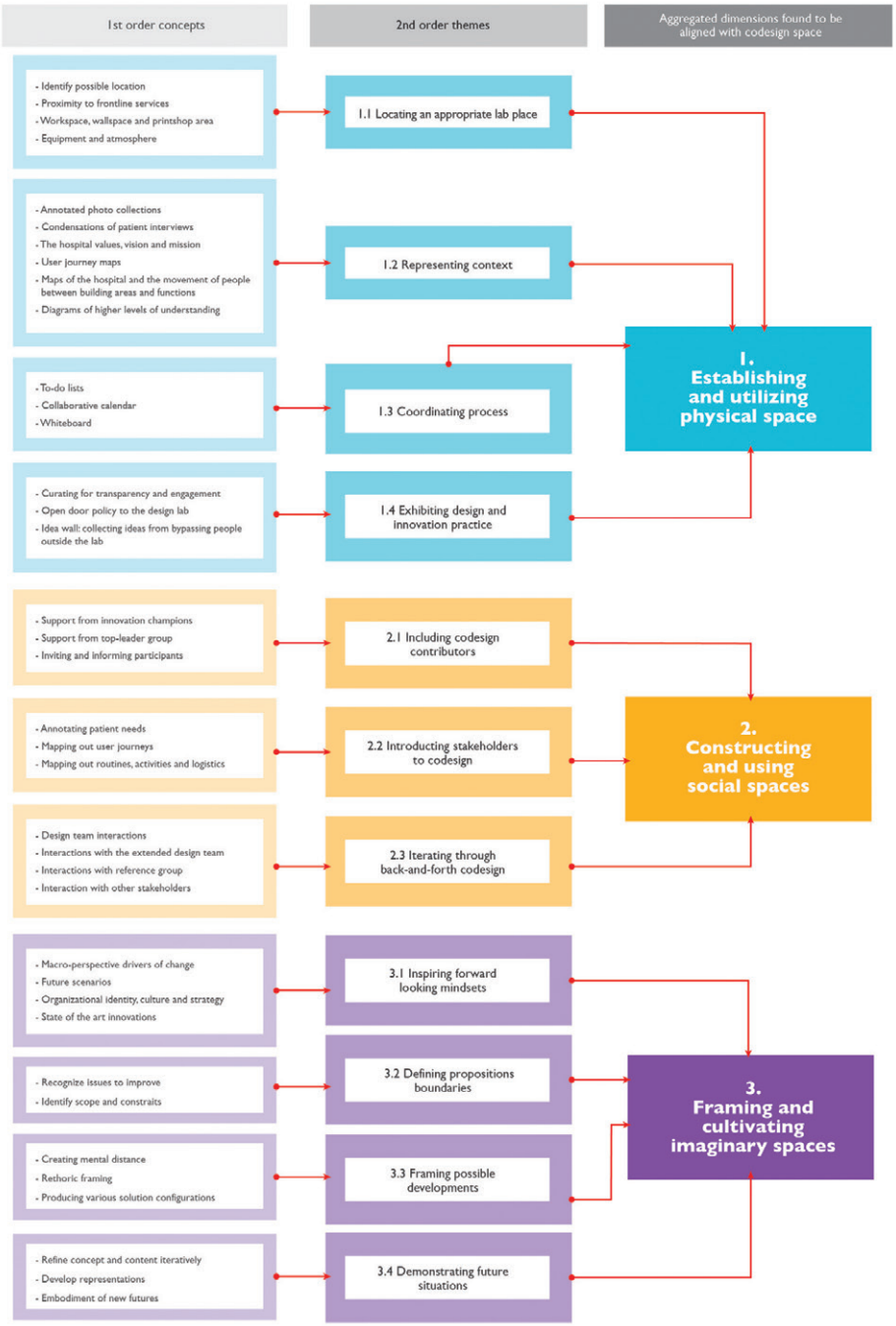

Figure 2: First-order, second-order and aggregated dimensions analysing the making use of spaces in healthcare service design labs.

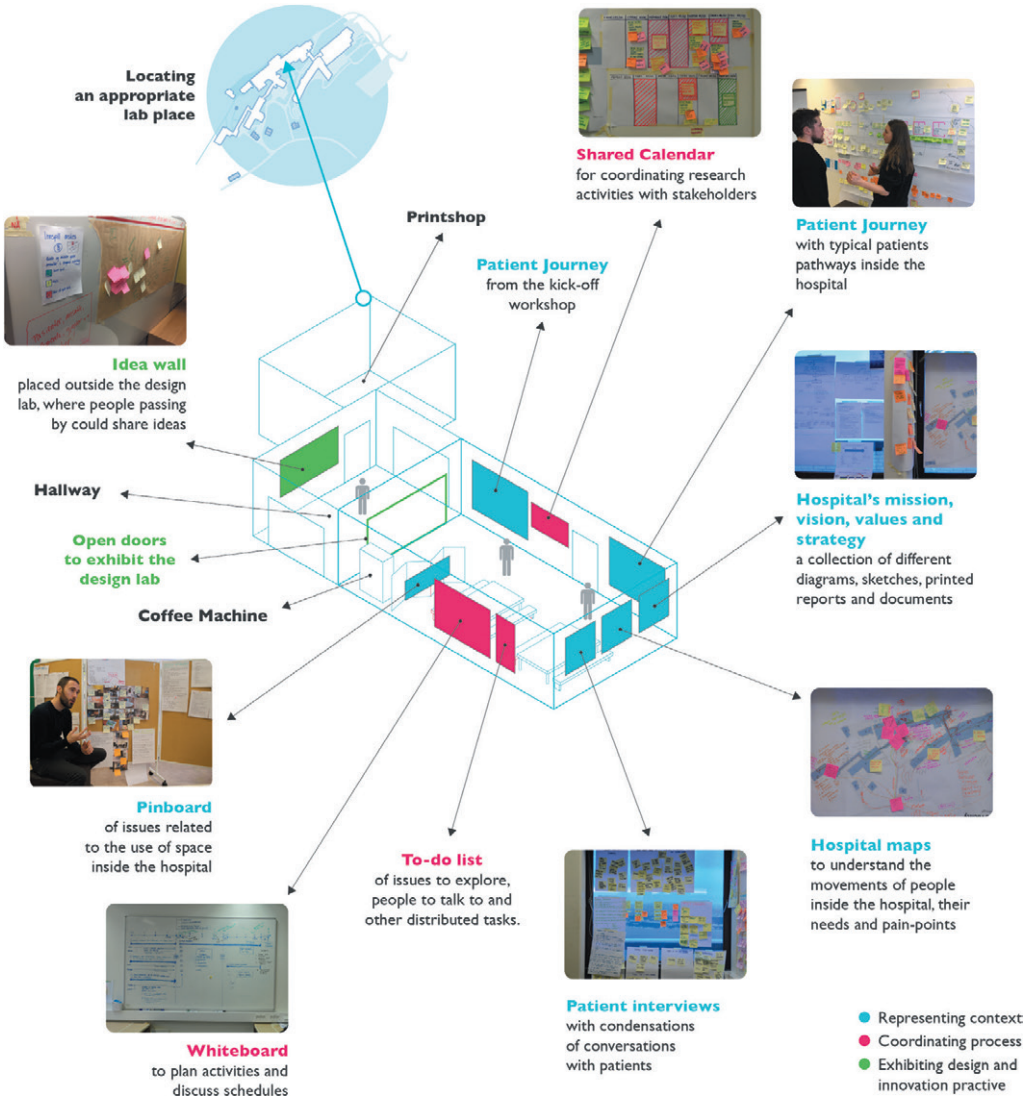

Figure 3: Physical elements of the located lab space representing context, supporting process and exhibiting innovation practice.

1.2. Representing context

The walls of the embedded design lab were used to display, organize and overview the vast number of representations of the hospital as a context. Initially, different areas inside the lab were divided into different research themes. Each theme was explored through fieldwork by a team of two designers who were collecting material and representing their findings on their designated research areas inside the lab. The location of the lab, which was close to

hospital treatment facilities and patient rooms, made it easy for the students to gain access to relevant sites and converse with various stakeholders.

The collections of findings that were exposed to the lab walls were used to support collaborative rapid learning and understanding of the hospital as a context, including the hospital's facilities, service provision, routines, culture and strategies. For example, an entire representation of the most typical patient journey was codesigned on one of the lab's walls. In practice, the physical space acted as an immersive backdrop for group discussions, containing various compiled representations of the hospital context. This made it easier for the participants to overview the involved complexities, give direct attention to specific findings, make connections and prioritize issues (Figure 4).

Figure 4: Designers and academic staff engaged in a discussion while referring to different contextual representations inside the design lab. Photograph: Jonathan Romm.

1.3. Coordinating process

Physical space was also used for coordination throughout the process. One example of this was the evolving wall-mounted time schedule (Figure 5) used for coordinating research activities with stakeholders. Another example was the whiteboard, which was used to discuss and illustrate phases and plans collaboratively. Using space for coordination allowed for collaborative decision making regarding how to move forward. Further, it helped to facilitate synchronic and a-synchronic coordination of activities, as shown in Figure 5, where meetings and tasks were added to the wall-mounted time schedule by different participants during the process. In this way, all the participants were able to easily access, modify and follow activities.

1.4 Exhibiting design and innovation practice

Because the lab was located close to where people were passing by, the physical lab space became a dynamic showcase for how an innovation process can take place inside the hospital. The large amount of materials displayed created awareness and triggered curiosity towards the ongoing innovation processes in general. During the formal evaluation of the intervention, this aspect was recognized as an important contribution of the intervention.

Figure 5: Shared wall-mounted time schedule – an example of physical spatial representations supporting process. Photograph: Jonathan Romm.

Minor spatial features affected the level of involvement of passers-by. One such feature was the coffee machine. An informal agreement was made at first to keep the doors to the lab open to invite passers-by who wanted coffee to take part in conversations. At the beginning, a low folding screen placed beside the coffee machine seemed to create a threshold for visitors to enter the space, as shown in Figure 3. After the screen was moved, visitors suddenly entered the space, asked questions and posted comments.

Using the hospital space in such an unfamiliar manner also created unintended tensions. Some staff members were worried that the lab, with its notes stuck on walls and windows, posed a threat to hygiene. This needed attention from the hospital leadership, who gave formal approval for the intervention to go on using the space in such a manner.

To summarize, our inquiry suggests that service designers may make use of physical space for the collection and distribution of insights, collaborative sensemaking, coordination and exhibiting service design practice. One of the participating designers wrote a reflection about the role of the physical design lab space:

> In a way, what happened on the walls was also a reflection of the process in our heads and by modifying it and arranging it, we gave shape to a common understanding of the matters we were discussing. […] Exposing all of the material in such a public way, not only for us, but also for the rest of the people inside the hospital, made it permeable. Anyone could comment, add, erase, intervene, so that made it a living system that was modified constantly by several people.

2. *Constructing and using social spaces*

We use the term social spaces to describe the gatherings and interactions of people engaged in service design. A shared sense of belonging and devoted engagement to help produce meaningful and useful service propositions are examples of these social constructs. To create these social spaces, we found that being prepared to include contributors is a key to ensure support from various participants, as illustrated in Figure 6 towards the bottom. Further, an important precondition for using the social space was the introduction of codesign as an approach early in the process, as shown above the dashed line below in Figure 6. These prerequisites allowed for making use of iterative back-and-forth codesign interactions in different scales and places, as shown in Figure 6 towards the top. Next, we describe each of these themes and provide examples.

2.1. Including codesign contributors

One main finding was the importance of careful planning and the prearrangements needed to create the basis for social spaces to develop because of the limited availability of hospital staff and patients. Considerable effort had to be made to ensure that the design team had access to different stakeholders throughout the intervention. A detailed time plan was developed with meeting points, workshops and presentations during the preintervention consultations with the hospital innovation champions. The plan was addressed during a top-leader CEO-level meeting at the hospital a few weeks before the intervention took place. At the meeting, section leaders from the hospital were

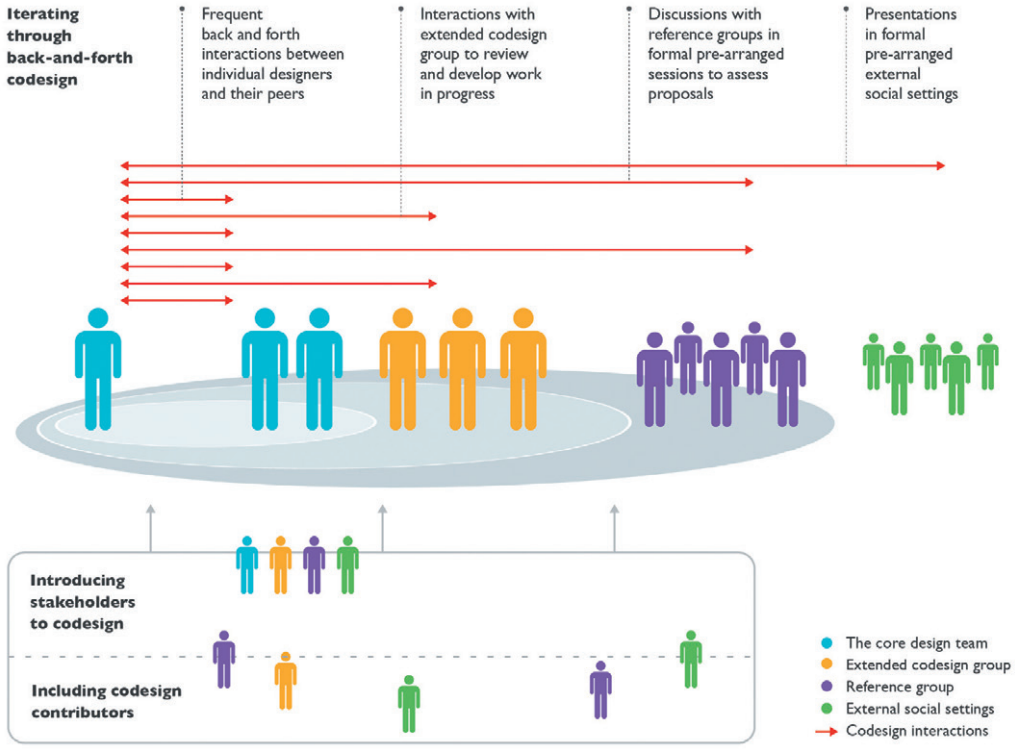

Figure 6: The making use of social space inside the embedded design lab.

asked to choose and reserve worktime for representatives to form a cross-functional resource group so that they could take part in the planned sessions. Ensuring support from top management helped to formalize the intervention and provided a mandate for the champions of the project to secure support from patient representatives and staff members.

2.2. Introducing stakeholders to codesign

One finding that surfaced from our inquiry was the importance of introducing codesign as an approach early in the process. Kicking off the intervention, a two-day workshop event was held, bringing all participating stakeholders together to meet the design team and take part in discussions about what service design is and how codesign works. Particular concerns were raised on how to mix the groups to facilitate collaboration across organizational divides. To obtain a shared sense of purpose and demonstrate codesign in practice, a mannequin doll representing a patient was placed in the centre of the room. The participants were asked to articulate the needs that patients would typically have when being at the hospital and to then stick them on the doll (Figure 7).

Further, several codesign tasks were carried out at the workshop, generating massive amounts of data and representing the complexity of the healthcare services provided at the hospital. Besides helping the designers gain an

Figure 7: Participants sharing patient needs on a mannequin during the kick-off workshop. Photograph: Thiago Freitas.

early understanding of the hospital context, the event also gave agency to the resource group to act as a supportive community for the intervention. Further, the early establishment of relationships between designers and the reference group members eased the next steps of carrying out fieldwork explorations.

2.3. Iterating through back-and-forth codesign

Codesign activities were practised in different spaces and with different participant groups (Figure 6). Inside the core design team, which consisted of the design students marked in blue, designers interacted frequently and informally to get feedback and iterate on quick sketches. The refined materials from these interactions were then put forward to the extended codesign group, including the teaching staff and the appointed champions from the hospital, depicted in orange. These interactions happened mostly inside the physical lab space, where the work-in-progress was reviewed and further developed. After several iterations, the reworked representations were exposed in larger social settings that involved the reference group, marked in purple. During the five preplanned codesign workshops that took place outside the lab, these representations were used as open-ended backdrops for discussions and as subjects for collaborative modifications with the larger assigned reference group. Proposals were also presented and discussed in other forums both internally and outside the hospital, marked in green. The lab facilitated social spaces of back-and-forth coassessments and codesign interactions, illustrated as red arrows, which helped raise the quality of service design representations and propositions iteratively.

As a precondition for making use of social spaces, the inclusion of participants and making them comfortable with codesign as an approach were found to be essential. The codesign sessions were carried out through iterations in various social constellations. One of the participating students summarized his experience on how proposals were developed, rejected and further refined through these social back-and-forth codesign iterations by expressing the following:

> inside the macro-process there were several micro-processes that happened mostly in the course of a day. Sometimes as a group, we would take one step forward only to, in the upcoming days, take two steps back. Each successful attempt at developing a concept, an idea or a tangible design material carried inside itself the memory of the last, unsuccessful ones.

3. Framing and cultivating imaginary spaces

Our analysis exposed several activities carried out to frame and cultivate shared imaginary spaces. We use the term imaginary space as a shared mental construct of situated possible, meaningful and useful future service proposals. This spatial dimension is critical in the process of exploring potential value propositions and engaging stakeholders in envisioning what does not yet exist. Our exploration found that studying future drivers of change, scenarios and strategies are the initial steps to help inspire a forward-looking mindset. Further, creating a shared understanding of the appropriate proposition space boundary, setting the collaborative framing of concepts and demonstrating possible future solutions were found useful for cultivating imaginary spaces (Figure 8). Next, we describe and exemplify how these themes supported the process of service design inside the lab.

3.1. Inspiring forward-looking mindsets

Providing initial guidance towards forward-looking conjectures helped inspire and spark early imaginations of possibilities, as indicated at the bottom of Figure 8. Different reports on the drivers of change in the health sector and macro-perspective healthcare future scenarios were collected and made available for the students. Further, before the lab was established, presentations for students were held to discuss the hospital's culture, identity and characteristics. Hospital strategy documents were also distributed among the students to share insights on challenges, future plans and capabilities. During the first weeks of the intervention, the hospital innovation department arranged to showcase different innovative projects that were running at the hospital and elsewhere internationally to give the students a sense of the state-of-the-art.

3.2. Defining proposition boundaries

Derived from the fieldwork done during the first three weeks of the intervention, the collected empirical insights, strategies and future scenarios were synthesized. To prioritize the findings, two workshops were facilitated: an internal workshop with the reference group to prioritize the initial findings and an external workshop with architects who were experts in hospital planning to discuss the relevance of these findings. During the second workshop,

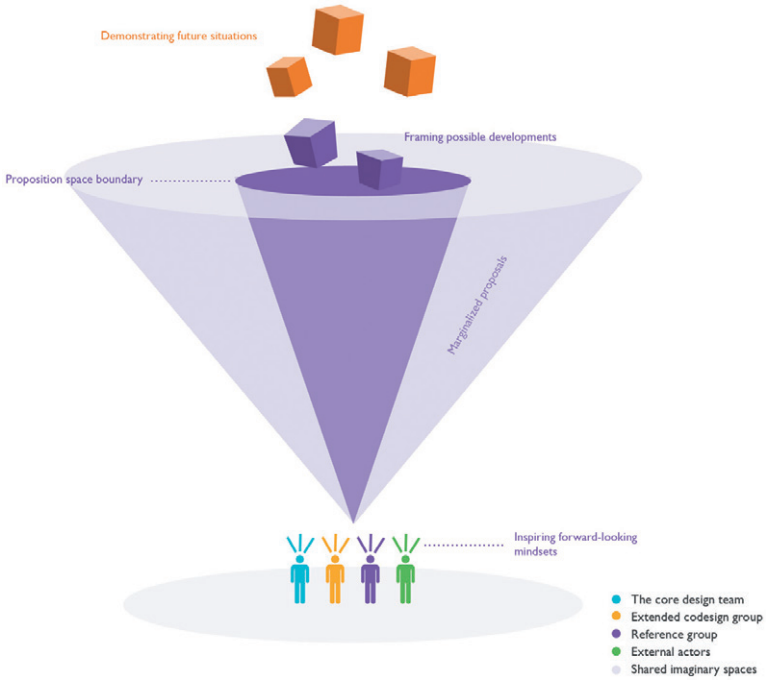

Figure 8: Illustration of the themes involved in framing and cultivating a shared imaginary space.

the architects showed surprisingly little interest in specific findings, such as little personal space for patients, long transitions through corridors, or little storage capacity. Instead, the overall characteristics, treatment philosophies and future developments of the hospital were viewed as more valuable inputs for the architectural planning process. These insights provided important guides for defining the boundaries of propositions that would be of value to develop further and discard marginalized proposals, illustrated as the purple cones in Figure 8. For example, the use of the hospital surroundings to support the recovery process of patients, the hospital as a patient-centric organization, and the process of discharge were given priority. Also, the formal steps of the procurement process of architects to develop proposals for the new hospital wing was recognized as an important constraint. This led to a decision that the lab should avoid sketching out specific future user journeys or architectural solutions but rather work to find ways to inspire the yet-to-be-commissioned architects to resolve the prioritized issues themselves. Clarifying these boundaries helped establish a shared mental model that delimited the proposition space, providing a direction for conceptualizing the service to be designed, illustrated as a dark purple cone in Figure 8.

3.3. Framing possible developments

Speculations of how the prioritized issues may translate into overall conceptual messages helped frame the directions for exploring possible service developments. We found that creating a mental distance from the situation at hand

Figure 9: Stakeholders discussing the mock-ups of the conversational folders at the design lab. Photograph: Anath Hojman.

eased the conceptualization process. For example, at one point, the design team chose to tidy up the entire design lab space to give room for thinking without being exposed to the collected data. Furthermore, the team decided to hold a concept development workshop in a remote location to gain mental distance from the hospital and the design lab.

During these remote sessions, a narrative describing the overall contribution of the intervention targeting two main user groups was articulated as a service concept, illustrated as purple boxes in Figure 8. *A service to facilitate future conversations with commissioned architects and with hospital staff. To inspire both architects to include the identified prioritized issues in their renovation plans and the staff to begin making incremental improvements related to these issues, regardless of the renovation process.* Afterwards, the configuration of various specific service moments and touchpoints became easier to envision and develop.

3.4. Demonstrating future situations

We found that quick iterations with various stakeholders were useful to further develop the service design concept and proposed service. We also found that the embodiment of these concepts through demonstrations of possible future situations, illustrated as orange boxes in Figure 8, helped verify the concepts' intentions and experiences. During the final stages, five illustrated conversational folders were designed to be used by moderators at the hospital, such as in meetings with planners, with architects and with hospital staff. To test these folders, quick mock-ups were printed out and discussed with a group of influential stakeholders (Figure 9).

The evolving ideas regarding issues that may influence the future of the hospital also created some tensions. For example, as the intervention gained attention and propositions began to mature, clinical leadership expressed worries that the developing proposals may interfere with formal clinical procedures. Representatives from the lab were invited to present their work-in-progress at a high-level clinical management forum to make sure that the proposals were aligned with clinical approaches and regulations.

To embody and try out these propositions, the hospital leaders' corridor area was used to engage with the invited participants in five conversations. Each conversation was repeated for three different groups of mixed audiences and was facilitated by the appointed moderators from the hospital. During these conversations, the moderators were taking ownership and training using the folders, which were designed to help them structure, illustrate and literally unfold each conversation.

To summarize, we observed that the lab facilitated the making use of shared imaginary spaces through framing, narration, explorations and demonstrations of potential propositions. The following reflection, made by a student, exemplifies how imagination was used to frame a proposition:

> The designer's role is to come up with a proposal that fits all parts (e.g. users, healthcare staff and so on) and that the leaders are willing to change. For example, here is a quote I heard from a patient: 'When I look at the view from the terrace, feeling the wind in my face – if I just close my eyes for a second – I swear – when I open them again, it feels like I could fly'. The quote in itself might sound like a cliché, but seen in this context, it becomes valuable. The quote was made by an outpatient who has been bound to a wheelchair for over two decades.

This empirical observation was used as one of several sources pointing towards the importance of providing access to nature and living systems, such as views, gardens and beehives, to support the recovery process of patients. During the process, this issue grew to become a shared future vision and was designed as one of the five discussions to be taken up with future commissioned architects and staff at the hospital.

The interlinked dynamics of making use of codesign spaces in healthcare lab practice

By zooming out and reflecting on the entire intervention while reviewing the rich data portfolio, it became clear that the three spatial dimensions were dynamically interlinked and that the making use of them required a combined and continuous attention throughout the process. Further, our analysis highlights the focal role of the lab as linked to other codesign spaces that were leveraged during the process. Next, we elaborate on and illustrate these more compound findings.

Our analysis reveals that the spatial dimensions influence each other bilaterally, as illustrated in Figure 10, and that they all converge and create synergies during codesign sessions, marked with a red star in the middle of the figure. Physical spaces, illustrated as a blue arrow, allowed for social spaces to form, enabling back-and-forth interactions among participants. The social space, represented by the orange arrow, created a sense of belonging and ownership to the physical lab space. The social space also affected the

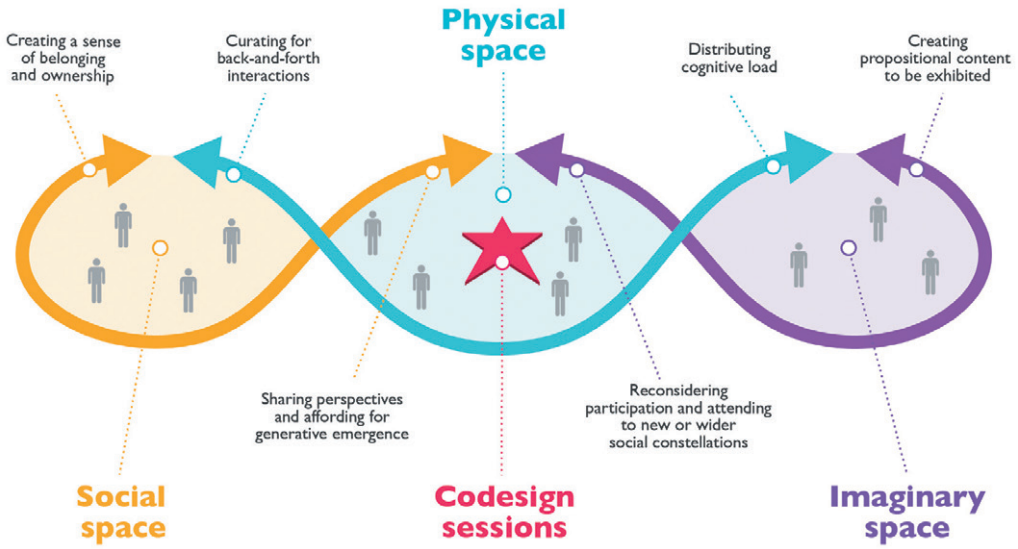

Figure 10: Illustration of how the physical, social and imaginary spaces influence one another and are dynamically evolving through lab-facilitated codesign sessions.

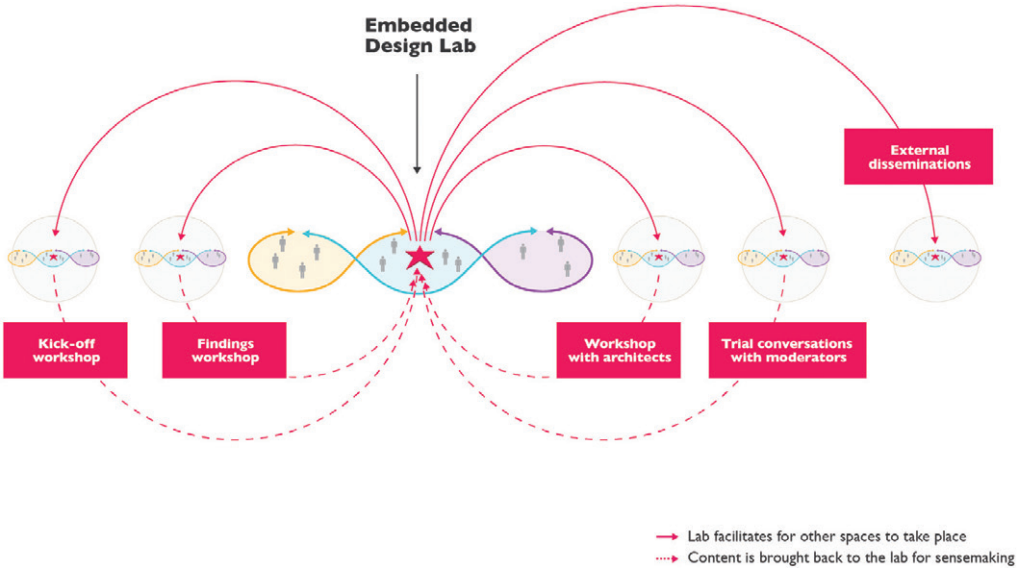

Figure 11: The lab as a focal codesign space mirroring content from external codesign spaces and reflecting content back to new external codesign spaces.

imaginary space, shown as a purple arrow, through sharing of perspectives, thus affording for generative emergence. In return, the imaginary space fed back towards attending to new or wider social constellations as visions were prioritized and propositions were developing. The imaginary space influenced the physical space by creating proposals to be exhibited, while the physical

space supported the imaginary space through distributing cognitive loads, thus making the overview of possibilities easier. Based on our analysis, the three spatial dimensions can be understood as connected loops that influence each other and that are contiguously and dynamically evolving through iterative codesign sessions that were facilitated by the lab.

Further, we found that the lab, as illustrated in the centre of Figure 11, functioned as a focal codesign space facilitating other external codesign activities in various locations to take place, as indicated by the red lines above. Throughout the process, the content from all the other codesign spaces that were made use of were brought back and represented inside the lab, linking them to one another, as represented by the dashed lines. As the process went on, the reflections and compilations from these external sessions were then echoed back from inside the lab space, feeding open-ended content into new external codesign activities, or disseminated outwards to wider audiences.

The codesign space of the lab is interconnected and dynamically evolving over time. Further, it is influencing a number of other codesign spaces that are made use of during such processes. Functioning as a synthesizer, the codesign lab space forms a hub where content from all external codesign activities can be collected, displayed and reflected upon, forming the basis for new codesign spaces to take shape and become alive.

DISCUSSION

Our research provides new insights into how space can be made use of to support service design practices inside healthcare design labs. Through our investigations, we reveal and illustrate the dynamic interrelationships of physical, social and imaginary spaces that are at play in service design processes within healthcare design labs. By exploring the making use of space in healthcare service design labs, this inquiry unpacks, explicates and contextualizes the concept of codesign space (Sanders and Westerlund 2011) within healthcare design labs. Further, we offer expanded practice-based knowledge to support healthcare service designers and innovators working inside labs to more thoughtfully make use of these assets.

Theoretical implications

First, in line with Sanders and Westerlund (2011), who suggest using all three dimensions of the codesign space simultaneously, our research challenges the skewed focus on physical spaces in the conversations about design labs (e.g. Kinugasa-Tsui 2018). Our empirical investigation reinforces and exemplifies the interlinkages and validates the interconnections of all three spatial dimensions in practice. Hence, we stress the importance of addressing the social and imaginary capacities in the lab discourse. Second, challenging the conception of design labs being *a* space (Mulgan 2014; Torjman 2012), our exploration highlights the importance of considering the multiplicity of spaces beyond the lab; the distributed spaces outside the physical lab context that are influenced during service design processes become a critical part of the design lab practice. We suggest that there is a need to think differently about the boundaries of the lab space and how we understand other codesign spaces that are affected by design labs and vice versa. Perhaps, labs should be conceived more of as *a space of spaces*, engaged in dialogues with other contextual arenas. Third, design theory links designed objects with the concept of the imaginary to become the vehicles for changing cultural patterns of social activity,

understanding and meaning (Folkmann 2011). Hence, we argue that the imaginary capacities that labs offer move beyond projects and service propositions towards affecting the cultural patterns and mental models of organizations more broadly.

In line with recent critical views of social innovation labs (Kieboom 2014), this research highlights the need for a shift in the discourse on design labs in healthcare. Based on the current research, we call for a shift from focusing on facilitating for projects and developing specific service value propositions towards an expanded conversation about how to build infrastructures that are also suited to support *service ecosystem design* approaches (Vink et al. 2020). Labs need to move towards developing appropriate service design approaches and methods to facilitate reflexivity and the untangling of the complexities that institutional arrangements in healthcare are influencing. Such systemic approaches and ways of working may curate the emergence of new shared mental models, thus sparking more long-term cultural change and deeper impacts through using design labs.

Practical implications for working with the three spatial dimensions

When setting up a lab, the physical lab space is the easiest dimension to comprehend and attend to. As suggested by Reay et al. (2017), open physical spaces providing easy access for stakeholders should be prioritized. Our research expands the notion of open spaces by emphasizing the importance of locating the lab space near to frontline care areas and the attention to detail that is needed to sincerely curate invitingness. Expanding on the work of Blomkvist and Segelström (2014), our research highlights that the physical capabilities of the lab space should be prioritized towards enabling overviewing, with sufficient wall space to mirror empirical insights and exhibit conceptions. However, to make sure that labs become alive and productive, the current research stresses that the social and imaginary dimensions are equally – and in some cases even more important – to address than the physical dimension. We urge practitioners to more thoughtfully attend to all three dimensions simultaneously while working in healthcare labs. For example, practitioners may ask themselves the following questions: How can the physical lab space support our work process most effectively? Who should we involve, and when, to enable proper user participation (Björgvinsson et al. 2012)? How do we make sure that future propositions are appropriately situated to fit our particular context?

Social spaces involve building relationships and ownership among stakeholders and supporting codesign iterations. Our research highlights the iterative nature of moving between the core and the extended groups, while including various actors in different social arenas throughout the processes. Practitioners may refer to Figure 6, to act as a map for guiding their process. Further, practitioners should seek support from internal champions (Romm and Vink 2018), for providing access to various stakeholders inside healthcare service ecosystems.

In addition, practitioners must not forget the essential design lab practice of facilitating shared imaginary spaces. Central to shaping these imaginaries is combining what *is* and what *might be*. The first aspect is covered by gaining an understanding of everyday life issues through ethnographic studies (Segelström et al. 2009). The second aspect is informed through working with

future scenarios that may inspire the emergence of progressive imaginations. To find a proper fit between what *is* and what *might be*, practitioners need to engage in processes of framing and reframing (Dorst 2011), to direct their creativity towards suitable service concepts. Further, we encourage practitioners to demonstrate propositions through enactments to clearly illustrate experiences and create a sense of shared ownership.

Shaping physical, social and imaginary spaces in healthcare design labs is a challenging task, because these dimensions are interlinked and dynamically unfolding throughout the process. However, more thoughtful attendance to the making use of these capacities inside healthcare labs may not only help develop more situated service propositions, but also reshape shared mental models (Vink et al. 2019), thus supporting more long-term institutional change.

Limitations and future research

While this study focuses on building an understanding of space within the emerging practice of service design inside healthcare design labs, there is a large body of literature related to the notions of the physical, social and imaginary affecting innovation that was not in the scope of our empirical investigation (such as in martial culture, innovation spaces in urban studies, sociology, future studies and more). Our empirical focus helps build a nuanced understanding of what making use of space looks like in practice, but building on this understanding there is a need for a more systematic review of the related theories to substantiate and link knowledge about all three dimensions.

The empirical insights of this research are based on one design lab intervention. The specific context and circumstantial complexities involved in such efforts may have influenced our articulations regarding the making use of space in healthcare design labs. We encourage more explorations on the making use of space inside design labs and similar arrangements. The fact that the intervention was done involving students as part of an academic research collaboration might have created fewer tensions than in comparable cases. This factor might also have influenced the making use of space because the students themselves were in a learning situation with little constraints regarding resource investments, such as time, budgets and so on. On the other hand, the academic environment allowed for a more explorative approach towards attending to the making use of space inside the lab. More research is needed on how more experienced or commissioned designers make use of space in healthcare design lab settings.

Further, we have limited data on the effect of the intervention over time. However, we know that versions of the produced conversational folders have been used both internally at the hospital and in interactions with architects long after the intervention had taken place. Furthermore, we received feedback from the innovation department at Sunnaas stating that the lab intervention had a notable impact on a more open and inclusive approach to innovation processes inside the hospital. The space where the lab was located, three and a half years ago, is still used as a codesign space inside the hospital, labelled the 'Sunnaas idea lab'. There is a need to assess and further explore the cultural impacts of healthcare design labs over time and how they support the emergence of new shared mental models and organizational culture.

CONCLUSION

The current research exposes the interlinked physical, social and imaginary spatial capacities that are made use of to support healthcare service design practice carried out inside labs. Through action research, we analyse and exemplify how a hospital lab space was made use of to help designers, along with a variety of participants, to advance healthcare service design processes. By grounding and expanding the concept of *codesign space* (Sanders and Westerlund 2011) in the context of a healthcare design lab, the practices of the making use of *codesign lab space* are exposed: (1) physical spaces support multifaceted collaborative planning, learning and sensemaking, as well as promoting an innovative culture; (2) social spaces facilitates iterative interactions among multiple stakeholders in various scales; and (3) imaginary spaces help shape new mental models and envision possible future value propositions collaboratively. We identify and illustrate how these spatial dimensions are dynamically interlinked and mutually affecting each other. Further, we uncover the role of the lab as a hub that affects and is affected by external codesign spaces that play out during such processes. We argue that service designers and innovators working in healthcare design labs may benefit from curating for these spatial dimensions to manifest and become alive simultaneously throughout the entire development process. Paying more deliberate and combined attention to physical, social and imaginary spaces improves the practice of using design labs for creating suitable value propositions and more long-term cultural impacts.

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Jonathan Romm

INSIDE HEALTHCARE DESIGN LABS

Exploring the practice of healthcare service design in the context of embedded service design labs

The complex characteristics of healthcare systems and wicked nature of problems that arise in such settings can challenge service design practice to develop new methods and ways of working. Recently, design labs have emerged in the area of healthcare as a way to support service design practices carried out in such settings.

This thesis explores how service design labs may act as supportive spaces for practicing service design inside large healthcare service systems. To do so, four 10–12-week-long action research interventions that supported inquiry into real-life service design processes were carried out inside three large Norwegian hospitals.

This research explicates the compound approaches used by service design practitioners amid the complexities inevitably found in healthcare. It identifies and explicates the central healthcare service design conversation and facilitation practices. Further, it builds a theoretical frame for service design labs to act as supportive physical, social and imaginary spaces.

Additionally, the research conceptualises service design labs as temporal and situated meta-designs inside complex service systems.

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