*Mira Alhonsuo*

# EARLY PHASE OF HEALTHCARE-RELATED SERVICE DESIGN

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MIRA ALHONSUO

# Early Phase of Healthcare-Related Service Design

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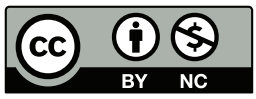


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Dedicated to the people
behind their stories

# Abstract

Healthcare organizations are under constant pressure to develop and reform. The object to be developed may vary from the hospital's signs to national social and healthcare reforms. Service design and co-design provide one way to research and develop healthcare services. These different ways of approaching development can support and inspire people to participate in the development process.

This research focused on examining the early phase of healthcare-related service design and determining what is needed before starting an actual design process in a healthcare organization. The focus was narrowed to looking at the perspectives of healthcare professionals as well as how they can be introduced to service design and co-design and, thus, how to arouse their interest in design-driven development activities. These perspectives generated the main research question: How can service design and co-design approaches support the early phase of healthcare-related service development?

This article-based research is grounded in constructivism and encompasses a qualitative research project using case study and ethnography as the methodological choices. The research was carried out through four sub-studies, formulated as academic publications. Sub-study I investigated service design tools and collaborative practices used to support and develop customer journeys and hospital management practices. Sub-study II aimed to understand how patients' experiences and co-design methods were used in the pre-construction phase of a new hospital. Sub-studies III and IV were conducted through three design sprints and assessed, for instance, the involvement of healthcare professionals as part of the design sprints and what were the strengths and weaknesses of the design sprints, especially in relation to the development of healthcare services.

The findings from these sub-studies yielded the following conclusions. First, benchmarking is an important process both for developing hospital management practices and for selecting efficient design-based methods during the development process. Second, design methods are a way to create and share a vision, understand service

ecosystems, concretize services, and gather evidence of the benefits of service design and co-design. Third, the pressured timescale and limited healthcare resources challenge participation in co-design and the usage of design methods. Lastly, the design sprint in healthcare is an efficient process for knowledge and information sharing, understanding the design process, learning different design methods, and creating synergy among stakeholders. Design sprints can, therefore, be seen as an intensive introduction to the service design field and co-design.

The principle result of this research is a practical framework for the early phase of healthcare-related service design – before the actual development process. The framework introduces three main sub-phases: benchmarking, preparation, and design sprint. The framework allows for observing the different levels of service ecosystems, clarifying the early phase of healthcare-related service design, such as the dimensions of the service to be developed and the resources needed during the development process, and discussing the design methods suitable for everyday work.

***Keywords:*** service design, co-design, healthcare service development, design process, design sprint

# Tiivistelmä

Terveydenhuollon organisaatiot ovat jatkuvien uudistuspaineiden alla. Kehitettävän kohteen mittasuhteet voivat vaihdella sairaalan opastauluista valtakunnallisiin sosiaali- ja terveydenhuollon uudistuksiin. Palvelumuotoilu ja yhteissuunnittelu tarjoavat yhden tavan tutkia ja kehittää terveydenhuollon palveluita. Nämä erilaiset kehittämisen tavat voivat tukea ja innostaa ihmisiä osallistumaan kehittämisen prosessiin.

Väitöskirjassa tutkittiin terveydenhuollon palveluiden kehittämisprosessin alkuvaihetta terveydenhuollon organisaatiossa. Tutkimus rajattiin erityisesti terveydenhuollon ammattilaisten näkökulmiin, sekä siihen, millä tavoin ammattilaiset voidaan tutustuttaa palvelumuotoiluun ja yhteissuunnitteluun, ja miten herätetään heidän kiinnostuksensa muotoilulähtöiseen kehittämistoimintaan. Tästä lähtökohdasta syntyi tutkimuksen pääkysymys: miten palvelumuotoilun ja yhteissuunnittelun lähestymistavat voivat tukea terveydenhuoltopalveluiden kehittämisen alkuvaihetta?

Väitöskirja on artikkelipohjainen. Sitä ohjaa konstruktivistinen paradigma. Tutkimusstrategia on laadullinen, ja sen metodologisia valintoja ovat etnografia ja tapaustutkimus. Väitöstutkimus on jaettu artikkeleiden mukaan neljäksi osatutkimukseksi. Ensimmäisessä osatutkimuksessa tarkasteltiin palvelumuotoilun työkaluja ja yhteissuunnittelun tapoja sairaalan johtamiskäytäntöjen tukemisessa ja kehittämisessä. Toisen osatutkimuksen tavoitteena oli ymmärtää, miten potilaiden kokemukset ja yhteissuunnittelun menetelmät on otettu huomioon sairaalanrakennusprojektin esisuunnitteluvaiheessa. Kolmannessa ja neljännessä osatutkimuksessa toteutettiin kolme muotoilusprinttiä. Niiden kautta tarkasteltiin muun muassa terveydenhuollon ammattilaisten osallisuutta osana muotoilusprinttiä sekä sitä, mitkä ovat muotoilusprinttien vahvuudet ja heikkoudet erityisesti terveydenhuollon palveluiden kehittämisessä.

Näiden osatutkimusten kautta kiteytyivät vastaukset tutkimuskysymyksiin. Tutkimustuloksina kyettiin osoittamaan, että vertailuanalyysi, eli benchmarking, on tärkeä prosessi niin sairaalan

johtamiskäytäntöjen kehittämisessä kuin toimivien muotoilulähtöisten menetelmien valinnassa kehittämisprosessin aikana. Muotoilun menetelmät osoittautuivat tavaksi luoda ja jakaa visioita, ymmärtää palveluekosysteemejä, konkretisoida palveluja ja kerätä todisteita palvelumuotoilun ja yhteissuunnittelun hyödyistä. Tulokset osoittavat, että aikataulupaineet ja rajalliset terveydenhuollon resurssit hankaloittavat yhteissuunnitteluun osallistumista ja muotoilun menetelmien käyttöönottoa. Terveydenhuollon muotoilusprinttien avulla voitiin edistää tiedon jakamista, muotoiluprosessin ymmärtämistä, erilaisten muotoilun menetelmien oppimista sekä sidosryhmien välisen synergian rakentamista. Muotoilusprintit voidaankin nähdä intensiivisenä johdatuksena palvelumuotoiluun ja yhteissuunnitteluun.

Tutkimuksen päätuloksena luotiin käytännönläheinen viitekehys terveydenhuollon palvelumuotoilun alkuvaiheen tueksi – ennen virallisen kehittämisprosessin käynnistämistä. Viitekehys muodostuu kolmesta vaiheesta: vertailuanalyysi (benchmarking), valmistelu ja muotoilusprintti. Viitekehyksen avulla voidaan tarkastella palveluekosysteemien eri tasoja sekä sitä, miten alkuvaiheen suunnittelua voidaan selkeyttää esimerkiksi tarkastelemalla kehitettävän palvelun mittasuhteita ja kehittämisprosessin aikana tarvittavia resursseja sekä työarkeen soveltuvia muotoilun menetelmiä.

***Avainsanat:*** palvelumuotoilu, yhteissuunnittelu, terveydenhuollon palveluiden kehittäminen, muotoiluprosessi, muotoilusprintti

# Acknowledgments

This academic journey has planted lifelong roots that keep me standing even in a high wind. These roots have grown strong and long. I would like to take this opportunity to thank those whose existence has been significant on the journey and who, with their own skills and essences, have strengthened my roots. These words are the final written rows in my dissertation but are definitely the most important to me. With a warm heart, I would like to thank the following people.

I have been lucky to have three intelligent supervisors, who are strong and empathetic women, to guide my dissertation. Thank you, Professor Satu Miettinen. You have supported me from the beginning and believed in me. You've given me enough freedom to take my own path but have shown directions whenever my compass hasn't known which way to point. You have shown me places from which I have drawn experiences and created important relationships for the future. I am forever grateful for these opportunities and moments together. Thank you, Emerita Professor Kaarina Määttä. You came along in the final stages of my dissertation process, when my head was full of more or less fuzzy ideas. You taught me to think more clearly, to believe in myself, and to trust that my research was almost complete, even though I still had a long way to go. Your positive essence has left me with good memories. Finally, the most important and significant woman on my research journey is Adjunct Professor Melanie Sarantou. I got to know you at the beginning of my postgraduate studies, when I was looking for myself and I was already changing direction. You pointed me toward the paths I could walk. You've been there when I've been lost and brought me forward. You have been a piece of gold on this journey, and there are not enough words to say how grateful I am to you. Thank you, Melanie!

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Dr. Katja Battarbee, for your detailed thoughts on my dissertation, which evoked both insights and thoughts about my work. Your recommendations for improvements were valuable and also provided lessons for the future.

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My last lines of words of gratitude are addressed to my friends and family. Thank you to the lovely friends who have curiously asked me how my dissertation is progressing. Thank you, friends, at whose request I have turned off the computer, gone climbing, jogging, or to the gym. There is one special friend in this world. Along the way, my hand has been held firmly by my friend for over 27 years. Thank you my dear soul sister Martta Kivekäs. I have been able to lift my burden from my shoulders, handing it to you for a moment, so I could breathe better at times. It is an honor for me to show your soulfulness as a handprint on the cover image of my dissertation. Thank you for being part of this journey almost every day.

Thank you, Mom and Dad. You have been my support since my journey took me to Rovaniemi to study in 2007. At the time, no one yet had any idea how long my journey would take and what kinds of milestones there would be. I am happy to see how proud you are of my achievement. Thank you, Henri, my brother. Even though I haven't shared things with you about my life (like my dissertation), you've been on my mind and in my heart more than you think. Thank you to my parents-in-law Pirjo and Seppo for the discussions and for taking care of us in Rovaniemi.

Finally, I would like to thank my husband Tapio. Thank you for giving me space but also for making sure I was away from my work. However, you haven't questioned if I dug up the computer in the Norwegian fjords or continued an article until late at night. You've taken good care of me, and I hope I can give something back to you in the future. Thank you, Draikka the dog, for keeping your routines up, demanding outdoor walks and ball games every now and then. The best ideas and conclusions have come to my mind while walking with you.

Mira Alhonsuo

Rovaniemi, 20th October 2021

# List of Original Publications and the Author's Contributions

This dissertation is based on the following four peer-reviewed publications. Here, I have labeled the articles with the numbers 1–4 and will refer to them in the same way in the text. The author's contributions are described after each article.

**Article 1**
Miettinen, S., & Alhonsuo, M. (2019). Service designing a new hospital for Lapland Hospital District. In M. A. Pfannstiel & C. Rasche (Eds.), Service design and service thinking in healthcare and hospital management: Theory, concepts, practice (pp. 481–497). Cham, Switzerland: Springer Nature. https://link.springer.com/chapter/10.1007%2F978-3-030-00749-2_27

As the second author, my contribution to the work was as follows:
In case study 1, I did the interviews and analyzed the interview data, and in case study 2, I planned, collected, and analyzed the data from the entire case study. In the writing process, I wrote the case study parts and contributed in a minor way to other sections.

**Article 2**
Alhonsuo, M., & Colley, A. (2019). Designing new hospitals – Who cares about the patients? In F. Alt, A. Bulling, & T. Döring (Eds.), MuC'19: Proceedings of Mensch und Computer 2019 (pp. 725–729). New York, NY: Association for Computing. doi:10.1145/3340764.3344898

I had the primary responsibility for the article; I collected and analyzed interview data and observed a workshop. I wrote the main text in collaboration with the second author, who provided generous help and support. I focused more on the method and results, and I rendered support with the related work section and discussion section. I also did the poster visualization and presentation at the conference.

**Article 3**
Alhonsuo, M., Hookway, S., Sarantou, M., Miettinen, S., & Mõtus, M. (2020). Healthcare design sprints: What can be changed and achieved in five days? In S. Boess, M. Cheung, & R. Cain (Eds.), Synergy – DRS International Conference 2020, August 11–14, 2020 (pp. 975–991). doi:10.21606/drs.2020.231

**Article 4**
Alhonsuo, M., Sarantou, M., Hookway, S., Miettinen, S., & Motus, M. (2020). Participation of healthcare representatives in health-related design sprints. In J-F. Boujut, G. Cascini, S. Ahmed-Kristensen, G. V. Georgiev, & N. Iivari (Eds.), Proceedings of the Sixth International Conference on Design Creativity (ICDC 2020), August 26–28, 2020 (pp. 44–51). doi:10.35199/ICDC.2020.06

As the first author of articles 3 and 4, my main responsibilities were as follows. In case study 1, I planned, collected, and analyzed the research diary data. I designed and conducted the observation notes and the unstructured interviews during the design sprint, which I analyzed independently. In case study 2, I collected and analyzed the research diary data. I wrote the observation notes and conducted the unstructured interviews during the design sprint. I analyzed these data independently. In case study 3, I planned, collected, and analyzed the research diary data, which was done after a design sprint. As a main facilitator of the design sprint (case study 3), I reflected on my own experiences after the design sprint. I also conducted the interviews during the design sprints with note-taking assistance provided by a colleague. I analyzed the data independently. During the writing process, I had the main responsibility for both articles (3 and 4), but I collaborated closely with the second and third co-authors. I presented both papers at online conferences.

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Picture: Maileena Tuokko

# 1. Introduction

## 1.1. Research Focus and Context

Healthcare is a complex field of multi-layered processes, varieties of actions, and people with different backgrounds and expertise (Bowen et al., 2013). As a service, it is universally used and has an impact on our economies and quality of life (Berry & Bendapudi, 2007), and it tackles, for instance, continuing growth, the aging population, service reforms, new technologies, and above all, internal and external pressures to change (Fry, 2019). These challenges push healthcare toward more innovative solutions, which often might be difficult to implement not only due to organizational resistance to change (Vink, Joly, Wetter-Edman, Tronvoll, & Edvardsson, 2019; Wang, Lee, & Maciejewski, 2015) but also a lack of focused and secure management (Fry, 2019; Nilsen, Dugstad, Eide, Gullslett, & Eide, 2016). These challenges can also be seen as "wicked problems" that are difficult or impossible to solve. That is, as there are no unambiguous criteria or agreement on the solution among stakeholders, it is difficult to say when a problem is solved, and there is no option to revert the solutions to the former phase (e.g., Rittel & Webber, 1973). Although wicked problem is already an established term in design, in this research, I am generally talking about complex services.

Design and healthcare have had a long history together in healthcare improvement (Rowe, Knox, & Harvey, 2020). The objective of healthcare-related development can vary significantly and may consist of the physical architecture and interior design or the holistic service journey from the patient's perspective and the different touchpoints related to the service. It may also consist of all of the above elements together, where the service

itself is not confined to the clinical encounters and physical boundaries of the building but extends to a large number of different interfaces and interactions (Wolstenholme, Cobb, Bowen, Wright, & Dearden, 2010). This is a good illustration of how multi-leveled and complex healthcare services are. Public healthcare has already applied patient involvement and co-design approaches (Nesta, 2013), but heavy pressure is put on designers and their success in "creating something that does not yet exist" (Nelson & Stolterman, 2012, p. 28). Although many studies present evolving but nevertheless critical perspectives on the development of healthcare services, there remains much work to be done to determine how service design and co-design approaches could support healthcare-related development even further.

Previous studies have discussed where service design should have its place and impact in the development process (e.g., Almqvist, 2017, 2020; Clatworthy, 2013; Raun, 2017 ; Yu & Sangiorgi, 2014). In fact, some of the recent literature has noted that the early phase of the design process, the so-called fuzzy front end, has already been investigated and received a lot of attention (Alam, 2006; Almqvist, 2017, 2019; Clatworthy, 2013; Raun, 2017), and it is, therefore, time to focus on the later phases where implementation occurs, because design has not reached the desired capacity (Holmlid & Malmberg, 2018; Malmberg, 2017). However, the front end is the most information intensive. Here, different types of information from internal and external sources are brought into the project (Zahay, Griffin, & Fredricks, 2004), the major decisions are made (Clatworthy, 2013), and, for instance, teams and stakeholders get to know not only the given brief but also each other. I believe that there are opportunities for development in the early phase of the design process to engage stakeholders and facilitate their participation in service design and co-design and, thus, drive change in healthcare organizations.

A change in healthcare is truly needed (Bate & Robert, 2007; Fry, 2019; Jones, 2013) , but there is no standard or equal way to approach these changes. As highlighted in the literature, change and transformation in an organization happen through learning (Kuure, Miettinen, & Alhonsuo, 2014), and staff management is necessary when changes must be adopted and implemented in the healthcare staff's work life (e.g., Nilsen et al., 2016; Stickdorn & Schneider, 2011), but despite this, there is no one way to approach the changes. In design, the processes cannot be standardized due to the very different needs for development and multi-layered and siloed service structures. However, when aiming for change in complex organizations, such as healthcare organizations, we need to understand the

service ecosystem, which is impossible to design in its entirety including contexts and actors (Polaine, Løvlie, & Reason, 2013). By outlining the levels of different service ecosystems, we can understand more precisely the different layers and the relationships between them.

This research has broken down the field of development into three different service ecosystem levels to support healthcare-related service development. These service ecosystem levels are, as Beirão, Patrício, and Fisk (2017) has formulated, the micro, meso, and macro levels. Here, the micro level focuses on physicians and customer exchange services, service touchpoints, and situations within a hospital. The meso level considers hospital and other healthcare organization interactions, which can be at the regional and local levels and involve public and private sector collaboration. The most challenging level is the macro level, which incorporates the national level with the government and Ministry of Health. The division into service ecosystem levels facilitates perceiving different and complex healthcare services, and consequently, the achievement of objectives is more realistic. In any case, practical approaches are needed to perceive these levels and to understand the values of service design and co-design. Therefore, this research proposes an alternative approach.

This research specifically focuses on and examines the early phase of healthcare-related service design to determine what is needed before starting an actual design process for healthcare service development in an organization and integrating people from different backgrounds and with different expertise. It focuses on the phase even earlier than the so-called fuzzy front end (e.g., Cooper & Kleindschmidt, 1986; Smith & Reinertsen, 1998). I am interested in seeking ways to interest hospitals in what service design and design tools can enable in healthcare service development and, through that, bring patients, relatives, and others into co-design cycles and develop better healthcare experiences for the future. I have realized that something needs to be done before the actual healthcare service design process can start—a process in which end users (e.g., patients or family members) and other important stakeholders are more closely involved in the co-design. There is a crucial phase at the beginning of service development that should be dedicated to people working in healthcare sector, such as doctors, nurses, support staff, and management. The phase focused on understanding, evidence gathering, learning, and knowing each other is the phase that I will discuss in more detail in this dissertation.

Intertwined around this challenge are four academic articles that together form the practical framework that is the principle result of this research. These academic articles highlight three main theories: service

design, co-design, and healthcare services. Service design has been a natural part of my research since the early stages of my career, but it also provides a strong theoretical field for service development, and thus, also has strong roots in this research. Co-design is widely used in the healthcare domain to understand the bigger picture of the field (e.g., Pirinen, 2016; Trischler, Dietrich, & Rundle-Thiele, 2019; Vaajakallio, Lee, Kronqvist, & Mattelmäki, 2013) and requires creative initiative from the teams, which include researchers, designers, and other important stakeholders, who are "experts of their experiences" (Sleeswijk Visser, Stappers, Van der Lugt, & Sanders, 2005, p. 127). Healthcare services are discussed through the lenses of change and transformation, external and internal pressure for change, and existing approaches for developing such services. This research does not focus on the different theories of change and transformation but, rather, sees these as fields where service design is used and an area where behavior is influenced in one way or another.

The four academic articles are the fundamental basis of my research. Next, I will briefly introduce them. Sub-study I of this research investigated the role of service design tools and collaborative practices in supporting and developing service journeys and the hospital management practice. The article "Service Designing a New Hospital for Lapland Hospital District" (Miettinen & Alhonsuo, 2019) was published in the book Service Design and Service Thinking in Healthcare and Hospital Management: Theory, Concepts, Practice, which targets hospital managers, process managers, service designers, organizational policymakers, leaders, and researchers. The chapter of this Springer book has a very practical slant. It introduces two case studies: (1) Benchmarking healthcare in Silicon Valley and (2) Rehabilitation processes of children living in Lapland. The case studies reveal two significant areas: benchmarking and visual design methods. Benchmarking is a fast, cost-effective approach used to understand the best practices and presents evidence of different management practices based on lean, agile, and human-centered approaches and the quality, effectiveness, and timely availability of services. Visualized design methods and concretization tools support the communication and perception of a multi-layered, complex organization. In addition, workshops where the visualized data are represented and discussed are a crucial starting point in meso-level development, where actors from public and private hospitals, patients' associations, or information technology (IT) vendors collaborate at the organizational, regional, and local levels (Beirao et al., 2017).

The second article, "Designing New Hospitals – Who Cares about the Patients?" (Alhonsuo & Colley, 2019), is a short paper that was

presented as a poster. It describes sub-study II of this research, which investigated patients' experiences in the pre-construction phase of new hospital and healthcare service design. Although this research did not address the role of patients in the early development, I became interested in new hospital design and construction projects, especially in how experts in this context understand, for example, the values of co-design with patients and their participation in the construction projects. Even though previous studies stressed the potential benefits of patient-centered co-design (e.g., Donetto et al., 2015), the results of case study 2 of this sub-study showed the diversity of opinions and challenges regarding patient involvement in these kinds of hospital construction projects. The sub-study emphasized that challenges, such as limited timescales and resources, were faced in the use of co-designing and patient-centered methods. We found that a good practice for concretizing healthcare-related services in the construction phase, where many ideas are still quite abstract, is virtual reality (VR) and physical replicas of, for example, treatment rooms. This article creates an understanding of how differently design methods are utilized in such a massive, complex, and expensive development project as the construction of a new hospital.

The third and fourth articles focus on healthcare-related design sprints. As mentioned previously, change and transformation are topics covered by this research, and thus, design sprints were investigated as good opportunities to advance cultural shifts in organizations (Kutvonen, 2017). I had an opportunity to investigate healthcare-related design sprints even further, which was ultimately a crucial part of the outcomes of the research. The third article (sub-study III), "Healthcare Design Sprints: What Can Be Changed and Achieved in Five Days?" (Alhonsuo, Hookway, Sarantou, Miettinen, & Motus, 2020) presents an overview of the strengths and weaknesses of healthcare-related design sprints. I discuss the challenges for change in design sprints and how the synergy among participants was created through an agile way of doing. The final article (sub-study IV), "Participation of Healthcare Representatives in Health-related Design Sprints" (Alhonsuo, Sarantou, Hookway, Miettinen, & Motus, 2020) zooms in on a very practical level of the design sprints and observes the roles of healthcare professionals from the viewpoint of how they can support design sprints in the development of healthcare-related services.

This academic research is written with a very practical emphasis and aims to reach people working with design in the healthcare field, such as healthcare practitioners, academics, and students. It does not provide

ready-made answers or truths but, rather, constructs my learning as an inspiration to tackle the early phase of the development process. Even though the focus is strongly linked to healthcare service design, the outcomes can be scaled across other organizations. I hope you enjoy the journey and where this research will take you.

## 1.2. My Research Journey

During my journey as a researcher, I have had opportunities to work with multi-disciplinary teams and get to know people with different research interests, backgrounds, and experiences. I have heard of and seen many inspiring academic journeys. These stories have helped me find my own research interest and have opened doors in the healthcare field—not only in Finland but also abroad. In 2014, after completing my health-related master's thesis in service design, I knew I wanted to dig deeper into the healthcare field, not knowing how overwhelmed I would be by the number of important and urgent challenges .

A typical tendency for service designers is to observe services around you—especially the ones in which you are very interested. This happens to me, too. I passionately observe healthcare services, with which I and people close to me come in contact. I conducted unofficial empirical research, for example, in an emergency polyclinic in Cape Town, South Africa, after I had badly injured my hamstring; in a small clinic in Vancouver, Canada, when I had high fever; and also, in my hometown of Rovaniemi when I had terrible stomach pain. I observed the healthcare my dear grandfather received in his last years. Observation has been surprisingly successful, but it has included many sad stories from people around me. People have been willing to share their experiences with me because of my research interest, knowing that due to ethical considerations, I must keep their stories inside me and not make them part of my research. Those stories have pushed me to continue my research and have reminded me many times why I am doing this. They have given me motivation to continue even though the road has been rocky. Here, I would like to express my heartfelt gratitude to those anonymous people.

The complex healthcare PhD journey was not straightforward. I was overwhelmed with the numerous interesting areas and caring processes to consider. I wanted to start with palliative care and end-of-life experiences, but I realized quite soon that I was not ready to jump into that dark water. I replanned my research and decided to study hospital construction projects

and new hospital design through a service design lens, but I realized that those projects would take too many years to complete. I needed to rethink and adapt. Another door opened, and I had an opportunity to be part of an international team, where we co-designed healthcare through design sprints. That path was an excellent opportunity and helped me to better focus my research objectives. I knew that my research scope was broad but valuable for healthcare and a wider audience.

I have completed many projects, case studies, and study courses in the healthcare field and have trained healthcare professionals for service design in hospitals. Yet there are a few things that continue to surprise me. Over the years, I have been questioned repeatedly about the relevance of service design by healthcare professionals asking what service designers can do without having an overall understanding of the internal processes of a hospital or how design approaches can really change things as complex as healthcare processes. Even though these direct questions were indicative of legitimate concerns, I also saw that they reflected a genuine curiosity about service design, which ultimately led to opportunities to conduct the case studies and workshops in the field of healthcare in different development projects. In healthcare, I have also heard comments like "I didn't know that our patients think in that way" (field notes), and even close associates have said, "I have not dared to share this experience earlier to anyone" (field notes). I have also seen that there have been some limitations, from a hospital perspective, to bringing patients into the co-design for the very first time. However, when this step has been taken, the feedback from the healthcare professionals has been very positive, and they have been willing to co-design more with patients. Last but definitely not least, I have witnessed the change in how healthcare practitioners and professionals see the value of and opportunities in design methods. They have been surprised not only by the concrete and visual tools' ability to help them perceive the complexities but also the outcomes of the design process. It is not only the service innovation implemented in everyday practice but also the learning and change to what has happened during the process that have been the most gratifying for me.

Indeed, my journey has not been clear and straightforward and it may well be illustrated with the same fuzzy front end picture that I have introduced in the theories of my research. The following Figure 1 shows my research journey and its timeline.

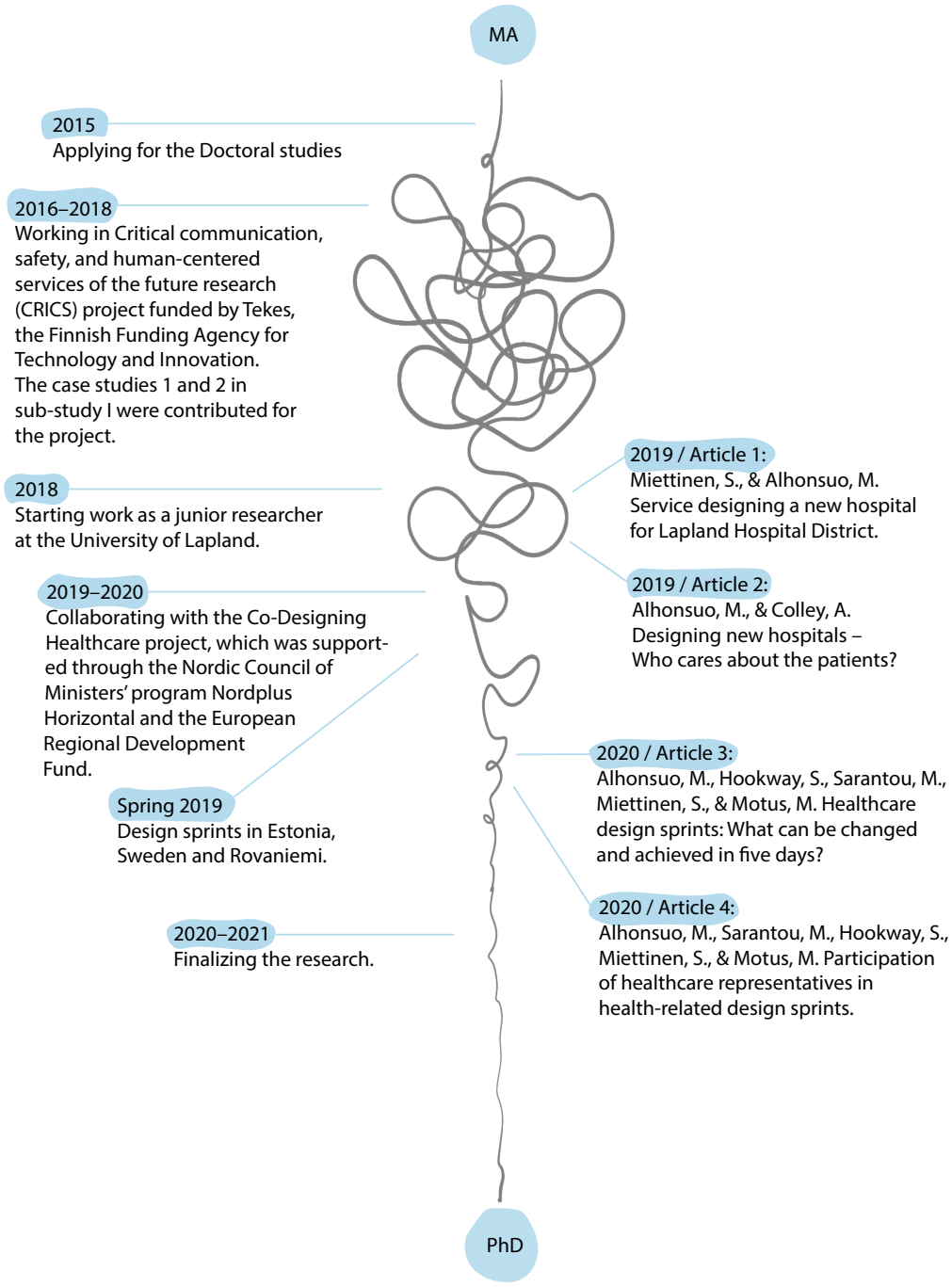



***Figure 1.*** My research journey. (Author's illustration)

## 1.3. Research Questions and Aims

The main objective of the research is to describe healthcare-related development as a part of co-design and service design approaches, especially from the process point of view. In this section, I will introduce the main research question and four sub-questions that were formulated from the sub-studies discussed in this research and will elucidate the aims of each research question.

The main research question, which overarches the entire research, is as follows:

***How can service design and co-design approaches support the early phase of healthcare-related service development?***

The aim of this question is to derive an understanding of the opportunities, needs, and values in the very first phase, when the collaboration among service design, co-design, and healthcare-related service development is discussed. Through this question, I open a discussion where design processes are criticized for not considering the aspect of bringing a design approach into the development process of an organization that is not familiar with it. I aim to investigate how to support the first steps and foster better collaboration between the fields of practicality and complexity, especially from the fuzzy front end point of view. This article-based research introduces four academic publications where four sub-questions are formulated. Below, I explain the research questions and aims of each sub-study.

Sub-study I:
***How can service design tools and collaborative practices be used to support and develop customer journeys and hospital management practices?***

Sub-study I aimed to investigate agile and human-centered services by using a service design approach in the Lapland Hospital District. This sub-study examined two case studies that were done through development projects in Lapland Central Hospital. The first case study involved developing management processes for the new hospital by using a benchmarking process as an approach to understand the healthcare-related service innovations in other hospitals and different practices used to implement the service innovations. The second case study investigated

children's rehabilitation services in Lapland municipalities and how the service design tools helped to visualize the existing healthcare ecosystems and tackle challenges.

Sub-study II:
***How are patients' experiences considered when designing new hospitals and healthcare services?***

Sub-study II aimed to understand the patients' roles and the use of co-design methods in new hospital projects. We approached the question through two new hospital builds to identify who really cares about the patients' experiences when designing new hospitals and healthcare services. Although the end result of this research would delve into the roles of healthcare professionals and designers in the early stages of the development process, and would not provide the tools to implement patient-centered research, this sub-study was important for understanding the needs of healthcare practitioners in such complex projects. In this case, we were not considering only the exterior architecture to interior decoration but also interactions and holistic healthcare processes. In addition, the field includes different technical and construction professionals who are active and crucial parts of the entire new hospital development project, and this also had to be considered.

Sub-study III:
***What are the strengths and weaknesses of health-related design sprints?***

Sub-study III aimed to discuss what can be changed and achieved in the intensive and health-related design sprint process and what the strengths and weaknesses of the process are in relation to service development. We examined the outcomes from the practical level of design tools and considered the value of the design sprint approach in addressing challenges for change in healthcare organizations and increasing synergy in agile ways of co-designing. The design sprints in sub-studies III and IV were intended to develop joint research and innovation initiatives within Estonia, Sweden, and Finland, the countries that participated in the project. In addition, the design sprints were devised to engage all relevant stakeholders and support interaction among them to increase innovative capacity through knowledge transfer.

Sub-study IV:
***How can healthcare representatives support design sprints in the development of healthcare-related services?***

Sub-study IV aimed to understand the value of design sprints from the perspectives of various healthcare representatives. In addition, we addressed what roles we can identify from the hospital side and how these different roles support healthcare-related service development through a design sprint approach. The aims of the design sprints were described in the previous paragraph on sub-study III.

## 1.4. Research Limitations

This research was narrowed down to specifically examine the early phase of healthcare-related service design and determine what is needed before starting a successful design process in a complex organization and integrate people from different backgrounds and with different expertise. In this brief section, I will introduce the signposts that guided me throughout the research.

**Service design** is a human-centered approach to understand the needs of various stakeholders, and it focuses on value creation, aiming for effective and efficient services. Service design is the design field I have been studying and focusing on since 2012, when I started my academic career as a research assistant at the University of Lapland.

**Healthcare service development** is essential in a changing world that challenges its structures. It has been my passion since I started my master's thesis in the Emergency Polyclinic at Lapland Central Hospital in 2013, which I completed in 2014.

**Co-design** is a natural part of service design that enables experts and stakeholders to actively take part in the service development, and requires creative initiative from the teams, which include researchers, designers, and other important stakeholders. Through co-design, participants' voices can be heard better, and they can impact different phases of the design process.

The **design process**, both in its simplicity and complexity, has interested

me for many years. As an illustration, design processes are easy to follow and clear, but in real life, they may turn out to be something completely different. The extensive prior work on design processes discusses, for instance, where we should allocate resources or skills to achieve better dialogue, service innovations, or implementation. There are constructive and ongoing debates on this topic, which I have engaged in first-hand.

**Design sprint** is a design approach explored in the main case studies in sub-studies III and IV. Intensive design sprints were utilized in three countries and, because of that, were relevant cases to investigate as part of the early phase of healthcare-related development. Design sprint is typically five-day-long design process, which includes including the elements of agile, design thinking, and lean start-up.

**Fuzzy front end** is a "pre-phase" in the design process where many activities take place. In this phase, more effort is put into understanding the existing context of experience, defining different future opportunities and what is the right thing to design.

## 1.5. Structure of the Dissertation

This dissertation is structured into six sections as follows. Section 1. Introduction has described the background, my personal research journey, and limitations of the research. It has also explained the research questions and my contributions through the four sub-studies. Section 2. Theoretical background describes the three main theoretical fields of the study: service design, co-design, and healthcare services. The service design subsection includes a short history of service design, how different processes have evolved in design and development, and the set of design methods and tools to scale throughout the services. The co-design subsection introduces its place in the design field and how it is utilized in service design and healthcare. The following subsection on healthcare services first discusses healthcare service overall, the meaning of change and transformation in healthcare organizations, and how to develop healthcare services.

Section 3. Research design introduces the core elements of research design, the worldview of this research, and methodological choices. In addition, the four sub-studies are discussed in this section, such as how the data were collected and analyzed in each one. At the end of the section, I describe ethical considerations and evaluations. Section 4. Results

presents the main findings and outcomes from the four sub-studies, which are contained in their own respective subsections. At the end of Section 4, I summarize the key findings using tables. Section 5. Discussion presents the main empirical findings and describes them in terms of the theoretical framework. Here, the practical framework is presented. Finally, Section 6. Conclusion wraps up the dissertation by discussing its impact and offers suggestions for future research.


Picture: Maileena Tuokko

# 2. Theoretical Background

The following subsections define the theoretical background of the research, which comprises service design, co-design, and healthcare services. First, the service design subsection introduces a brief history of the service design approach, its different processes in design and development, and the most commonly used design methods when interplaying between different service levels. Second, the co-design field is discussed concerning its connection to service design and healthcare. Third, healthcare services are examined from the perspectives of organizational change and healthcare development.

## 2.1. Service Design

> The difference between products and services is more than semantic. Products are tangible objects that exist in both time and space; services consist solely of acts or process(es), and exist in time only. The basic distinction between "things" and "processes" is the starting point for a focused investigation of services. Services are rendered; products are possessed. Services cannot be possessed; they can only be experienced, created or participated in.
> (Shostack, 1982, p. 49)

These words opened Shostack's (1982) article "How to Design a Service." Service design as a design discipline has taken a huge step over the last two decades, since academia and the public and private sectors around the world realized that services dominate economic growth (Bitner, Ostrom,

& Morgan, 2008). Besides service design, the disciplines of marketing, management, and engineering have had great input into the growing service sector (Meroni & Sangiorgi, 2011). According to Edvardsson, Gustafsson, and Roos (2005) and Mager (2004), the role of service design should be seen more as a complementary field in service development, management, and marketing. Service design aims to systematically apply design methods and principles to the design of services, and it "integrates the possibilities and means to perform a service with the desired qualities, within the economic and strategic intent of an organization" (Holmlid & Evenson, 2008, p. 341). Service design is a human-centered, collaborative, and creative approach (Blomkvist, Holmlid, & Segelström, 2010; Meroni & Sangiorgi, 2011) and is also considered a way of thinking as a part of practices for service innovations (Stickdorn & Schneider, 2011). Recently, service design has been proposed as a multidisciplinary practice in service innovation (Ostrom et al., 2015; Wetter-Edman et al., 2014), which uses "'designerly' ways of changing and innovating" (Sangiorgi & Junginger, 2015, p. 166).

The definition of service design has not always been straightforward. Over the years, there have been discussions, for instance, on different ways of approaching service design and the role of service from various disciplinary perspectives (e.g., Bitner, Booms, & Tetreault, 1990; Clatworthy, 2010; Mager, 2008; Morelli, Götzen, & Simeone, 2021), and how the work of service design is understood (Kimbell, 2011a). As an example, Kimbell (2011a) divided service design into two main tensions, where the first tension focuses on "understanding design either as problem-solving that aims to realize what has already been conceived of, or as an exploratory enquiry involving constructing understanding about what is being designed, involving end users and others in creating meaning," and the second considers "a tension between the view that the distinction between goods and services matters significantly, or that service is better understood as a fundamental activity with multiple actors within a value constellation" (p. 45).

Another widely referred to perspective comes from Vargo and Lusch (2004, 2008), who argued that there are two different dominant logics: a goods-dominant logic (G-D logic) and a service-dominant logic (S-D logic). Briefly, G-D logic can be seen "as a category of market offerings" (Edvardsson et al., 2005, p. 118); in other words, it is a view of products. Here, the purpose of economic activities is to distribute goods that can be sold and where users are passive in the process. In S-D logic, in contrast, services are the primary unit of exchange where users and

customers are actively part of the services (Morelli et al., 2021; Vargo & Lusch, 2004), and thus, "value creation is best understood from the lens of the customer based on value in use" (Edvardsson et al., 2005, p. 107). Thus, services can be understood as a dynamic process where value is co-created (Vargo & Lusch, 2004). S-D logic was first introduced by Vargo and Lusch (2004, 2008) in the early 2000s, when the roles of services and goods were analyzed and identified.

S-D logic identifies service ecosystems as the "unit" of analysis for value co-creation (Vargo & Lusch, 2017). The concept of a service ecosystem offers a framework for research focused on, for example, resource integration as an important means of connecting people and technology within and among service systems (Vargo & Akaka, 2012), or as Vargo and Lusch (2014) described it, the service ecosystem is a "relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (p. 24). The ecosystem framework can provide crucial insights when innovating services systematically and describing healthcare environments more accurately (Miettinen & Alhonsuo, 2019). Here, we must understand that healthcare is not only a multi-layered process in a hospital context but also part of a bigger picture as a component of the social welfare and public service structure.

A complex ecosystem in its entirety including contexts and actors is impossible to design (Polaine, Løvlie, & Reason, 2013), and the term ecosystem needs to be viewed critically, as it may be misleading. Mercan and Göktas (2011) criticized the popularized term "ecosystem," whose origin is in biology and refers to a holistic natural and sustainable system, which is what healthcare may be striving toward. My research follows Beirao et al.'s (2017) three levels of the service ecosystem: the micro, meso, and macro levels. In this dissertation, I will utilize and describe these levels and mirror them in the healthcare context to better understand the scales of development. Here, the micro level includes patient–doctor interactions or situations within the hospital where touchpoints have an important role in the internal processes. Touchpoints are tangible or intangible interactions or contact points between the end user and the service provider (Stickdorn & Schneider, 2011). As a level, it is usually the simplest to design and work with because the important stakeholders are easily reachable.

The meso level focuses on hospital and other healthcare organization interactions and, thus, reaches the regional and local levels. This can be collaborations between public and private hospitals, patient associations, and IT vendors. This level already requires more preparation compared to

the micro level that takes into account the possibilities and needs of other and different hospitals for both smooth collaboration and a commitment to developing their operations. The highest and most complex level is the macro level that considers government and other organizations' actions and, thus, also describes well the definition of wicked problems, as it involves political decision-making.

This three-level model has similarities with the service definitions of Morelli, Götzen, and Simeone (2021) identifying services as (1) interactions between unbalanced roles (e.g., patient and doctor); (2) an infrastructure that supports the interactions or other service activities; and (3) a systemic institution that organizes the service activities and processes (pp. 11–12). These three areas are extremely important in service design, and they all aim to create value through the different levels. The levels define different possible contexts for design and can be seen as an ecosystem that is related to the production of value. Figure 2 visualizes the three levels of a service ecosystem in the healthcare field, which is also considered later in this dissertation.

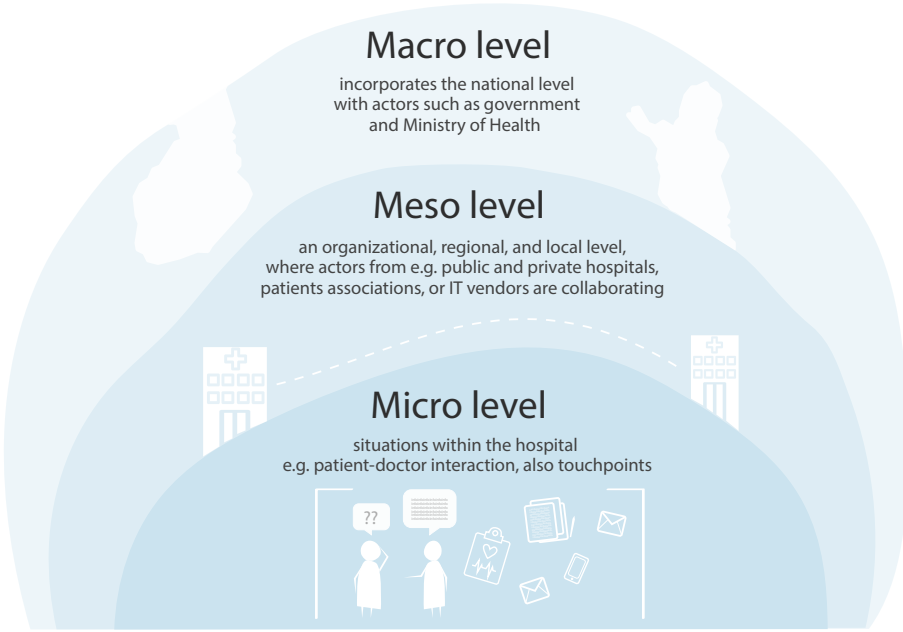



***Figure 2.*** An overview of the micro, meso, and macro levels in healthcare. (Author's illustration)

Value is co-created at these levels; however, from my experience, they require a slightly different approach and understanding from the other

parties involved in the development process. From this point of view, it is important to clarify one's own understanding of what can be designed, how, and with whom. It is especially important in fields where service design is not well known. This issue also overlaps with other areas of my research and will be addressed in the discussion.

### 2.1.1. Role of the Service Designer

The service designer's role is no longer one of an expert who designs and delivers solutions but of a facilitator who guides stakeholders through the co-design process (Yu & Sangiorgi, 2017). Service designers "collect, listen to, and synthesize different perspectives to support the non-designers' creative efforts and guide the different inputs toward a valuable solution" (Malmberg et al., 2019, p. 9). They give people a space where they have permission and the power to influence a design process, and through cyclic co-design work, different design methods can be developed further to allow participation, engagement, and creativity (Miettinen, 2013).

Design thinking is an integral part of service design as well as the service designer's mindset. According to Miettinen, Rontti, Kuure, and Lindström (2012), the common characteristics of good design thinkers are empathy, integrative thinking, optimism, experimentalism, and collaboration. Design thinking should not be seen only as a mindset of service designers. The service designers must seek to transfer this mindset to other stakeholders and participants as well, because "Holistic service design is based on an interrelated and systematic approach starting with design thinking having user-driven design in its track" (Pfannstiel & Rasche, 2019, p. vi). Design thinking leads stakeholders in design teams through a systematic approach toward service innovation (Vetterli & Scherrer, 2019), and in the bigger picture, organizations must understand (service) design thinking to be able to redesign services in innovative ways (Clack & Ellison, 2019). Hence, service designers should consider the importance of design thinking at a very early stage in the design process.

The fields where service designers act are wide. For instance, they can work as in-house designers or consultants in private small and medium-sized enterprises (SMEs), large public organizations and industries, or associations or societies (clubs). The healthcare field, on which this research focuses, can also be referred to as having wicked problems (see, e.g., Buchanan, 1992; Rittel & Webber, 1973; Suoheimo, 2020), which means that these problems are highly "complex, intertwined

with many other problems, and probably not 'solvable' in the way we are used to thinking about solving problems" (Polaine et al., 2013, p. 186). In these complex contexts, service designers are engaged in situations where special skills are required, for instance, identifying the emotional skills of participants in workshops and co-creative practices (Soto, 2021). Synergy is also needed among participants and other involved stakeholders, and it can be created through design methods and design thinking. Here, as was determined in article 4 (sub-study IV) by Alhonsuo, Hookway, et al. (2020), the service designer's role is to boost the synergy within a team.

A typical way for a service designer to work is as an external consultant (Almqvist, 2019). Thus, service designers are often involved in the early phase of the development process; however, this has been criticized in many recent studies. The criticism highlights, for example, that the designer's job is to focus on identifying user insights and idea generation and then leave the development projects with user insight knowledge in their hands (Almqvist, 2017, 2020). This is called "user insight drift" (Almqvist, 2017, p. S2524), when the user's needs and service experiences are no longer linked and, thus, cannot have an impact on the final service solution and its implementation. The designer here is an important link between both the end users and the organization, for example. It does not matter if the designer is a consultant or a permanent player in the organization, but the deep and detailed information gathered by the service designer should not, in my opinion, be lost. It is important to emphasize the role of service designer throughout the development process and make this clear right at the beginning of the process.

Service designers can have an impact on peer-to-peer learning through collaborative work (Kuure & Miettinen, 2013) and the learning process of participants, which can support, for example, changes in co-design processes and services (Kuure et al., 2014). According to Sangiorgi (2011), the evolving field of service design is moving toward a form of design for transformation, where the service design is not only changing the service itself but also changing the capacity inside the organizations and communities to steer changes themselves. Service design is explored as a catalyst for organizational change and transformation (Junginger, 2015; Yu & Sangiorgi, 2018), but it requires stakeholders' participation in the service design process to impact and change behavior (Wetter-Edman, Vink, & Blomkvist, 2018). From this perspective, service designers are becoming increasingly needed in various areas of our social and economic systems, and thus, their capabilities should be explained in detail (Morelli et al., 2021).

In the literature aiming for change in healthcare organizations, we often encounter terms and theories related to, for instance, transformative change and transformational change (e.g., Sangiorgi, 2011), change management (e.g., Lin, Hughes, Katica, Dining-Zuber, & Plsek, 2011), organizational change (Julier, 2006), and institutional change (Scott, Ruef, Mendel, & Caronna, 2000). In this dissertation, I mainly refer to *change* and *transformation* as mentioned in the context and literature. Medina (2018) distinguished between the two terms as follows: *change* is, for example,

> Moving people from one department to another, adding or removing a layer in the hierarchy, assigning new managers, creating or renaming roles, recruiting some new people, or slimming down the organization, is about change. The essence is still the same, nothing new has been created from the original components. (para. 9)

*Transformation* in an organization is "changing the essence, about creating something new based on the old parts; it is about utilizing the potential and capabilities in a different way" (para. 10). Related to transformation, the literature has introduced transformative change and transformational change. As I also use these terms several times in this dissertation, I feel it important to clarify their meanings. Transformative change is a practical and strategic process that triggers transformation and effects change within an organization and, thus, can be seen as a broad-based change. Transformational change "alter[s] what we do, not just how we do what we do" (Moss, 2017, para. 6). It leads to transformation and reshapes processes and strategies and, thus, can shift the culture in an organization. With the latter term, the focus is more on the present and what is happening at the moment.

This research does not focus on the different theories of change and transformation but, rather, sees these approaches as an important part of service development and different levels of service ecosystems. Furthermore, when a service design consultant enters into a development project, they might not yet have any idea about what level of change or transformation relates to the development. This knowledge is important to understand and discuss at the early stage of the development process to ensure that the desired outcomes of the project can be achieved. In addition, I see it as important to examine change and/or transformation at the micro, meso, and macro levels, where organizational structures can be better perceived. In this research, I consider the macro level in terms of the transformative change, the meso level in between transformative

and transformational change, and the micro level as zooming in on the transformational change.

### 2.1.2. Different Processes in Design and Development

> The design landscape today is characterized by conflict and confusion, evident in a growing realization that anticipation of the needs and dreams of people is necessary but at the same time very difficult to do. We see turf battles between designers and researchers as designers try to conduct their own research and researchers struggle to do work relevant to design. With more and more disciplines becoming involved in the front end of the process, there is discontent between disciplines at multiple borders.
> (Sanders, 2010, pp. 117–118)

Here, more than 10 years ago, Sanders described the design landscape and the role of designers and researchers in the early phase of the design process, where people from different disciplines express their own will. The world has not changed much, and these struggles and conflicts still exist. In this subsection, I will discuss this topic further from the design process perspective.

The design field is full of different modifications of development processes. This is because, over the years, design research has emphasized the process of design, which has proven to be a powerful tool when developing design education and practice (Dorst, 2008). Currently, the design discipline is seen as a way for designers to create innovative solutions to complex problems by thinking and structuring the design process (Miettinen & Sarantou, 2019). The design process can be described as "the specific series of events, actions or methods by which a procedure or set of procedures are followed, in order to achieve an intended purpose, goal or outcome" (Best, 2015, p. 208). Although design processes are often visualized as a linear structure with clear phases, in the real world, they are more non-linear and iterative, including the many different needs of end users and customers. For this reason, design processes are difficult to standardize (Best, 2015).

We can see the roots of the service design process in the new product development (NPD) process of the 1980s, when the need for a more systematic and linear product-related development process was recognized (Booz, Allen & Hamilton, 1982; Cooper & Kleindschmidt,

1986). The NPD process has been researched for years, and publications have detailed the best practices of the NPD process (e.g., Belliveau, Griffin, & Somermeyer, 2004). When the NPD process focuses on products, the new service development (NSD) process helps to develop, launch, and consider the main characteristics of services and is closely related to innovation management (Clatworthy, 2013). It was proposed to be an iterative, nonlinear process with four phases: design, analysis, development, and launch (Johnson, Menor, Roth, & Chase, 2000). The NSD process evolved from the NPD process (e.g., Clatworthy, 2013) and is increasingly attracting more research.

Alongside NSD, service design has been introduced and evolved. While NSD offers a structured, also called stage-gate, process with a cross-functional project team for developing services, service design includes activities, methods, and tools to concretize the services and their details (Goldstein, Johnston, Duffy, & Rao, 2002; Yu & Sangiorgi, 2014). Service designers can be seen as part of the NSD process for specific tasks or periods of time (Clatworthy, 2013). Although many service designers are familiar with NSD as a process structure, there is still space for research, which brings NSD and service design closer together (Clatworthy, 2013). The role of service design in service development is to contribute to fields such as contextualization, user orientation, and design as strategic instruments (Edvardsson, Gustafsson, Johnson, & Sandén, 2000; Holmlid & Evenson, 2008).

One of the interesting components of the NSD process is the front-end phase, often called a "fuzzy" front end. Formerly, the phase was called "pre-design" in the design process, where many activities take place to inform and inspire the exploration of open-ended questions (Sanders & Stappers, 2008). Sanders and Stappers (2008) visualized the design process with its fuzzy front-end phase (Figure 3), insightfully showing how complex the early phases of the design process might be. Thus, the front-end phase has garnered a lot of attention and interest. For instance, Sanders (2010) claimed that in the front-end phase, we must put more effort into understanding the existing context of experience and identify and define different opportunities for future experience. In addition, Sanders (2010) highlighted that "in the front end we aim to figure out what is the right thing to design. We explore what will be useful, usable and desirable for people in the future" (p. 117). The fuzzy front end was coined by Smith and Reinertsen (1998), and it clearly explains how imprecise the process is with ad hoc decisions (Alam, 2006; Cooper & Kleindschmidt, 1986). Alam (2006) studied the importance of customer involvement in

NSD, especially in the fuzzy front end, and defined customer interactions as "interactions between service producers and the representative(s) of one or more customer firms at various stages of a NSD process" (p. 468).

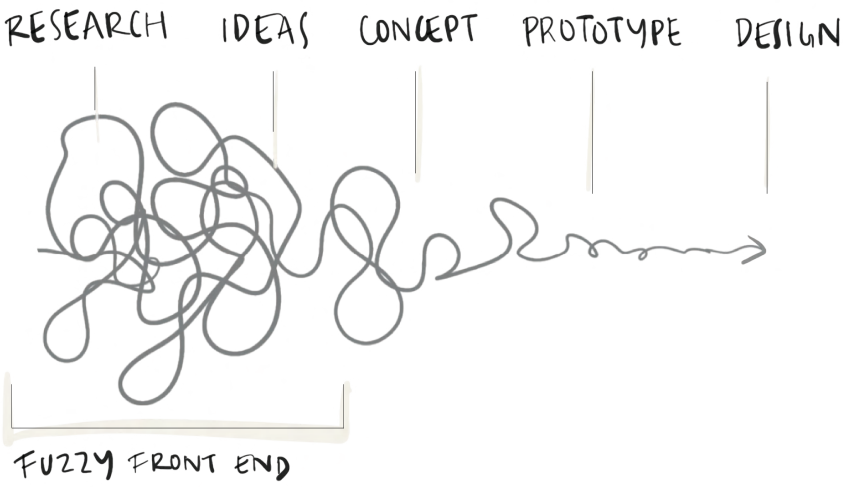



***Figure 3.*** Fuzzy front end. (Adapted from Sanders and Stappers, 2008, p. 6; Newman, 2010; Author's illustration).

According to Clatworthy (2013), three main characteristics emphasize the importance of the front end of a project: (1) the major decisions are made in this phase; (2) it is the start-up phase of a project, and the project team gets to know not only each other but also the brief and plan the details of the project; and (3) customer input starts to be crucial (pp. 28–30). In addition, the front-end phase is the most information intensive, where different types of information from internal and external sources are brought into the project (Zahay et al., 2004). Hence, many crucial elements are added in the early phase, and in my opinion, these take a lot of time and attention.

For decades, the design world seems to have put more effort into focusing on and examining the front-end phase of the design process. This is seen in many service design books that offer multiple examples of tools, methods, and techniques for the early and middle phases; however, little has been contributed about the later phases, when the implementation of service innovation should happen. Recently, and increasingly, there have been criticisms of designers for their weaknesses in the implementation phase (Yu & Sangiorgi, 2014) and their "lack of attention to organizational

issues and cultures" (Mulgan, 2014, p. 4). This gap has been acknowledged, and there have been some relevant studies investigating the back-end process.

Almqvist (2017, 2020) has investigated the service design consultant's role in the design process. She pointed out that designers work predominantly in the early phases of service development. Together with Sangiorgi, Prendiville, Jung, and Yu (2015), Almqvist confirmed that design agencies are involved mainly in identifying user insights and idea generation. Almqvist also noted that designers usually exit projects with user insight knowledge in their hands. When the designer leaves, users' important and deepest insights also leave. Almqvist (2017, 2020) used the term "user insight drift," where user needs and service experiences are no longer strongly linked. As a result, the project might suffer, especially in the decision-making in the back-end phases.

As I highlighted in the previous paragraph, recent studies have focused more on the later phases of the design process. Even though the studies have stressed that the early phases have already been closely investigated (Almqvist, 2017; Clatworthy, 2013; Raun, 2017), I do see a lack of understanding of the very early phases of the design process. Here, I consider what can be done in the development of healthcare-related service design before the actual design process and the so-called fuzzy front end begin—that is, what can be done with service design in advance so that the design process is not so "fuzzy". Services are understood as part of the service ecosystem picture and the important role of stakeholders, and especially the service designer, throughout the design process is perceived as valuable.

Figure 4 visualizes the central focus of my research. It illustrates a few commonly used design processes in a transparent overlap and perceives how they follow the same kind of structure from the discovery phase to the delivery phase. This research, thus, discusses what is needed before starting an actual design process for healthcare service development in an organization, and how service design and co-design approaches can support the early phase of healthcare-related service development. This is investigated through four sub-studies introduced later in this dissertation. In the following sub-sections, I will introduce the Double Diamond design process and then the design sprint process. I will describe the processes from the perspective of service development in organizations and how they support and guide (or do not guide) the development.

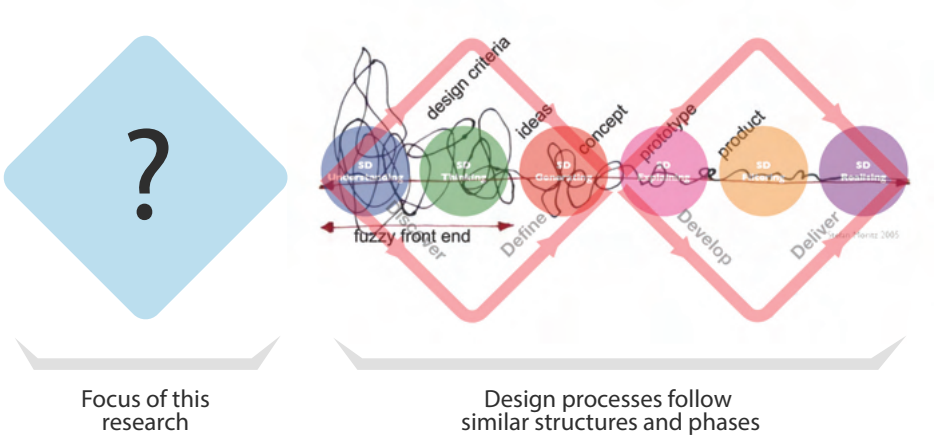



***Figure 4.*** Focus of the research on design processes. Design processes in the figure are by Design Council (2015), Stefan Moritz (2005), and Sanders and Stappers (2008). (Author's illustration)

## Double Diamond

One of the most commonly adopted structures in the service design field is the Double Diamond design process of the Design Council, created in 2004 (2015). The Design Council was established in 1944 to support Britain's economic recovery, and today, its mission "is to make life better by design." The Double Diamond visualizes the process in four main phases: discover, define, develop, and deliver (Figure 5). Compared with other design processes, this follows quite the same structure. For instance, Moritz (2005) created a design process with six phases beginning with understanding and thinking, continuing to generating and explaining, and finishing with filtering and realizing.

The similarities between these design processes are obvious: they start with gathering data from the field to understand users and other important stakeholders. Then the data are analyzed and defined, and the main findings, such as insights, challenges, or design drivers, are highlighted. After this step, it is easier to start the creative phase with ideation and concretizing solutions for the challenges. The last phase focuses on implementing and delivering the concepts in real life. The different processes are often visualized misleadingly in linear and easy-to-follow structures, where the arrows instruct people to proceed to the next phase.

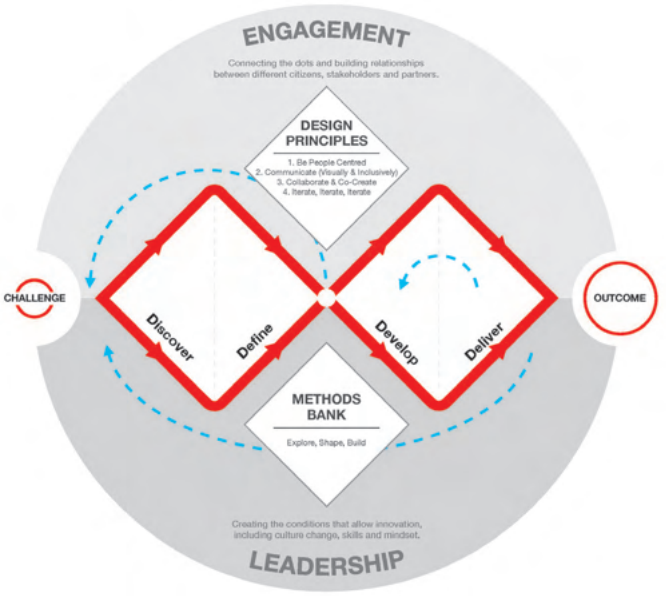



***Figure 5.*** The Double Diamond design process by Design Council. (Design Council Double Diamond, created in 2004)

The Double Diamond design process has been criticized not only because of its linearity but also because it separates "the analysis/discovery and the definition of the problem from the ideation and the delivery of the solution(s)" (Lipiec, 2019, para. 3). Lipiec further argued that wicked problems in particular cannot be understood well enough until after a solution is formulated. Thus, he stated, "The vision of the solution stimulates the research and framing of the problem, which is informing and shaping the vision of the solution, and so on" (para. 3). From this point of view, we cannot follow the different design processes as strictly as those visualized. Especially in complex organizations that tackle wicked problems, the process must be adaptable to the organization's everyday operations and activities. Moreover, the views of problems, problem redefinitions, and solutions cannot be pinpointed at a specific place in the process; rather, they adapt as knowledge accumulates. An overview of the design process and its methods might help the organization understand and better perceive how the problems and solutions align with the process. Here, design sprints are an ideal approach to use to understand the process

in "miniature." Design sprints are introduced in the next section, but before heading there, let us take a closer look at the Double Diamond and how it has been further developed.

The very first phase (discovering/understanding) is a broad area, where one requirement is to understand the objectives of the project (Moritz, 2005). It also includes field work aimed at understanding people and services in the context of a given brief. However, as a broad phase, it involves too much to be one of the most important moments in development work to build consensus with the organization and the team, understand the used design approaches, and listen to how they fit into the organization's daily life. We cannot ignore people who can play an important role throughout the design process. These individuals can come from the organization and may not have any interface with service design or co-design. Especially in healthcare, professionals are busy and their contribution to collaboration is important. If there is no understanding of the design approach, jumping into the design field may seem particularly strange and frustrating. Here, we need to provide evidence and determine what to achieve through the design process and its creative practices.

Lately, the Design Council has also recognized this gap in clarifying orientation and field work. They launched another framework for the systemic design field (Design Council, 2021) where the Double Diamond design process has been developed further. The aim is to support designers working on major, complex challenges with people across different disciplines and sectors. Notably, in their recently published process, visualization of the systemic design framework recognizes the very early phase. The first element in the early phase is defined as "orientation and vision setting," which happens before the actual design process (explore, reframe, create, and catalyze) happens. The "orientation and vision setting" element highlights that "how you start your work will determine the outcome" (Design Council, 2021, p. 48). Thus, it is important to drastically rethink our world and create a hopeful vision of what we want to reach, and aim for positive, value-driven ways to develop a clear mission from that.

The framework encourages spending time with team members and stakeholders to build trust before the actual process begins and return to these positive values throughout the project. Even though the framework introduces some activities for the very first phase where one, for example, creates and understands other people's connections to the project, perceives the bigger system where the project will sit, or develops some principles to guide the project, still missing, for instance, is learning of the design

activities itself, which is emphasized as a very important finding in sub-studies III (Alhonsuo, Hookway, et al., 2020) and IV (Alhonsuo, Sarantou, et al., 2020) of this research.

### Design sprints

The design sprint approach is an intensive, typically five-day-long design process including the elements of agile, design thinking, and lean start-up (Knapp, Zeratsky, & Kowitz, 2016). The idea for the design sprint approach emerged in 2009 when Jake Knapp (2016) was working at Google and wanted to improve team processes. This approach is usually applied by a small team and "serves to maximize the chances of making something people want" (Banfield, Lombardo, & Wax, 2016, p. 5). It is primarily used in start-up environments where digital, software, and product innovation are under development. The design sprint framework helps sprint teams answer critical business questions through rapid prototyping and user testing. Through a rigid and facilitated process and elements of agile, lean, and design thinking, teams produce a minimum viable product (MVP) or service (MVS) as an outcome of the sprint (Magistretti, Trabucchi, Dell'Era, & Buganza, 2019). The design sprint process by Knapp et al. (2016) is visualized in Figure 6.

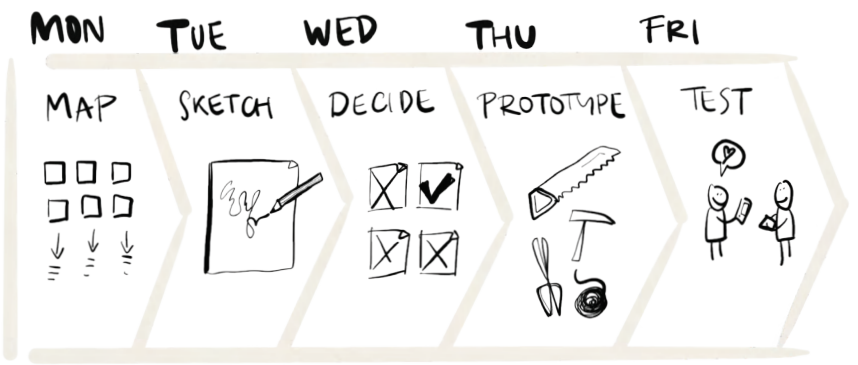



***Figure 6.*** The design sprint process. (Adapted from Knapp, Zeratsky, and Kowitz, 2016; Author's illustration)

A design sprint is an intensive way of working, and it has similarities with hackathons, where team members collaborate intensively and work ad hoc

on a design project (Madson, 2021). Sprints are good opportunities to learn new customer-centered ways of working and, thus, advance cultural shifts in organizations (Kutvonen, 2017). The design sprint brings stakeholders together, but as Knapp et al. (2016) clarified, individuals who work alone generate better ideas than when brainstorming out loud in groups. Knapp et al. noted that "working alone offers time to do research, find inspiration, and think about the problem. And the pressure of responsibility that comes from working alone often spurs us to our best work" (p. 107). However, each of us may recognize a situation where intense work constantly revolves in the mind and ideas are processed when the workday is over. For this reason, it is important to offer tools for participants to help them take advantage of their thoughts. However, the role of the design sprint facilitator is to guide and manage from a methodological perspective and not influence the decision-making process (Knapp et al., 2016).

A small amount of research has been conducted on design sprints in the social and healthcare field (Valentine, Kroll, Bruce, Lim, & Mountain, 2017; Vechakul, Shrimali, & Sandhu, 2015), although design sprints can be seen as a great way to involve and engage a busy healthcare staff on a tight schedule. As highlighted in article 3 in this research by Alhonsuo, Hookway, et al. (2020), a design sprint process does not aim for either polished or finished outcomes or service concepts that are ready to implement. The ideas are relatively weak and not structured to perfectly fit in complex healthcare ecosystems. One challenge in implementing service concepts in the healthcare field is that the service solutions fail because their implementation is perceived as unstable or unfocused (Fry, 2019; Nilsen et al., 2016). In addition, staff management is needed when new service changes must be adopted in the work routines in a hospital (e.g., Nilsen et al., 2016; Stickdorn & Schneider, 2011). From this point of view, there is not enough time during the design sprint to tackle the abovementioned challenges, but the produced ideas and the design sprint process with its creative methods can be a starting point for affecting change in organizations.

In addition, I cannot help but think of the role of design sprint from the perspective of agile development, rapid prototyping, and quick user tests, which enable failing fast and often. This was also emphasized in a study by Valentine et al. (2017) and can definitely be seen as a value in health-related service design approaches, which offer different tools and methods for rapid concretization. However, at this point, I want to highlight the value of learning through design sprints, which is seen as a key finding of the articles of this research by Alhonsuo, Hookway, et al.

(2020) and Alhonsuo, Sarantou, et al. (2020). Learning is considered the learning of design thinking and design methods in these articles.

### 2.1.3. Interplay between Different Service Levels

In this subsection, I will introduce different design methods that have played a significant role in this research. I will keep the main focus on visualization and concretization methods, as they had a major impact on the research overall. I will also discuss the values of design methods in perceiving different service levels and the interplay between them. First, I will provide a little background of design methods.

Different design methods have had a significant role in the design field since the late 1950s (Bayazit, 2004), and the interest in them has spread beyond the design field as the attention to design thinking has increased (Kimbell, 2011b). The general method that service design uses is ethnographic research (e.g., Segelström & Holmlid, 2015), which aims to gather a holistic picture of the researched topic, engage the relevant stakeholders, and understand their experiences by interviewing and observing them (Creswell, 2014).

Service design uses various visualization and concretization tools and methods (Koh, Slingsby, Dykes, & Kam, 2011; Shneiderman, Plaisant, & Hesse, 2013), which aim, for instance, to visualize and understand user experiences (Prendiville, Gwilt, & Mitchell, 2017; Segelström, 2013) or step into another person's shoes through prototyping (Blomkvist, 2016) and role-playing (Kaario, Vaajakallio, Lehtinen, Kantola, & Kuikkaniemi, 2009). In service design, visualization is used throughout the design process. In the discovery phase, for instance, questionnaires, interviews, research diaries, and design probes can be visualized to make the materials more user friendly and creative for stakeholders to fill out. In the define phase, the data from the field are analyzed in a more understandable way and, here, the visualization usually plays an important role. This phase utilizes, for instance, different personas and mapping tools, aiming to make sense of the data and define the insights and real challenges. The mappings and modellings are very common design methods for service designers (Patrício, Fisk, Falcão e Cunha, & Constantine, 2011), such as user journey mappings, stakeholder mappings, structured service blueprints (Bitner et al., 2008; Patrício, Fisk, & Falcão e Cunha, 2008), and service walkthroughs (Blomkvist & Bode, 2012). Figure 7 presents a few examples of visualization methods.

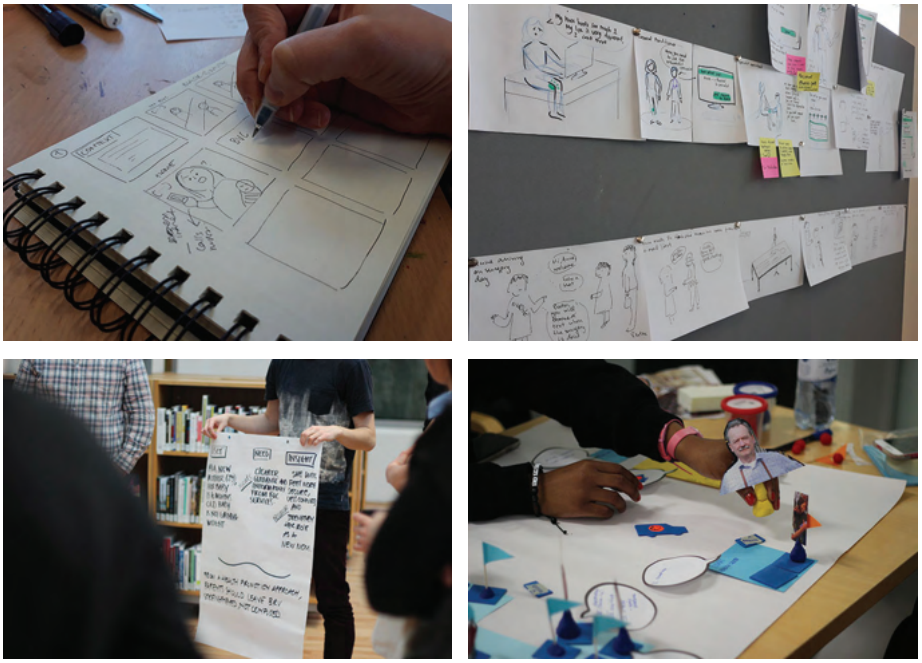


***Figure 7.*** Different visualization methods in practice. Top left: storyboard (Picture: Maileena Tuokko); top right: patient service journey (Picture: Mira Alhonsuo); bottom left: defined user insights on a poster (Picture: Maileena Tuokko); bottom right: desktop walkthrough (Picture: Maileena Tuokko)

In the development phase of the design process, which is a phase of developing potential solutions (Design Council, 2015), the more concrete design methods are introduced, such as prototyping methods. Service prototyping is a "goal-oriented but playful way" (Schulz, Geithner, Woelfel, & Krzywinski, 2015, p. 323) to build and test different service ideas. Tangible and concrete communication tools effectively support co-design processes in communication topics, which might be difficult to articulate otherwise (Rygh & Clatworthy, 2019). Prototyping also has value because it benefits the design process by saving resources, such as time and money (Blomkvist, 2014), and thus, it is a valuable method to implement, for instance, in new hospital construction projects, where the time pressure is tight, especially at the beginning, as stressed in sub-study II of this research by Alhonsuo and Colley (2019). Prototyping has similarities with simulation, which is not a new method in healthcare (Poikela, 2017). Thus, prototyping can provide new features to support simulation. Further, service prototyping is a tool for learning about and implementing

transformative changes (Kuure, Miettinen, & Alhonsuo, 2014), and thus, its impact on the development of healthcare services can be significant. In this study, service prototyping was carried out in case study 2 of sub-study I and in the design sprints organized in sub-studies III and IV. It was only utilized in very rapid user testing, but was nevertheless seen as important, for example, as part of the benchmarking process. Figure 8 below shows some prototyping pictures from the design sprints. The final phase is usually for delivering the services that work (Design Council, 2015) and implementing them in the more strategic phase, where the visualizations are finalized to explain and interpret a service concept in more detail.


***Figure 8.*** Service prototyping and role-playing. On the left: role-play action – me as a nurse. On the right: design sprint teams preparing a user test for their service concept. (Pictures: Maileena Tuokko)

According to Hakio and Mattelmäki (2011) exploratory, participatory, and visual design methods fit well to enhance the cross-functional collaboration in public organizations, where public healthcare belongs. The value of visualization methods is that they clarify the complex services and different service levels. Stepping into the shoes of another allows for a more detailed look at the service. There are hundreds of design methods for scaling services, and especially in multi-layer services, such as healthcare services, we need to zoom in and zoom out to obtain an overall picture of the different details, moments, and processes in a timeline. As Polaine (2013) described, the practice of service design is a continual process where we zoom in and out to see the details to achieve an overview. In service design terminology, we use the terms user journey, service moment, and touchpoints. These three areas help us to scale through the multi-layered services.

The service journey (also known as user journey, customer journey,

and patient's journey) visualizes the process of service in a timeline. The service journey is divided into service moments, which help to specify different needs and challenges in each phase. These moments consist of multiple touchpoints, which are crucial elements required to provide successful service. The service journey can be seen as a narrative, which tells a story of one's experiences, and touchpoints are tangible or intangible interaction or contact points between the end user and the service provider (Stickdorn & Schneider, 2011). Through touchpoints, we can investigate, for example, how a referral is guiding a patient through the preparation of their care plan, how clear the information sign is at the entrance, or how music affects their feelings while waiting for their doctor's appointment in a hallway. The touchpoint can be a flyer a caregiver hands out to a patient about their illness or a notification message reminding them about an upcoming appointment. These different touchpoints are a crucial part of the holistic process.

Interplay between different service levels is important for several reasons. First, visualized service journey mapping helps to perceive a holistic picture of a specific healthcare-related service. Journey maps "can show many of the overarching values and the tone of voice of a service using a partial view" (Stickdorn et al. 2018, p. 51). In healthcare-related service development, this is important when the scale of a patient's journey can range from a quick (a few minutes) laboratory visit to years of struggle with cancer or a lifelong disease, such as diabetes. The service journey is an eye-opening method to see different nuances and insights in a service, and it is a good tool to start the discussion. From another point of view, service journey mapping can offer the first view of the healthcare ecosystem and insights not only from the patients' point of view but also from that of healthcare professionals.

As an example, through the service journey, we might see that patients do not find the way to the right ward at the hospital, and thus, it takes them extra time to navigate and ask staff for help. After this finding, we can jump into the second step, zooming into the service moments, and observe why this navigation is difficult and where the misguidance happens. We might see that information is lacking in some of the service moments. We can then ideate and test different service solutions in these moments and see how they work in real life. The last important viewpoint, which concerns why scaling healthcare is important in this research, is to see how touchpoints can support holistic service. Here, for instance, the patient has received a paper with a detailed description of where to go next or an application navigates them inside the hospital.

The abovementioned elements build the puzzles together, forming the picture of internal and external ecosystems. Service journey mapping can be one way to understand patient journey approaches, which Simonse, Albayrak, and Starre (2019) noted is lacking documentation in the literature. Thus, my research focuses on the very early phase of the development process and discusses, for instance, with whom and how the very early phase of service design practices should be done so that effective collaboration and understanding among different stakeholders can be sought, and thus, a design-driven process with its functions can be learned, embraced, and accepted in healthcare-related service development.

## 2.2. Co-design

In my research, I followed the co-design approach, which shares similar fundamentals with co-creation, and thus, they are often considered to be the same. Sander and Stappers (2008) referred to co-creation as "any act of collective creativity, i.e. creativity that is shared by two or more people" and co-design as a "collective creativity as it is applied across the whole span of a design process" and "to the creativity of designers and people not trained in design working together in the design development process" (p. 6). Co-design gives a voice to people who have not been part of collaborative work before in the belief that everybody is creative in the right environment. It requires creative initiative from teams, which include researchers, designers, and other important stakeholders, who are "experts of their experiences" (Sleeswijk Visser et al., 2005, p. 127). Co-design has been found to be effective in the exploration of users' knowledge (Steen, Manschot, & De Konig, 2011; Trischler & Charles, 2019). For the abovementioned characteristics, I chose co-design as a fundamental approach for my research along with service design, and thus, I will also discuss learning of design practices and processes as one of the key elements in my research.

At this point, let us take an initial look at the roots of co-design. The value of involving both end users and other stakeholders as part of the design process has increased since the 1970s (Sanders & Stappers, 2008), and it has become increasingly popular in businesses and organizations (Binder, Brandt, & Gregory, 2008). The role of user involvement has changed over the past few decades from design for users to design with and by users (Sanders & Stappers, 2008). The roles can vary from passive engagement to proactive engagement, where users "contribute to solving

and framing design challenges" (Keinonen, 2009, p. 145). Co-design is connected to the field of participation (Lee, 2008) with creative cooperation across the whole design process (Steen et al., 2011). Co-design happens usually in workshops, where people interact among each other through design methods. Workshops are designed so that they have an impact on people by shaping the behavior of participants (Vogt, 2009).

Co-design and service design have many mutually supportive elements. According to Steen et al. (2011), two different perspectives are needed when combining service design and co-design: understanding a service's demand side, which includes users' and customers' needs, and understanding the supply side, which consists of technologies and service processes. The authors also noted that it is important to first identify the goals of the development project and a few co-design activities and then associate and align benefits to these goals. Communication and interactions are not only the fundamentals of co-design but are also a central part of every service (Kuure et al., 2014). Understanding people's behaviors and experiences and the role of technologies and touchpoints in holistic service processes is important when participants in co-design sessions represent their own fields and backgrounds (Alhonsuo, Hookway, et al., 2020).

All of us can bring value to the co-design process by having practical, local, and rich experiences of services (Kuure, 2020), but this is especially true of those who have first-hand knowledge and lived experience of the service. Here, empathic design is centered within service design studies, requiring designers to focus more on these real-life stories (e.g., Mattelmäki, Vaajakallio, & Koskinen, 2014) and supporting a creative understanding (Postma, Zwartkruis-Pelgrim, Daemen, & Du, 2012). According to Mattelmäki and Battarbee (2002), "Design empathy is needed when going from rational and practical issues to personal experiences and private context" (p. 266). This is important in the context of healthcare, where people tackle very sensitive, personal, and private issues, and it should also be considered in the early phase of service design and co-design processes to ensure quality and trust in cooperation. Thus, I also emphasize the trust between the participants, which was also considered in the sub-studies of this study (Figure 9).


***Figure 9.*** Building trust between participants and creating team posters in design sprints (sub-studies III and IV). (Pictures: Maileena Tuokko)

Co-design is widely used in the healthcare domain to understand the field in terms of its bigger picture (e.g., Pirinen, 2016; Trischler, Dietrich, & Rundle-Thiele, 2019; Vaajakallio, Lee, Kronqvist, & Mattelmäki, 2013) but also when developing specific treatment processes (e.g., Kronqvist, Järvinen, & Leinonen, 2013; Pyatt, Sinclair, & Bibb, 2019). In many healthcare-related studies, experience-based co-design (EBCD), originally called experience-based design (EBD), is integral to co-design and service design, which means that patients and healthcare staff's experiences are closely considered (e.g., Bate & Robert, 2007; Donetto, et al., 2015; Herriott, 2018; Robert et al., 2015). In this dissertation, the inclusion of patient experiences is only slightly discussed, as the research examined the involvement of healthcare professionals in the design process. The research did not underestimate the importance of patient participation but, rather, built a foundation for collaboration and understanding among healthcare professionals to make patients more involved and welcomed later in the design process.

Nevertheless, challenges are highlighted and raised for discussion in co-designing healthcare fields with service design. For instance, how to deal with sensitive and less engaging cases with vulnerable user groups and how the relevant users can also actively and equally contribute in the early stages of the service design process have been explored (Trischler, Dietrich, & Rundle-Thiele, 2019). Researchers have also investigated how the co-design process following EBCD requires healthcare professionals and patients to renegotiate their roles and expectations and reform the relationships of power between citizens and public services (Donetto et al., 2015). In this regard, they have tried to determine how to select the participants for co-design workshops when self-selecting may result in

bias and the participants do not represent the desired population (Boyd, McKernon, Mullin, & Old, 2012).

According to Hakio and Mattelmäki (2011), co-design in public organizations might face difficulties related to communication between design and healthcare terminologies, trust, and shared understanding within the project group. They also suggested that there might be issues such as the risk of losing credibility or fear regarding design practices. The authors stressed that it is extremely important to consider how design practitioners approach the orientation phase of co-design and design methods. PowerPoint presentations or seminars are not enough to introduce a co-design approach, and because of this, there is a need for more hands-on experience. They also discussed the importance of empathy for other people, such as colleagues, stakeholders, or users, as being able to position oneself in someone else's situation is the key to transformation and change.

Although patient involvement and patient experiences have been emphasized in many of the studies noted above, in this research, I have brought forward the need to build trust between actors in the design field (e.g., service designers, design researchers, design students) and actors in the healthcare field (e.g., doctors, nurses, other experts). The critical issues mentioned in the previous paragraph can then be discussed with participants in the early phase when the understanding of the possibilities and practices of service design and co-design is clearer. In addition, my research has found that there is a need to put effort into fostering the learning of design thinking and methods in practice, encouraging collaboration and knowledge-sharing among the healthcare practitioners, and using co-design and service design in the early phase of the design process.

## 2.3. Healthcare Services

Healthcare is a complex field of silo-structured processes, where interactions among various stakeholders are relied upon (Bowen et al., 2013), and is a universally used service that impacts economies and quality of life (Berry & Bendapudi, 2007). Healthcare is described as a "routine part of our lives, but it is often anything but routine for the people receiving it" (Goodwin, 2020, p. 37). Nevertheless, healthcare is a critically important service, where we often end up unintentionally, not knowing how much it will cost or what will happen. It is an unknown quantity with an unknown duration

of the service journey, where we have to trust different experts.

Even though hospitals play a central role in the delivery of healthcare services (McKee & Healy, 2002) and are places for the people, who face different experiences, such as fear, trauma, frustration, and happiness during clinical care, healthcare services are increasingly provided in people's homes (e.g., Ludden & Vallgårda, 2019). The end users of healthcare services are not only the patients in need of care but also the family members or visitors, who burden the process with their own needs. Their role is crucial when, for example, patients check out of the hospital and continue their recovery at home with important support from family members. In this phase, home-based healthcare starts producing its own processes.

The healthcare field is "the most hands-on of professions and services, and yet is extremely technical" and its complexity crosscuts "from services to payment to policy" (Jones, 2013, p. xv). It includes many different system types. Jones (2013) defined a system as follows:

> A "system" can be defined as a purposeful collection of interdependent activities that operate as a single dynamic and complex process, with intentional or automatic regulation over its inputs of resources, energy, and information to produce defined outputs. In any whole system, the parts are inextricably interdependent and the whole has a single identity. (Jones, 2013, p. 258)

For this reason, it is important to understand the S-D logic and its ecosystem approaches, which I introduced in service design subsection 2.1.

### 2.3.1. Change in Healthcare Organizations

The service quality in healthcare is difficult to determine because of its characteristics of heterogeneity, intangibility, and simultaneity (Gambarov, Sarno, Hysa, Calabrese, & Bilotta, 2017). Healthcare is a continuously changing environment that faces challenges associated with an aging population, ongoing growth, varieties of different diseases, new knowledge, developing technology, and political expectations (e.g., Fry, 2019), and thus, it needs to change (Bate & Robert, 2007; Fry, 2019; Jones, 2013) to better perceive a changing world. According to Bazzano and Martin (2017), "Addressing the burgeoning inequities in global health is one of the most complex and urgent social challenges of our time, inherently linked with

economic issues, good governance, proactive and collaborative strategies, political will, and community engagement" (p. 736). The healthcare field in its complexity has not been an easy environment for co-design to exist in, and for years, challenges have been reported (e.g., Hakio & Mattelmäki, 2011; Vaajakallio, Lee, Kronqvist, & Mattelmäki, 2013). In addition, patient-centered innovations are difficult to achieve because there is no consistent understanding of the current situation, and the resources in organizations are limited (Vetterli & Scherrer, 2019).

These pressures for change can be divided into internal and external pressures (Fry, 2019). We have a need for "new ways to learn, think, and work quickly to make sense of the human, system, and organizational problems that co-occur every day in the morass of healthcare" (Jones, 2013, p. 29). Figure 10 visualizes the internal and external pressures for change by Fry (2019) and Jones (2013).

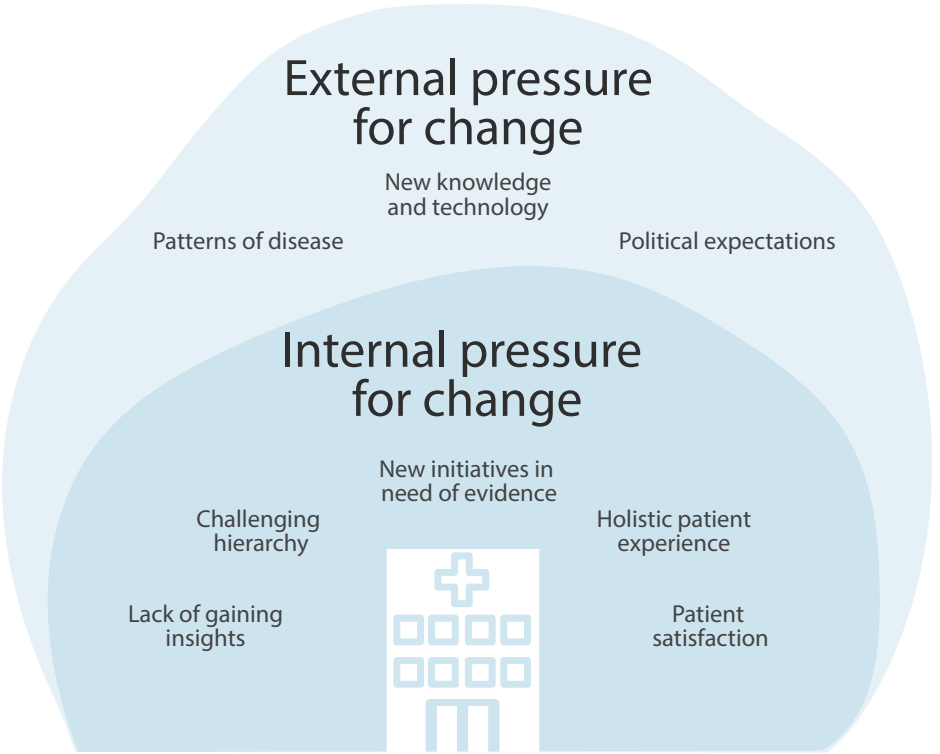



***Figure 10.*** Pressures for change in healthcare. (Adapted from Fry, 2019 and Jones, 2013; Author's illustration)

Expanding on Figure 10, I want to highlight a few of the key points, which Fry (2019) discussed in her study. She described the challenges in healthcare in terms of the following four areas:

1. Hierarchy prevents growth, which in the healthcare context means silo structures (e.g., Donetto et al., 2015; Radnor, Holweg, & Waring, 2012).
2. Failing is seen as a risk in healthcare, where failures might lead to a patient's life or death (e.g., Edmondson, 2004).
3. Staff management is necessary when changes must be adopted and implemented in the healthcare staff's work life (e.g., Nilsen et al., 2016; Stickdorn & Schneider, 2011).
4. Innovation in healthcare cannot be disruptive because different risks to clinical service and costs must be managed (Clack & Ellison, 2019; Jones, 2013).

In addition, evidencing is needed for decision-making at the organizational and design levels, which helps to drive learning and transformation step by step (Foglieni, Villari, & Maffei, 2017), and for adopting service design in healthcare organizations (Foglieni, Segato, Sangiorgi, & Carrera, 2019).

In the combination of co-design and service design, we may come across the term transformation design (Burns, Cottam, Vanstone, & Winhall, 2006; Sangiorgi, 2011), which is often mentioned in public service innovation and healthcare services (Steen et al., 2011). Transformation design can be used not only to develop services but also to continuously impact change processes and innovation in an organization. For instance, transformation design aims not only to implement new service solutions but also to design skills, tools, and organizational capacity for ongoing change (e.g., Burns et al., 2006; Sangiorgi, 2011). Transformation design also does the following:

> asks designers to shape behaviour – of people, systems and organizations – as well as form. Because of this, its practice demands a high level of 'systems thinking': an ability to consider an issue holistically rather than reductively, understand relationships as well as components, and to synthesize complex sets of information and constraints in order to frame the problem. (Sangiorgi, 2011, p. 21).

Over the last decade, designers have been continuously striving for transformation processes in public organizations with an aim to integrate design and develop a design culture in organizations (e.g., Holmlid &

Malmberg, 2018). There have been critiques stating that design has actually not reached the desired capacity in organizations, and therefore, many design-led processes and toolboxes have ended up as one-off projects (Holmlid & Malmberg, 2018; Malmberg, 2017). The change in healthcare organizations has been investigated recently, but many of the studies have focused on the implementation phase or end part of the design process (e.g., Almqvist, 2020; Malmberg, 2017; Raun, 2017). Nonetheless, in this research, I have focused on change from the very early phase of the development process.

### 2.3.2. Healthcare Development

Healthcare and design have had a long history together in healthcare improvement (Rowe, Knox, & Harvey, 2020). Healthcare, along with other public services, has increasingly applied patient involvement and co-design approaches (Nesta, 2013), and thus, engaging people, not only professionals but also patients, in the development process is seen as very important (e.g., Bate & Robert, 2007). In fact, Canham, Jun, and Selby (2016) noted that the main challenges they faced in their research were related to time-consuming participatory approaches with multiple stakeholders and difficulties in implementing change in healthcare systems. These challenges were also identified in this research and will be discussed in depth in the conclusion section.

In the case of hospital design, the development process must not only address the physical architecture and interior design but also the service journeys, from information finding to the detailed process description, where different touchpoints must be considered. As an example, Wolstenholme et al. (2010) found in their design-led service improvement project with outpatient services that the service itself extends beyond the clinical encounters and the physical extent of the building and involves an enormous number of different interfaces and interactions, such as wayfinding, staff interactions, and confirmation letters. The authors argued that these are all critical factors in understanding the experiences of patients and healthcare professionals, and that they "have an impact upon the ability of the service to perform its clinical role" (p. 465). The abovementioned study truly highlighted the multi-layered features of healthcare services. In addition, healthcare services in general have distinctive cultural attributes, with hierarchies, high variation in specializations in different silos, and reluctance to take risks (Bowen et

al., 2013). Thus, understanding the different focuses of development is important, whether it is clinical practices, physical touchpoints, the design of a hospital building floor plan, or the restructuring of the inter-hospital service structure. The subject of development needs to be considered at different levels of the ecosystem to plan and implement the development process (or project) realistically.

Co-design and service design have garnered increasing interest in the healthcare field (Pirinen, 2016). Many healthcare organizations are investing in service design, which can help in redesigning existing services or creating new health-related service innovation in a participatory way (e.g., Freire & Sangiorgi, 2010; Mager & Alonso, 2017). One of the largest single healthcare service providers in the world is the UK National Health Service (NHS). It is also well known in the service design field because its innovations have focused on the most urgent health-related topics, such as an aging population with multiple health problems and an increasing number of chronic health conditions and their self-care. In Finland, several very relevant studies have been done involving how service design practices have supported health-related development. For example, Kronqvist, Järvinen, and Leinonen (2013) presented a game board concept for sarcoma-type cancer patients, where the visualized game board with tangible props helped the patients remember and discuss their experiences during the interviews.

Another example comes from Kronqvist, Erving, and Leinonen (2013), where they set up a cardboard hospital as a real-sized prototyping environment for creating patient-centered hospital spaces and services. The environment was created for use in the building project of a new hospital wing. The outcomes suggested, for instance, that the cardboard hospital would continue to be used during the building design process and be combined with other design methods, such as virtual simulations and test prototypes constructed of wood panels. In this way, healthcare service development in its complexity pressured the service designers to perceive the entire holistic picture of service. Different tools for mapping usually help with perceiving either an individual's service journey or a multi-layered entirety. The blueprint is a tool especially for the latter when mapping interactions among the patient, nurse, doctor, or other experts (Polaine et al., 2013). The authors stressed that a blueprint is an effective tool for managing complexity.

As described in subsection 2.1.2, design processes offer a wide variation of guiding phases, as do the practical handbooks for healthcare improvement through co-design, service design, or other design-related

disciplines (e.g., Jones, 2013; Ku & Lupton, 2019; Mawer et al., 2019). The literature presents very detailed descriptions and explains how to proceed from one step to another. For example, Mawer et al. (2019) were the first to argue that "The process of selecting a project will reveal many problems in your organization that are worthy of your efforts. Choosing the right one, and defining it correctly, is the single biggest factor that will determine your success" (p. 16). These authors then introduced crucial phases with multiple steps to the early stage of the development process in a healthcare organization. The first one is the scope phase comprising the following seven steps: (1) explore data, (2) explore the system, (3) evaluate the potential return, (4) select your challenge, (5) refine the scope, (6) validate your decisions, and (7) secure a mandate. Next is the prepare phase including the following five steps: (1) build your team, (2) create a project plan, (3) prepare space and materials, (4) dot the i's and cross the t's, and (5) host a team kickoff. The latter is introduced with the following quotation: "You will avoid a fuzzy front end and get your project off to a running start if you forecast the challenges you are likely to encounter along the way and the resources you'll need to meet them" (p. 68).

This is an ideal example to show that good preparation is needed when working inside healthcare organizations. Even though data from the very first phase are needed for building evidence for change, Mawer et al. (2019) did not introduce benchmarking as a valuable and crucial method in the early phase of development. The healthcare industry has used benchmarking over the years for quality control in healthcare services and it has become an essential part of most developed healthcare systems (Kay, 2007). Benchmarking is the continuous, systematic process of developing management and evaluating services, products, and work practices in organizations, which are represented as leaders in a particular area or who have the best practices for the purpose of organizational improvement (Benson, 1994; Higgings, 1997). In comparison, Koskinen et al. (2011) stated that negative benchmarking cases may teach a lot, arguing "even the best designers and companies fail occasionally, and these failures may be just as informative as the successes" (p. 81). The overall aim of benchmarking in the healthcare field is to improve efficiency, quality of care, patient safety, and patient satisfaction (West, 2021). Moreover, the focus of benchmarking can be on internal, external, or functional processes. The impacts of benchmarking in healthcare are such things as cost reduction, improved efficiency and effectiveness, and a mandate for maintaining quality healthcare (Higgings, 1997). Benchmarking as a process is frequently used in the design field, but many practice-based

service design handbooks do not offer tips or templates for doing it. Benchmarking should be considered a part of a continuous improvement process (Kay, 2007), and from that point of view, it is a valuable process for service design, where services are constantly evolving and never "ready."

In healthcare, solid mainstream hospitals are continuously using benchmarking to avoid risks, defects, and limited patient safety and for improving quality (e.g., Liedtke et al., 2017; Rasche, Margaria, & Floyd, 2017). In addition, benchmarking can be used for internal purposes, where professionals collect performance data and then benchmark them with the aim of improving the internal culture and making clinically meaningful quality changes (Gleason & Bohn, 2017). Gleason and Bohn (2017) consider it a way to "change the mentality" (p. 151). Article 1 of this research by Miettinen and Alhonsuo (2019) emphasizes that change processes need peer-to-peer learning, and thus, transformational change in organizational cultures and a commitment at the management level are needed so benchmarking can ensure that the outcomes of service design processes are observable. This also requires that all stakeholders understand how the scaling-up step can take not only innovations from experiments to implementation but also strategic day-to-day management.

As addressed in article 2 of this research by Alhonsuo and Colley (2019), the use of benchmarking remains perhaps one of the most cost-effective and fastest approaches for a new hospital to adopt general best practices for patient-centered care. Yet benchmarking as a process seems to be lacking consideration in the service design literature. As a possible process for understanding healthcare services at the micro, meso, and macro levels, there is huge potential to develop tools for benchmarking and reflect the experienced processes in a holistic way, for example, through prototyping in role-playing or desktop walkthroughs. I will discuss this gap later in my conclusion.

Picture: Maileena Tuokko

# 3. Research Design

As a researcher, I have always been curious about the people around me, and the design field has provided many opportunities to work with different people. I understand the world around me better when I am part of it in a practical sense. I learn by doing, which is the reason why I have been doing my research in design and in a very practice-oriented way. This has definitely guided me on my way while constructing this dissertation. The choice of methodology for this study was defined through the objectives of four sub-studies conducted for this work. In addition, my own previous and ongoing professional experiences as a service designer have had an influence on the selected approaches.

The main objective of my research is to describe **how service design and co-design approaches support healthcare-related service development, especially in the early phase of the design process.** The aim is to answer the research question through the four sub-studies. The first sub-study has been published as an academic book chapter and the other three have been reported in international peer-reviewed conference proceedings. This section will discuss the research design approach and its philosophical relationship to the topic. At the end of the section, I will describe each sub-study in detail, explaining the methods, data, and analyses.

## 3.1. Research through Design

We can see design everywhere around us. All environments, furnishings, clothes, technologies, communications systems, artifacts, services, and

processes have been designed. The designer's role is to "produce efficient, effective, imaginative and stimulating designs" that are based on the communication of a specific need or proposal (Cross, 2007, p. 33). The definition of design involves multiple interpretations and approaches. Design has been seen as instrumental to problem-solving (Simon, 1973) and plan-making (Rittel, 1987). Schön (1987) crystallized design as an action where the designer is an individual who can look at a different complex and incoherent situation, have the imagination to think about how things can be done differently, and then design something new out of it.

Design problems have been seen also as "wicked problems," which are loosely defined as problems that are difficult or impossible to solve, such as those related to healthcare, quality of life, and poverty (Rittel & Webber, 1973). Here, "designers have to learn to have the self-confidence to define, redefine and change the problem-as-given in the light of the solution that emerges from their minds and hands" (Cross, 2007, p. 24) We can see complexities, needs, varieties of design disciplines, and the increasing speed of new innovation and technologies affecting and challenging design as it is. Considerable pressure is put on designers because of their ability to design something totally new. According to Nelson and Stolterman (2012),

> we will never be able to ground design on the idea that the "right" design is out there, embedded in reality, just waiting to be discovered. To the contrary, design will always be about creating something that does not yet exist. It is not about finding something already in existence. (Nelson and Stolterman, 2012, p. 28)

Over the last few decades, design research has put its roots down in academic and theoretical fields. There has been research on design practice to understand the processes; research for design to improve the results; and research through design, which, as the newest direction, "helps to communicate the nature of this relationship toward other academics" (Bredies, 2016, p. 12). The research through design (RtD) concept, on which this research is also based, was introduced by Frayling (1993). Later, RtD was critiqued by Zimmerman, Stolterman, and Forlizzi (2010): "We argue that there is a need for serious development of RtD into a proper research methodology that can produce relevant and rigorous theory" (p. 216). RtD falls under the rubric of constructive design research (Koskinen, Zimmerman, Bonder, Redström, & Wensveen, 2011), which also overlaps with this research. When the aim of the research is to develop a concrete

plan, instrument, or process model, and when it comes to creating a new kind of reality on the basis of theories, existing studies, and research data, constructive research is a suitable approach (Ojasalo, Moilanen, & Ritalahti, 2015).

Design in public services, such as healthcare services addressed in this research, demands a new form of design practice, and it is essential to have a design researcher as a social expert for such work, according to Press (2016). Press also noted that "the danger of service design for public services is that it becomes incorporated within the institutional paradigm that it has the potential to challenge, and thus becomes just another technocratic tool of the public sector" (p. 25). Moreover, according to Press, a design researcher as a social expert should rather aim to construct social problems through design and be actively part of them, not aim to solve the social problems. This truly has connections within this research, as I actively participated in the sub-studies described here. By adopting service design and co-design approaches and engaging a wide range of people, we can together aim to reconstruct future directions for our societies. By adapting research through design in my own study, I strengthened the link between service design practice and design research. The practical frameworks for health-related development were, thus, created during the research.

Figure 11 is adapted from the illustration by Saunders and Tosey (2012), which is the metaphor of the "Research Onion." It provides an overview of my research design, representing the elements that need to be considered in relation to other design elements. These elements are described in detail in the following subsections.


***Figure 11.*** Overview of the study. (Author's illustration)

## 3.2. Constructivism

The worldview of this research is based on constructivism, also known as interpretivism and social constructivism. A worldview is "a general philosophical orientation about the world and the nature of research that a researcher brings to study" (Creswell, 2014, p. 6). In constructivism, a reality is socially constructed and individuals engage with their world in an attempt to understand the world in which they live and work. The researcher aims to listen to and understand people and trust the views of multiple participants through language, and then interprets the findings in a process shaped by the experience of the researcher (Creswell, 2014). In service design research, constructivism is one of the most commonly used epistemologies (Sun, 2020) and theories in practice (Yang & Gergen, 2012). Constructivism is typically characterized by an inductive approach to research, where the research starts in real-world settings and contexts and in which empirical data are gathered. Then the researchers interpret the data, leading to the development of theories and, thus, the construction of knowledge.

Constructivism is closely related to learning, where learning is seen as an active process of constructing knowledge, and through this, making sense of the world (Adams, 2003). The common element of all varieties of constructivist theories is "the nature of the learning environment is one of experimentation and dialogue, where knowledge is seen within the context of problems to be discussed and solved" (Adams, 2006, p. 245). Here, the learning is a social process (Shepard, 2000), and in my research, it happened through co-design practices and workshops. According to Creswell and Creswell (2018), as a researcher, I am actively part of the research and influence the interpretation of the phenomenon through my own background and perspectives. This truly has an impact on the research process, where I can choose the topic and problem of the research and formulate the research questions and methods (Crotty, 1998). In addition, constructivism relies on a qualitative research framework, which is also used in organizational research and organizational change (Doldor, Silvester, & Atewologun, 2017).

From an ontological perspective, which is defined as a consideration of being and what is and what exists (Packer & Goicoechea, 2000), constructivism has multiple perspectives and realities. "Realities" in this viewpoint were defined by Guba and Lincoln (1994):

> [Realities are] apprehendable in the form of multiple, intangible

> mental constructions, socially and experientially based, local and specific in nature (although elements are often shared among many individuals and even across cultures), and dependent for their form and content on the individual persons or groups holding the constructions. (Guba and Lincoln, 1994, pp. 110–111)

According to Bisman and Highfield (2012), reality is created by the mind. They argued that different social organizations, cultures, and experiences can create several social realities. They pointed out, however, that what is real is specific to an individual, and there might be similarities between individuals and groups of individuals in understanding what is real.

## 3.3. Research Strategies and Methodological Choices

I used a qualitative research strategy with ethnography and case study as my methodological choices. Research of this type uses an inductive approach, where researchers start with a real-world setting and gather empirical materials from case studies. After this come the interpretation and reflections with a hypothesis and theory. Qualitative research follows an inductive design, where meaningful and descriptive data are generated (Leavy, 2017). This is in-depth research, where the aim is to collect different forms of data from different sources and investigate them from many different perspectives (Muratovski, 2015). According to Leedy and Ormorod (2010), qualitative research fits best for describing, interpreting, and verifying topics. It is ideal for understanding settings, processes, relationships, or people, which rings true with this study. In a service design setting, co-designing with people is crucial. Even though the developed topics are related to services and processes, they tie people and their relationships together and help to clarify user experiences. Service design methods and tools aim to understand user experiences and the stories behind them through open-ended, narrative, and visual ways, where participants can share their views and opinions freely.

### Case Studies

Case study approaches were used as a research strategy in sub-studies I, III, and IV. The case study is a qualitative research framework with a set of tools for data collection regarding complex phenomena (Baxter & Jack,

2008), and it is linked to the constructivist paradigm (Stake, 1995). The case study approach enables multiple levels of analysis from a single study (Yin, 2009), which can be a program, activity, process, or individual(s) (Creswell, 2014). According to Yin (2014), case study as a research approach should be considered in situations when the research focus is on answering "how" and "why," as relevant behavior cannot be manipulated by those who are involved in the study, and the study under investigation is contemporary. In an explorative way, case studies give an in-depth understanding of a real-life context, which fits well in the service design field.

In general, case studies are criticized for lacking rigor and not following systematic procedures, being difficult to generalize, and taking up too much time while producing large amounts of information (Yin, 2014). It was obvious that during the case studies, the forms of data collection and procedures changed to better suit the situations and environment. Consequently, in some cases, the amount of data increased but was not too overwhelming to take into account. It should also be noted that in these case studies, the phenomenon was healthcare-related processes in the hospital context, where different stakeholders co-design using different design methods.

## Ethnographic Studies

Previously, I introduced a case study approach that has some similarities to ethnographic studies. Ethnographic studies aim to obtain a holistic picture of the topic under investigation and engage individuals and understand their everyday experiences by interviewing and observing them (Creswell, 2014). Ethnography, which Leavy (2017) described as "a written text about culture" (p. 259), studies social interactions, people's behavior, what they believe, and other perceptions that appear within communities, organizations, and groups (Muratovski, 2015). Both service design and ethnographic studies aim to provide holistic insights into different cultures, which Muratovski (2015) defined as "people's views and actions" (p. 56). Also under investigation are the elements of the environment around them, including the sounds, sights, and locations, which can be linked as touchpoints, according to service design literature. Service touchpoints are tangible objects or spaces (Moritz, 2005) in the line of interaction between the customer and service provider, or they are intangible elements, such as sounds, smells, and temperature. The service touchpoints are around us in different service moments and have an overall impact on how we

experience these moments. The service touchpoints are important to recognize in ethnographic studies.

Ethnography in the context of design is embedded in iterative design processes, is short-term and quick in its duration (Müller, 2021), and can offer numerous options for dealing playfully with collected data, which requires not only explication and reflection but also discipline (Müller, 2020). In design ethnography, "it is permitted to burst open conventions, explore boundaries and expand cognitive horizons. (…) Design ethnography can mean observing social situations passively in order to change them afterwards through interventions, then observing the results again, and so on" (Müller, 2020, p. 227). As in my research, the research process of design could change unexpectedly. In it, the researcher's role is to adapt during the process and be creative, even playful, to better understand elements of the environment, for example.

Nevertheless, ethnography emphasizes three key elements that researchers need to consider: type of communication, level of integration, and duration of the study (Muratovski, 2015). The first element, type of communication, is crucial in research done in the healthcare field, where my personal motivation for conducting the study alone was not enough. From my experience, there needs to be a clear introduction to what is going to happen, how it is done, and what its value is for participants. In the healthcare context, professionals from the hospital give their time for the project, and the hospital lacks resources while the professionals attend a workshop. If the communication is unclear, it is difficult to engage them. In addition, the type of communication is crucial during the study especially when experts from various healthcare professions in the hospital, patients of different ages with different backgrounds and diseases, and I as a designer meet. The second element, level of integration, refers to the researcher being either an "outsider" or "insider," as Muratovski (2015) explained. An experienced researcher knows when to be a silent observer or interviewer and when their role should be more active and engaging.

Regarding the third element, duration of the study, especially in healthcare-related co-design workshops, there needs to be enough time for thinking through complex scenarios, experiences, and service processes. This has been a huge learning point for me as a researcher, where a period of silence is not always a moment for ignorance or even for unconsciousness. It is usually a moment for in-depth thinking and processing—and sometimes, it exerts positive pressure that pushes people toward dialoguing. In the past, it was common to engage in ethnography as a long-term commitment, but that has changed, and it is currently more

short-term and multisided and/or focuses on a specific element or aspect (Madden, 2017). This was also considered in all the sub-studies in this work, as the healthcare organizations could not contribute full-time to the research. Well-scheduled and planned ethnography is an effective research approach for understanding organizations in a bigger service ecosystem picture, where multiple stakeholders, teams, and people also act in very narrow and specific service moments.

## 3.4 Data Collection Methods and Analyses of the Sub-Studies

In this subsection, I describe the data collection methods and analysis of each of the sub-studies. Descriptions of the sub-studies also include tables summarizing their respective overviews.

### Content Analysis

The data from the sub-studies were analyzed through content analysis, which is a qualitative method that systematically investigates texts (Leavy, 2017), including summing and counting phenomena in text or images (Muratovski, 2015). It can be an analysis of documented human communications and textual content as well as the context in which the text was created (Leavy, 2017). In this research, the design processes, workshops, and long-term hospital construction projects were highlighted and various design methods of developing healthcare services in different phases were under investigation. It was crucial to understand not only the participants' communicated texts but also the context in this research phase of the process where the texts were created. This method deepens the understanding of the specific content and "allows researchers to investigate the meanings embedded within texts" (Leavy, 2017, p. 146).

The interview data from sub-studies I and II were transcribed, and content analysis was performed on the transcripts through manual coding. The analyzed themes were defined before the study to guide the right semi-structured interview questions but were specified and completed during the analyses while the categorizing was done. In sub-studies III and IV, the participants' research diaries were transcribed into Excel and specific themes/phases of the design sprint process were highlighted. In addition, my own field notes as well as the semi-structured interview notes from the

design sprints were added in the themes. Tables 1, 2, 3, and 4 summarize the research questions, articles, methods, data, and analysis of each sub-study.

***Table 1.*** Summary of sub-study I

| Sub-study I | |
|---|---|
| Research question | How can service design tools and collaborative practices be used to support and develop customer journeys and hospital management practices? |
| Article | Miettinen, S., & Alhonsuo, M. (2019). Service designing a new hospital for Lapland Hospital District. |
| Methods and data | Methodology:<br>- Participatory observation<br>- Interviews<br>- Workshops<br>- Design probes<br><br>Data:<br>- Observation notes<br>- Unstructured interviews<br>- Semi-structured interviews<br>- Questionnaire answers through design probes |
| Analysis | Qualitative content analysis (text and visual) |

***Table 2.*** Summary of sub-study II

| Sub-study II | |
|---|---|
| Research question | How are patients' experiences considered when designing new hospitals and healthcare services? |
| Article | Alhonsuo, M., & Colley, A. (2019). Designing new hospitals – Who cares about the patients? |
| Methods and data | Methodology:<br>- Semi-structured interviews<br>- Observation notes in a co-design workshop<br><br>Data:<br>- Semi-structured interviews<br>- Written and visual notes |
| Analysis | Thematic analysis |

***Table 3.*** Summary of sub-study III

| Sub-study III | |
|---|---|
| Research question | What are the strengths and weaknesses of health-related design sprints? |
| Article | Alhonsuo, M., Hookway, S., Sarantou, M., Miettinen, S., & Motus, M. (2020). Healthcare design sprints: What can be changed and achieved in five days? |
| Methods and data | Methods:<br>- Case study research (research cycles)<br>- Ethnography<br><br>Data:<br>- Responses from research diaries<br>- Unstructured interviews<br>- Visual and written notes from the field |
| Analysis | Thematic analysis |

***Table 4.*** Summary of sub-study IV

| Sub-study IV | |
|---|---|
| Research question | How can healthcare representatives support design sprints in the development of healthcare-related services? |
| Article | Alhonsuo, M., Sarantou, M., Hookway, S., Miettinen, S., & Motus, M. (2020). Participation of healthcare representatives in health-related design sprints. |
| Methods and data | Methods:<br>- Case study research (research cycles)<br>- Ethnography<br><br>Data:<br>- Responses from research diaries<br>- Unstructured interviews<br>- Visual and written notes from the field |
| Analysis | Thematic analysis |

### 3.4.1. Sub-Study I

Sub-study I focused on how service design tools and collaborative practices can be used to support and develop customer journeys and hospital management practices. The study answered the research question through two different case studies of development projects related to Lapland Central Hospital. The study was undertaken in 2017, in Rovaniemi, which is in the northern part of Finland, and in Silicon Valley, California, USA. The main aims were to understand and investigate new demands for more agile management and healthcare processes as well as the uses of service design tools and collaborative practices to create a vision of and commitment to developing customer journeys in hospitals. In addition, it aimed to understand the role of visualization as a facilitator of fuller analysis and a means of better understanding hospital ecosystems. The case study research was carried out through participatory observation, interviews, and group discussions in selected healthcare organizations (Meyer, 2000), which are described next.

## Case Study 1: Benchmarking Healthcare in the Silicon Valley

This case study involved developing management processes for the new hospital using a benchmarking process. The goal of the benchmarking process was to learn about hospital management practices through lean, agile, and human-centered approaches. Benchmarking is increasingly used in healthcare institutions, where its value is in reducing expenses and improving product and service quality. It involves a continual process of developing hospital management processes by evaluating these against leading healthcare organizations (Benson, 1994). The hospital's management chose to use the benchmarking tool to adapt both the tool and the process involved for the district under study. The goal was to benchmark lean and human-centered care processes in Silicon Valley and learn new ways of designing and delivering healthcare services for customers. The case study was divided into three main phases: preparation, benchmarking site visits and interviews (joint discussions), and analysis (Figure 12). There were four participants in the benchmarking trip: the development manager, the chief administrative nurse, a project manager from the Lapland Hospital District, and the development manager from Oulu Hospital District, which is a neighboring region in Lapland. The benchmarking visits were prepared and monitored by a senior researcher from Lapland University. The abovementioned professionals are referred to as a *research group* in the following paragraphs. Here, I must note that I was not part of the research group, but I actively collaborated with the senior researcher who conducted the case study.

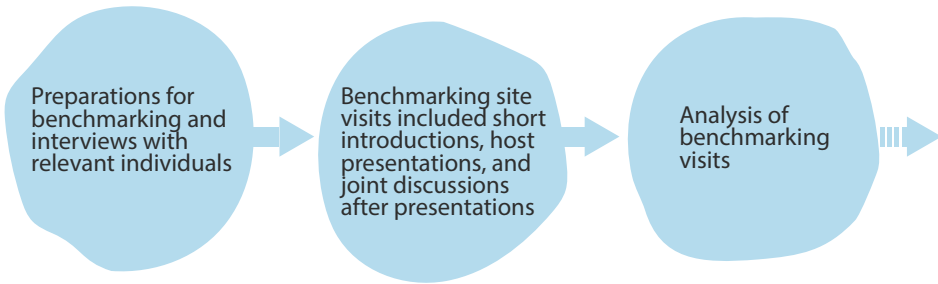



***Figure 12.*** The research process in case study 1: Benchmarking healthcare in Silicon Valley.

The first phase, preparation for the site visits, was a major part of the benchmarking process, which included researching potential hospitals and

contacting them. A senior researcher from the University of Lapland, who was at that time located in Palo Alto, California, discussed the selection of the best contacts and site visits with the medical experts at Stanford University and a local expert directing the Healthcare Design Research Program at the Stanford Center for Design Research. The site visits were organized by Kaiser Permanente's service design team in San Francisco, Stanford Healthcare, and Zuckerberg San Francisco General Hospital's service delivery management, Zen Hospice Project for palliative care in San Francisco, HanaHaus Design Thinking Meetup in Palo Alto, and the Healthcare Design Research Program at the Stanford Center for Design Research. Preparations included planning for the site visits and interviews with relevant individuals.

The second phase, benchmarking the site visits, included short introductions, host presentations, and joint discussions after the presentations. The research team also produced numerous group discussions after every visit to reflect the findings and thoughts of participants. There were two main topics emphasized in the evaluation of the benchmarking trip: (1) human-centered service journeys and models in the hospital and (2) lean and "true north," describing a lean organization strategy that places patients at the center of service processes. The first topic highlighted the need to develop more service-centered thinking and patient-centered processes, such as an appointment booking system considering the patients' point of view and customer service training for hospital staff. The second topic, lean and "true north," was seen not only at a management level but also in the everyday practice of the site hospitals. The site visits provided the visiting research team with an opportunity to evaluate and appreciate their own existing successful experiments, patient-centered practices, and development processes.

During the last phase, the analysis of benchmarking the site visits, useful ideas and outputs were quickly developed into practice at Lapland Central Hospital. One of the implementations was a "huddle," which is a quick stand-up meeting, where the hospital's management meets daily and discusses the existing resources in the wards. In the meetings, the intensity of nursing care is managed better in the wards where resources are needed the most. The huddle was experimented with in two hospital units. Implementation was limited, however, due to the beginning of summer holiday season. Three interviews were conducted with the people from Lapland Central Hospital who were also part of the research group benchmarking the site visits. The interviews included questions such as "Which benchmarking destination was most meaningful for

the development of the hospital's operations, and why?"; "What did the benchmarking site visits provide for the group?"; "How would you develop benchmarking work itself?"; "How did you apply lean/huddle in your own work after the trip?"; "What kind of experiences have there been?"; and "How did benchmarking open up ecosystem thinking from a service perspective?" These data were transcribed and analyzed via a qualitative content analysis method.

### Case Study 2: Rehabilitation Processes of Children Living in Lapland

The second case study focused on examining and developing existing children's rehabilitation processes and ecosystems in the eight municipalities of Lapland. The case study was conducted from February 2017 to June 2017 and was part of a project called Critical Communication, Safety and Human-Centered Services of the Future (CRICS). Strong collaboration was done with Lapland Central Hospital, especially with the children's department. The hospital coordinated the case study participants because they had contacts with healthcare professionals in the municipalities. These professionals were doctors, nurses, different therapists, such as physiotherapists and speech therapists, neuropsychologists, and social workers. Participants in the case study used service design tools to visualize the existing healthcare ecosystem surrounding municipalities' rehabilitation facilities and to tackle local challenges in this program. The aim was to develop new solutions for better and more efficient services that can provide equal healthcare to all families and their children in this remote region. The case study was conducted in three workshops and three design probes (Figure 13).

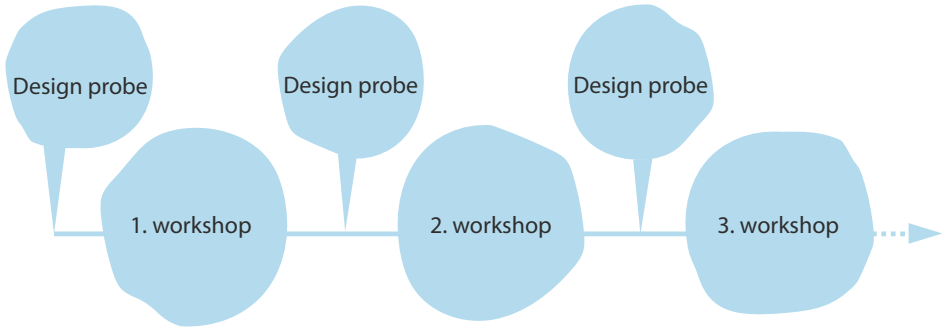



***Figure 13.*** The research process in case study 2: Rehabilitation processes of children living in Lapland.

Design probes are defined as user-centered and design-oriented self-documentation tools where the aim is not only to understand human phenomena and design opportunities (Mattelmäki, 2006) but also to "purposefully invite or provoke users to reflect on and verbalize their experiences, feelings and attitudes, and to visualize their actions and contexts." (Mattelmäki, 2005, p. 83). As a method, it activates participants in a playful and creative way to collect exploratory and personal data. The probes are widely used as a design method, and according to Mattelmäki (2005), they can be presented in four different settings: cultural probes (Gaver & Dunne, 1999), informational probes (Hemmings, Crabtree, Rodden, Clarke, & Rouncefield, 2002), technology probes (Hutchinson et al., 2003), and empathy probes (Mattelmäki & Battarbee, 2002).

This study utilized probes as an information gathering method instead of trying to specifically understand how people were feeling. The aim of the first probe was to collect data on existing resources, needs, and challenges. The probe was a questionnaire in pdf format with typing options. It was sent to municipal healthcare professionals with an introduction. They could fill out the questionnaire on a computer or print it out, handwrite it, and scan or send it via the post. We received 25 responses. The answers were transcribed into Excel and then into an expansive printed template, which we called the resource blueprint. The visualized resource blueprint was used in the first workshop, and it proved to be crucial throughout the whole project. It worked as an information-sharing platform and opened up the discussion between professionals. It was also crucial for explaining the service ecosystem framework of all eight municipalities.

The first workshop was held in Rovaniemi with 24 participants. The aim of the workshop was to understand the resources, needs, and challenges in children's rehabilitation processes in Lapland. Data from the questionnaires and resource blueprint were used and supplemented but not finalized. The workshop was very dialogue-focused and achieved two objectives: agreement on definitions of perceiving children's rehabilitation in Lapland and concluding six development challenges. The latter was generated in a form of mind map in small groups. The data were documented in pictures and transcribed into Excel.

The second design probe was a questionnaire with nine responses. The aims were to seek different solutions or ideas for more adaptive services in rehabilitation. Question examples from the probe concerned how to enable the active roles of the child and the family in rehabilitation (planning, implementation) and to think of ways to make (rehabilitation)

services easily accessible to families. We also wanted to understand the external resources, for example, in schools or hobbies and how we could utilize those in rehabilitation programs. In addition, the Lapland Central District sent questionnaires to families, who were their existing or past customers, and asked for feedback on and development ideas for their services. Thirty questionnaires were sent and 11 replies were received. The data from the design probe and questionnaire were themed and presented in the following workshop.

In the second workshop, data from the previous probes and questionnaires were presented and discussed with 22 participants. The main objective of the workshop was to create a service journey that visualized six main phases: (1) worrying, (2) contacting a service provider, (3) assessing the child's functional capacity, (4) creating a rehabilitation plan, (5) implementing the plan, and (6) controlling and assessing rehabilitation results. This visualized process supported participants in defining the entire rehabilitation process and understanding the most important needs involved.

The third design probe was done with the Google Forms questionnaire tool, utilized the created service journey, and deepened the internal processes in each of the six phases. We asked professionals to highlight such aspects as who is part of the phase, where it happens, how it happens, and what kind of minimum viable service/product would be suitable in this phase. In addition, the questionnaire included ideas already created, and we asked participants to vote on the best ideas. The most voted for ideas were prototyped in the last workshop. We collected 15 replies from the online inquiry.

The last workshop summarized the whole case study. The aim was to prototype and role-play the most voted-for ideas with 26 healthcare professionals. Two scenarios were selected and the participants took on different roles, such as mom, dad, child, teacher, nurse, and physiotherapist. The workshop was video recorded and iterated service scenarios were visualized as storyboards.

The service design outcomes of case study 2 were three visualized service concept pictures (Figure 14), which were presented in a subsequent healthcare seminar. The first service concept was a digital platform to provide different rehabilitation services for families without a doctor's referral. This idea would enable families to, for example, use virtual reality as a new way to motivate children with movements. The second service concept was a digital service allowing a multi-professional team to meet families quickly and easily without long journeys and scheduling

challenges. The service first would determine where the challenges are, on the basis of which the system can select the right professionals. The system would create a separate diary for the child, enabling the family and professionals to follow the rehabilitation as a service path, see past and future appointments, and compile a rehabilitation plan. The system would allow for seeing how the child has developed during the rehabilitation process. Parents could also interact with experts via chat, if needed. The third service concept, School as part of rehabilitation, was developed as a support service for teachers in schools that would enable teachers to contact a neuropsychiatric coach and ask for support and assistance during teaching. A neuropsychiatric coach would provide mental support to a child or adolescent in coping with everyday challenges using their own strengths. Thus, the integration of the teacher into rehabilitation was deemed important.

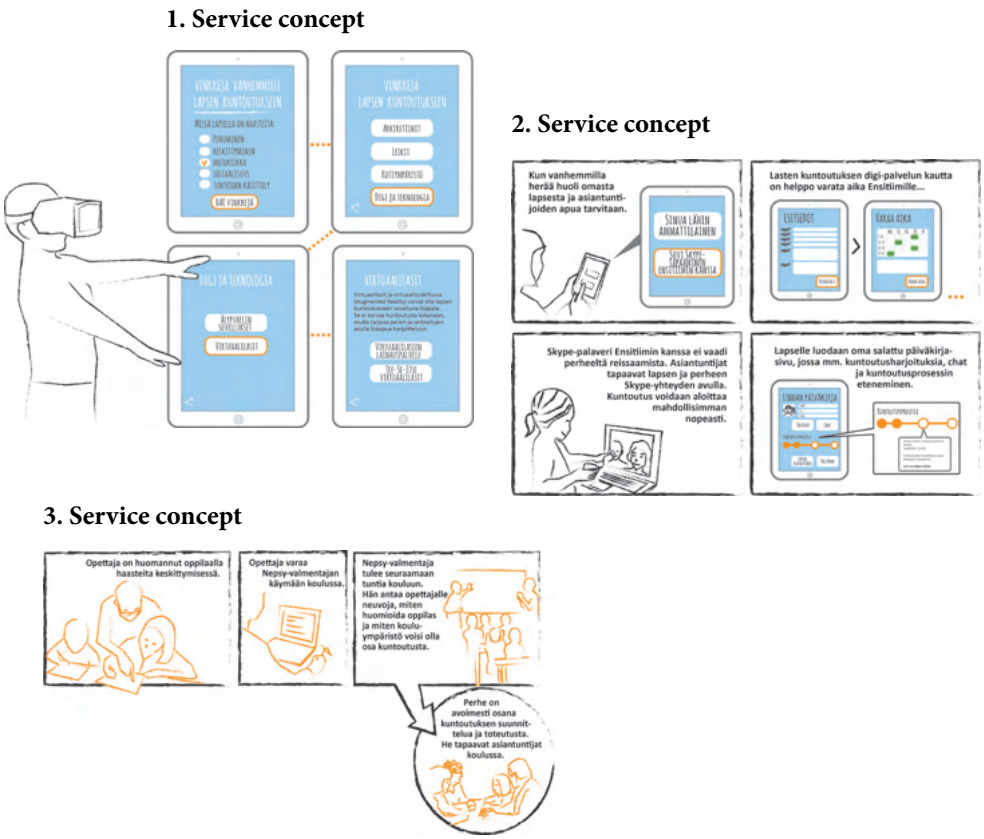



***Figure 14.*** Examples of visualized service concepts created for families and healthcare professionals during the case-study 2 in sub-study I. (Author's illustration)

### 3.4.2. Sub-Study II

The second sub-study investigated patients' experiences of the design process of new hospitals, especially co-design methods including patients. I was especially curious to study the pre-construction phase of new hospital design, where changes may be more easily incorporated and patient voices included. The article was a short paper that aimed to validate and extend existing discussions on the challenges, needs, and good practices of applying patient-centered co-design methods. The paper described the co-design methods in two new hospital builds through semi-structured interviews, which I organized with three experts in two hospitals. In addition, I observed a co-design workshop between hospital staff and hospital architects in one of the hospitals. The interviews and observations were done in 2018.

The interview questions aimed to clarify the big picture of a new hospital design process, especially the pre-construction part. The questions consisted of four main themes: (1) planning phases of new hospital design, (2) the stakeholders who were involved and why, (3) what methods and tools were used in which phases, and (4) how patients participated in the design and decision processes. I aimed to get a deeper understanding of what works and what does not. The interviews were recorded and transcribed. I used an affinity diagramming approach to identify the main themes from the data.

The co-design workshop between hospital staff and hospital architects in one of the hospitals focused on the cardiology ward. I observed the two-hour-long session, where an architect, four nurses, and two doctors discussed the floor plan of the ward. They focused, for example, on the waiting and patient areas in the ward. I mainly observed how the patients were being considered during the discussion and how the services were concretized in the waiting and patient areas. I took notes during the workshop and added the data into the affinity mapping used in interviews.

### 3.4.3. Sub-Studies III and IV

Sub-studies III and IV were conducted through three health-related design sprints in the form of case studies. These were held in three different locations: Gothenburg, Sweden; Tallinn, Estonia; and Rovaniemi, Finland. The design sprints were part of the research project called Co-designing

Healthcare, which was a two-year joint initiative of higher education and healthcare institutions of the three abovementioned countries. The project had three main aims: to attract more designers to the healthcare sector, to encourage more healthcare providers to use "design as process" and "design as strategy," and to develop more digital health solutions that support new organization, process, and payment models in healthcare. The project started in November 2018 and ended in December 2020.

The participants who supported the project in Sweden were from the University of Gothenburg, HDK-Valand; Academy of Art and Design, Sahlgrenska School of Innovation and Entrepreneurship (SSIE); Sahlgrenska Academy School of Medicine; and Sahlgrenska University Hospital and Children's Health Center Services. Those from Estonia were from the Estonian Academy of Arts, Connected Health Cluster, and North Estonia Medical Centre, and those from Finland were from the University of Lapland and Lapland Central Hospital. The collaboration among academics was strong during the project, and it supported and encouraged research mobilities of the students and staff.

The design sprints in each location varied. The local hospital or health center gave a brief for the design sprint, and the planning and scheduling were done by the local team. The design methods used in each location were also differentiated by the number of participants, briefs, and facilities. A concise overview of the respective design sprints, data collection, and participants is discussed in the following paragraphs.

## Case Study 1: Design Sprint in Gothenburg, Sweden

The four-day design sprint in Gothenburg was conducted in April 2019. Participants in the design sprints were 18 students with international and multidisciplinary backgrounds and four hospital representatives. Two of the hospital staff were working in Child Health Centre (BVC) Services, and two others were from the North Estonia Medical Centre. The design brief was to improve communication between nurses and parents in BVC Services. In Sweden, children participate in BVC Services from birth to the age of 6 years. There were two focus areas: information on the different visits during the child's time at BVC, and information in regard to preparing for a visit (the child's perspective). As an outcome of the three design sprint teams, communication tools, such as "Chatbox" and a "Yearbook," were created to enhance the interaction between parents and professionals. The ideas were given to BVC but were not yet implemented.

The design sprint process followed simple steps using a design process starting from an investigation and field work, mapping down the data to define the design challenges, and then continuing to the solution through ideation and prototyping. Figure 15 summarizes the design sprint process and the design methods used in Gothenburg each day.

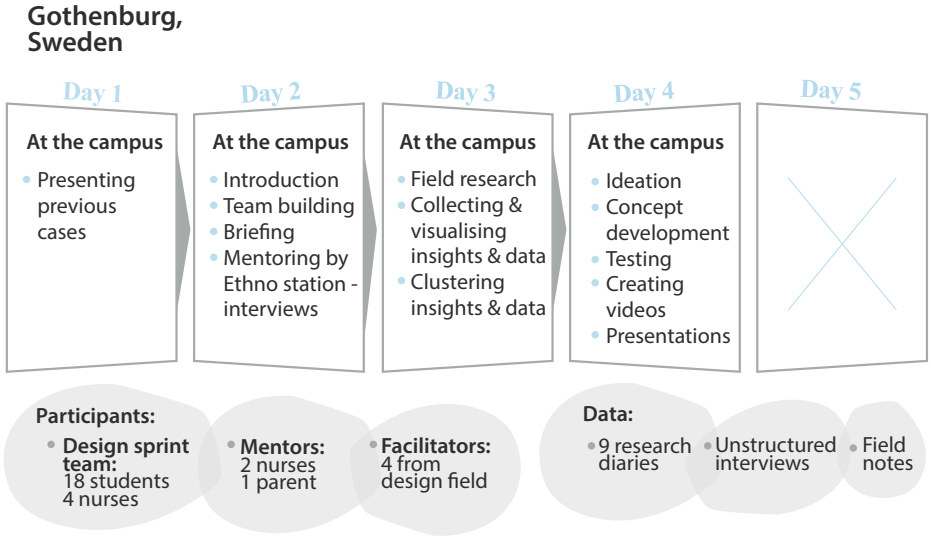



***Figure 15.*** Design sprint process in Gothenburg, Sweden.

Data from the design sprint in Gothenburg were collected through research diaries, field notes, and unstructured interviews. The research diaries were sent via email right after each design sprint day. The questions (4 varied questions per day) considered various topics, for example, "What kind of design methods were used during a design sprint day, and how did the methods work in your case?"; "Which methods helped to understand the case better?"; "What kinds of methods would have worked better to capture the needs or dreams of parents and/or children?"; "How did you think the design sprint concept would work in health-related service development?"; and "What are some other reflections, experiences, or thoughts of the day?" We received nine replies in total. The research diaries appeared to be too tiring for the design sprint participants to write in after intensive days. I took field notes during the design sprint, and I continually observed the participants, design methods used in the design sprint process, and the environment and facilities offered to the teams. I did visual and written notes from the field, where I highlighted each design method used in the design sprint process and the teams' thoughts about the method. I also

made notes during the unstructured, ad hoc interviews when asking participants specific questions, such as how the intensive days could be done better to reach the best healthcare-related information and what the participants felt was most difficult during their most intensive days.

### Case Study 2: Design Sprint in Tallinn, Estonia

The second design sprint was held in Tallinn in April 2019. It was a five-day-long design sprint done in collaboration with North Estonia Medical Centre (PERH), ER/Trauma, Day Surgery, Stroke and Cerebrovascular, and Palliative Care units. The design sprint was part of the bigger service design course at the Estonia Academy of Arts (EKA) and Taltech. Local students of EKA had already started their exploratory research in February, but the actual design sprint process was implemented in April. Then 19 students from multidisciplinary fields and one from a healthcare background joined a pop-up design studio in the lobby of the North Estonia Medical Centre and challenged themselves in five teams one of the following five themes: (1) making the pre-visit process valuable; (2) leading a meaningful life after a stroke; (3) day surgery center; (4) death with dignity; and (5) emergency department (ED) patients' stress and anxiety. The conceptual solutions were co-designed in each of the five teams, and the local students continued the development after the design sprint when their course ended in the summer.

The design sprint teams first familiarized themselves with the existing data, which the local students had gathered and visualized for huge paper-based canvases during the first few months of the course. Next, the teams followed the basic structure of the design process, starting from the site visits, deepening the understanding with mentoring rounds, building rough prototypes and/or desktop walkthroughs from the ideas, and finally, testing, evaluating, and iterating the concepts before the final presentations. The design sprint in Tallinn offered an opportunity to utilize the healthcare professionals and experts as visiting mentors during their intensive work. Visiting mentors were from the hospital IT, quality management, communication, service, and clinical fields. The students could ask questions and gather information from the experts from specific fields, thus avoiding any confusion or other difficulties during the sprint. Figure 16 summarizes the design sprint process in Tallinn in more detail.

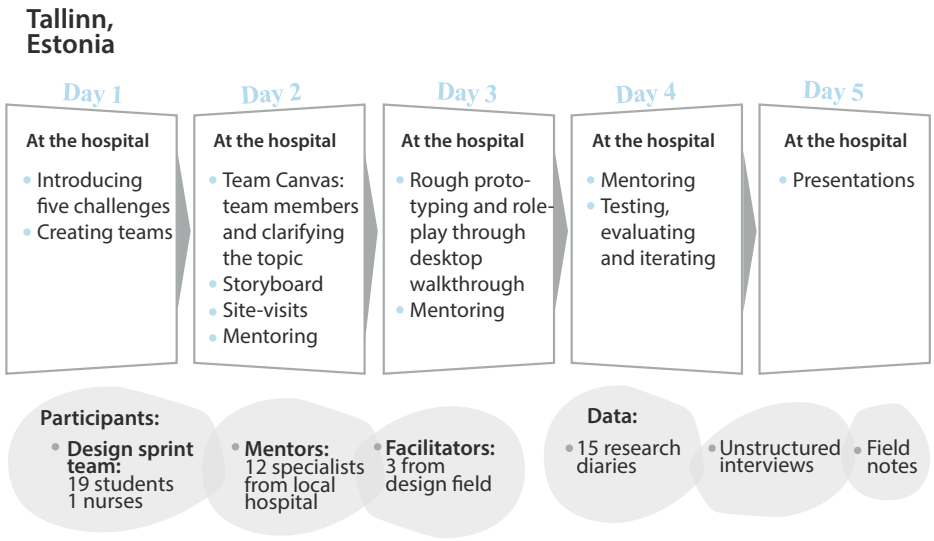



***Figure 16.*** Design sprint process in Tallinn, Estonia.

The data collected from the design sprint in Tallinn included 15 research diaries from the participants, my own field notes, and unstructured interviews. The research diary was an A5-size booklet with prompts such as "3 good thoughts from today," "2 questions which arose for you," "1 idea you'll put into practice," "3–5 keywords to illustrate your team's process today," and "other reflections, experiences, or thoughts which you feel are relevant to say." The research diary with the prompts was created by the leader of the design sprint facilitators from EKA, who also worked as the main facilitators in this design sprint.

The unstructured, ad hoc interviews were done in the same way as in Gothenburg. I observed the design sprint process and teamwork and asked questions, such as "How did you feel that the mentoring round supported you last time?"; "What would have worked as a better method or approach to reach the understanding in your design brief?"; and "How would you compare the pros and cons in this design sprint versus the previous one in Gothenburg?" The last question was asked of the students who had also participated in the design sprint in Gothenburg. I recorded field notes during the design sprint using an observation style very similar to the one I had used in Gothenburg. I observed the participants, design methods used in the design sprint process, and the environment and facilities offered to the teams. I did visual and written notes from the field, where I highlighted each design method used in the design sprint process and the teams' thoughts about the method.

## Case Study 3: Design Sprint in Rovaniemi, Finland

The last design sprint was organized in Rovaniemi at the beginning of May 2019. It was a five-day-long process with two teams of three international students. The aim of the design sprint was to investigate and develop a care and treatment reservation center at Lapland Central Hospital. Due to the long travel distances in the Lapland area, the brief was divided into two case studies. The first team considered a patient who lived far from specialized healthcare institutions, in Utsjoki, which is 450 km from Rovaniemi, where the specialized healthcare is provided. The second team focused on a patient who lived in the Rovaniemi area, near the central hospital, but was busy with seasonal work and family life. The teams developed healthcare services, such as a LAPP LAB service bus to take healthcare services and e-health solutions into rural areas and a web-based service system to make the treatment reservation process more flexible by allowing patients to book, change, and cancel appointments.

The design sprint process started with introducing the brief and doing the field work. The findings were mapped down, and understanding was deepened through mentoring (two nurses from the hospital and two other experts from the design/healthcare fields). Then the teams ideated different solutions and user-tested the selected ideas through prototyping. The final concepts were filmed as a concept video. Figure 17 provides a detailed process description.

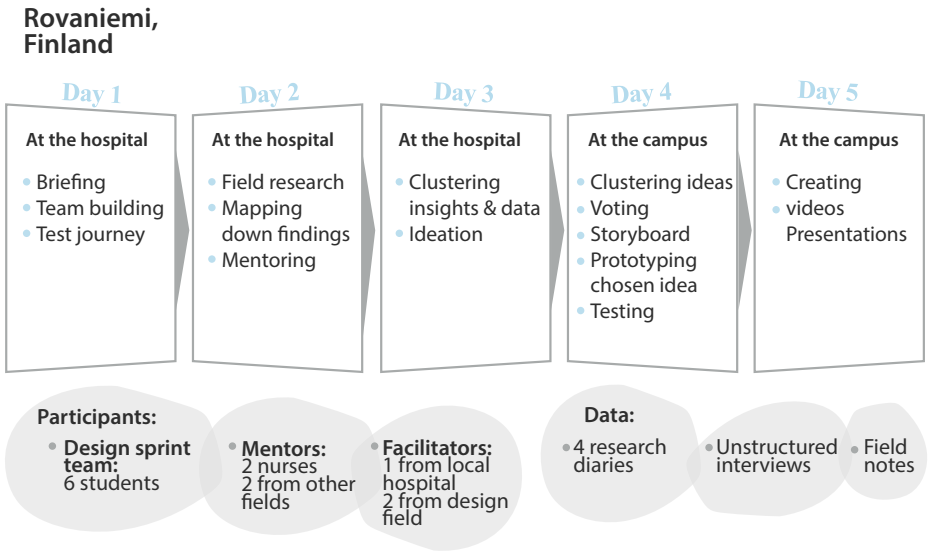



***Figure 17.*** Design sprint process in Rovaniemi, Finland.

I was the main facilitator in the design sprint in Rovaniemi and was supported by my colleague from the University of Lapland and the coordinator from Lapland Central Hospital. The design sprint was planned according to my observation notes from the design sprints in Gothenburg and Tallinn. I formulated the structure through selected best practices I had documented in my field notes and interviews. I also took some notes during the design sprint, but it was not so systematic compared with the previous design sprints where my role was more like an engaged design researcher than a full-time facilitator. After the first, second, and third days, we had short interview sessions with the six students. I asked questions concerning their feelings about the day and methods, what they would have done differently, and what went well. I also received four research diaries. Here, the research diary was like a questionnaire at the end of the entire design sprint, where I asked some of the same questions as in previous design sprints but also requested more detailed feedback about the design sprint schedule (lengths and breaks) and ratings of the methods used during the sprint.

## 3.5. Ethical Considerations and Evaluations

The sub-studies introduced in this research followed and considered the ethical guidelines and norms of the Finnish National Board on Research Integrity (TENK). As research involves collecting data from people about themselves (Punch, 2005), researchers must protect their participants by gaining their trust. In sub-studies I, III, and IV, research permissions were sought throughout the research projects and at the local hospitals. In addition, all participants in all four sub-studies were informed about their participation in the academic research. We guaranteed that their participation was voluntary and that withdrawing from the research at any time was possible. The data collection in each sub-study was conducted in a manner that ensured anonymity, and the research data were stored on a secure server.

The participants involved in this research were healthcare professionals (sub-studies I–IV) and students from different disciplines (sub-studies III and IV). Patients were not included directly in this research, and thus, there was no need to apply for permission from the local institutional review board. In sub-study I, the hospital conducted its own questionnaire with parents. The answers were anonymized before I could utilize the results in case study 2 (of sub-study I). I would also like to

mention that during the design sprints in sub-studies III and IV, there was interaction with the patients. This interaction occurred when design sprint teams researched and developed the design challenges given to them from the local hospital. In such cases, research permission was sought from the local hospitals.

Considering ethics, there are several issues researchers must understand. As Leavy (2017) explained, there are components that require ethical considerations in decision-making and practice. These components are, for instance, how we decide which group of people to study and how to identify individuals for the study, how to interact with these people, and how we disseminate the research findings. Leavy defined the ethical substructures of research in three dimensions: the philosophical dimension, which asks "What do you believe?"; the praxis dimension, which asks "What do you do?"; and the reflexivity dimension, which asks "How does power come to bear?" (pp. 24–25).

### What Do You Believe?

The philosophical dimension highlights our own beliefs, attitudes, and ideas about the world, and thus, it shapes our decisions, thoughts, and actions. As mentioned in my description of my academic journey, the healthcare field has not offered a straightforward plan for what to investigate. From an ethical point of view, I believe this has had an impact on my beliefs. When I did not have a clear direction as to what to aim for, and I concentrated more on the healthcare professionals' point of view, I positioned myself in an open field where the research design led me to look at cases from perspectives with which I was not familiar and to interpret the language of the data from a neutral point of view. The difference here would have been to consider patients, which might have had a more powerful impact on shaping my decisions, thoughts, and actions. Leavy (2017) also emphasized that it is important to use mutually understandable language with people involved in the research.

### What Do You Do?

The ethical praxis considers what we do in terms of designing and executing our research agendas. This is influenced by our beliefs (Leavy, 2017). Leavy also explained that the dimension of "What do we do?" has

an impact on the setup of our research design, data collection, and content generation and representation. Ethically, researchers should pay attention to the potential value or significance of research on a proposed topic. Here, an essential idea that has been a constant factor throughout the research journey has been the focus on creating value for healthcare development, which must truly consider the healthcare professionals from different backgrounds and fields. The value of "What do I do?" during the research design, data collection, and representation has been very clear from the beginning. The outcomes of the research must propose new ways to connect service design and co-design approaches and healthcare-related development.

**How Does the Power Come to Bear?**

The ethical dimension of reflexivity discusses "how power comes to bear on the process and how we reflect on our own position as researchers" (Leavy, 2017, pp. 47–48), especially highlighting our personal accountability and the role of power in research practice. Thus, the ethical dimension pays attention not only to reflecting how power can influence our behaviors and attitudes but also our own role in shaping the research experience. In this context, there is a hierarchical relationship between the researcher and participants that might have an impact during the entire research process, for instance, if interviewees can subsequently comment on transcribed interview data or participate as coauthors of the article. The researcher's attitude might also have an impact on the theoretical framework or the worldview of the research. In my research, one source from which I collected data was my own field notes from the sub-studies (e.g., observation notes and visual and written notes from the field), which also touched on my relationships with the participants. In hindsight, I could have better reflected on my own position throughout the data collection and analysis to make the reflexivity more pervasive.

In summary, the healthcare field has not always been an easy environment for me when doing research. I have faced situations where my work (or design research) was questioned, I have had to change agreed interview times from one hour to 10 minutes because of changed work pressure in the hospital, I have had to mediate inconsistencies that have arisen from the material I have collected, and I have had to remove many interactions within the hospital from my mind because of ethical considerations. However, I believe that my work history in developing

various healthcare services has been helpful in this journey when facing suddenly changing situations and dealing with different hierarchical and ethical issues.

After reflecting on my sub-studies through the ethical lens, I understood that the more complex an organization is, the more deeply the researcher needs to be aware of ethics. In addition, when building research through constructivist epistemology, the researcher must listen to and understand people and trust the views of participants through language. As Creswell stressed (2014),

> Researchers recognize that their own backgrounds shape their interpretation, and they position themselves in the research to acknowledge how their interpretation flows from their personal, cultural, and historical experiences. The researcher's intent is to make sense of (or interpret) the meanings others have about the world. (Creswell, 2014, p. 8)

I would add that constructivism increases the awareness of ethical considerations of researchers, but the three ethical substructures of research outlined by Leavy (2017) support researchers in looking at issues from different perspectives.

Nonetheless, I must emphasize that although I have learned a lot along the way, the fields of qualitative research design, service design, and healthcare have posed challenges that I could not have foreseen. One of the most challenging things for me is that design as a field of development can be so unknown from a healthcare perspective that its connections to ethical issues may not even be known. This situation puts the service designer in a position where they should be able to describe the process and methods used thoroughly and comprehensively. However, the iterative process of design research and adaptation to different situations and rapid changes make it difficult to explain. I have noticed, the more the hospital has been involved in service design (whether it is a student project or its own research), the easier it is to discuss the details of the research together and create clear frameworks and ethical alignments for the work. This journey has been both challenging and interesting to me from an ethical point of view.

## 3.6. Reflexivity of the Research

My role throughout this research process has been both as a service designer (and facilitator) and a design researcher. I accomplished the research plan; the methodological choices; data planning, gathering, and analysis; and workshop facilitation in both roles. However, these roles do not differ significantly and they, at least in my opinion, bring value and reliability to the research. My service design background and especially my visualization skills have helped me illustrate and consider how the data gathering could be more fun and the templates more engaging, and my researcher background helped me think about what kinds of questions would elicit sufficient information and avoid asking unnecessary questions, which is important from an ethical point of view. Many design methods gain a stronger academic grip when they are designed, produced, and analyzed through the eyes of a researcher. Unfortunately, in the sub-studies of this research, time pressure limited the use of visualization, for example, in the design sprints.

I also believe that healthcare professionals who rely on scientific research in their work will appreciate design research that is qualitatively and thoroughly designed, follows scientific structures, and is ethically reviewed. Although I think design research is often built during the process, changing directions, goals, or practices, it is a significant field of learning that challenges the design researcher to apply their knowledge during the research process.

Reflection is an important given in qualitative research, to which learning is strongly linked. Schön (1987, 1991) suggested two levels of reflection: reflection-in-action (reflexivity) and reflection-on-action (critical reflection), whose roots are in Dewey's (1933) work. Reflection-in-action occurs while you are doing something and allows you to react, consider, and change situations immediately. Reflection-on-action is critical afterwards, when something has happened and you think about what needs to be changed and reconsidered for the future (Schön, 1987, 1991). These two levels of reflection are important, and they are discussed in the following paragraphs.

### Reflection-in-action

In design, "'drifting' is a quality measure as it tells the story of a designer capable of continuous learning from findings and of adjusting causes

of action" (Krogh, Markussen, & Bang, 2015, p. 39), which, in my view, evolves with experience. The healthcare field is not the easiest field in which to practice design, and it can often challenge me. Even though I have accumulated more than eight years of experience in healthcare service design, I still find myself in situations where I am unable to work correctly and I make mistakes. The sub-studies in this research placed me in similarly difficult situations. One of the most difficult things I have encountered is related to the outcomes of design methods. I find that many would like to know in advance what the methods are aimed at and what they will achieve. Often, I do not know this either, and that is interpreted as uncertainty or ignorance. I often reflect about things afterwards, when reflection-on-action happens.

**Reflection-on-action**

In hindsight, I have sometimes regretted that I did not understand about capturing a particular moment or situation while constructing data from the field. In many cases, there has also been a rush to highlight the quality or incompleteness of the documentation. These are also gaps that I faced in this research. I lost my systematicity in the design sprint data and had to make last-minute changes especially to the participants' research diaries when they did not follow the structure I was planning on. However, the data were ultimately valuable and comprehensive, and their interpretation as part of other data collected during the sprint supported the research as a whole. As a service designer and design researcher, it is essential to evaluate and develop your skills, and reflection-on-action is at its best when you can share your experience with other designers and researchers, giving reflective support to develop both the design and academic communities.

# 4. Results

## 4.1. Service Design Tools as Supporting and Developing Hospital Management Practices

The large dataset from sub-study I is introduced in the following subsections. Here, I will answer the research question: **How can service design tools and collaborative practices be used to support and develop customer journeys and hospital management practices?** The results can be categorized into two areas. First, I will describe how benchmarking as a tool in the design process can support the development of hospital management practices, and second, I will introduce the design method as a way to create and share a vision and understand ecosystems in the healthcare context.

### 4.1.1. Benchmarking as a Process to Develop Hospital Management Practices

Benchmarking is a widely used process in the healthcare field, and it can be seen as an iterative approach in the development of health-related services (e.g., Kay, 2007; West, 2021). It has value because it helps to avoid risks, defects, and limits to patients' safety and can be used to improve service quality (Liedtke et al., 2017; Rasche et al., 2017). In sub-study I, the most significant effects of benchmarking were related to evidencing the development of lean management and "true north" thinking, which was the main objective of the case study 1. Evidencing is needed for decision-

making at the organizational and design levels, as it helps to drive learning and transformation forward (Foglieni et al., 2017). According to Fry (2019), evidence is important when new service processes and practices are introduced in hospitals.

Sub-study I determined that through benchmarking, we can ensure the quality, effectiveness, and timely availability of services and provide evidence through examples in the hospital context. Benchmarking has its value and contribution when agile experiments and evaluation practices are elaborated, making it particularly suitable for the agile development of a design sprint (Knapp et al., 2016). Benchmarking was seen as a way to learn more about hospital management practices based on lean, agile, and human-centered approaches. In addition, in sub-study II, we found that benchmarking was experienced as one of the fastest and most cost-effective approaches for a new hospital's pre-construction phase, where the best practices for patient-centered care must be observed and investigated.

Sub-study I stressed that the challenge of developing the benchmarking itself was strategically important and that there is a true need to adopt new practices to refine a benchmarking process especially in the service design field. As highlighted in the theoretical background of this research in subsection 2.3.2, the existing practical handbooks of service design do not offer tools or templates for benchmarking. Thus, implementations of and commitment to new design practices developed during and after benchmarking were experienced as difficult parts of the process. In the following paragraphs, I will discuss the three needs identified from sub-study I.

First, there is a need for a required set of design tools to put ideas into practice. Here, the healthcare management had a need for visual ways to disseminate and communicate information from the benchmarking site visits to the local healthcare professionals, experts, and communities. Visualization and concretization tools (Koh et al., 2011; Shneiderman et al., 2013) are highly important during the benchmarking process but should be used more broadly. In sub-study I, we found that visualization tools helped to create a shared understanding of healthcare ecosystems, which can support the implementation of lean strategies in healthcare processes. In addition, through visualizations, we can aim to create better communication and participation.

Second, when issuing mandates, there is a need to engage and commit people from the hospital, as noted by Wetter-Edman et al. (2018), who stressed that stakeholders' participation is crucial and that we can impact and change their behavior. In sub-study I, benchmarking

encouraged healthcare staff from the Lapland Hospital District to discuss not only service design approaches in healthcare but also lean practices in the healthcare context. The practical examples helped hospital management and service design practitioners understand how a service design approach would be an effective part of healthcare-related development in hospitals.

Third, there is a need for scaling up the service experiments in hospitals. Here, the service design practices and tools are ideal to zoom in and out to see the smaller details and the larger overview (Polaine, 2013). During some of the benchmarking site visits done during the first case study in sub-study I, hospitals ran their experiments first in one unit and later scaled them up for the other units. We argued in sub-study I that the scaling-up step is one of the challenges in service design and human-centered development. Scaling up services is part of the change process, which requires peer-to-peer learning. Here, transformational change in the organizational culture and management's strong commitment to benchmarking are needed to ensure that the results of the service design process are discernable. The scaling-up step can take innovations from experimentation to implementation and strategic day-to-day management.

The role of service design could offer solutions for meeting all the aforementioned needs. Service design tools can help to create and develop more effective benchmarking processes and generate support and commitment for service ideas, which affects the overall success of development projects. In sub-study I, we suggested that service design could use video personas and short commentaries and statements of healthcare professionals and patients from the benchmarked hospital and also develop tools for both designing and evaluating agile experiments based on benchmarking. The documented data from benchmarked hospitals can also provide evidence for the service development process and support the service designer in their role. This useful documentation could also bring service designers' role closer to the early phase of the design process, when the designer can capture the contents and ideas generated during the benchmarking. The video recordings from the field and visual tools can also be valuable for internal purposes when aiming to improve the internal culture, initiating clinically meaningful changes in quality, and bringing about a "change in mentality" in an organization through benchmarking (Gleason & Bohn, 2017, p. 151).

### 4.1.2. Design Methods as a Way to Create and Share a Vision and Understand Ecosystems

In sub-study I, we found that even though healthcare professionals in different municipalities were actively working together, they were still missing knowledge of the service processes in different hospitals. This challenge might make the services slower or even unobtainable, especially when a province consists of many municipalities that should seamlessly cooperate. Sub-study I demonstrated that visualization and concretization tools (Koh et al., 2011; Shneiderman et al., 2013) enabled better communication and participation in development processes and helped to create a shared understanding of healthcare ecosystems, which can support the implementation of such things as lean strategies in healthcare processes. In addition, as Hakio and Mattelmäki (2011) argued, participatory and visual design methods fit well into enhancing the cross-functional collaboration in a public organization. In the following paragraphs, I will stress the value of visualization and service design workshops especially from the very early phase of the development process.

Eight municipalities were involved in the development process in case study 2 of sub-study I, where we determined that one of the biggest challenges is regional barriers. Information is missing from municipality to municipality, which makes the services slower or even unattainable. We visualized the resources as a blueprint template, which helped participants in the rehabilitation program share the information among the professionals, and through that, to perceive the healthcare-related service ecosystems of municipalities. In the service ecosystem levels devised by Beirao et al. (2017), the resource blueprint is linked to the micro and meso levels in this research. At the micro level, professionals inside the hospital shared knowledge and information, and at the meso level, professionals in other hospitals created an interaction and communicated together. The blueprint is a useful tool for managing complexity (Polaine et al., 2013), and therefore, the blueprint visualization as a concretizing tool amasses different data, knowledge, service processes, and the district's ecosystems for everyone to view. Here, the resource blueprint was done at the beginning of the development project, and it was laborious but definitely required at the starting point. The information and knowledge were finally reachable and understandable, which helped not only during the development but also later to understand what service design tools and methods the service designer can bring to the development. As Vetterli and Scherrer (2019)

stressed, patient-centered innovations are difficult to reach for because the resources are limited and there is no consistent understanding of the current situation in organizations. The resource blueprint supports the structuring of these situations.

The role of service design workshops was seen as a way to bring professionals "finally" together and, through design methods, to discuss and develop the health-related processes. As described in the second case study of sub-study I, the healthcare professionals saw the great value of having sufficient time to get to know each other and discuss among themselves. Although they might know each other by name and might also actively work together, for example, via phone or email, they may never have met face-to-face. The professionals from the rehabilitation field were curious to know more about the services, processes, and the entire district's ecosystems as well as the resources and how these were distributed in the municipalities. In sub-study I, we discovered that workshops are not only a great platform for meeting people, but they also generate value for further development projects and increase motivation for service innovations. Workshops as a co-design platform are also crucial when developing healthcare processes across municipalities, when it is crucial to foster trust, clear communication, and familiarity with other professionals. Here, the role of the service designer is particularly important for achieving equal, high-quality, and creative cooperation.

## 4.2. Patients' Experiences of Healthcare Services

Sub-study II answered the following research question: **How are patients' experiences considered when designing new hospitals and healthcare services?** Previous studies found that there are potential benefits of utilizing patient-centered co-design in the healthcare environment (e.g., Donetto et al., 2015). This potential was also clearly recognized in both hospitals in sub-study II, but the results revealed the existence of various challenges and different opinions concerning patient involvement and co-design methods, especially in the early phase of the new hospital construction process. In addition, due to schedule limitations, patient-centered co-design sessions were difficult to utilize, and the co-design methods were not optimal for every issue or phase. I will now discuss these issues more thoroughly in the following paragraphs.

### Limited Timescales and Resources

Even though the data in sub-study II were limited and collected from two hospitals (H1 and H2), they clearly indicated that there are no common practices in patient involvement when designing new hospitals. One of the notable results from sub-study II concerned limited timescales and resources in the use of co-design and patient-centered methods. Limitations of time and resources were mentioned as having the biggest impact in a context of bringing co-design into the long-term process of new hospital design, which is executed under time-schedule pressure and under the guidance of architects. It was noted that the schedule for the planning phase is usually so tight at the beginning that there is not enough time to go through all the processes in the hospital. In addition, in a silo-structured organization, the healthcare professionals are often optimized in their own area of expertise and, thus, there are challenges in wards being able to "discuss" among each other. This causes problems when the focus should be on the overall caring process, where the patient is the main stakeholder who has to experience the entire process from one silo to another. The impact of co-design methods and their challenges have been investigated in prior works (e.g., Bowen et al., 2013; Canham et al., 2016; Pirinen, 2016). As identified by Canham et al. (2016) participants over-estimating the potential scope and time scale for change is a main challenge with co-design methods in the healthcare context. In addition to these issues, which were also recognized in sub-study II, one of the mentioned struggles was designing something totally new in a hospital.

### Concretizing the Environment

Another key finding of sub-study II concerned concretizing methods or more specifically, concretizing the environment. Here, H2 used VR workshops to concretize the service ideas in the new hospital. They structured the VR sessions so that the hospital staff first tested and evaluated the essential apparatus and equipment, and subsequently, in the second VR session, they invited patients to give their opinions. They also invited people from the customer jury without any specific experience of the redesigned room and people with real-life experience. Thus, they could gather different observations and comments that were truly relevant. This sub-study showed that VR, as a way to concretize service processes and physical touchpoints, supported the development of physical solutions.

A VR co-design session can add realism to simulated environments and is an inexpensive way to test, ideate, and develop service scenarios and physical mock-ups, such as isolation rooms or self-registration machines. In addition, VR simulations and physical mock-ups as co-design practices can not only visualize the floor plans and equipment layout issues but also elicit the people's voices.

As a low-tech version of VR technology, H1 used a physical replica that was built in the parking lot of the hospital. The healthcare staff could visit, concretize, and test different apparatuses and equipment in this context, and feedback was collected and utilized for further use. No patients or customer jury were allowed in the location of the physical replica. The approaches of VR technology and physical replicas are linked to prototyping practices, which are popular methods in service design. When healthcare professionals can test out some new ideas through physical replicas, the ideas develop in their minds afterwards, and they make many suggestions later. This causes difficulties during the construction process, because any changes also affect technical issues. Knapp et al. (2016) also wrote about this phenomenon in design sprints, specifically regarding when you should better utilize the time working alone, for example, in the evening, when the mind is still engaged in thinking about what has occurred. At the same time, this should be considered in the schedule, where you first test the physical replica and then introduce your suggestions and ideas the day after. These prototyping practices are not a new area in healthcare development.

There are good examples presented from the cardboard hospital by Kronqvist et al. (2013) and how the real-sized prototyping environment could be part of the building design process with other evaluation methods, such as virtual simulations and test prototypes constructed of wood panels. As another example, Kronqvist et al. (2013) suggested gamification methods to bring patient-centered and holistic understanding into healthcare development. Here, patient experiences were discussed through the customer journey as a game board, which assisted the patients in the interviews in remembering, understanding, and discussing their experiences. The game board method could also be utilized to develop the new hospital construction process, where patients' lived experiences should be considered. The game board or, similarly, a desktop walkthrough helps to perceive, for example, distances when the real-size prototyping or VR helps in testing out the details in a specific moment, such as a visit to a treatment room. To link these methods, we followed a continual process of service design practices, where we zoomed in and out to see the details

and overviews (Polaine, 2013).

### Benchmarking the Co-design Methods

Sub-study II examined the use of benchmarking to adopt the best practices for patient-centered care in the early phases of new hospital design, which was actually done in H2. They used time to observe how other hospitals utilized different co-methods and good practices to further their own construction projects and duplicated them in their practice. As a comparison, H1 acknowledged in hindsight that it would have been beneficial to have more resources, time, and co-design methods for the planning phase. Moreover, during the early development phases, both hospitals utilized the customer jury, which consisted of citizens whose role was to represent the patients. The value of having patients as part of the co-design process was seen differently. H2 saw a lot of value in involving real users in the process and, therefore, nominated a person to investigate service flows, especially to ensure that the hospital's operation was effective and patient-centered. They also organized workshops with patients, seeing their involvement as crucial during the design phase. Conversely, H1 did not see much value in this in the early phases, stating that there might be too many different opinions.

In addition, sub-study II found that the data from customer jury meetings or workshops was not always further processed and utilized. Here, as an example, H1 organized a workshop with the customer jury, but the data were hardly used, if at all. It was also observed in sub-study II that in the workshops that did not include patients, the healthcare professionals sometimes shared their own knowledge based on the feedback they had personally received from patients. This feedback considered issues in the treatment process or details of the hospital building. The workshops were moments to remember and opportunities to share feedback. This observation indicates that patient experiences are important for healthcare professionals even if the patients themselves are not present to share them.

## 4.3. Strengths and Weaknesses of Health-Related Design Sprints

Sub-study III examined the following research question: **What are the strengths and weaknesses of health-related design sprints?** The sub-

study was conducted through three design sprints run in three hospitals in Sweden, Estonia, and Finland, respectively. Findings from the collected data (research diaries, field notes, and interviews) highlighted six strengths and three weaknesses from the participants' points of view (Table 5). Using these as themes, we categorized them into two main result areas: (1) challenges for change in design sprints and (2) synergy in agile ways of doing. In the following paragraphs, I will discuss these two areas in more depth.

***Table 5.*** Strengths and weaknesses from design sprint participants' perspectives.

| **Strengths and weaknesses from participants' points of view** | |
|---|---|
| **Strengths** | **Weaknesses** |
| - Learning design thinking and design methods<br>- Organizational change<br>- Dialogue between stakeholders associated with different design methods<br>- Understanding hospital processes from the end user's perspective<br>- Emphasizing stakeholders by employing co-designing<br>- Other relevant insights regarding hospital services | - Understanding the bigger picture of hospital processes and systems<br>- Relevance of the created service concept<br>- Ethical limitations and considerations |

## Challenges for Change in Design Sprints

The role of service design in healthcare has become important. However, the changing world of new technologies, aging populations, continuous growth, and social and healthcare reforms (e.g., Clack & Ellison, 2019; Fry, 2019) are challenging healthcare-related service design. Obviously, a design sprint alone is not a solution for tackling these challenges, but it can open new opportunities in the healthcare field. Learning was highlighted as the greatest strength in the health-related design sprints, which was strongly linked to design thinking and design methods, and it was shown that it can support change in co-design processes and services (Kuure et al.,

2014). Participants (both healthcare representatives and students) learned to use design methods in different phases during the design sprint process, and this also increased their capabilities in design thinking. Learning occurred within the design sprint teams when important knowledge could be immediately shared. In addition, the healthcare professionals were motivated to implement some of the design methods in their everyday practices, which had an impact on the transformation when design tools and skills were part of the organizational capacity for ongoing change (Burns et al., 2006; Sangiorgi, 2011).

One of the challenges for change in healthcare organizations is failing to learn from failures (Edmondson, 2004; Fry, 2019) and avoiding or managing risks and/or costs (Clack & Ellison, 2019; Fry, 2019; Jones, 2013). In this sub-study, one viewpoint was to focus on the roles of role-playing and prototyping when testing different service concepts. Role-playing enabled us to test ideas in a safe environment and iterate them further—this also included failing and learning more about risks. In addition, it was easier for healthcare representatives to suggest features and understand how technology fits in healthcare processes. Service prototyping can be said to be "quick and dirty," which is an explorative and "goal-oriented but playful way" (Schulz et al., 2015, p. 323). It is so "low-tech" that suggestions for better development ideas are easier to express. In addition, very limited time frames in the design sprint process kept the prototypes very rough.

We used mentoring in our design sprints, where the healthcare professionals and experts from different wards of the hospital visited design sprint teams to share their knowledge, motivation, and ideas. Mentoring can be a crucial part of healthcare-related design sprints when the organization is silo-structured and complex. Thus, we carefully selected the mentors for their open-mindedness and willingness to facilitate changes in healthcare. As hierarchical and silo-structured organizations prevent growth (Donetto et al., 2015; Fry, 2019; Radnor et al., 2012), through design methods, we enabled a platform for professionals to discuss their experiences and perceive a holistic picture of healthcare services, especially from the patient's point of view. The concrete design methods, such as visualizations methods, storyboards, and desktop walkthroughs, supported the understanding of holistic service journeys and emphasized the stakeholders not only from the patient's perspective but also from that of the hospital professionals' daily work life. Thus, it was important to have a concrete and real picture of where the service would be delivered. Design methods also supported the dialogue among participants, especially during the mentor visits.

It was noted in sub-study III that issues related to governance, strategies, political will, and economics were the most difficult to consider. The intensive design sprint, as an agile way of running through the design process, did not allow participants to focus on entire healthcare processes in depth. This can be seen as a huge challenge especially in complex and multi-layered healthcare service development, and for this reason, the design sprints exerted negative effects on concept ideation, trust, and the relevance of the final outcome. The outcomes from the design sprints were too weak to be implemented in existing service systems and service ecosystems. However, we found that narrowing the focus of the challenge or brief might help participants achieve more valuable results. Nevertheless, participation was determined to be the most important way to achieve change inside the healthcare organization, where healthcare representatives, various experts, managers, participants from different backgrounds, and designers develop together.

**Synergy in Agile Ways of Doing**

Another key finding from sub-study III concerned the importance of synergy in an agile way of doing. Synergy is an interaction and cooperation achieved during co-design and can be supported with design methods. Through co-design and design methods, we created a better understanding of services and discussed the challenges and potential solutions together. These tangible and concrete tools were a common language among participants from different backgrounds and specialties (Rygh & Clatworthy, 2019). In addition, in sub-study III, we determined that the facilitator's role in the design sprint was extremely important from the point of view of synergy. The facilitator boosts synergy within the teams, not only supporting the teams by guiding the dialogue and design thinking but also by supporting the usage of design methods. We found that the synergy and dialogue among the facilitators, participants, and mentors were more important than the end result itself.

At the core of health-related design sprints are a well-facilitated process, carefully selected design methods, and open-minded mentors. These create a synergy that can help to overcome challenges associated with making changes in the healthcare sector. In sub-study III, we reflected on common themes that emerged from the three health-related design sprints. These dominant themes were related to teamwork and the value of having design sprint participants from different backgrounds. When

designing under time pressure, we must encourage respect for everyone's knowledge, skills, and profession. Design methods worked as a platform for performing these skills, and through this, trust and mutual learning were generated within the team. These skills can be, for example, the ability to come up with innovative ideas, quick visualization or concretization skills, keeping the time, boosting the group, analyzing the data, or even having a professional healthcare background that reflects an understanding of the field. Moreover, there is space for developing every skill during the design sprint process.

These findings from sub-study III persuade us to suggest that design sprints could be seen as an example of or short introduction to the design field, a kick-off for new hospital projects, or a booster during the middle phase of a project, while not aimed at achieving concrete outcomes for implementation. The value of understanding what can be aimed at and achieved with design-based approaches is important. The design sprint approach familiarizes people inside an organization to see what can be achieved with design practices and how the different design methods can systematically build knowledge, define insights, refine research questions, and create solutions. This idea remained one of the central concepts throughout this research.

## 4.4. Healthcare Representatives as Supporting Design Sprints in Healthcare services

Sub-study IV investigated the participation of various healthcare representatives and specialists and how they can support the implementation of, optimize the use of, and catalyze an intensive and agile design sprint process for ongoing healthcare-related service development. In the following paragraphs, I will answer the research question of the sub-study: **How can healthcare representatives support design sprints in the development of healthcare-related services?** Here, I will describe the different roles of healthcare representatives in healthcare-related service development and how these roles supported the design sprint process. I will also introduce the key elements that healthcare representatives could draw on to help implement design sprints in the development of healthcare-related services. The data of the study were gathered through three design sprints, which were organized in three different locations: Gothenburg, Sweden; Tallinn, Estonia; and Rovaniemi, Finland.

In sub-study IV, we identified the main roles where the participation

of healthcare representatives was seen. The first role was as a team member, where the clinician, nurse, or specialist fully participated in the design sprint team. We saw this role as twofold: the healthcare representative supported the team members all the time by providing views based on their first-hand experience, and the design sprint team also provided learning opportunities to hospital staff through innovations and motivated other team members (mainly students) who brought their practical experience of implementing service design methods into the mix.

The second role of the healthcare representative was as a learner and design thinker. We found that being part of the design sprint teams acquainted the healthcare representatives with design thinking, gave them a better understanding of the customers' needs, and taught them to use design methods in practice and how these could assist with the implementation of tools in their daily work. We determined that such learning can be a good way to implement systemic change.

The third role was of the healthcare representative as a mentor. In this role, the healthcare staff visited the design sprint teams for different amounts of time, but on average, these visits were 20–30 minutes. The mentoring was done in all three design sprints, and it could happen on-site (e.g., in a specific ward or clinic) or at the location where the design sprint was held. We found that on-site mentoring was better for the design sprint teams, as the experts could more fully describe processes, systems, and technologies, and thus, the groups could better perceive the service journey from the customers' perspective. Thus, the mentors were seen as a catalyst in the design sprint process, and they were impacted by the value of the visualizations and design methods, which helped the students discuss and perceive the process holistically. The last role was of the hospital representative as facilitator, where they actively supported design teams by providing insights and knowledge and by contacting the right people inside the organization. A healthcare representative as facilitator was a great link between design sprint teams and hospitals.

These identified roles of the healthcare representatives are essential to the development of a framework for human-centered design sprints. This kind of practical framework is for use in design sprints by healthcare representatives who are moving toward the development of healthcare-related services. The framework can create opportunities to employ other methods, such as transformation service design. In the framework, we stressed four important themes: (1) learning and knowledge sharing; (2) design thinking, support, and participation; (3) power sharing and mentorship; and (4) facilitation.

### Learning and Knowledge Sharing

We found that in terms of learning and knowledge sharing, the healthcare professionals who participated in the entire design sprint learned how to gain a better understanding of design methods and to use them in their future work. This is an important aspect of the transformational change described by Sangiorgi (2011). The healthcare professionals also learned how different ideas were formulated and developed further during the different phases of the design sprint process. In addition, applying design methods and design thinking enabled knowledge sharing. Consequently, the healthcare representatives were able to immerse themselves better within the processes and bring transformational change to the hospitals through the exploration of new services.

### Design Thinking, Support, and Participation

In the co-design process, designers (often referred to as facilitators) usually guide participants and other stakeholders through the entire project (Miettinen et al., 2012). The designers guide dialogue, support the usage of design methods, help to empathize with people, and select the best possible tools for understanding the data, their insights, and outcomes. The participants' experiences and thoughts are linked by using different design methods and visualization techniques, which also increase the ability of design thinking. According to Miettinen et al. (2012) the common characteristics of good design thinkers are empathy, integrative thinking, optimism, experimentalism, and collaboration. These elements should be supported.

### Power Sharing and Mentorship

One of the most notable findings from sub-study IV concerned the value of power sharing through mentoring. The healthcare experts, who participated in the role of mentors, could clarify the complex and multi-layered healthcare processes for other design sprint team members and also better reflect the different roles and hierarchies in the silo-structured organization. Together, they produced important and deep insights, where the design methods worked as a platform for the data and dialogue. At the same time, the mentors were introduced to the design methods, but

due to the short visit times with the teams, the methods were not learned in-depth. As we found in sub-study III, the design sprint was seen as an example for the healthcare staff. Yet the sharing of responsibilities during mentoring and co-learning enabled dynamic and agile sprint processes, and thus, the design sprint process benefitted from having access to a variety of inputs from different healthcare representatives and experts at the different phases of the design sprint process. A holistic understanding of the hospital ecosystem was created during these shared sessions (Figure 18).

***Figure 18.*** Mentoring during the design sprints in Rovaniemi. (Pictures: Maileena Tuokko)

**Facilitation**

Finally, I want to stress the last theme of sub-study IV. The facilitator often leads the design process and uses design methods and dialogue with the participants and stakeholders from different fields (Sanders & Stappers, 2008; Yu & Sangiorgi, 2017). Thus, the role of facilitator is crucial during the design process, where different skills are needed to reach the aims or planned outcomes. In the sub-study, we saw that facilitators needed to understand how to approach the design brief or design drivers, how to apply different design methods, how to collaborate with participants from different fields, and how to manage tensions and conflicts during co-design. According to Sanders (2010), in the front end of the design process, many people want to have a role: there are not only experts from different fields and users but also researchers and designers. All are willing to express their needs and dreams and offer their voices and hands. Therefore, Sanders added, a common phenomenon is that these stakeholders have conflicting interests, there is discontent among disciplines, and power

relations become highly complex. Thus, the facilitator role is crucial for finding ways to face and manage these conflicts and gaps. Figure 19 below shows the facilitation in the practice, negotiating with healthcare staff and the design sprint team members.

***Figure 19.*** Facilitation in the practice in the design sprint in Rovaniemi. In the picture on the left, I am negotiating with the coordinator from the hospital. In the picture on the right, I am listening to and observing the design sprint team members. (Pictures: Maileena Tuokko)

## 4.5. Summary of the Key Findings

In this subsection, I will summarize the main findings of the four sub-studies described in detail above. I will provide tables, which, as visualizations, are practical in defining the critical points from quite complex sub-studies.

Table 6 describes the findings of sub-study I and answers its research question: **How can service design tools and collaborative practices be used to support and develop customer journeys and hospital management practices?**

***Table 6.*** Key findings from sub-study I

Sub-study I highlighted two main areas that are relevant for this research question.

**Benchmarking as a tool to develop hospital management practices:**
Benchmarking is valuable for evidencing different management practices based on lean, agile, human-centered approaches and quality, effectiveness, and timely availability of services. Benchmarking also contributes when developing agile experiments and evaluation practices. It is a fast and cost-effective approach for understanding the best practices for patient-centered care, especially for the new hospital pre-construction phase.

The design field is lacking structured practices and tools to do benchmarking in complex organizations. Thus, we identified three crucial needs:
- The need to engage and commit people from the hospital to be part of the benchmarking, for example, how healthcare professionals could be more actively involved in data collection during benchmarking or how they could be experiencing benchmarked processes.
- The need for adopting healthcare-related benchmarking practices and tools in service design, especially the implementation of and commitment to these during and after benchmarking. Here, we discussed the roles of visualization, video personas, and short commentaries and statements from the benchmarked hospital.
- The need to learn new ways to scale up service experiments in hospital environments, such as how the service innovations could be tested for agile in different wards and applied to these different environments.

**Design methods as a way to create and share a vision and understand ecosystems:**
Healthcare professionals are missing knowledge of service processes from different hospitals, which might make the services slower or unobtainable. Furthermore, *visualization and concretization tools* not only support communication and participation but also foster understanding of the healthcare ecosystems through silos, municipalities, and regional barriers. The *resource blueprint* is a tool to perceive different ecosystems and their layers. In addition, it makes information sharing and service development easier through regional barriers.
*Service design workshops* provide a great opportunity to finally bring people together to meet each other. Workshops generate value for further development projects, increase motivation for the service innovations, and promote trust, clear communication, and familiarity with other professionals.

Table 7 introduces the key findings from sub-study II and answers its research question: **How are patients' experiences considered when designing new hospitals and healthcare services?**

***Table 7.*** Key findings from sub-study II.

| |
|---|
| The results from sub-study II indicated the existence of a variety of challenges and different opinions about patient involvement and co-design methods especially in the early phase of the new hospital construction process. Here, I describe the three main themes we determined.<br><br>**Limited timescales and resources** in the use of co-design and patient-centered methods were stressed as one identified challenge, which also had an impact in the context of bringing co-design into the long-term process of a new hospital. In construction projects, the time pressure is tight, especially at the beginning, and thus, there might not be enough time to go through all the processes. In addition, healthcare professionals are optimized for their expertise, which supports the silo structure. Overestimating the potential scope and timescale of changes was seen as critical in co-design methods, especially when designing something totally new.<br><br>**Concretizing the environment**, especially in a new construction project, was defined as a challenge. VR co-design workshops were utilized and found to be a good method to outline spaces by adding more realism. It was an inexpensive way to test, ideate, and develop service scenarios and physical mock-ups. Another example was to build a physical replica.<br><br>**Benchmarking** was used in this sub-study to adopt the best practices for patient-centered care and co-design methods. |

Table 8 summarizes the key findings from sub-study III and answers its research question: **What are the strengths and weaknesses of health-related design sprints?**

***Table 8.*** Key results from sub-study III.

**Challenges for change in design sprints**

- Learning was seen as a strength in design sprints, which was linked to design thinking and design methods. Some of the design methods learned during the design sprints were implemented in the everyday practice of the hospitals by healthcare professionals.
- Role-playing enabled us to test service ideas in a safe environment and iterate them further. This had an impact on failing and learning more about risks.
- Healthcare professionals and experts, who were carefully selected for their open-mindedness and willingness to facilitate changes in healthcare, mainly participated as mentors in the design sprints.
- The design sprint did not allow participants to focus on the entire healthcare process in depth, making issues related to governance, strategies, political will, and economics the most difficult to consider. Thus, the design sprints in some cases had negative effects on concept ideation, trust, and the relevance of the final outcome.
- Participation was highlighted as the most important way to achieve change inside a healthcare organization when healthcare representatives, various experts, managers, participants from different backgrounds, and designers develop together.

**Synergy in agile ways of doing**

- The facilitator's role was crucial for boosting synergy within the design sprint teams. Synergy and dialogue among all people involved were more important than the end result itself.
- Well-facilitated processes, carefully selected design methods, and open-minded mentors create synergy, which helps to overcome challenges associated with making changes in the healthcare sector.
- Respect must be created for everyone's knowledge, skills, and profession. Design methods worked as a platform for applying these skills, and through that, trust and mutual learning were generated within the team.
- Design sprints were seen as an example of or short introduction to the design field, a kick-off for new hospital projects, or a booster during the middle phase of a project, not aimed at achieving concrete outcomes for implementation.
- The design sprint approach familiarizes people inside an organization with what can be aimed for and achieved with design practices and how the different design methods can systematically build knowledge, define insights, and create solutions.

Lastly, the key results from sub-study IV are highlighted in Table 9. The sub-study's research question was as follows: **How can healthcare representatives support design sprints in the development of healthcare-related services?**

***Table 9.*** Key findings from sub-study IV.

| |
|---|
| We identified four roles for participating healthcare representatives: team member, learner and design thinker, mentor, and facilitator. These identified roles were the basis for the development of a four-theme framework that could be used for co-design and human-centered design sprints. The themes are briefly introduced below.<br><br>**Learning and knowledge sharing**<br>This involves not only gaining a better understanding of methods in the design process but also learning to understand, apply, and use design methods and design thinking in future work.<br><br>**Design thinking, support, and participation**<br>Designers (often also facilitators) guide dialogue, support the usage of design methods, help to empathize with people, and select the best possible tools for understanding the data, their insights, and outcomes.<br><br>**Power sharing and mentorship**<br>Experts can clarify the complex and multi-layered healthcare processes for students who can then gain deep insights into the healthcare systems as a result.<br><br>**Facilitation**<br>The role of facilitator is crucial during the design sprint process, where different skills are needed to achieve the aims or planned outcomes. Facilitators need to understand how to approach the design brief, how to apply different design methods, how to collaborate with participants from different fields, and how to manage tensions and conflicts during co-design. |

# 5. Discussion

This doctoral dissertation focuses on answering the main research question: **How can service design and co-design approaches support the early phase of healthcare-related service development?** I have addressed this question through the four sub-questions formulated respectively in the four sub-studies which have provided the basis for my research. The sub-studies, which answered these sub-questions, were introduced in depth in the previous sections, each ending with a short summary. In this section, I will first reflect on the main research question in terms of my theoretical background and then propose a practical framework for the early phase of healthcare-related service development, discussing it through the lenses of objectives, impact and values, and design methods and tools. In addition, I will highlight the service ecosystem levels and how the practical framework helps to outline these different service ecosystem levels. This understanding can be utilized especially when planning a design process for healthcare-related service development.

## 5.1. Preliminary Preparation and Evidence

Previous studies have discussed where service design should have its place and impact in the development process (e.g., Almqvist, 2017, 2020; Clatworthy, 2013; Raun, 2017; Yu & Sangiorgi, 2014). In fact, some of the recent literature has noted that the early phase of the design process, the so-called fuzzy front end, has already been investigated, and it is, therefore, time to focus on the later phases where implementation occurs. It has also been critically stated that different design-led processes and toolboxes have

been the only outcomes of organizational development and design has not reached the desired capacity (Holmlid & Malmberg, 2018; Malmberg, 2017). However, the front end is the most information-intensive phase, where different types of information from internal and external sources are brought into the project (Zahay et al., 2004) and the major decisions are made (Clatworthy, 2013); thus, we should put more effort into the early phase. It is also a moment where the team members get to know each other and the given brief and the team plans the details of the project.

In this research, preliminary preparation was provided through benchmarking and preparing the benchmarking data and design sprints. The sub-studies introduced in this research found that there are elements that service designers should consider before starting a healthcare-related service development project. These elements are related to building trust and engagement among participants; understanding the service design and co-design; learning design practices, processes, and methods; and adapting the process to the everyday work practices. From the service design and co-design points of view, the preliminary preparations aim to evidence the potential of service design and the value of co-design through the entire development project and to avoid leaving the designers outside of the project with the important and deepest insights of the users in their hands, as Almqvist (2017, 2020) has explained. The different roles and participation of service designers and other stakeholders can then be justified more clearly throughout the project.

In addition, the preliminary preparations aim to avoid fuzziness at the beginning of the service development project. When the groundwork is planned, evidenced, and prepared well, we can establish a better understanding of the object to be developed on the basis of the initial knowledge and consequently provide more evidence for the organizational and design levels before the actual development project begins. According to Foglieni et al. (2017), evidence is needed for decision-making at both the organizational level and the design level, which helps to drive learning, change, and transformation step-by-step. At the organizational level, the evidence can be utilized while planning the structure of the design process for service development and creating a common understanding from it. The following questions can then be considered: What is the aim of development in complex organizations; what is included and excluded in the brief; how can we define the service under development; and what are the resources of each ward/hospital from the service development and process engagement points of view?

In this research, evidence was gathered through service design

methods, where the data collected from the field, for example, through benchmarking or questionnaires, were visualized by using different mapping tools. These mapping tools can be, for instance, service journey mapping or resource blueprints, which were also utilized and analyzed in sub-studies I, III, and IV of this research, and they can be beneficial for development especially in the beginning of the process. In addition, through other concrete design methods, such as prototyping and desktop walkthroughs, evidence can be created when concretely describing the experiences of stakeholders or stepping into the shoes of another. In this research, I saw the evidence as being concretized and observed strategic benchmarking process and visualization tools helping to perceive the complexities in the silo-structured organizations.

The value of using benchmarking is that it builds evidence that is gathered from other (healthcare) organizations. The evidence from the benchmarking can be, for example, how other organizations are producing a service, how the change has been implemented in an organization, or how they have successfully utilized and used design methods as part of service development. Benchmarking is already well known in the healthcare industry, where it has been used over the years for quality in healthcare services (Kay, 2007), and thus, the leap into new approaches is not significantly different.

The potential to further develop the benchmarking processes, visualization tools, and prototyping methods for both designing and evaluating agile experiments based on benchmarking exists. As prototyping saves resources, such as time and money (Blomkvist, 2014), it could be a beneficial tool in benchmarking, for instance, during new construction projects or in agile experiments during the design sprints in the early phase. However, combining this benchmarking into visualization and prototyping requires preparations for which the service designer has expertise. As emphasized in sub-study I of this research, healthcare management has expressed a clear need to find visual ways to disseminate and communicate benchmarking information to larger audiences in their home communities. Therefore, the design sprint with prepared benchmarking evidence could be one successful way to disseminate and communicate information. Service design could, for instance, focus on using video personas and short commentaries and statements from individuals met during the site visits or on generating the digital benchmarked data for VR. The usage of VR in healthcare service development was found to be a good practice in sub-study II.

## 5.2. Familiarization with the Unknown

Challenges to change arise when healthcare organizations aim for innovation and development (e.g., Fry, 2019). Even though healthcare and design have had a long history together in healthcare service improvement (Rowe et al., 2020), studies have shown that the field is still lacking knowledge of, for instance, selections of participants for co-design workshops (Boyd et al., 2012) and communication about design in terms of healthcare terminology, trust, and shared understanding (Hakio & Mattelmäki, 2011). In addition, issues such as the risk of losing credibility or fear of design practices may exist (Hakio & Mattelmäki, 2011). As noted in the literature, service design is studied to be a catalyst for organizational change and transformation (Junginger, 2015; Yu & Sangiorgi, 2018), and it would be valuable to involve and engage healthcare professionals who are interested in and curious about design. There is a need to have these professionals from the healthcare field as part of the service design process to impact and change the behavior of stakeholders (Wetter-Edman et al., 2018).

Service design, as a development approach, might be a strange way of working for several practitioners in the field of healthcare and it, thus, raises many questions and uncertainties. Nevertheless, the curiosity and suspicion about service design did not go unnoticed during the sub-studies of the research. There is a true need to provide new initiatives for the early phase of the service development process in complex healthcare organizations and aim for better and more efficient cooperation. The goal here is to familiarize people from the healthcare field with service design and co-design so they can better contribute to the project planning and suggest how the methods can be better adapted to their everyday practices during the design process for service development. This is important when working with people who are busy and often overburdened with their work.

This research indicates that an intensive design sprint is a way to support healthcare-related service development through service design and co-design approaches. It is seen here as an example to introduce the design process, design methods and tools, and what can be achieved through them. The overview of the design process introduced through a design sprint gives value to several issues. As highlighted in sub-studies III and IV, a key element for understanding, applying, and using design methods and design thinking was learning to use design methods. An agile way of hands-on doing created a synergy among participants,

professionals, and experts from different silos who were involved and engaged in sharing their knowledge and insights. They learned to use different design methods and they understood the value of visualization, especially from the viewpoint of complexity. Most importantly, the design sprint was not only valuable for the upcoming project planning but, as the findings of sub-study IV stressed, the design methods used during the design sprint were transferred to everyday work and were not used only for the purpose of achieving the goals of the design sprint. This might also have an impact on the emergence of completely new types of design methods in the healthcare field when they are co-designed by designers and healthcare professionals.

Design sprints would add even more value to the service development process if management were better involved. Change or transformation in an organization happens through learning (Kuure et al., 2014), and one of the most powerful ways to achieve change is for organizations or communities to start steering changes themselves (Sangiorgi, 2011). From this point of view, the role of management is particularly important, and thus, it should not be underestimated or completely ignored. It is unfortunate that sometimes projects that are carried out in cooperation with academic, design-driven case studies get approval from management, but there is no further interest from management thereafter in participation. Although healthcare professionals may be enthusiastic about service design and creative co-design methods, their implementation and, thus, the culture of change are not taking off. For this reason, staff management is necessary when changes must be adopted and implemented in the healthcare staff's work life (e.g., Nilsen et al., 2016; Stickdorn & Schneider, 2011), and one way to better engage them is to familiarize them with the unknown.

Here, an agile and intensive design sprint (e.g., Knapp et al., 2016) offers a quick overview of the design methods and design process, but above all, through a rigid and facilitated process and elements of agile, design, and lean thinking, the design sprint teams learn to produce a minimum of viable services (Magistretti et al., 2019) and implement the design practices for future service development projects. In addition, agile experiments have value when failures occur in a safe environment, before actual implementation. Failing is seen as a risk in healthcare, as failure might lead to a patient's death (e.g., Edmondson, 2004). For that reason, design sprints are good opportunities to advance cultural shifts in organizations where failure can be handled safely (Kutvonen, 2017), and thus, design sprints can be a major starting point in the development of healthcare services and in a design-centric cultural change.

As explained in sub-studies III and IV, design sprints should rather be seen as an example of or short introduction to the design field or a kick-off for new hospital projects, not aimed at achieving concrete outcomes for implementation but, rather, at understanding what can be aimed at and achieved with the design approaches, and systematically building knowledge, defining insights, refining research questions, and creating preliminary solutions. In addition, in perceiving more realistically which service ecosystem levels the development project reaches, we can plan better how many resources we need, how large a collaborative network we should create for the project, whom we want to involve in the project, and, for example, how much time is needed for the project.

## 5.3. Practical Framework for Healthcare Service Development

Service design has the potential to support healthcare-related service development especially for complex, silo-structured, multi-stakeholder services, where processes, resources, management structures, and visions should be better understood. As a result, it is important to realize, for instance, the resources, time, and design methods required for the service to be developed. There are no right solutions or approaches to facilitating the design process for healthcare-related service development, but there are issues to consider that support the starting point and, thus, help in further phases when the actual design process for service development starts. The following Figure 20 illustrates the location of the practical framework in this research and its three steps. The practical framework is called *Pre-phase for healthcare service development*.

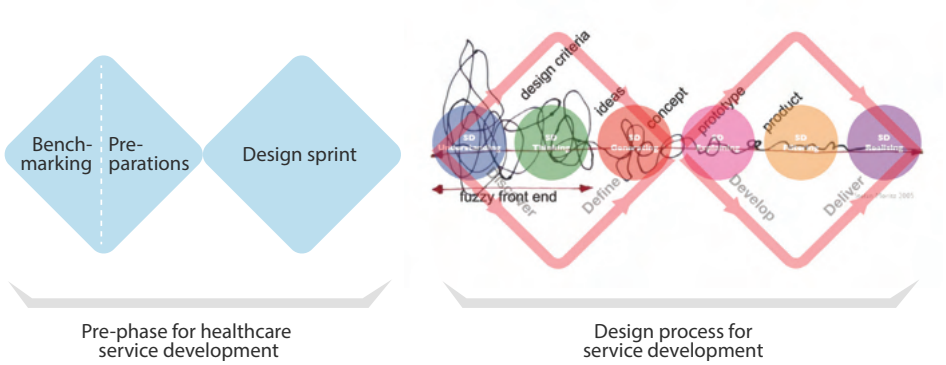



***Figure 20.*** Overview of the practical framework "Pre-phase for healthcare service development" as part of the design process for service development. (Author's illustration)

The Pre-phase for healthcare service development framework can be seen as a pre-process or a kick-off for the actual design process of service development. It aims to clarify the fuzzy front end and make the scope of service development clearer. Tables 10-12 zoom in on the framework and defines the objectives, impact and values, and design tools and methods of each of the three steps, which are benchmarking, preparation, and design sprint. Afterwards, I will review the steps in terms of the three service ecosystem levels—micro, meso, and macro levels by Beirao et al. (2017).

***Table 10.*** The three steps of preliminary preparations from the viewpoint of objectives.

| | **Benchmarking (BM)** | **Preparation** | **Design sprint** |
|---|---|---|---|
| **Objectives** | - Understanding services and management practices of other hospitals and service design and co-design approaches to be adopted for the development process<br>- Gathering evidence for the development project | - Visualizing internal and external ecosystems<br>- Preparing documentation from BM<br>- Structuring complexities and multi-layered services | - Bringing together healthcare professionals, especially across municipalities<br>- Fostering trust, mutual understanding and learning, and familiarity among professionals<br>- Perceiving services holistically<br>- Bringing the visualized data to everyone<br>- Learning design methods and design processes |

***Table 11.*** The three steps of preliminary preparations from the viewpoints of impacts and value.

| | **Benchmarking (BM)** | **Preparation** | **Design sprint** |
|---|---|---|---|
| **Impacts and values** | - Evidencing for developing, e.g., lean management and "true north" thinking<br>- BM has value and contributes to the elaboration of agile experiments and evaluation practices<br>- Supporting the stability and sustainability of municipal economies<br>- Quality, effectiveness, and timely availability of services<br>- Fast and cost-effective approaches | - Common language<br>- Easy to talk through visualization<br>- Perceiving healthcare ecosystems in a bigger picture<br>- Proving the value of service design, co-design and design methods<br>- Supporting the service designer in their role<br>- Video recordings from the field and visual tools can be valuable internally for improving the internal culture, initiating clinically meaningful changes in quality, and inducing a "change in mentality" in an organization through BM | - Stepping into others' shoes<br>- Understanding service design and co-design<br>- Creating synergy in agile ways of doing<br>- Shared understanding, communication, and participation in the development process<br>- Learning can make service design and co-design part of the everyday practice and development culture<br>- Creating motivation and engagement in the development project<br>- Change and transformation<br>- The designer's role is important for achieving equal, high-quality, and creative cooperation<br>- Power sharing |

***Table 12.*** The three steps of preliminary preparations from the viewpoints of design tools and methods.

| | **Benchmarking (BM)** | **Preparation** | **Design sprint** |
|---|---|---|---|
| **Design tools and methods** | - Service design tools can help in creating and developing more effective BM processes and generating support and commitment to service ideas<br>- E.g., video personas and short commentaries and statements of healthcare professionals and patients<br>- Visualization tools and concretization tools are crucial, for example, for better understanding healthcare ecosystems<br>- Prototyping methods could be developed further by BM | - Design probes to gather insights from healthcare professionals, such as existing needs, resources, and challenges<br>- Visualizing data: e.g., blueprint visualization as a concretizing tool amasses different data, knowledge, service processes, and the district's ecosystems<br>- If BM is documented well, the data can be prepared for prototyping (role-playing or desktop walkthroughs)<br>- Developing tools for designing and evaluating agile experiments based on BM | - Multiple ways to plan, organize, and facilitate a design sprint<br>- Recommended methods from the research: site visits, ethno stations, desktop walkthroughs, prototyping, and user testing (please refer to the sub-studies for more details)<br>- Mentoring: healthcare professionals and experts from different wards of the hospital shared their knowledge, motivation, and ideas through different design methods, e.g., visualization methods, storyboards, and desktop walkthroughs<br>- BM data help overall to understand the different healthcare service ecosystems and are useful for evidencing different ideas |

### 5.3.1. Practical Framework and Service Ecosystem Levels

The objective of service development can vary significantly. The need for service development can be a single touchpoint, such as a paper-based, visualized service journey for patient–doctor interaction (micro level); a more complex online service, such as a digital application for regional healthcare allowing patients to book, change, and cancel appointments (meta level); or a very high level national reform, where healthcare districts should communicate and provide services without gaps or data loss (macro level). If there is no conception of what service design and co-design can aim for and achieve, it will be difficult to create mutual

understanding between service designers and healthcare staff about the development project. Figure 21 below illustrates how the Pre-phase for healthcare service development framework serves as a basis for the three service ecosystem levels: micro, meso, and macro levels. Afterwards, I will explain the service ecosystem levels using examples.

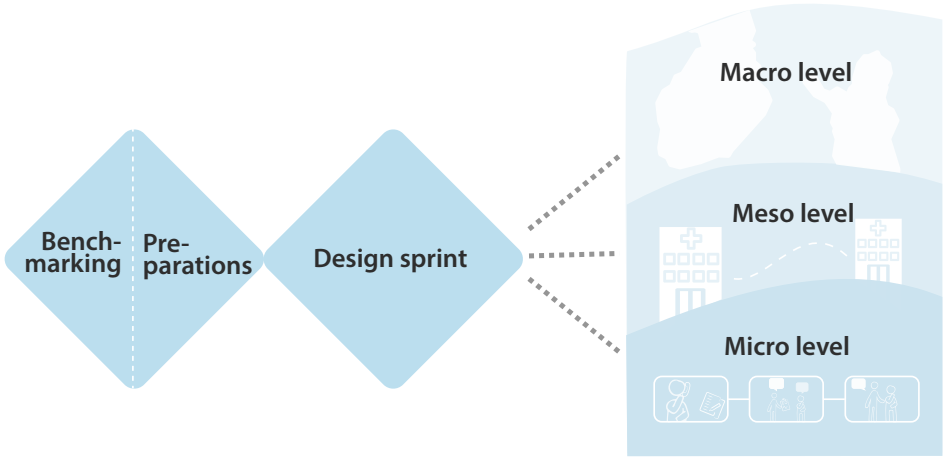



***Figure 21.*** Pre-phase for healthcare service development framework and the service ecosystem levels. (Author's illustration)

## Micro Level Development

In this research, the micro level of the service ecosystem is defined by its simplicity in situations within the hospital, such as patient–doctor interaction. It also comprises several touchpoints through which the interaction takes place. The touchpoints are either tangible or intangible interactions or contact points between, for example, the end user and the service provider (Stickdorn & Schneider, 2011) and are a crucial part of the holistic service and service experience.

As an example taken from this research, sub-study I introduced how the benchmarking site visits successfully produced useful outputs, and some ideas were quickly developed into practical experiments. One of the practices implemented was constructed around the idea of a "huddle"—a quick stand-up meeting to discuss the hospital's daily management. However, the implemented idea of a huddle was not entirely worked out. One reason for the poor implementation was time, as the huddle was launched during the summer holidays. This could have been anticipated

through better preparation and design sprint. When a benchmarked service is well evaluated considering the needs of healthcare professionals and when there is an opportunity to influence an idea, its acceptance, and the change in organizational culture, will be more positive.

In the healthcare service ecosystem, micro level development might actually often be the simplest to design, because planning, design, and implementation do not necessarily require a lot of resources or time. Thus, in the ideal situation, the service development through service design should seem simple enough that once you have experienced the pre-phases of healthcare service development and have learned the basics, you can continue the development in your organization. As Sangiorgi (2011) addressed, the most powerful way to achieve change is for organizations or communities to start steering the changes themselves. Micro level development can also be something that healthcare professionals can achieve together, without the service designer's full-time involvement in development.

**Meso Level Development**

The meso level is an organizational, regional, and local level where actors from public and private hospitals, patients' associations, or IT vendors collaborate (Beirao et al., 2017). Thus, meso level development must consider a broad network of different stakeholders, making the planning crucial to get all relevant stakeholders to focus on the same topic. Sub-study I was linked to this level. Notably, sub-study I introduced two case studies—one involving benchmarking site visits in healthcare in Silicon Valley and one focused on examining and developing the existing children's rehabilitation processes and service ecosystems in the eight municipalities of Lapland. The case studies were separate cases with no connection to each other, although connected cases would have brought considerable added value to this study. In retrospect, benchmarking could have provided useful material to mirror different ideas and existing solutions for the children's rehabilitation services.

Nonetheless, in this meso level development, value was co-created through the very first workshop, where the results of the first design probe (resource blueprint) were reviewed. This material, which I see as a preparation, ended up being crucial because it explained the service ecosystem framework, which was important, since all eight municipalities needed to understand each of the other ecosystems and aimed to scale

up healthcare services across the municipalities. Case study 2 consisted of three individual workshops scheduled for long periods of time. As an outcome, three service concepts were visualized, but the service development itself wasted away. The reports were published, but there was no official follow-up on how the concepts would be taken forward. All the produced materials and concepts would have been important in planning a design process for service development. The workshop could very well have been organized in the form of an intensive design sprint. I believe that during a design sprint, we could have achieved even more content, results, and common understanding and knowledge in five days than in the long-term, fragmented, individual workshops. In addition, the intensity would have tied stakeholders more closely together across municipalities and possibly boosted the collaboration and service development. This could have had long-term benefits in the development of meso level services.

In meso level development, it is crucial to create a strong network, get to know each other, create a common understanding of the brief, and see how other hospitals are dealing with the developed service. Foremost, the Pre-phase for healthcare service development framework helps to find appropriate design approaches and methods to tackle the topic and engage stakeholders in a design process for service development.

### Macro Level Development

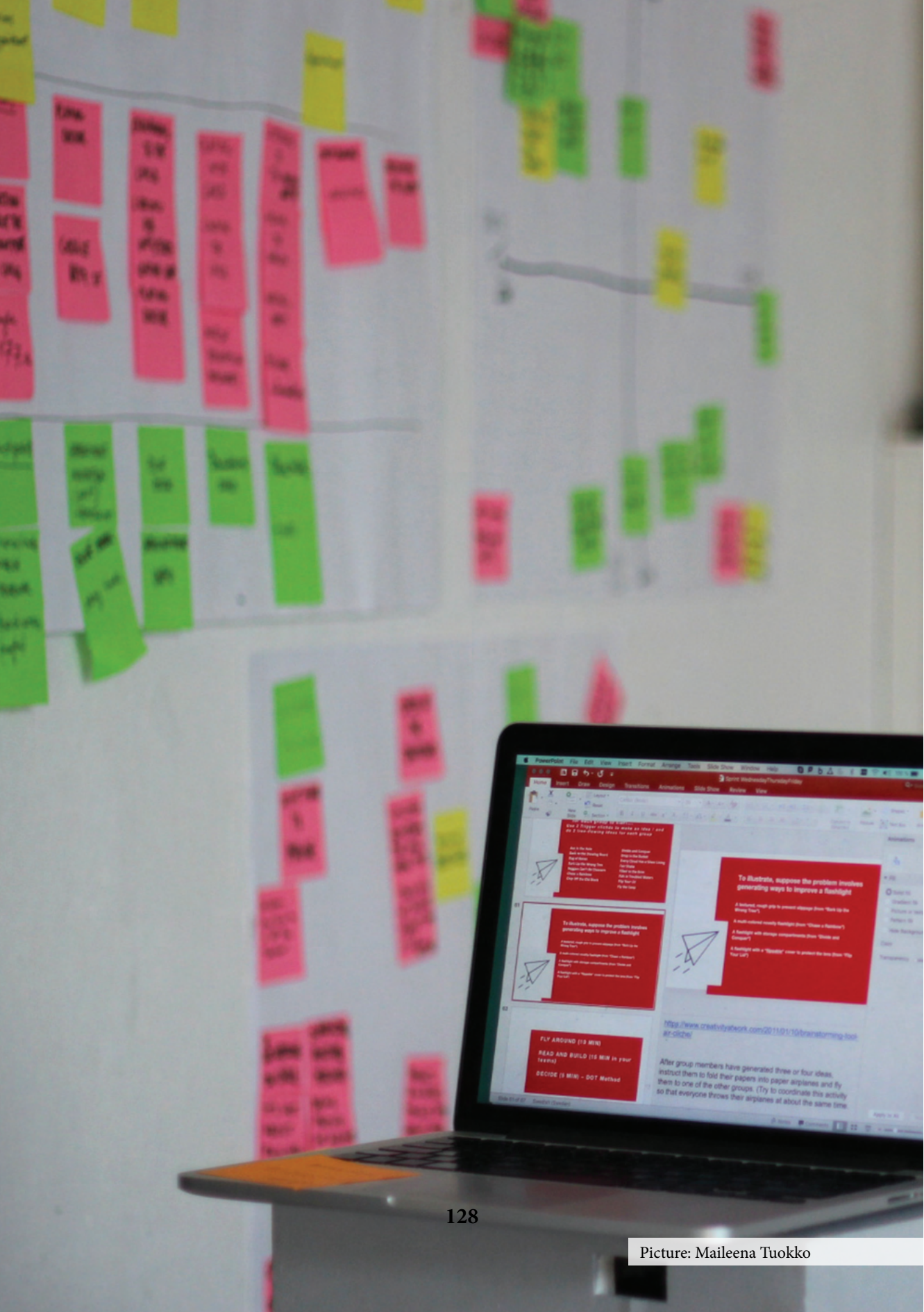
The macro level incorporates the national level with actors such as the government and the Ministry of Health (Beirao et al., 2017), and it is the most complex level to design, as it brings organizations together even over long distances. Sub-studies III and IV reached for macro level development in the big picture. The Co-designing healthcare project, which made it possible to organize the design sprints in Estonia, Sweden, and Finland, was a good example of a means of determining how design-related collaboration can be used at the macro level. The benchmarking, which happened among the project team members at the beginning of the project, was a rich experience for gaining an understanding of other healthcare services. However, it was not structured and did not happen as planned, and thus, it was not fully utilized during the design sprints. In addition, the design briefs in design sprints in three different hospitals differed significantly, causing the benchmarking material to no longer serve its intended purpose. In the future, more systematic preparation will be required for development at the macro level even before benchmarking.

This will require, among other things, the decision regarding the service to be developed to be made between the partners—in this example, Estonia, Sweden, and Finland.

The aim of the Co-designing healthcare project was to educate more designers to gain service design experience in the healthcare sector, and also to educate healthcare provider to use "design as process" and "design as strategy". This cross-border collaboration with the healthcare sector, the design industry, academia, and other relevant collaborators can be a key to macro-level changes as more evidence emerges of the potential for service design and co-design approaches.

These three design sprints also strengthened the healthcare-related design network through international, academic collaboration that has remained strong since the projects. With these projects, service design and co-design can be learned in complex healthcare environments no matter how simple or demanding the object to be developed is. In addition, the design will be brought closer to the healthcare field and the professionals working there. I also believe that small micro level changes have long-term positive effects on both meso and macro level changes, and as discussed in sub-study I,

> Service design and its multiple methods are a good option when designing new healthcare services, especially when these combine various healthcare ecosystems. Service design tools create entry points and platforms for developing shared understandings and insights and negotiating reforms of healthcare practices and patient-centred processes. (Miettinen & Alhonsuo, 2019, p. 494)






Picture: Maileena Tuokko

# 6. Conclusions

## 6.1. Impacts of the Research

The novelty of this research is its introduction of a practical framework for the early stage of the development process. The impact of the framework relies on several issues. First, it can foster the role of service designer from the beginning of the development process and—instead of what Mulgan (2014) stressed as designers having a "lack of attention to organizational issues and cultures" (p. 4)—aim to increase the knowledge and attention to organizational issues and cultures. This knowledge in designers' hands could help service designers to better plan the entire design process, not only touching on the operational levels but also involving the strategic levels at the earliest possible stage.

I believe there are design tools that clearly have a stronger impact on the strategy of an organization and should play a more important role in the complex service design. Benchmarking, which was also introduced in this research in sub-study I, emphasizes one of these methods and should be further investigated. I also believe that by engaging healthcare professionals in the early phase of service development, more specifically in the pre-phase of healthcare service development, they have a more important role in influencing not only the planning and scheduling of the development process but also the application of the design methods used in busy healthcare work.

Medical and nursing education utilizes simulations, which is not a new teaching method in healthcare (Poikela, 2017). Furthermore, hospitals are using scenario-based simulation training in their everyday practices. These simulations have similarities to service prototyping, and

so there is place to adapt the two to each other. In addition, lecture and teaching input on service design has been increasingly sought in nursing education, at least at the Lapland University of Applied Sciences. Thus, service design could have an impact on nursing education by adapting its approaches to the learning programs. In addition, collaborating healthcare-related service development with nursing and design education and professionals from the healthcare field might have an impact on the future where innovation is no longer seen as disruptive from the point of view of being a risk to clinical service, as Jones (2013) and Clack and Ellison (2019) have explained. The ways of collaborating through service design and co-design can bring professionals from different silos together and, thus, avoid hierarchy being an obstacle to growth (e.g., Donetto et al., 2015; Radnor et al., 2012). Improving and increasing the understanding of design-centered approaches at the educational level might also have an impact on the strategic level of the healthcare sector: the more you recognize these creative approaches, the easier it is for the designer to get involved in the service development process.

## 6.2. Suggestions for Further Research

Healthcare is a complex and multi-layered field that offers many design-related opportunities and interplays between different service levels. Its siloed structure enables a great platform for service design to tackle many different cases. When summarizing the sub-studies of this research, the opportunities for future investigations became obvious. Here, I would like to again emphasize the role of benchmarking through the service design approach as a way to develop healthcare-related services. A well-known service design method is prototyping (e.g., Blomkvist, 2012; Coughlan, Fulton Suri, & Canales, 2007; Holmlid & Evenson, 2007), where service scenarios are simulated through role-playing or concretized through paper-based or Lego Serious Play desktop walkthroughs. These help people play through the service experiences before establishing them in an organization (Holmlid & Evenson, 2007), which can be a way to bring more evidence into the development process. According to Fry (2019), new initiatives need more evidence. There is great potential to investigate how well we can bring evidence into development when we benchmark healthcare services through prototyping. In the service design field, service prototyping has shown good outcomes in learning (Kuure & Miettinen, 2013) and transformational change in the case of social services (Kuure et

al., 2014), which, compared with healthcare services, also has some complex and silo-structured elements. According to Blomkvist (2012), prototyping can be conducted at four levels: (1) artifact, (2) use, (3) context, and (4) service levels. These levels could offer a way to fractionalize the complex process while making it observable and concrete through benchmarking.

During the Nordplus Horizontal project (where the design sprints described in this dissertation were conducted), our project partners had a meeting in Rovaniemi. The initial plan was to go on a road trip to all three locations—Tallinn, Gothenburg, and Rovaniemi—and benchmark the local partner hospitals before undertaking the actual design sprints. Due to some difficulties in finding suitable time slots for the road trip, we decided to meet in Rovaniemi, leaving Tallinn out of our trip itinerary. I was inspired by the possibility of bringing the hospital experience through prototyping from Tallinn to Rovaniemi. I asked our partners from Tallinn to go to the hospital and take pictures so they could create a service journey. I gave them instructions on how to take pictures so that we could walk through the hospital in the simulation laboratory (SINCO – Service Innovation Corner) located at the University of Lapland, Faculty of Art and Design (Miettinen, Rontti, Kuure & Lindström, 2012; Rontti, Miettinen, Kuure & Lindström, 2012). The experience of walking through the local hospital of Tallinn in the simulation environment in Rovaniemi received a lot of positive feedback and showed that this type of experience is something that should be developed further (Figure 22).

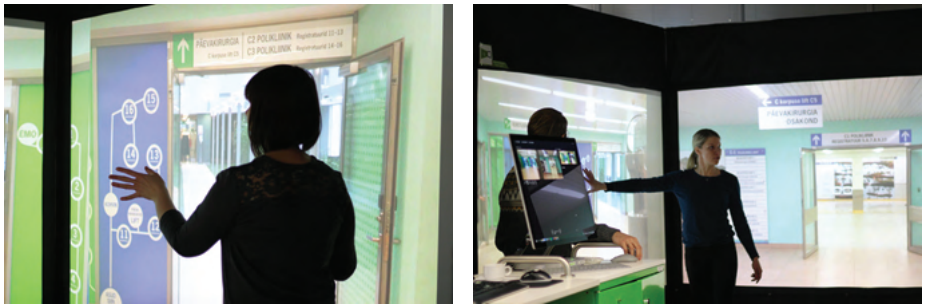


***Figure 22.*** Benchmarking through service prototyping in SINCO-lab, University of Lapland. (Pictures: Maileena Tuokko)

Making benchmarking more realistic for the early front-end phase and showing how the services are run in different locations or how the details are structured can help with the starting point. Benchmarking is also a

relevant method for service designers to understand the variations of complex healthcare services and perceive the patients' journeys and different actions from healthcare professionals. Although benchmarking is not a new method in the healthcare field (Kay, 2007), it still has huge potential to be even better through a service design approach. Service design can supply the benchmarked location with more concrete, story-based, and timeline-related action, which is easier to understand, experience, ideate further, and, most of all, accept. In addition, the digital solutions for documenting service experiences will play a crucial role in future benchmarking. This topic has true value and will provide great opportunities for further research.

Another area for further research is related to systematic visualization methods, linked to benchmarking data from other hospitals as well as the hospital that is under development. There is a need to go further with these methods, which help to perceive at least the following areas: (1) the service as a timeline blueprint with service moments for patients, healthcare providers, and other crucial stakeholders, such as physiotherapists or social service providers; (2) a resource blueprint that better mirrors the possibilities in the developed location; and (3) visualizing the crucial touchpoints so they are easier to understand and even test. Systematic visualization needs more research to be framed as a ready-filled template that fits well with different hospital service structures. This will support the strategic initiatives of healthcare.

Finally, I would like to point out that there are many possibilities for going even further with design sprint processes that are specifically designed for the healthcare field. Here, I want to emphasize the roles of different participants and the skills of facilitators and that the design sprint could be a monthly, biannual, or annual practice of healthcare development. The design sprint has its space and time—with the people who are willing to be a part of it being the most important factor. This could be a great way to implement design practices, service design methods, and design thinking as a conventional practice in the healthcare field.

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