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# Healthcare design sprints: What can be changed and achieved in five days?

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**Abstract:** This paper focuses on three design sprints aimed at co-designing healthcare services by employing service design methods and co-design approaches. The design sprints each lasted for 4–5 days, consisting of multiple teams and involving healthcare professionals, students, end-users, and facilitators from the service design field. The design sprints were examined to determine strengths and weaknesses in relation to health-related service development. The results highlight key insights from the three design sprints, which included learning and understanding through design methods, design thinking and dialogue and how these affected organisational culture and change. The findings, which are discussed in detail, include these insights and the effectiveness of design sprints in healthcare.

**Keywords**: service design; design sprint; healthcare; design process

## 1. Introduction

Healthcare is a continuously changing environment designed to tackle challenges associated with competitive advantage (Clack & Ellison, 2019), an aging population and internal and external pressures to change (Fry, 2019)—challenges which are pushing healthcare towards more innovative solutions. However, changes and innovations in healthcare are often complex and difficult to implement due to organisational resistance to change (Vink, Joly, Wetter-Edman, Tronvoll, & Edvardsson, 2019; Wang, Lee, & Maciejewski, 2015), along with a lack of focused and secure management (Fry, 2019; Nilsen, Dugstad, Eide, Gullslett, & Eide, 2016). In this context, innovative service design can be crucial for innovation, and it can help organisations obtain competitive advantages (Clack & Ellison, 2019), improve learning and undergo transformation (Kuure, Miettinen, & Alhonsuo, 2014). In line with this, many healthcare organisations are investing in service design in an effort to redesign existing services or create new services in a participatory way (e.g., Freire & Sangiorgi, 2010; Mager

& Alonso, 2017). In addition, there are increasing opportunities for future research into how design can spark change within existing social systems, especially in the healthcare sector (Rodrigues & Vink, 2016). The primary aim is to understand the user's experiences before, during and after using a service (Sangiorgi, 2011). In the design process, the designer acts as a facilitator rather than an expert service user or provider but leads the design process and supports these efforts with design methods and dialogue with stakeholders from different fields (Gleason & Bohn, 2019; Sanders & Stappers, 2008; Yu & Sangiorgi, 2017). However, little research has been dedicated to agile design processes, such as design sprints, and what can be achieved in a limited time frame. This is especially true in healthcare, and the strengths and weaknesses of design sprints in health-related contexts require more attention to determine if design sprints can be employed to tackle complex processes that are underpinned by hierarchies and various stakeholder groups.

Empirically, this article introduces three design sprints in the form of case studies held in three different locations: Gothenburg, Sweden; Tallinn, Estonia; and Rovaniemi, Finland. The data were collected through research diaries, as well as semi-structured interviews with the hospital staff and student participants. The facilitators' (also the author in this paper) own observation field notes were considered. The primary aims of the design sprints in this project were to develop joint research and innovation initiatives within the Nordic-Baltic region, engage all relevant stakeholders and support interaction among them to increase innovative capacity by transferring knowledge. An additional aim was to advocate design thinking as a methodology to help build services where end-users can act as co-designers of the healthcare system. The main outcomes from each design sprint included the investigation into and development of health-related service solutions for local hospitals.

In Hence, this study discusses the key findings from agile design sprints lasting 4–5 days and what can actually be achieved from these design sprints. The design sprints were employed to determine the strengths and weaknesses of health-related design sprints and what should be considered to create better synergy among the design sprint participants. The remainder of the article is organised as follows: first, we briefly introduce our theoretical background; we then describe our methods, databases and findings; finally, we conclude with outcomes, discussions and conclusions.

# 2. Theoretical background

In this section, we introduce our theoretical background, which includes three general areas: (1) health-related service design; (2) design process and design sprints; and (3) synergy through co-designing and design thinking. We focus on these topics as the main characteristics in the paper and reflect our findings through these topics.

## *2.1 Health-related service design*

Over the past several decades, service design has been increasing in the design field. Its roots are in the early 1980s, when it was part of marketing and management disciplines.

Since service design has evolved to achieve more valuable co-creation, customers have become more involved in facilitating the creation of their service experiences (Heikkilä et al., 2011; Mager, 2009). Service design overlaps with many different well-known design disciplines, such as human-centred design (Buchanan, 2001), participatory design (Hendriks, Wilkinson, Huybrechts, & Slegers, 2018), co-design (Luck, 2018; Steen & Koning, 2011) and experience-based design (Bate & Robert, 2008). The practices and definitions may vary slightly based on countries and approaches. Regardless, the value of service design and its participatory methods involves designing with people (Polaine, Lovlie, & Reason, 2013). The participatory and co-design methods are human-centred, where participants are often part of "an iterative cycle of design, test and measure, and redesign" (Miettinen, Rontti, Kuure, & Lindström, 2012). Connecting cultural, social and human interaction are fundamental areas of service design (Miettinen, Rontti, Kuure, & Lindström, 2012). In its simplicity, service design is a mindset, process, toolset, cross-disciplinary language, and management approach (Stickdorn, Hormess, Lawrence, & Schneider, 2018).

While the role of service design has become important in healthcare, it has also become highly challenging. There is an urgent need to perceive a changing world, where new technologies, aging populations, continuous growth, and social and healthcare reforms meet (Clack & Ellison, 2019; Fry, 2019). Also, according to Bazzano and Martin (2017, p. 736), "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." Mulgan (2014, p. 4) highlights the changing of designers' skills as a challenge that affects implementation in an organisation. In addition, Fry (2019, pp. 382–383) argues that healthcare change is quite challenging, and she describes the challenges using the following key points:

1. Hierarchy prevents growth, which may be especially true in professions and silo structures (e.g., Donetto, Pierri, Tsianakas, & Robert, 2015; Radnor, Holweg, & Waring, 2012).
2. Failing to learn from failures can be tragic, where the failures in hospitals include the consideration of their patients' life and death (e.g., Edmondson, 2004).
3. Importance of staff management is necessary when new change must be adapted in their work routine (e.g., Nilsen et al., 2016; Stickdorn & Schneider, 2016).
4. Healthcare innovation cannot be disruptive because risks to clinical service and costs must be managed (Jones, 2013).

It is clear that the complexities and challenges in healthcare are multidimensional, and they pressure designers to consider all the issues mentioned. This study reflected on these aspects through our health-related design sprints.

## 2.2 Design process and design sprints

In the design field, people often face different variations of design processes, which commonly include different steps and aspects (Miettinen et al., 2012). The typical phases of design processes start from research and fieldwork, then continue by defining findings and insights that result in the development of new concepts. Thereafter, the best solutions are concretised and tested, and the chosen idea(s) are finally implemented (e.g., Mager, 2009; Miettinen et al., 2012; Moritz, 2005; Van Oosterom, 2009). The service design process is often adapted based on the needs of humans, organisations and the problems to be solved. In addition, every process must be adapted for the project and must consider the complexities of the challenges, the people involved, underlying ideas or challenges, budget, time frames and other resources (Stickdorn et al., 2018).

Many service solutions and change initiatives fail when the implementation is perceived as insecure or unfocused (Fry, 2019; Nilsen et al., 2016). This can be clearly seen in intensive, usually five-phase (and five-day) design sprints that employ design thinking by a small team (Banfield, Lombardo, & Wax, 2016). New information generated from the process is quickly gathered and defined and from that, findings are wildly ideated and wisely iterated, and final concepts are quickly presented. Figure 1 visualises the design sprint as a process. The design sprint is a highly successful business strategy that can create innovation that any development team can use (Knapp, Zeratsky, & Kowitz, 2016). The concepts themselves are relatively weak and not structured to perfectly fit existing healthcare ecosystems, which are often complicated and multi-layered. However, instead of producing valuable and polished outcomes, the concepts can open doors for design thinking and design methodologies, and through those, it is possible to affect change in organisations. Little research has been conducted on the subject of health-related design sprints. The novelty of understanding the strengths and weaknesses of design sprints in the healthcare field and what can be achieved were the key points found in our study.


*Figure 1. The design sprint process in a nutshell*

## 2.3 Synergy through co-designing and design thinking

Synergy can be defined as a collaboration in the co-design process, whereby stakeholders from various fields practise with design methods and design thinking. Synergies occur throughout the entire design process. Since the 1970s, the value of having end-users and other stakeholders involved in the design process has increased (Sanders & Stappers, 2008). This involvement can be linked with participatory design, human-centred design, and co-design. Co-design applies creative cooperation across the whole design process (Steen,

Manschot, & Koning, 2011), with its roots in participatory design techniques. Co-design is critical to service design because it incorporates perspectives associated with different stakeholders, technologies and processes. This links service design with co-design, where the aim is to understand people's behaviour and experience in service processes and how technologies and other touchpoints holistically support customers' journeys, while stakeholders represent their own fields and backgrounds. Healthcare representatives and service end-users (e.g., patients and family members) have knowledge of their experiences that guides and supports the design outcomes. More specifically, bringing patients to the co-design centre is valuable because they can take "a more direct and ongoing role in identifying, implementing, and evaluating improvements to healthcare services" (Robert et al., 2015, p.1). Such value is highlighted in many studies (e.g., Donetto et al., 2015).

Design thinking is a primary characteristic of the design process and service design. Through design thinking, people can "create concepts, solutions and future service experiences" (Miettinen et al., 2012, p. 3), which creates value for the service providers and end-users. Designers, often as facilitators in the co-design process, coordinate and guide stakeholders through the entire development project (Miettinen et al., 2012). This requires designers to empathise with people, guide dialogue between them, choose correct methods and visualise data, insights and outcomes. Designers must also allow participants to lead at times so that the latter can practise their design thinking. Participants' views and thoughts can be linked using different and creative design methods, design research, design thinking and visualisation techniques, while empathy, integrative thinking, optimism, experimentalism and collaboration are common characteristics of good design thinkers (Miettinen et al., 2012).

## 3. Research methods and data

This article focuses on three case studies (i.e., design sprints), and as a research strategy, this enables multiple levels of analysis from a single study (Yin, 2009) and allows a focus on understanding, describing, predicting and controlling the individual (e.g., process, organisation, group or culture) (Woodside, 2010). In general, case studies are criticised for lacking rigour, being difficult to generalise, taking up too much time and producing large amounts of information (Yin, 2003b), but as a methodology, it enables the exploration of a single phenomenon in a natural setting by using mixed method approaches to reach in-depth understanding and knowledge (Collis & Hussey, 2009). In this case study research, the phenomenon was health-related design sprints in the hospital context, where different stakeholders co-design by using different design methods. For this project, case studies offered three approaches to perceive synergy in groups and compare findings.

In this study, the design sprints were held in Gothenburg, Sweden; Tallinn, Estonia; and Rovaniemi, Finland. They all included international and multidisciplinary participants (Sweden n=22, Estonia n= 20 and Finland n=6), which created design sprint teams of three to six persons. In Gothenburg, the design sprint teams consisted mainly of students from

different disciplines, but four of the participants were from the healthcare sector: two from local hospitals and two from Tallinn's medical centre. In Tallinn, 19 participants were students, and one had a healthcare background. In Finland, all six participants in teams were international students, mainly from design backgrounds.

In all three design sprints, healthcare practitioners from the local hospitals were involved as part-time mentors and/or facilitators. Mentors were healthcare professionals from different wards (e.g., the IT department and administration unit who supported the participants part-time in the design sprints). The facilitators were service designers and the authors of this article, who led and facilitated the design sprints. In Tallinn and Rovaniemi, the hospital representative (i.e., the contact person between the design sprint project and hospital) also participated as a facilitator. During the case studies, members of the wider public were used in field work to provide general data and to understand the brief. These participants were given semi-structured and open-ended interviews, being asked questions such as "Are you familiar with this service?", "How do you find the service?" and "How would you like to change the time in your referral?" The interview questions were specified for each brief, and the ethical considerations were discussed beforehand with the teams.

## *3.1 Data*

The data were collected through research diaries, facilitators' field notes, and semi-structured interviews conducted by design sprint participants. In addition, two unstructured interviews were administered to two design sprint participants during and after their project. In the following paragraphs, these instruments are described in detail.

In each design sprint, the research diaries evolved with minor changes. In Gothenburg, the data set consisted of nine research diaries kept by 22 participants. Every participant received an email after every design sprint session, with three to four questions regarding the methods used during the day, as well as participants' feelings and thoughts. The research diary data collection method revealed that it was challenging for the participants to complete the entries in their research diaries after long, exhausting and intensive days. In Tallinn, the research diaries were paper-based booklets. The same questions were asked and answered at the end of each day, such as "Good thoughts from today", "Questions which arose for you" and "Idea you'll put into practice". From 20 participants, 15 research diaries were returned. In Rovaniemi, instead of asking participants to write their thoughts down in the email or research diaries after each day, we focused our time on semi-structured debriefing interviews after each of the first three days. We asked the same questions, which were highlighted in previous research diaries in Gothenburg and Tallinn. In addition, we sent an online questionnaire after the sprint was completely finished to gain insights and reflections regarding the overall experience. We received four detailed questionnaires from six participants. The data from all locations were then scanned, transcribed in Excel and categorised by topic, using a thematic analysis approach.

Field notes were taken by the first author of this paper, who observed the design sprints in Gothenburg and Tallinn and facilitated the design sprint in Rovaniemi. The field notes are researchers' remarks (e.g., how team participants were reflecting and discussing while using design methods, how design methods cleared up the brief and how the synergy was seen in groups). Findings from the field notes were added into Excel, as were research diary data.

Semi-structured interviews focused on understanding the participants' experience during the design sprints and reflecting the experience afterwards. In Rovaniemi, instead of asking the participants to document their thoughts in research diaries, we interviewed them after the first three days of the design sprint. We formulated the interview questions in such a way that could be used both for interviews and our personal notes in our research diaries. The interviews were not recorded, but another facilitator wrote down the key points. In addition, the first author of this paper had in-depth discussions with two student participants. One student participated in each design sprint, and the other participated in the design sprint in Gothenburg and Tallinn. The notes were taken during the discussion and were added into Excel, along with previous data.

## *3.2 Case studies*

The three case studies utilised multiple design methods and tools which are familiar from the service design field. The aims of the design methods were to find needs, challenges and opportunities by using interviews in the field and, with the mentors, to collect and analyse the data in visual forms and templates for understanding the insights of the topics and deepening the understanding by formulating user personas and point-of-view charts or by discussing scenarios through desktop walkthrough methods. In each case study, the ideation was done differently and the ideas were concretised by prototyping. The following table (Table 1), visualises the three design sprint processes and the design methods used in each location. The last vertical row highlights the amount of collected research data in each case study. Details regarding the case studies are provided in the following subchapters.

| Location & participants | Short description of design methods used per day in each location | | | | | Collected data |
|---|---|---|---|---|---|---|
| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | |
| **Gothenburg, Sweden**<br>18 students<br>4 nurses | • Presenting previous cases | • Introduction<br>• Team building<br>• Briefing<br>• Ethno station - interviews | • Field research<br>• Collecting & visualising insights & data<br>• Clustering insights & data | • Ideation<br>• Concept development<br>• Testing<br>• Creating videos<br>• Presentations | | • 9 research diaries<br>• Field notes<br>• Unstructured interviews |
| **Tallinn, Estonia**<br>19 students<br>1 nurses | • Introducing five challenges<br>• Creating teams | • Team Canvas: team members and clarifying the topic<br>• Storyboard<br>• Site-visits<br>• Mentoring | • Rough proto-typing and role-play through desktop walkthrough<br>• Mentoring | • Mentoring<br>• Testing, evaluating and iterating | • Presentations | • 15 research diaries<br>• Field notes<br>• Unstructured interviews |
| **Rovaniemi, Finland**<br>6 students<br>0 nurses | • Briefing<br>• Team building<br>• Test journey | • Field research<br>• Mapping down findings<br>• Mentoring | • Clustering insights & data<br>• Ideation | • Clustering ideas<br>• Voting<br>• Storyboard<br>• Prototyping chosen idea<br>• Testing | • Creating videos<br>• Presentations | • 4 research diaries<br>• Field notes<br>• Unstructured interviews |

*Table 1. Integration of design methods and collected research data from each design sprint*

## *3.3 Case study: Design sprint in Gothenburg*

The first four-day design sprint was held in Gothenburg, Sweden in April 2019 with 18 international and multidisciplinary participants, and four hospital representatives (two nurses from Gothenburg and two hospital staff from Tallinn) were included. The participants worked with a design brief from Child Health Centre Services (BVC), where the research focuses included (1) information regarding the different visits during the child's time at BVC, and (2) information related to prepping for a visit from the child's perspective. As an interesting outcome, the teams created different communication tools, such as "Chatbox" and a "Yearbook", for interaction between parents and professionals.

## *3.4 Case study: Design sprint in Tallinn*

The second five-day design sprint was held in Estonia, Tallinn in April 2019 with 19 participants who were also from abroad and from multidisciplinary fields; one participant had a healthcare background. The aim was to investigate and develop patient journeys in five North Estonia Medical Centre clinics by employing design thinking and co-design methods. The design challenges included (1) making the pre-visit process valuable; (2) leading a meaningful life after a stroke; (3) day surgery centre; (4) death with dignity; and (5) emergency department (ED) patients' stress and anxiety. Five conceptual solutions were co-

designed to address these challenges in partnership with design sprint participants and staff from the North Estonia Medical Centre. The design sprint in Tallinn was facilitated by a service design teacher and a hospital representative.

### *3.5 Case study: Design sprint in Rovaniemi*

The last five-day design sprint was held with six participants in Rovaniemi at the beginning of May 2019. The aim was to investigate and develop a care and treatment reservation centre at Lapland Central Hospital by employing design thinking and co-design methods. The challenge was divided into two case studies, including patients who lived far from specialised healthcare institutions and patients who lived near the central hospital, which provides specialised healthcare services in Rovaniemi. Two groups of three participants developed two different concepts for the care and treatment reservation centre. The first group, which focused on a patient living in a remote area, created a LAPP LAB service bus to take healthcare services and e-health solutions into rural areas in Lapland. The second group, which focused on patients living near Lapland Central hospital, created a web-based service system to make the treatment reservation process more flexible by allowing patients to book, change and cancel appointments by themselves.

## 4. Mapping the findings

We now turn our attention to the analysis of our research, by first considering the findings from the collected research diaries, field notes and interviews. The findings are then considered in the context of key insights associated with certain theoretical frameworks, and as shown in Table 2 below, the collected data were categorised according to recurring themes.

| **Strengths and weaknesses from participants' points of view** | |
|---|---|
| **Strengths** | **Weaknesses** |
| - Learning design thinking and design methods<br>- Organisational change<br>- Dialogue between stakeholders associated with different design methods<br>- Understanding hospital processes from the end-user's perspective<br>- Emphasising 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 |

*Table 2. Strengths and weaknesses from design sprint participants' perspectives, based on the recurring themes identified in the research diaries.*

Learning was highlighted as the greatest strength in the design sprints. Learning was strongly linked to design thinking and design methods. This was especially true for the healthcare professionals who were part of a design sprint team. Participant nurses described their experiences as “Learning how to think innovative” and “Very inspiring sprint and very educational”. The nurses stated their willingness to implement some of the design sprint methods in their everyday practice to make the processes more tangible and gain a better understanding of the holistic experiences of users. In addition, learning occurred inside the design team, which was evident when a nurse was able to immediately communicate how the system or service was working at a given moment. The design sprints were seen as a sample or short introduction to the design field.

Concrete design methods (especially visualisations) helped participants and mentors better perceive service processes and systems. Creating customer journeys as a comic strip or storyboards and playing scenarios through desktop walkthroughs (see Figure 4) played a crucial role in the enhancement of dialogue. Notably, mentors (healthcare professionals) were able to understand the holistic service journey from the user’s (patient’s) perspective. For instance, a doctor acting as a mentor took the user pawn, went through the service from the user’s perspective and perceived the holistic user journey. The research diaries from participants who participated in design sprint teams, our own field notes and feedback from the hospital highlighted that in practice, design thinking and design methods can have a positive effect on organisational changes.

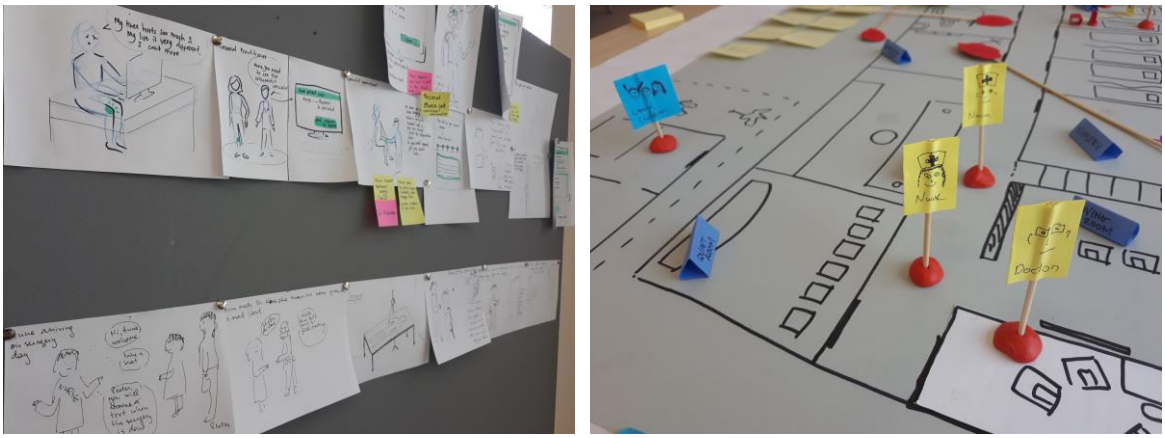

*Figure 2. On the left, a storyboard illustrates the existing service process. On the right, desktop walkthroughs are used as a tangible tool to better understand service flow from a top-down angle*

In this sense, we could also say that participants and mentors empathised with other relevant stakeholders who were the key characters in their specific case study. Participants found that it was important to have a real picture of where the service is delivered. For instance, in Gothenburg, participants visited the clinic and observed and interviewed nurses. Seeing and experiencing services with their own eyes and stepping into the service users’ shoes created a holistic picture of the front-facing services (visible side of the service). In Rovaniemi, participants began their design sprint with a test journey, where they walked

through the local hospital using fake ID cards and went through three wards (see Figure 5). The test journey would have been perfect if the activity had focused more on reservation service, which was the primary subject of the design sprint. Still, it was a good introduction, which improved participants' familiarity with the local hospital and people.

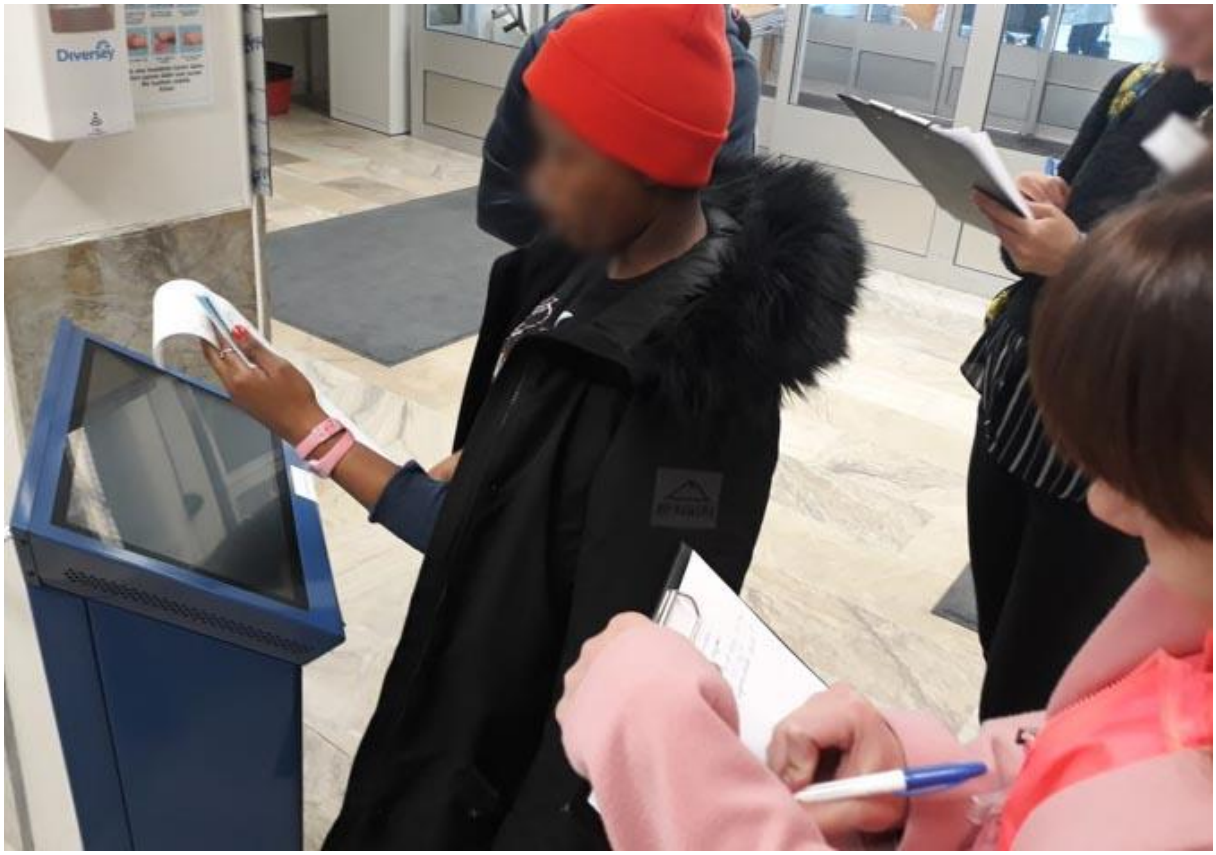


*Figure 3. A test journey in the local hospital helped participants to quickly familiarise themselves with the existing service from the user's perspective.*

Nevertheless, the limited time frame did not allow participants to focus on the entire hospital processes and systems in depth. Certain process gaps were found to be invisible to users: namely, those that occur behind the scenes, which are often complex and multi-layered in the healthcare field. This had a negative effect on concept ideation, trust and the relevance of the final outcome. The most common feedback from participants indicated that the desired end results did not appear fully realised due to gaps between existing service systems and service ecosystems. These weaknesses increased when participants were unfamiliar with local healthcare services.

During the design sprints and design methods used in those, the participants in each team generated a significant amount of valuable information. For instance, through interviews and desktop walkthroughs, many other critical pain points or needs of healthcare services were highlighted or discussed. In health-related topics, the needs and challenges can be multi-dimensional, so different critics were highlighted depending on which ward or position the person is working in. The design sprint teams analysed their gathered information by

using sticky-notes or flip charts, so that everyone in the groups could see the written details and themes. The notes included information outside of the given brief, which were written down, but not considered. In Rovaniemi, the contact person from the hospital was very eager to use hundreds of post-its, pointing out that “there are so many important and relevant findings which need to be highlighted in our other projects”. Based on this, participants presented their notes as one additional deliverable to the hospital.

While conducting research in the hospital, ethical limitations and the risk of hearing or seeing something unethical must be considered. In addition, such considerations shed light on what you can ask users in a hospital hallway or on a street while doing field work. These ethical considerations were discussed at the beginning of the design sprints in each location, and participants reported that they felt unsure about what they could do or ask. In this sense, it was easier for the participants to interview mentors because they were hospital professionals. Anyway, during the case studies, members of the wider public were used in field work to gain a wider understanding of the brief. Moreover, in the agile design process, it is difficult to go very deep with one’s research, and the deeper data that participants collected were obtained from hospital representatives.

# 5. Change and achievement through design sprints

The aim of this study was to identify the strengths and weaknesses of health-related design sprints and how to improve synergies among design sprint participants. Based on our experiences from the three design sprints, our key findings (Table 2) from the perspective of health-related service design were presented, and the challenges associated with making changes are discussed in the theoretical framework. We then shared our experiences concerning the synergy among all actors in the health-related service design sprints. These are reflected in the strengths and weaknesses identified in our findings.

## *5.1 Challenges for change in design sprints*

Generally, hierarchy and silo-structured organisations prevent growth (Donetto et al., 2015; Fry, 2019; Radnor, Holweg & Waring, 2012). In our three design sprints, the mentors (healthcare professionals from different healthcare fields) were carefully selected for their open-mindedness and willingness to facilitate changes in healthcare. The mentors shared the best possible knowledge and motivation with design sprint teams. Mentoring rounds helped students go further with the brief and design drivers. In addition, understanding holistic patient journeys that go hand-in-hand with hierarchical struggles was perceived as a strength more than a weakness. Design methods and their visualisations supported the understanding of the holistic service journey from the patient’s perspective, as well as from the perspective of the hospital professional’s daily work life.

Testing and prototyping through role playing was also conducted in each design sprint. Notably, through concrete examples, it was easier to suggest features and better understand how technology fits in hospital processes to make systems even more suitable for everyday

use. Role playing also further enabled failing in safe environments and iterated service concepts to avoid or manage certain risks and/or costs (Calck & Ellison, 2019; Fry, 2019; Jones, 2013). This is linked to learning design methods, understanding hospital processes in a holistic manner and identifying needed organisational changes.

The results of this study indicated that issues related to governance, strategies, political will and economics were the most difficult to consider. The time-pressured design sprints did not allow participants to delve deeper into these topics. Nevertheless, design sprints were found to be potentially valuable as kick-offs for new hospital projects or as boosters during the middle phase of the project. If the outcomes are implemented later, these topics will be considered more valuable in the hospital development process.

Community engagement, complex and urgent social challenges (Bazzano & Martin, 2017), aging populations, continuous growth, social and healthcare reforms (Clack & Ellison, 2019; Fry, 2019) are areas that can be considered in the service design process. When conducted in an agile manner, a design sprint pressures participants to think about what must be achieved in five days. Narrowing the focus of the challenge might give better and more valuable results, although participation in the design process is important. When managers, various specialists, participants from different backgrounds and designers are included in the design sprint team, the process can be improved and more realistic outcomes can be obtained. This may improve and facilitate changes in hospitals.

## *5.2 Synergy in agile ways of doing*

In this study, synergy was defined as a collaboration among participants and other important stakeholders involved in the design sprint process. We see synergy as an achievement, which design methods and design thinking can support. Design methods such as storyboards, desktop walkthroughs and body storming created a better understanding of services, and this helped people with different backgrounds and knowledge discuss the challenges and potential solutions together. The concrete, tangible tools work as a “common language” among participants in the design sprint teams and healthcare professionals (Rygh & Clatworthy, 2019). Notably, support is also needed from facilitators, who must have skills to guide dialogue and design thinking, while also supporting the usage of design methods. The facilitator’s role is also to boost synergy inside the teams.

We found that through design sprints, it was not possible to achieve finalised service outcomes that can fix existing services or create something totally new. If there is insufficient time for implementation, there is a real risk that outcomes will fail (Fry, 2019; Nilsen et al., 2016). We also found that the synergy and dialogue among all the participants, mentors and facilitators is more important than the end result. Well-facilitated design sprints, open-minded mentors and carefully selected design methods are at the core, which affect synergy and can help overcome challenges associated with making changes in hospitals.

Reflecting on the data of this research, some common themes emerged from our three design sprints. These dominant themes are related to teamwork and the value of having participants with different backgrounds. In all design sprints, respect for everyone's knowledge, skills and profession was seen as highly important, where design methods worked as a platform to bring out skills. Every skill had a space, and participants found their skills to build the synergy in their team. These skills were, for instance, to ask the right questions or listen to people, visualise or concretise concepts, ideate creative service concepts, lead and support one's group, keeping in time and boosting one's team as they become tired. The professionals who had a deep understanding of their own field (e.g., doctors or nurses of specific hospital wards) should not be forgotten either. Their skills were clearly seen in each design sprint team, highlighting the power of giving space for others' skills to be acknowledged. When the clock is ticking during the intensive design sprint, every group member's skill should be used, and this also generates trust and mutual learning. This creates value inside of the team and generates respect. This is a core element in synergy, while different abilities are found, encouraged and supported inside teams.

# 6. Conclusion

The design sprints were not only seen as mandatory project contributions from the hospital's point of view but as a great learning opportunity in the healthcare context. As a way of co-designing in the healthcare field, design sprints can be a collaborative approach to bring design thinking into a hospital. It is an effective approach to engaging hospital representatives and concretising design methods in practice. Design sprints pressure design teams to understand the different levels of complexities in hospitals, including its processes, systems, technologies, infrastructures and ecosystems.

Design sprints appear to be an effective approach for kick-off events at the beginning of new development projects or as a booster in the middle of the project. As a kick-off, it gives important tools and a mindset, which are needed to expand and ongoingly explore certain topics, such as how to involve stakeholders and listen to them, how to guide dialogue and give space to express themselves and how to map insights and concretise ideas. Design sprints also provide tools to support synergy among internal teams, design teams and design consultants. Design sprints can be a good starting point to achieve more sustainable services in hospitals. Even so, the pace of the design sprint within a slow-moving organisation, such as those that are so prevalent in the healthcare system, may be just what the design sprint claims to be—a breath of fresh air. The fresh air allows new conversations that can trickle beyond the time-slotted event referred to as a "sprint".

For the next stages of design sprint development in hospitals, engagement and ethical issues must be considered, along with an agile method of going further with time-pressured processes. While the mentors in this study were hospital representatives, the engagement of patients and family members cannot be stressed enough. Their role in effective and efficient healthcare service development is crucial and must be more fully considered in the future.

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