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Title	Implementing Service Design Methods and Tools into Software Development A case study: Service Design sprint		
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<p><b>Abstract</b></p> <p>Service Design is a comprehensive and collaborative design approach for creating value for all stakeholders. Service Design includes several methods and tools for the improvement of a new or an existing service. The implementation of Service Design into software development has been only partially studied. Likewise, research regarding the benefits and challenges concerning the utilization of Service Design precisely in software development is rather deficient. The aim of this thesis was to experiment applying Service Design methods and tools into software development through a pilot project carried out in a Finnish software development company. This research presents possible benefits and challenges that implementing Service Design into software development may have. In addition, critical factors to be considered while implementing Service Design are proposed.</p> <p>The thesis was composed with an action research approach, which included several data collection methods. The data was mainly collected through a focus group interview, semi-structured interviews, a questionnaire survey and the actual case study: The Service Design sprint. Due to the global pandemic regarding Covid-19 the Service Design sprint had to be held remotely, contrary to the original plan. The remote implementation brought its own challenges to the planning phase, but also enhanced the efficiency of the workshops held during the sprint. The results of the action research cycle are compared to previous research on the field. The findings of this thesis support some of the previous findings, but also differences and additional factors were identified during this research.</p> <p>The identified benefits of Service Design in software development include benefits for both internal and external stakeholders. These are improved internal motivation, understanding the customer better, efficient resource allocation, delivering added value to the customer and increased customer satisfaction. Concurrently the identified challenges that may be faced while implementing Service Design are related to the lack of time and commitment, internal assumptions, involving relevant people to the process and prototyping methods in remote workshops.</p> <p>Based on the literature review and the results of the empirical research it can be concluded that Service Design can be implemented into software development through pilot projects. The critical factors identified during the research are based on carrying out a pilot project when implementing Service Design into software development. The critical factors regarding the pilot project include detailed and encompassing planning, discovering suitable Service Design methods and tools, scoping the sprint challenge, finding a lightweight solution and providing concrete results and findings to all stakeholders. This thesis offers a basis and background for further studies regarding the utilization of Service Design in software development.</p>			
Key words	Service Design, Service Design tools and methods, agile software development, SaaS, B2B		
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<b>Tiivistelmä</b> <p>Palvelumuotoilu on kattava, yhteistyöhön perustuva lähestymistapa suunnitteluun ja sen tavoitteena on arvon luominen kaikille sidosryhmille. Palvelumuotoiluun sisältyy useita metodeja ja työkaluja, joita hyödyntämällä voidaan kehittää sekä uutta että jo olemassa olevaa palvelua. Palvelumuotoilun implementointia ohjelmistokehitykseen on tutkittu vain osittain, eikä myöskään tutkimusta palvelumuotoilun tuomista hyödyistä ja haasteista erityisesti ohjelmistokehityksen näkökulmasta ole juurikaan tehty. Tämän pro gradu -tutkielman tavoitteena oli kokeilla palvelumuotoilun metodien ja työkalujen hyödyntämistä ohjelmistokehityksessä suomalaisessa ohjelmistoyrityksessä toteutetun pilottiprojektin kautta. Tutkimuksen tuloksena esitetään mahdollisia hyötyjä ja haasteita, joita palvelumuotoilun implementoimisesta ohjelmistokehitykseen voi seurata. Lisäksi tutkimus nostaa esille kriittisiä tekijöitä, jotka tulisi huomioida tässä yhteydessä.</p> <p>Tutkimus toteutettiin toimintatutkimuksena, jossa hyödynnettiin useita eri aineistonkeruumenetelmiä. Aineisto muodostui pääasiassa fokusryhmähaastattelusta, puolistrukturoiduista haastatteluista, kyselystä sekä itse case-tutkimuksesta eli palvelumuotoilusprintistä. Koronapandemian takia palvelumuotoilusprintti jouduttiin alkuperäisistä suunnitelmista poiketen toteuttaa etätyöskentelynä. Etätoteutus toi suunnitteluun omia haasteita, mutta myös tehosti sprintin yhteydessä pidettyjä työpajoja. Toimintatutkimuksen tuloksia verrattiin alan aiempiin tutkimuksiin. Tämän tutkimuksen löydökset tukevat osaltaan aiempia löydöksiä, mutta myös eroavaisuuksia ja uusia tekijöitä tunnistettiin.</p> <p>Ohjelmistokehityksessä palvelumuotoilun mahdolliset hyödyt kohdistuivat sekä yrityksen sisäisille että ulkoisille sidosryhmille. Hyödyistä korostuivat parantunut sisäinen motivaatio, parempi asiakasymmärrys, tehokas resurssien allokointi, lisäarvon luominen asiakkaalle sekä kohonnut asiakastytyväisyys. Samanaikaisesti palvelumuotoilun käyttöönotossa ohjelmistokehityksessä voidaan kohdata myös haasteita. Tutkimuksen perusteella mahdollisiksi haasteiksi tunnistettiin ajan ja sitoutumisen puute, sisäiset ennakkokäsitykset palvelumuotoilua kohtaan, keskeisten henkilöiden osallistaminen prosessiin sekä prototyypimethodien hyödyntäminen etänä toteutettavissa työpajoissa.</p> <p>Kirjallisuuskatsauksen sekä empiirisen tutkimuksen tulosten perusteella voidaan todeta, että palvelumuotoilu voidaan implementoida osaksi ohjelmistokehitystä pilottiprojektien kautta. Tutkimuksen aikana tunnistettiin kriittisiä tekijöitä, jotka liittyvät pilottiprojektin toteuttamiseen. Näistä tekijöistä korostuivat yksityiskohtaisen suunnittelun tärkeys, sopivien palvelumuotoilu metodien ja työkalujen tunnistaminen, sprintissä käsiteltävän ongelman riittävä rajaaminen, kevyen ratkaisun löytäminen sekä konkreettisten tulosten ja löydösten esittely kaikille sidosryhmille. Tämä pro gradu -tutkielma tarjoaa taustan jatkotutkimukselle liittyen palvelumuotoilun hyödyntämiseen ohjelmistokehityksessä.</p>			
Asiasanat	Palvelumuotoilu, palvelumuotoilu metodit ja työkalut, ketterä ohjelmistokehitys, SaaS, B2B		
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**UNIVERSITY  
OF TURKU**

Turku School of  
Economics

# **IMPLEMENTING SERVICE DESIGN METHODS AND TOOLS INTO SOFTWARE DEVELOPMENT**

**A case study: Service Design sprint**

Master's Thesis  
in Information Systems Science

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The originality of this thesis has been checked in accordance with the University of Turku quality assurance system using the Turnitin OriginalityCheck service.

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# 1 INTRODUCTION

## 1.1 Background

Nowadays all companies are involved in the software business either directly or indirectly. Software affects all industries and can be seen as the main driver for innovation. (Elbert 2015, 92.) Software development teams often experience pressure to keep up with the dynamic business environment and continuously changing customer requirements. The success of a product or service is determined by the created customer value and therefore software development teams constantly aim to create and develop innovative features to provide added value for the customer. (Sauvola et al. 2018, 52.) Customer participation and active involvement throughout the software development process are key factors to ensure focusing on the correct matters and consequently creating customer satisfaction. However, there are often several layers of people and processes between the end-users and the software development team, which complicates the user involvement. Service Design offers methods to bridge the gap between developers and users. (Sauvola et al. 2016, 326.)

Defining Service Design remains challenging as it can be explained in numerous ways. Depending on the situation Service Design can be seen as a mindset, a process, a toolset, a cross-disciplinary language or as a management approach. (Stickdorn et al. 2018, 20.) Even though Service Design was first utilized in business-to-consumer (B2C) context, it has been discovered to be a practical approach for business-to-business (B2B) environment as well. Service Design can be used to improve the existing services an organization offers as well as to develop completely new value propositions. Moreover, Service Design is suitable for internal development of companies' processes. (Sauvola et al. 2016, 15, 235.)

This master's thesis will be addressing the research gap by approaching the research questions with action research. The research gap will be described in the following subchapter. The environment of this thesis is a Finnish software development company, referred to as Company X. Company X follows the principles of agile software development and provides a Software-as-a-Service (SaaS)<sup>1</sup> for human resource management. Specifically, the research case study in this thesis deals with two key modules of the software: staffing and workforce scheduling. The aim of this research is to discover the best Service Design methods and tools for software development and experiment implementing these into the development process through a pilot project. The research supports

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<sup>1</sup> Software-as-a-Service (SaaS) is a software delivery model in which the license is based on a subscription and the software is centrally hosted. (Turner et al. 2003, 38.)

Company X to identify the benefits, challenges and critical factors of Service Design implementation in order to improve the product development process and deliver the best possible value for customers.

## 1.2 Research gap

In Service Design the creation of value is not limited to the end-user or customer but includes creating added value throughout the process. Therefore, Service Design can be utilized for B2B as well as for internal services or public services. (Stickdorn et al. 2018, 15.) Service Design has been studied widely in the field of creating new products and services. However, there are only a few studies regarding the implementation of Service Design specifically into software development processes and therefore it is a field, that requires more research. Sauvola et al. (2016) conclude in their research “Integrating Service Design Prototyping into Software Development” that generalization based on their research results is naturally limited. However, the results offer a rich background for future studies. For future research they suggest identifying tools that can be utilized to analyze and include workshop results into software development processes. (Sauvola et al. 2016, 331.)

Service Design might seem as an elusive concept and therefore it is important to discover what applying Service Design actually means and how Service Design methods and tools can be implemented in the software development industry. It is also important to recognize, how Service Design will affect different stakeholders. The field of research is relevant, because Service Design has been a ponderable subject during the past years, but it has not yet been studied as widely in software development as in many other fields. This master’s thesis aims to recognize the Service Design tools and methods that best suit software development, while considering **agile software development** and **an existing software** instead of a situation where the software is built from scratch. In addition, this study adds to prior literature by Sauvola, Rontti, Laivamaa, Oivo and Kuvaja (2016).

## 1.3 Research questions

This master’s thesis aims to answer the following research questions:

1. **What is Service Design?**
2. **How can Service Design methods and tools be implemented into internal processes in B2B software development?**
3. **What are the benefits, challenges and critical factors when implementing Service Design methods and tools into software development?**

The sub questions below will help to build a knowledge base to respond to the main research questions:

- How is Service Design usually implemented?
- What are the most common Service Design methods and tools?

In addition, the following research tasks will be carried out during the research process, in order to answer the research questions in the best possible way:

- Cooperating with different stakeholders, including employees, customers and end-users of Company X, throughout the project.
- Applying Service Design methods and tools into internal processes in Company X through a pilot project and evaluating the benefits, challenges and key factors regarding the process.

## 1.4 Summary

The key findings of this research consist of guidelines for implementing Service Design into internal processes in B2B software development and an aggregation of the benefits, challenges and critical factors of implementing Service Design into software development. In addition, the Service Design tools and methods that are applied in the case study are presented and analyzed.

This master's thesis begins with Chapter 1 which introduces the reader to the research area and describes the research gap. Chapter 2 will explain the background of the main topic and related work for the study and answer the first research question: *What is Service Design?* Chapter 2 will also address the second research question and go through the best suggested Service Design methods and tools for software development, which will be utilized in the Service Design implementation case later. The empirical research design will be introduced in Chapter 3, including the research methodology, data collection methods, data analysis and the evaluation of trustworthiness of this research. Chapter 4 will present the case study in detail and provide a proposal to the second research question: *How can Service Design methods and tools be implemented into internal processes in B2B software development?* Chapter 5 will go through the results and key findings of each data collection method. The answer to the last research question: *What are the benefits, challenges and critical factors when implementing Service Design methods and tools into software development?* will be presented in Chapter 6: Discussion. The thesis is finalized in Chapter 7 by presenting the conclusions, research limitations and suggestions for further research.

## 2 SERVICE DESIGN

### 2.1 The development of Service Design

Design thinking, which was born already in the 1970s can be seen as a hypernym for Service Design. Even though design thinking has been around for decades it has been emphasized and highlighted only the last few decades. (Gobble 2014, 59.) Brown (2008) describes design thinking as a mindset that can transform the way products, services, processes and even strategy are developed. Design thinking aims for maximizing value creation for customers, increasing business value and even creating completely new forms of value by using the principles of design. (Brown 2008, 86-92.)

In the beginning of 1980s, the importance of designing services was first highlighted. Modelling and blueprinting were included into innovating and developing services. It was noticed that products and services are often formed by a more compound combination of both products and services. (Shostack 1982, 49, 63.) The term Service Design was born in 1982 and was first used by Lynn Shostack in her article “How to Design a Service”. Already back then, the benefits of Service Design, including market success and growth, were recognized (Shostack 1984, 134).

In 1986 Donald A. Norman published the book “User Centered System Design: New Perspectives on Human-Computer Interaction”, which guides the reader to new ways of thinking about user-centered system design. The focus is on interactive systems and how these systems can ease people’s work. (Pea 1987, 129-130.) The book placed the user at the center of the development process, which was an important ideological shift (Catalanotto 2018, 73).

It was not until the 1990s that Service Design could actually be seen as a design discipline. However, Service Design was still a term used mostly solely in marketing. In 2001 the first design consultancy focusing particularly on Service Design was opened. A year after this a consultancy based on Service Design opened also on the public sector and this is when Service Design found its way to also other business areas than marketing. (Catalanotto 2018, 100).

In the 2000s Service Design became a profession and the first companies started specializing in Service Design (Catalanotto 2018, 98). Service Design Network (SDN) was founded in 2004 and is a leading non-profit institution for expertise in Service Design with more than 1300 members and over 100 listed member organizations. SDN focuses on strengthening the impact of service design, within both private and public sectors, by sharing knowledge and collaborating through international events, publications and coordinating with several academic institutions and businesses. (Service-Design-Network.org.)

In 2005 first schools, such as Stanford's D.School and Oslo School of Architecture and Design, started to focus on Design Thinking and on teaching and researching Service Design. The first master's degree in Service Design was created in 2009. The first conference, that was focused solely on Service Design was held in 2007, which can be seen as a proof of maturity of the field. A year after the first conference focusing on Service Design was held the first toolset for Service Design was also created. The toolset constitutes of a collection of Service Design methods (Catalanotto 2018, 104-113), and is used by many service designers yet today. This thesis will focus more on the presented methods in the following chapter.

During the past 10 years Service Design has been a "buzz word" that arises in several conversations regardless of the business domain. Many books have been written on Service Design and methods and tools have been developed and improved. Several companies have noticed the business benefits of Service Design and hence recruited service designers. (Catalanotto 2018, 118-129.) In addition, the design sprint was invented at Google by Jake Knapp in 2018 and later perfected with experts at GV (GV.com/sprint). This is an important event regarding this thesis as the case study of this research will follow the principles of a design sprint. The service design sprint will be specifically presented in Chapter 4.

## 2.2 Defining Service Design

Frederick Brooks' classic article "No Silver Bullet, Essence and Accidents of Software Engineering" was first published in 1986. It addresses the challenging substance of software engineering and why there is no single technology or a management process that promises comprehensive improvement in productivity, reliability and simplicity. Brooks compares a software project to a werewolf, as both can change unexpectedly into something uncontrollable and unfamiliar. The silver bullet indicates the only weapon that can lay a werewolf in rest, but Brooks claims that regarding software there is no such silver bullet. (Brooks 1986, 10-12.)

Service Design is probably neither the longed-for silver bullet in software development. The focus on Service Design should not be on the term itself, but on everything it includes. Several methods and tools like user story mapping and design sprint models that are applied in Service Design are recognized as useful approaches also under other approaches such as user experience (UX) and the aim should be in combining service design, agile software development and lean philosophies. (Sauvola et al. 2016, 325.)

Service Design highlights the fact that value is co-created between the customer and the service provider. This is not similarly emphasized in other design approaches like

participatory design or digital interaction design. Even though, the term “service” is common in both of the above-mentioned, the center of attention does not exceed the customer experience beyond the user experience or use experience outside of the service touchpoints<sup>2</sup>. In a way, Service Design has been able to revive other design approaches. (Holmlid 2009, 105-106.)

Several international IT Service Management (ITSM) models and other standards such as IT Infrastructure Library (ITIL) include Service Design as an obligatory part of their set of processes. ITSM stands for the management system of the organization, including the management of resources and capabilities as well as delivering value to customers through IT services. Service Design definitions vary between the ITSM schemes, but all include descriptions for expected core elements including different phases, activities, roles, artifacts and techniques. It was also recognized that often carrying out a Service Design process requires additional consulting and unifying terms and concepts among the team. (Mora et al. 2012, 2, 6-7.)

In this research Service Design means a holistic and collaborative approach to create value for the service user as well as the service provider (Service-Design-Network.org). The Service Design approach includes multiple tools and methods for different phases of the development process to enable comprehensive understanding of user emotions and motivations for all stakeholders (Miettinen et al. 2014, 1-3). In the context of this thesis Service Design has an outside-in aspect on the development of services and the emphasis is especially on applying different design methods and techniques to the design process of services (Alves & Nunes 2013, 215). Service Design combines different methods and approaches that have been utilized before (Yu & Sangiorgi 2018, 42). The following sub-chapters will introduce the basic principles, methods and tools of Service Design. In addition, propositions and views based on previous research are presented regarding the tools and methods.

### **2.2.1 Service Design principles**

Service Design is a practical and human-centered approach for creating and improving the offerings of organizations (Yu & Sangiorgi 2018, 42). The heritage of Service Design comes from human-computer interaction (HCI) methods, while Service Design further highlights the importance of continuously involving the user and customer to the design process (Alves & Nunes 2013, 215). Service Design has many similarities with other approaches like design thinking, user experience design, holistic UX, experience design and human-centered design. All these practices have several principles in common and

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<sup>2</sup> Touchpoints are anything that is designed to direct user experience in the wanted direction. (Howard 2007.)

can be utilized together. Selecting the correct terms, regarding what approach or approaches are being used, is not important as opposed to actually doing design and exploiting the benefits of the approaches. (Stickdorn et al. 2018, 20, 27.) Other approaches that Service Design relates to are emotional design and contextual design. In addition, Service Design has a lot in common with collaborative ways of innovation, following similar principles as participatory design and codesign. (Yu & Sangiorgi 2018, 42.)

In 2010 Stickdorn et al. described five principles for Service Design in their book “This is Service Design thinking”. Those principles have been re-examined and updated in their newest book “This is Service Design doing” (2018), to correlate with the evolution of Service Design. The renewed principles for Service Design emphasize the importance of iteration, learning from failures and adapting the process as needed. Another important point that has been added is the immediate and essential need for Service Design to be relevant to business. Even though Service Design is based on improving experiences, it nonetheless correlates with the business goals of the organization and understands the processes and technological opportunities. (Stickdorn et al. 2018, 26.)

The new principles of service design are: human-centered, collaborative, iterative, sequential, real and holistic. **Human-centered:** emphasizes the importance of involving all the different people who are affected by the service. **Collaborative:** endorses the first principle by highlighting that stakeholders from different backgrounds should be engaged to the service design process. **Iterative:** reminding of the experimental, cyclic and evolving nature of the service design approach. **Sequential:** the service should be created and described through actions that are connected to each other. **Real:** each step of the development process should include research and prototyping in reality. **Holistic:** services should create value to all stakeholders and across the business. (Stickdorn et al. 2018, 27.)

The same principles are repeated in different publications. Civic Service Design expresses that public services should be co-created with the people who use them, prototyped and tested for usability, accessible to all, fairly distributed and carefully tested and evaluated for effectivity (Civicservicedesign.com). These have a lot in common with the above-mentioned Service Design principles presented by Stickdorn et al. (2018). Capital One’s One Design Community highlights the following core principles of Service Design: human centered, co-creative, orchestrated, tangible and holistic. Human centered stands for the focus on the people for whom the designing is done. Co-creative means emphasizing the importance of customers and other stakeholders in the design and delivery of the service. Orchestrated highlights the importance of taking all necessary elements and processes into account while designing the service. Tangible introduces value of intangible services through digital touchpoints that can be seen and experienced. Holistic means working towards the end-to-end experience. (Narges 2018.) These principles support the previously mentioned Service Design principles.

The Design Council presents four design principles that also support the principles presented by Stickdorn et al. (2018). The first principle presented by the Design Council is “put people first”, which emphasizes understanding the needs, strengths and aspirations of the people using the service. The second principle is “communicate visually and inclusively”, which helps the participants reach a common understanding of the problem and ideas. The third principle presented by the Design Council is “collaborate and co-create”, which encourages the people involved to inspire each other. The fourth principle adds “iterate, iterate, iterate”, which furthers noticing errors early and avoiding risks, but also building confidence in the ideas. (Design Council 2019.)

### **2.2.2 Service Design methods**

Stickdorn et al. (2018) define methods as procedures that are utilized to carry out or approach a matter. They introduce 54 methods that are divided under four essential activities of Service Design: research, ideation, prototyping and facilitation. Each of these activities are further divided into categories that contain several methods. ([ThisIsServiceDesignDoing.com/methods](http://ThisIsServiceDesignDoing.com/methods).) The division of the methods will be based on the above-mentioned activities presented by Stickdorn et al. (2018), but several other resources will be brought in when covering the actual methods. This thesis will focus especially on methods that are intended for software development.

#### **Research methods**

The research methods are designed for collecting data for Service Design research. Research data is an essential tool in Service Design. The collected data can be divided into raw data which is primarily collected during research, and interpreted data which reflects the researcher’s reasoning. The research data can include different types of raw data, such as text (notes and transcripts), numbers (statistics and metrics), photos, videos, screenshots, audio recordings and artifacts (tickets, info, flyers, maps). The interpreted research data includes second-order concepts, such as key insights and user stories.

Service design includes similar research methods as action research. Therefore, the approaches support each other in many ways. The categories under research are desk research, self-ethnographic approaches, participant approaches, non-participant approaches, co-creative workshops and data visualization, synthesis and analysis. Desk research and especially preparatory research is where every Service Design process should start. It stands for the researcher’s own work before starting the actual research or field research. Preparatory research can aim in learning more about the organization, customers, services or the research question, to mention a few. It can include online research as well as initial internal interviews. ([ThisIsServiceDesignDoing.com/methods](http://ThisIsServiceDesignDoing.com/methods).)



The participant approaches category on the other hand includes methods such as participant observation, contextual interviews, in-depth interviews and focus groups. (Stickdorn et al. 2018, 117.) Of those focus groups are groups of selected people who can share their opinions and ideas on a given topic. Focus groups can be used for the research phase as well as to gather feedback of design ideas. (Alves & Nunes 2013, 220.) The setting of focus groups is often rather informal. Researchers usually ask only initial questions and let the group continue the discussion themselves and generate questions to each other. (Stickdorn et al. 2018, 123.)

Such as the participant approaches, co-creative workshops are also methods that engage other participants to the research work. Co-creative workshops can be used for co-creating assumption-based personas, journey maps or system maps which should be reviewed and challenged during the process. Eventually assumption-based personas, journey maps and system maps evolve to research-based tools with an increased importance. (ThisIsServiceDesignDoing.com/methods.)

### **Ideation methods**

The ideation methods include approaches for easing the creation, filtering and selection of ideas. These methods are divided under five categories starting with pre-ideation, followed by generating many ideas, adding depth and diversity, understanding, clustering, and ranking options and finally reducing options. (Stickdorn et al. 2018, 177.)

Pre-ideation methods help making challenges more manageable and including more diverse approaches. The methods include various approaches such as utilizing journey maps or system maps from the research phase and then creating new maps by adding, removing or replacing elements. Another approach utilizes user stories and insights collected in the research phase to create for example “How might we...?” questions that can be clustered and prioritized. (Designkit.org.)

Several different methods are also provided in literature for idea generation and adding depth and diversity to the ideas. The approaches include both physical and visual methods that can be used for creating idea descriptions (text) and sketches (visualizations). In addition, methods for understanding, clustering and ranking options and ideas are provided. Finally, after the ideas are ranked into a more organized order, they can be reduced and further prioritized. (Stickdorn et al. 2018, 180-187.)

### **Prototyping methods**

Prototyping is a phase that includes plenty of the methods used in Service Design. Therefore, this thesis will focus on the ones that are most common in software development. Prototypes in software development can be drafts or sketches of the interfaces, actors using devices or click-models, up to working versions of code that can be run on the chosen device. (Stickdorn et al. 2018, 72.)

The findings of the research composed by Sauvola et al. (2016) present benefits, challenges and critical factors of utilizing experience prototyping methods in a software development context. The identified benefits of experience prototyping are improved communication, instant feedback, increased motivation and innovation, mindset change, easier learning and decision making, improved identification and prioritization of features or potential market segments and value creation. The identified challenges of experience prototyping include facilitation, stakeholder availability, measurement, data management as well as timing and placement of the workshop. (Sauvola et al. 2016, 329.)

In addition, critical factors of experience prototyping were identified by Sauvola et al. (2018). The critical factors include the necessity of Service Design expertise both in-house and outsourced, the importance of the preparation phase, the success of the facilitation and the involvement of real customers and end-users. (Sauvola et al. 2016, 329-330.) These factors will be considered in the case study.

### **Facilitating methods**

Facilitation includes all the activities that support the facilitator of the workshop to keep all the participants engaged, motivated and interested. Three concepts are identified to have a key role in the facilitators work: consent, status and neutrality. Consent refers to the significance of whether the facilitator has the consent of the participants and on what level the consensus is found. The status of the facilitator is often complex, multipolar and variable. The status of a facilitator can be compared to a Joker; the facilitator is not qualified to hold real power, so the facilitator is free to ask stupid questions and “name the elephant in the room”. The third key concept is neutrality, which means the facilitator should always remain fair and make sure that the group is proceeding towards the goals, that are set for the workshop. (Stickdorn et al. 2018, 391-393.)

The suggested methods for facilitation include three different warm-up methods for either starting or during the workshop and one method for collecting feedback efficiently during or after the workshop. The aim of all the facilitation methods is to awake and engage participants to the workshop and possibly introduce or demonstrate a new mindset. ([ThisIsServiceDesignDoing.com/methods](http://ThisIsServiceDesignDoing.com/methods).)

When facilitating workshops check-in and check-out methods are in a crucial role as they invite each participant to be present and endorse the group commitment. The role of the check-in methods is to engage the participants to the upcoming and set the context on what is going to be done in the workshop. The emphasis on the check-out methods is often on reflection and closure of the workshop. ([Toolbox.Hyperisland.com/check-in-questions](http://Toolbox.Hyperisland.com/check-in-questions).)

The Double Diamond is a renowned model that visualizes the design process in four phases: discover, define, develop, deliver. It was launched in 2004 by the Design Council

in the United Kingdom. During the past 15 years, a broad collection of tools and techniques for different phases of the design process have been developed. The framework for innovation was created to support designers and non-designers tackle social, economic and environmental problems and hence renovate the way public and private organizations develop and deliver services. (Design Council 2019.) The Double Diamond framework is represented in Figure 1.

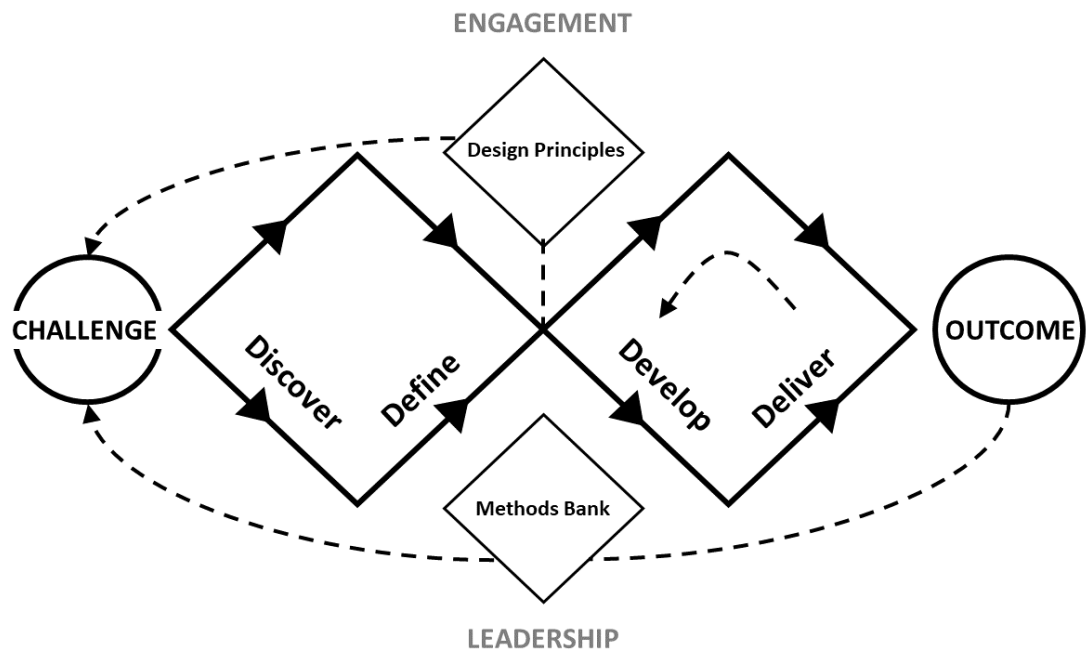


Figure 1 Framework for Innovation: The Double Diamond (Design Council 2019).

The two diamonds of the framework demonstrate a process of examining an issue deeply (divergent thinking) and then taking focused action (convergent thinking). The two phases in the first diamond are discover and define. *Discovering* helps understanding the actual problem and involves communication with the people concerned with the challenge or problem. *Defining* the challenge in a new way happens after insight is gathered in the discovery phase. The second diamond includes two phases that are develop and deliver. *Developing* encourages people to co-design with various stakeholders and seek new answers and inspiration to the clearly defined problem. *Delivering* stands for testing different solutions, discarding the ones that do not work and improving the ones that will. (Design Council 2019.)

The design principles of the framework support problem-solvers to adopt and work in the best possible way. The design principles include putting people first, communicating visually and inclusively, collaborating, co-creating and ongoing iterating. The methods bank includes a portfolio of methods to explore challenges, needs and opportunities,

shape prototypes, insights and visions and build ideas, plans and expertise during the design process. “Engagement” at the top of the framework reminds that involving different stakeholders and building relationships is as important as the creation of ideas. “Leadership” reminds about the importance of creating suitable conditions for innovation, allowing projects to be agile, open and able to change. (Design Council 2019.)

### 2.2.3 *Service Design tools*

The multidisciplinary heritage of Service Design provides a wide range of tools and methods. The extensive assortment is simultaneously a richness and a fragility, especially for novice Service Design practitioners. Alves & Nunes (2013) present a classification of Service Design methods and tools to guide beginners on the field as well as to ensure mutual understanding among teams. They reviewed and classified 164 tools and methods based on their relevance to the Service Design community and six dimensions: why, who, what, how, when and where. They selected methods and tools that had three or more references. (Alves & Nunes 2013, 218-219.) This accounts to 25 methods or tools which will be presented later.

Stickdorn et al. (2018) define tools as concrete models that follow specific structures or are created on templates. Several Service Design tools can be applied within one Service Design method. Service Design tools include different types of research data, journey maps, system maps, service prototypes and business model canvases. An important aspect to notice when using different tools is to recognize the information expressed by the research-based or assumption-based tools. Research-based tools are more reliable than assumption-based tools as they typically include the research methods utilized for the data collection. Especially, when facing assumption-based tools created by others the researcher should at least challenge the assumptions behind the created content. However, assumption-based tools created for example through a co-creative workshop involving several professionals can produce reliable information. (Stickdorn et al. 2018, 37, 41.)

The Service Design Tools is an on-going project that started in 2009 based on Roberta Tassi’s thesis “Communication Tools for Service Design”. It has become one of the key resources in the service design discipline, providing a comprehensive collection of service design tools and techniques. A new version of the collection was launched in 2019 focusing on updating the database, refreshed content and case studies and enhancing the user experience. The collection includes 35 tools for different needs. The tools can be sorted by several options, for example by the stage of the design process: research, ideation, prototyping, implementation and who will be involved in the design process: experts, stakeholders, service staff, users. (Servicedesigntools.org.) The suitable tools according

the phase of the design process and the people involved in the design process are presented in Table 1 below.

Table 1 Suitable tools in different phases of the Service Design process (Service design-tools.org).

Stage of the design process	Engaging users	Engaging stakeholders	Engaging experts
<b>Research</b>	<b>Text:</b> Interview guide, Issue cards, Recruiting screener <b>Map:</b> Emotional journey + Diary study	<b>Text:</b> Empathy map, Hypothesis generation, Interview guide, Issue cards, Research plan <b>Map:</b> Ecosystem map, Journey map, Service blueprint, Stakeholders map, Success metrics, System map <b>Narrative:</b> Personas	<b>Text:</b> Interview guide, Issue cards Observation notes <b>Map:</b> Ecosystem map, Journey map, Mindmap, Synthesis wall, System map <b>Narrative:</b> Personas
<b>Ideation</b>	<b>Text:</b> Brainstorming, Issue cards <b>Simulation:</b> Concept walkthrough, Role playing, Rough prototyping	<b>Text:</b> Brainstorming, Experience principles, Hypothesis generation, Issue cards, Value proposition canvas <b>Map:</b> Ecosystem map, Evaluation matrix, Journey map, Offering map, System map <b>Narrative:</b> Personas, Service image, Tomorrows narrative's, User scenarios <b>Simulation:</b> Role playing, Rough prototyping	<b>Text:</b> Brainstorming, Issue cards <b>Map:</b> Ecosystem map, Journey map, Mindmap, System map <b>Narrative:</b> Personas, User scenarios
<b>Prototyping</b>	<b>Text:</b> Recruiting screener <b>Simulation:</b> Concept walkthrough, Experience prototypes, Role playing, Rough prototyping, Service prototype	<b>Map:</b> Journey map, System map <b>Narrative:</b> Personas, User scenarios <b>Simulation:</b> Experience prototypes, Role playing, Rough prototyping, Service prototype	<b>Text:</b> User stories <b>Map:</b> Journey map, System map <b>Narrative:</b> Personas, User scenarios
<b>Implementation</b>	<b>Simulation:</b> Service prototype	<b>Text:</b> Business model canvas, Service specifications, Value proposition canvas <b>Map:</b> Journey map, Service blueprint, Service roadmap, Stakeholders map, Success metrics, System map <b>Narrative:</b> Personas <b>Simulation:</b> Service prototype	<b>Text:</b> Business model canvas, Service specifications, User stories <b>Map:</b> Journey map, System map <b>Narrative:</b> Personas

The selection of the tools and techniques depends on the complexity of the processes and the service system that service design is applied to. Usually the design and creation phases require both abstract and realistic presentations. Abstract presentation includes tools like maps and flows, whereas images and narratives are tools for realistic presentations. (Diana et al. 2009, 73.) The 25 tools selected by Alves & Nunes (2013, 219-221) take into account the relevance the tools have to the Service Design community. The most frequently used tools include prototypes, scenarios, shadowing, blueprints, customer journey maps, focus groups, personas and storyboarding. García et al. (2013, 343) present that utilizing Service Design tools saves time and resources as participants are able to frame, ideate, prototype and evaluate ideas more efficiently.

We will examine in more detail five basic Service Design tools that were described in all the main references used in this subchapter and can therefore be seen as common Service Design tools. Most of these tools are recommended also for software development and suitable for involving customers or end-users in the Service Design process. Hence, these tools are relevant considering this research and the case study introduced in Chapter

4. The tools are described briefly below, and in addition, when and why these tools should be used is covered.

## Personas

Personas are profiles that represent a particular group of people, such as customers, employees, end-user or any other stakeholders. Personas are usually built after the observation of potential users (Alves & Nunes 2013, 221). The created profiles are not stereotypes, but archetypes based on research that can help understanding the service needs of different groups. A persona can consist of a portrait image, name, demographics, quote, mood images, description and statistics. However, information that is not relevant to the design challenge or research question should be avoided. (Stickdorn et al. 2018. 42.) Personas are great for remembering who you are designing for and for getting inspired by specific behaviors and challenges (Servicedesigntools.org). See Figure 2 below for an example of a persona template. For a completed persona see subchapter 4.3.5 *Post-sprint debriefing*.

The figure shows a persona template form with the following sections:

- PERSONA** (Header)
- Portrait** (Placeholder for a portrait image, with the text "POR TRAIT" in the center)
- NAME** (Text input field)
- OCCUPATION** (Text input field)
- OTHER** (Text input field, with the subtext "Other element that has an influence on your service.")
- SERVICE ATTITUDE** (Section with the question "Is your persona someone who figures everything out on his or her own, or not?")
  - DO-IT-YOURSELF** (Radio button)
  - ADVICE SEEKER** (Radio button)
  - DELEGATOR** (Radio button)
- DESCRIPTION** (Section with the instruction "Describe your persona. Describe who he or she is in the context of the (future) service. What are his or her objectives, both rational and emotional? Be sure to use the characteristics that you indicated in the dimension poster.")
- MOTIVATING** (Section with the question "What can make your user happy when using the service?")
- DEMOTIVATING** (Section with the question "What can deter your user from using the service?")

Figure 2 Persona template by Service Design Toolkit (2019).

## Journey maps / Customer journey maps

Journey maps are used to visualize the experience of a person over time. Journey maps are flexible tools to be used with customers and help finding gaps in customer experiences and discovering potential solutions. (Stickdorn et al. 2018, 44.) Journey maps reveal the interactions and touchpoints that the user has with the company and the service, as well as possible pain points. A journey map is a suitable tool for covering the whole process, including what happens before and after the core experience, not forgetting other services and providers that are involved. (Servicedesigntools.org.) Customer journey maps are descriptions of the customers journey through the service, focusing on experiences (Blomkvist & Segelström 2014, 8). See Figure 3 for a simple journey map template where different phases and touchpoints are joined.

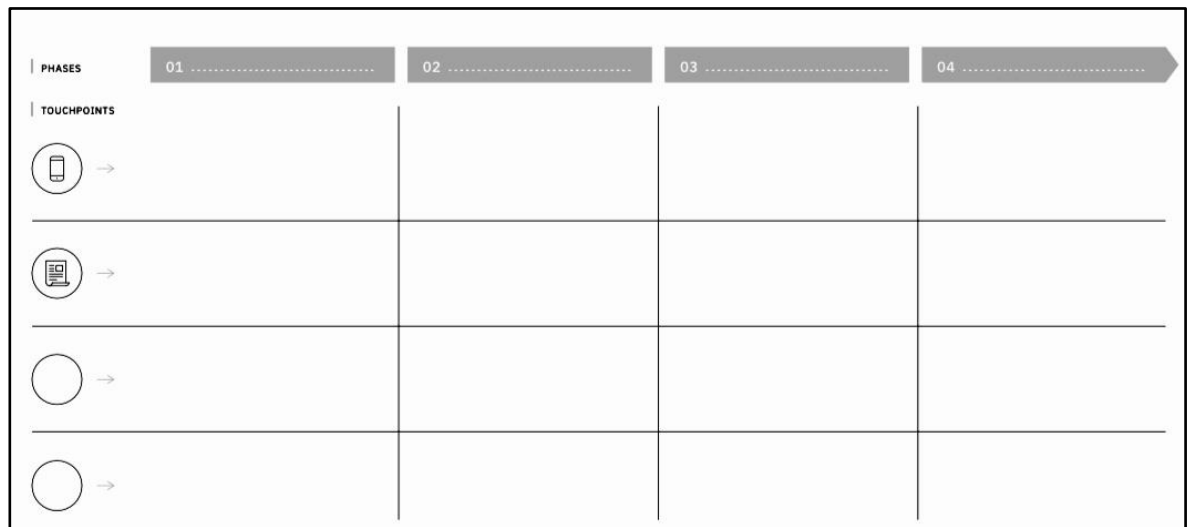


Figure 3 Journey map template by Service Design Tools (2019).

### Service blueprint

A description of all stakeholders, actions, interactions and components involved in the delivery of a service (Blomkvist & Segelström 2014, 8). Service blueprints usually have five typical components: customer actions, onstage/visible actions, backstage/invisible actions, support processes and physical evidence (Bitner, Ostrom & Morgan 2008, 72). Service blueprints can be seen as an extension of journey maps. The visualization of the service blueprint is set up to connect the customers experiences, both frontstage, including people and processes that the user has direct contact with, and backstage, including the people and processes that are invisible to the user. (Stickdorn et al. 2018, 54-55.) Service blueprints detail the interactions, characteristics and nature of the service precisely enough to verify, implement and maintain the service (Alves & Nunes 2013, 220). Service blueprints are suitable tools for understanding the cross-functional relationships and analyzing especially existing services, or defining a specific concept, yet the tool is not recommended for ideation (Servicedesigntools.org). See Figure 4 below for a service blueprint template.

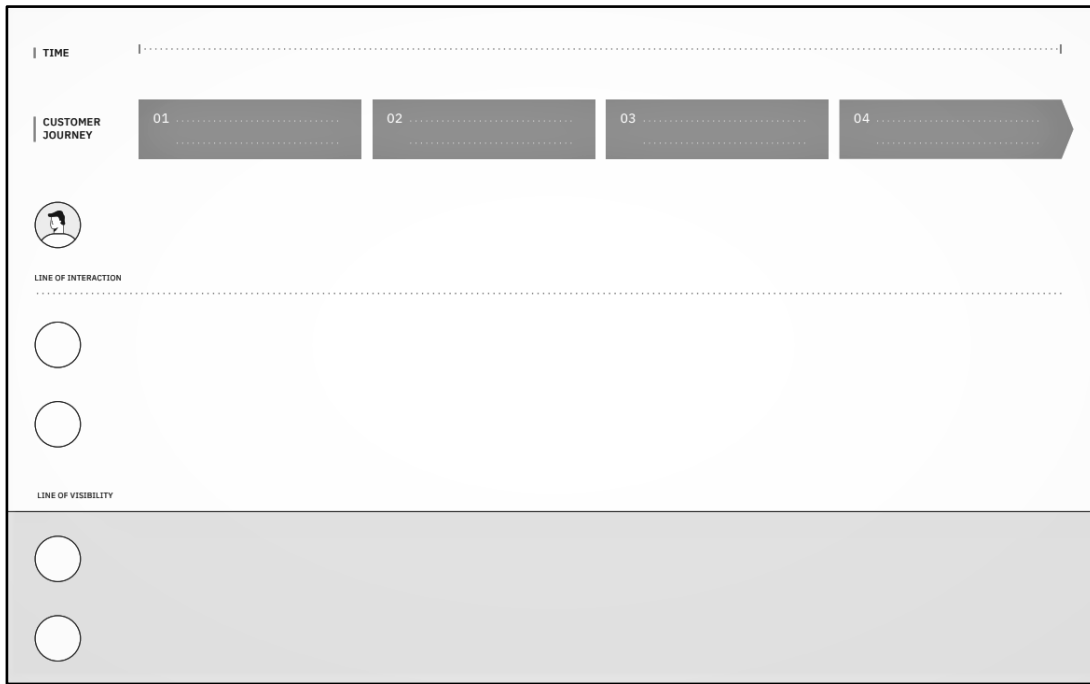


Figure 4 Service blueprint template by Service Design Tools (2019).

### System maps

System maps are visual or physical representations of the main components of the system in which the service is embedded. System maps can include multiple constituents, such as stakeholders, processes, services, platforms, places, insights, causes and effects. The most common system maps in Service Design are stakeholder maps, value network maps and ecosystem maps. Stakeholder maps visualize all the stakeholders involved in a specific experience, which helps perceiving how individuals and organizations are connected. Value network maps broaden the stakeholder map by presenting the exchanged value, such as money, services, information or trust, between the stakeholders. Ecosystem maps illustrate complex systems that include various constituents as well as relationships and interdependencies between the constituents. (Stickdorn et al. 2018, 58.) System maps are suitable tools for perceiving the service dynamics and noticing deficiencies and possibilities (ServiceDesignTools.org). For an example of a stakeholder map template see Figure 5 below.



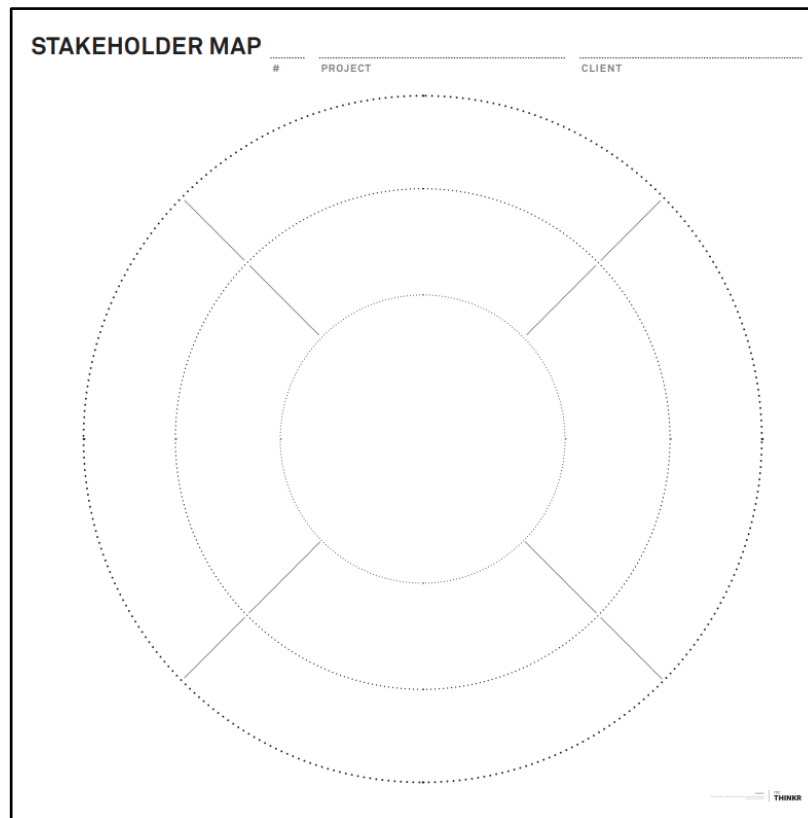


Figure 5 Stakeholder map template by mthinkr (2020).

### **Service/software prototypes**

Prototypes are representations of design ideas. Prototyping is the activity of using prototypes to collect knowledge about design ideas. Service prototypes replicate any chosen part of a service and are often staged experiences and processes, such as rehearsals, walkthroughs, simulations or pilots. Especially usability walkthroughs have been seen useful in software development, as they can potentially increase empathy for the involved stakeholders. The fidelity of prototypes has been discussed widely, especially in software development. Mostly, it is stated that fidelity provides more detailed feedback, but lower fidelity offers more general feedback. (Blomkvist 2014, 23-26, 57.) Schwarzenberger (2018, 286) suggests starting with low-fidelity prototypes and adding more details during the actual implementation of the prototype. Prototypes are useful for testing the overall experience and improving the design specifications (Servicedesigntools.org).

### **Business model canvas**

The business model canvas is a simple and straightforward template for describing, visualizing and changing business models by using nine core building blocks (Osterwalder & Pigneur 2010, 14-16.) Mapping out the nine building blocks on a pre-structured canvas helps discuss, design and invent new business models. The nine building blocks consist of customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partners and cost structure. Customer segments

include all the people and organizations that the company is creating value for such as customers and users. Value propositions are created for each segment to communicate the value of a product or service to the customers. Channels describe the touchpoints that are used to deliver value and interact with the customers. Customer relationships outline the type of relationship that is created with the customers. Revenue streams clarify how and through which pricing structures the business model is capturing value. Key resources are the assets that are essential when creating, delivering and capturing value in the business model. Key activities show the things that are required to perform well. Key partners stand for those who can help leverage the business as all key resources and key activities cannot be handled alone.

Once the infrastructure of the business model is understood also the cost structure can be outlined, and in the end, you have the whole business model in one image. (Strategyzer.com.) Business model canvases are practical for describing, challenging and changing the business model (Servicedesigntools.org). The Business Model Canvas created by Strategyzer is pictured in Figure 6 below.

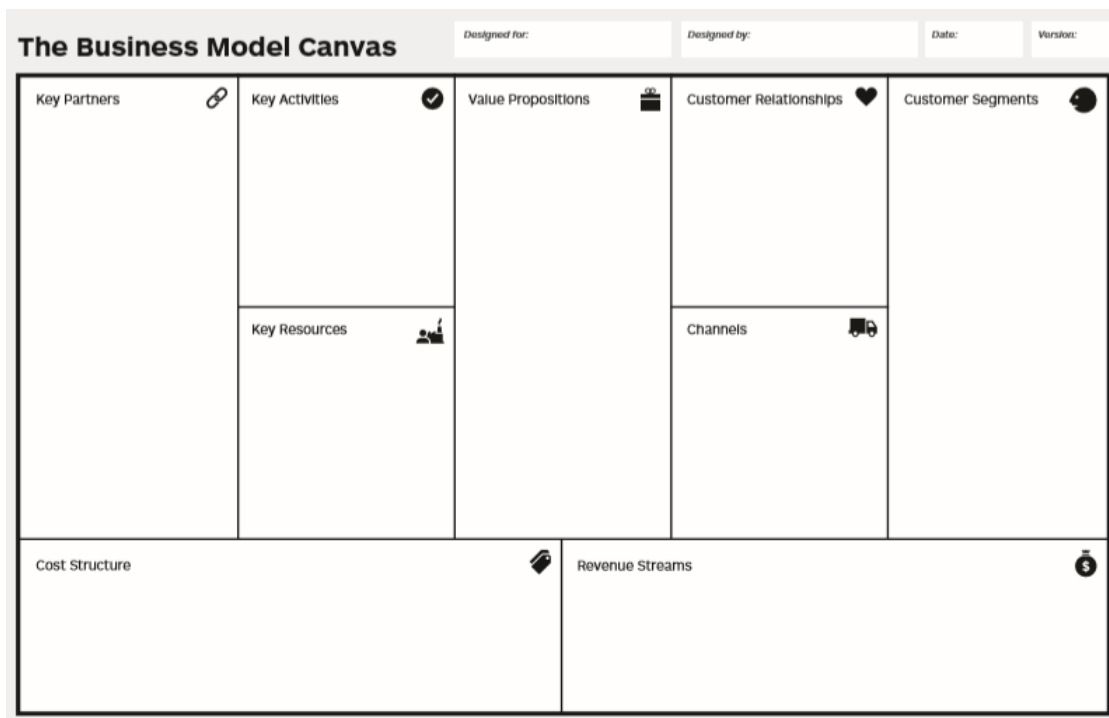


Figure 6 The Business Model Canvas by Strategyzer (2019).

## 2.3 Service Design in B2B software development

Especially in business-to-business (B2B) software development both internal and external stakeholders, such as users, developers and project managers, must be involved throughout the process. In B2B context service design offers an approach that views the

customer journey in its entirety to ensure customer satisfaction. Recognizing customers' needs and wants before, during and after the service will ensure designing and developing a process that will support the customers' goals. (Sauvola et al. 2016, 326.) Different stakeholders should work together with the software development teams to ensure that the software creates value and furthers their activities (Begel et al. 2015, 969).

Service Design offers also a holistic mindset for B2B context that requires understanding and researching the customers business and processes, as well as the end-users needs and wants. The touchpoint through which the service is experienced is in a key role. Touchpoints are anything that is designed to direct user experience in the wanted direction. (Howard 2007.) Nevertheless, service design covers the entire customer journey where customers are considered as active participants, rather than just feedback sources. As *collaborative* is one of the main principles in service design, also the importance of co-designing by involving different stakeholders is emphasized when applying service design. (Sauvola et al. 2016, 326-327.)

When utilizing Service Design in B2B software development the focus should be on recognizing the customer's needs and then building services that add value and help customers address their business challenges. Early feedback from the customer is in a crucial role. The end-user aspect should also be identified and taken into account when designing the service. (Reason 2010.) Also, Schwarzenberger (2018) highlights the importance of early user feedback and reminds that user feedback should start distinctly before the digital product is ready. Early feedback and aiming for testable products after every iteration should be made a habit. Gathering user feedback and focusing on the end-user aspect should not be solely the responsibility of the product manager, but designers, engineers and other team members should be involved as well. (Schwarzenberger 2018, 282.)

The process of Service Design in software development consists of different activities in different phases of the process, and it can be utilized for an early stage idea as well as for the continuous improvement of an existing product. Basically, the process consists of preparation, research, ideation and prototyping, which are all core activities of Service Design and familiar from the subchapter 2.2.2 *Service Design methods*. When aiming to implement Service Design into software development, it is recommended to divide different parts of the process into team activities and individual activities. For example, prototyping can be done as a team activity, but tracer bullet development<sup>3</sup> as an individual task. It is also important to give individuals enough time to work on their own before moving back to team activities. (Schwarzenberger 2018, 282-288.)

The biggest benefit that Service Design brings to software development is giving a common language to teams. Several agile methodologies, such as Scrum, Kanban and Extreme Programming, are more focused on the technical and engineering aspects while

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<sup>3</sup> Tracer bullet development, initially published by Andy Hunt and Dave Thomas (1999), addresses the most technically challenging tasks as soon as possible and delivers a useful result as soon as possible.

Service Design assists in deciding what to build and how to prioritize the work. The importance of early feedback from different stakeholders is also highlighted throughout the process to avoid expensive feedback loops before the feature release. Each iteration should aim for a running and usable piece of software. (Schwarzenberger 2018, 288.)

## **2.4 Implementing Service Design**

In order to successfully implement Service Design methods and tools to the software development processes of a company, it is crucial to recognize all the people involved in the required changes, both internally and externally. The implementation of Service Design will be examined through two different frameworks. A framework by Junginger & Sangiorgi (2009) is utilized when examining how implementing Service Design affects the company internally from the aspect of organizational change. In addition, an integrated framework by Furrer et al. (2016) is adapted to evaluate the Service Design process from the viewpoint of the relationship between the Service Design team and the customer.

This research has a focus on how agile software development affects the implementation of Service Design methods. Therefore, the principles of agile software development will be compared to the principles of Service Design and similarities and differences will be pointed out. Furthermore, Service Design will be compared to a traditional software development model to adduce the advantages that following a Service Design approach and agile software development methodologies enable.

### ***2.4.1 Service Design and change management***

Junginger & Sangiorgi (2009, 4344-4345) present a framework for the link between organizational change and Service Design based on their findings in their research. They found four similarities in their case studies regarding the link between organizational change and Service Design. Firstly, Service Design often begins at the organizational periphery, which means that the marginal location where Service Design work is first started might limit the interference in the daily operations. Secondly, building trust relationships for change between the Service Design team and stakeholders was recognized as a similarity. A collaborative, flexible and transparent approach as well as generating interest were in a key role when building trust relationships. The third similarity was developing transformative insights into the values, norms, assumptions and behaviors of the organization in order to build trust, stimulate interest and co-create a new vision. Lastly, pilot projects as a seed for change were recognized in both case studies. Pilot projects can

have an essential role in opening the way for transformative changes as they can help designers make behavioral values, norms and patterns tangible.

The presented framework consists of three different identified levels of depth that Service Design projects can reach in an organization. According to the gained level Service Design projects have different impacts and outcomes. The first level is *Service interaction design* which can be seen as the traditional level of service designers. Designers often focus on the design and redesign of service interactions and gain knowledge from user-centered design, and these changes may have both small or large and temporary or lasting impacts in the organization. However, changes on this level may remain contingent if the suggested improvement stay at the periphery without questioning norms and values behind the suggested improvements. The second level is *Service design intervention* which requires affecting the fundamental assumptions of the organization in order to achieve a radical change. Re-thinking the organizations elements around the new service experience and engaging the organization to demonstrate and visualize the value of change are key tasks of the service designer to achieve the potential impacts of this level. The third level is *Organizational transformation* for projects that require deeper transformations that touch into the fundamental assumptions of the organization. Service designers might face stronger resistance and should utilize design inquiry as a conversation with the organization in order to expose their deeper assumptions. The organization should work towards a shared vision where the service should develop. This requires a strong commitment from the whole organization and long-term collaboration. (Junginger & Sangiorgi 2009, 4345-4346.) The adapted framework is pictured in Figure 7.

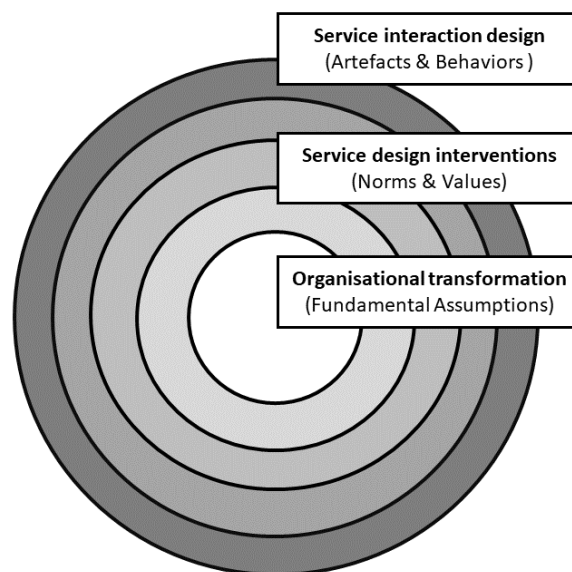


Figure 7 Levels of potential impact of Service Design projects (adapted from Junginger & Sangiorgi 2009).

As a conclusion from the framework research Junginger and Sangiorgi (2009) state that Service Design is still an emergent discipline based mainly on informal and tacit knowledge. Applying this framework into a wide range of contexts is suggested as a future research focus in the paper. This research puts the theoretical framework by Junginger and Sangiorgi (2009) into context and further studies how it can be utilized in B2B software development.

The framework by Furrer et al. (2016) combines studies from design science, marketing and service science and is purposed to work as a groundwork for directing and evaluating innovative Service Design. The framework consists of activities to be done in different stages of the Service Design process to create value to the customer. These activities are combined with roles for both internal and external stakeholders that in this case are the Service Design team and the customers. The framework is built on essential Service Design features that view customers as co-creators and the service as a process. It also maintains an essential distinction that the service providers are different from the customers and the two exchange values. (Furrer et al. 2016, 452-453.) The framework consists of seven steps that are pictured in Table 2 below.

Table 2 Framework for Innovative Service Design (adapted from Furrer et al. 2016).

<b>Activities</b>	<b>Service Design team's role</b>	<b>Customer's role</b>
1. Problem surfacing	Coach	Client
2. Problem structuring	Analyst	Usage subject, matter expert
3. Solution imagining	Experimenter: thought, virtual and material	Sounding board
4. Innovation creating	Role play customer	Role player
5. Innovation optimizing	Customer engineering	Co-designer/validator
6. Value proposition developing	Value optimizer	Value validator
7. Value delivering	Delivery point provider	Value co-creator and benefiter

The first step of the framework is *problem surfacing* where the Service Design team acts as a coach for the customer and supports the customer in clarifying the problem. The Service Design team has an active role in revealing the actual problem with the customer from all the information received. In the second step, *problem structuring*, the Service Design team takes the role of an analyst and exploits customer's knowledge to structure the problem so that the structure can direct designing an effective and value maximizing

service solution. This is followed by the *solution imaging* step where the Service Design team develops possible solutions as an experimenter, and the customer is used as a sounding board to test the functionality of the ideas. In the *innovation creating* step the possible roadblocks are identified and the required solutions obtained. After this comes the *innovation optimizing* step, where the Service Design team aims to balance the value for both parties by taking the role of a customer engineer and directing and modifying the service process as the customer works as a co-designer and a validator. The second last step is *value proposition developing* where the Service Design team focuses on making the value framing understandable to the customer and then communicating it in a compelling way. Customer reactions can provide valuable feedback and help optimizing the value proposition. Lastly comes the *value delivering* step where the Service Design team delivers value for both the customer and the company itself. Innovative Service Design should be planned so that value can be exchanged with minimal loss and maximum gain to each party in the process - from the company providing the service to the customer and vice versa. (Furrer et al. 2016, 463-465.)

The process of planning the case for this research and furthermore the actions of implementing Service Design methods and tools follow these basic steps provided by the framework. Moreover, it will be examined, how the framework adapts to this research context. Utilizing this theoretical background, it will be considered, how these steps and roles of the Service Design process differ from traditional software development methods. This is examined from the viewpoint of different stakeholders. The research is further focused on the situation in which the company follows an agile software development approach and the software product is mature instead of being built from scratch.

#### **2.4.2 Service Design and agile software development**

Agile software development raised to widespread public attention after the Agile Manifesto was published in 2001 (AgileManifesto.org). The agile principles have several definitions that have developed over time, but the emphasis in most definitions cover similar viewpoints with slightly different terms. Also, some agile methods such as Scrum and Extreme Programming emphasize slightly different agile principles. Especially when a large organization aims to become agile, in order to succeed, it is crucial to have more than just a set of practices to follow. When following agile software development, it is important to avoid misunderstandings and clarify, what does agile software development stand for. (Laanti et al. 2013, 255-257.) An equivalent challenge might be faced regarding Service Design.

Following agile methods in software development means the ability to adapt to change. Environments and requirements change continuously, and agile methods aim to respond

to the changes by being iterative, incremental and cooperative. (Chaves & de Freitas, 2019, 121.) Agile methods are people-centric and strive to recognize the value that proficient people and their relationships bring to software development. Improving customer satisfaction through cooperation and involving customers and other important stakeholders are also in a key role while following agile methods. The organizations ability to emphasize learning, self-organization and teamwork has a notable impact on the created value. (Nerur & Balijepally 2007, 81-82.)

Customer involvement is one of the key benefits that adopting agile methods brings. Satisfaction with the product has increased among both customers and developers after following agile software development methods. (Dybå & Dingsøy 2008, 846, 850.) Building successful software products and services requires understanding customers' requirements and involving them throughout the development process. Customer involvement refers to different ways of active participation by the customer or the end-user in the software development process with different interactive techniques. (Yaman et al. 2016, 249-250.)

Customer collaboration is a key principle also in Service Design. The new principles of Service Design by Stickdorn et al. (2018) include human-centered and collaborative as key aspects when applying Service Design. Involving customers to the design process can be carried out by organizing workshops with the customers and utilizing different design tasks and tools like prototyping in the workshops. Service Design approaches based on collaborative workshops have enabled applying Service Design as an abbreviated, but efficient design sprint as a pre-development phase in agile software development. (Sauvola et al. 2016, 327.)

Applying Service Design methods into an agile Scrum process as sprints may support the service provider to recognize the correct small tasks for delivering a better minimum viable product (MVP)<sup>4</sup> for the customer (Sauvola et al. 2016, 330). This again enhances the basic principles of agile software development as early and frequent deliveries are emphasized in several definitions of agile software development (Laanti et al. 2013, 248). Table 3 presents principles of agile software development and Service Design that have the most resemblance.

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<sup>4</sup> Minimum viable product (MVP) stands for the minimum set of features to create a viable product for the customer and collect early feedback on the product (Lenarduzzi & Taibi 2016).



Table 3 Resemblance between Agile and Service Design principles (adapted from Laanti et al. 2013, Service Design principles added).

<b>Agile principle</b>	<b>Definition</b>	<b>Service Design principle</b>	<b>Definition</b>
<b>Collaboration</b>	Business people should work with developers throughout the project on a daily basis.	<b>Collaborative</b>	Stakeholders from different backgrounds should be involved throughout the service design process.
<b>Motivated individuals, good environment, support &amp; trust</b>	Projects should be built in a supporting environment and around motivated individuals.	<b>Human-centered</b>	Highlights the importance of involving all the people affected by the service.
<b>Customer satisfaction, continuous delivery, value</b>	Satisfying the customer with early and continuous delivery of valuable software.	<b>Holistic</b>	Services should address the needs of all stakeholders across the business.
<b>Sustainability, people</b>	Promoting sustainable development. Sponsors, developers and users should maintain an ongoing pace.	<b>Iterative</b>	An experimental, adaptable and continual approach, iterating towards implementation.
<b>Adaptability, competitiveness</b>	Taking changing requirements into account.	<b>Sequential</b>	Taking interrelated actions into account.

The principles of Agile and Service Design have similarities, which can support applying Service Design methods into the software development process of an organization following agile methods. Both principles highlight the importance of collaboration between different stakeholders, involving all relevant people as well as sustainable and iterative development. These similarities can create synergistic effects when following both agile and Service Design principles. However, Service Design and agility have also slight differences, for example when considering the focus of the approaches in a bigger picture. Even though both approaches are user-centric agile has more focus on early delivery of valuable software to the customer, whereas Service Design highlights understanding the services from the customer perspective, but also the importance of creating value through the entire development process for all stakeholders.

On the other hand, when comparing Service Design to traditional software development models, such as the waterfall model, the benefits of Service Design stand out more clearly. In the waterfall model progress is seen flowing steadily downwards like a waterfall and changes during the design phase should be avoided. It is a linear model, where each step of the process is frozen before moving on to the next one, and changes to the requirements will not be considered in later phases. (Balaji & Murugaiyan 2012, 26-27.) These are opposite to many Service Design principles such as continuous iteration, adaptiveness and involving stakeholders throughout the design process.

Sauvola et al. (2016, 328) present a practical model for integrating Service Design sprints into an agile Scrum process. In the center of the model is user knowledge which is used for continuous learning during the Scrum process. User knowledge can be utilized in testing, validating and prioritizing features, updating the product roadmap and improving the product or service, resulting in increased customer satisfaction. The presented model is based on the potential of learning and the possibility of executing features that are delivered to customers as a minimum viable product (MVP). In addition, it is concluded that Service Design methods enhance the software development process and benefit both users and developers.

Service Design provides a comprehensive process including research, ideation and prototyping. After finishing these activities, the results should be specified as documented requirements. In software development the first Service Design iteration often ends where most agile methodologies, such as Scrum, begin: the product backlog. Furthermore, it is stated that the major improvement that Service Design brings to software development is giving a common language to teams. Agile methodologies, such as Scrum, Kanban and XP concentrate more on the engineering aspect whereas Service Design focuses on easing the prioritization of the backlog, as well as deciding what to build in the first place. (Stickdorn et al. 2018, 287-288.)

### 2.4.3 *Service Design and continuous software development*

The lifecycle of software development usually consists of the following phases: requirement analysis, specification, software architecture, implementation, testing, documentation, training and support and maintenance (Singh & Kaur 2017, 126). In the case of a mature software<sup>5</sup>, maintenance and development of the existing software are core activities. Software maintenance is an extensive activity that includes bug fixes, improvement of functionalities, eliminating obsolete features and optimization. An important aspect is also adapting to the changes of the business environment. (Yau, Nicholl, Tsai & Liu 1988, 1128.)

Nowadays, terms such as continuous software development and incremental software development are more common than talking about a mature software. Continuous software development shares principles with lean thinking which consists of a continuous iteration of process improvements. Process improvements can be radical changes (*kaikaku*) such as switching to an agile method from a traditional one or incremental changes (*kaizen*) such as adding retrospective meetings to the end of each sprint. (Fitz-

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<sup>5</sup> Herein a software which a) has an existing user base, b) is actively maintained, c) has been on the market for some time and d) is still continuously developed.

gerald & Stol 2017, 180-181.) Continuous software development involves continuous delivery and continuous deployment. However, it is more than that taking a holistic view to the entity of software development. Other activities related to the development phase such as analysis, design, coding and testing need to be considered as well. (Fitzgerald & Stol 2017, 185-187.) Service Design can offer a comprehensive approach for continuous software development and support the organization in iteration planning as well as iteration management (Stickdorn et al. 2018, 360).

Incremental and continuous software development, especially when following agile practices, can lead to several improvements such as increased release frequency, improved software quality, endorsed communication and understanding as well as enhanced reflection on customers' needs resulting in less change requests. (Petersen & Wohlin 2010, 687-688.) Service Design supports continuous software development as the Service Design process is often build out of several and ongoing iterations, which ideally lead to embedding Service Design as a continuous activity and mindset in the organization. Dividing projects into several iterations and adopting the adaptive and iterative way of thinking can enhance the software development process in its entirety. (Stickdorn et al. 2018, 336-337.)

#### ***2.4.4 Service Design and remote working***

Remote working has become increasingly popular during the past ten years. In Finland approximately every third wage earner worked remotely, at least occasionally, in 2018. (Tilastokeskus 2019.) In software development remote working is often seen as a possible alternative for traditional co-located offices. Different collaborative platforms, for example for communication and managing workflows, are crucial in preserving efficiency and engagement during remote working. (Sharp et al. 2016, 2-15.)

Emerging trends regarding remote working can be recognized under different categories such as technology, globalization and workplace culture. Technology enables virtual meetings and communication across the globe. Technology has also a huge role in learning allowing access to information and tools. Globalization on the other hand affects remote working as employees can be hired all around the world. In addition, workplace culture has become more valued. Flexibility is connected with employee satisfaction and well-being. Therefore, companies giving employees the opportunity to work remotely with other benefits have a cutting edge in attracting the most talented and skilled workforce. (MacRae & Sawatzky 2020, 6-7.)

Identified challenges when working remotely in an agile team include knowledge sharing, working together, remote pair programming, group meetings, awareness, tooling and infrastructures as well as social interaction and familiarity. However, it is concluded that

with careful planning of communication, utilization of necessary and appropriate tools, application of suitable social discipline, providing collaborative platforms and usage of both formal and informal channels for communication, remote working can succeed in an agile team. (Sharp et al. 2016, 9-13.)

Service Design is an activity that requires a lot of interaction and communication between all stakeholders. The challenge of going digital with Service Design is losing its accessibility. Luckily nowadays several digital tools can be found for remote collaboration, even especially intended for Service Design, the most popular tools being Miro, Smaply and Mural. It is crucial to try and keep things as simple as possible. (Service Design Show 2020.)

Virtual design tools enable real time collaboration and visualizing the work as it progresses to the whole team. Even with the best collaborative design tools it is crucial to plan the interactions of meetings and make sure that participants are actively engaged. In a remote workshop the importance of the facilitator is also highlighted. The facilitator needs to create momentum and ensure that the participants understand how each step contributes to the big-picture. (Business Models Inc 2020.)

## **2.5 Selected Service Design methods and tools**

The final set of tools and methods was modified as the original Service Design sprint had to be cancelled due to the Covid-19 pandemic. Consequently, a remote version of the Service Design Sprint was planned. The impacts on the research process will be more closely explained in the subchapter *3.2 Research process*.

### **2.5.1 Selection criteria**

The methods and tools for the Service Design sprint were selected based on selection criteria that was composed from the factors that were identified important during the literature review and the factors that arose from the focus group interview, simultaneously considering the available resources that Company X could provide for the case. When planning the remote version of the Service Design sprint the remote aspect was taken as a top priority for the selection criteria of the methods and tools. Remote working brought its own challenges and limitations to the use of the originally planned methods and tools. Therefore, the new methods and tools were approached with the remote implementation in mind. The original methods and tools were modified if needed and updated to other methods and tools that were more suitable for remote working.

The first selection criterion besides remote working was that the Service Design methods and tools would be utilized in a software development process. Based on the literature review the tools and methods that were recommended for software development were discussed. Another aspect was that the purpose of the case was to experiment the benefits, challenges and critical factors of utilizing the Service Design sprint in software development. Therefore, the scope of the case was defined compact enough. Because the business constraints were also to be considered, and for example the time period had to be relatively intense, not all interesting methods and tools were yet experimented during the first Service Design sprint.

The case study including the Service Design sprint concentrates on the research and ideation phases of the design process, which was also used as a selection criterion for the methods and tools. Several of the methods and tools that were addressed in the literature review were divided to the phases that they best suit. Consequently, in this case, methods and tools suitable for research and ideation were prioritized. However, a few methods and tools intended for prototyping were also selected for the original Service Design sprint.

An important selection criterion was also based on the fact that the end-users participating in the Service Design workshop are not only end-users, but also experts who have comprehensive know-how on the subject. For example, the tool bank provided by Service Design Tools (SDT) can be organized based on the tools suitable for engaging experts or users in different phases of the design process. In addition, to the selection criteria opinions of the members of the core Service Design team<sup>6</sup> were heard and methods and tools that were found interesting and potentially suitable for the case were selected for experiment.

### **2.5.2 Selected Service Design methods and tools**

The Service Design methods and tools that will be more closely examined in this research are the ones that were utilized in the remote implementation of the case study. To demonstrate the impacts the remote version had on the selected methods and tools also the original plan of the Service Design sprint is presented. See Figure 8 below for the originally selected Service Design tools and methods for the three-day Service Design sprint pilot project.

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<sup>6</sup> The description of the core Service Design project team can be found from subchapter 4.2.1 *The Service Design sprint team*.

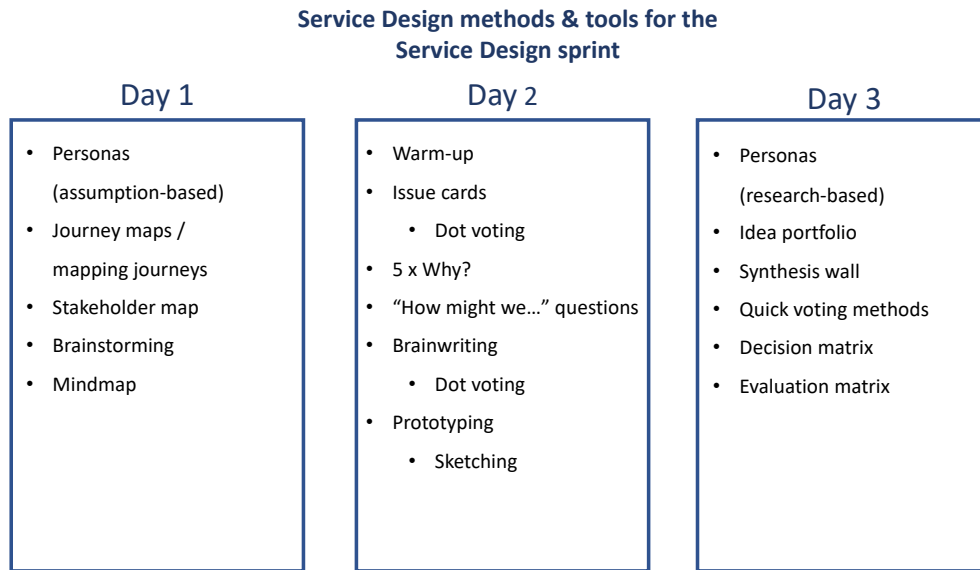


Figure 8 Originally selected methods and tools for the Service Design sprint.

The selected Service Design methods and tools for the remote implementation of the Service Design sprint include the following methods and tools: desk research, semi-structured interviews, developing key insights, mapping key findings, 5 x Why’s?, voting and prioritization methods, “How might we..?” questions, brainwriting, brainstorming, mind-mapping, feature planning, mapping features, idea portfolio, personas, user stories, wireframing, prototyping, warm-ups as check-in methods, feeling canvases as check-out methods and compiling research reports. See Figure 9 for the tools and methods selected for the remote version of the Service Design sprint.

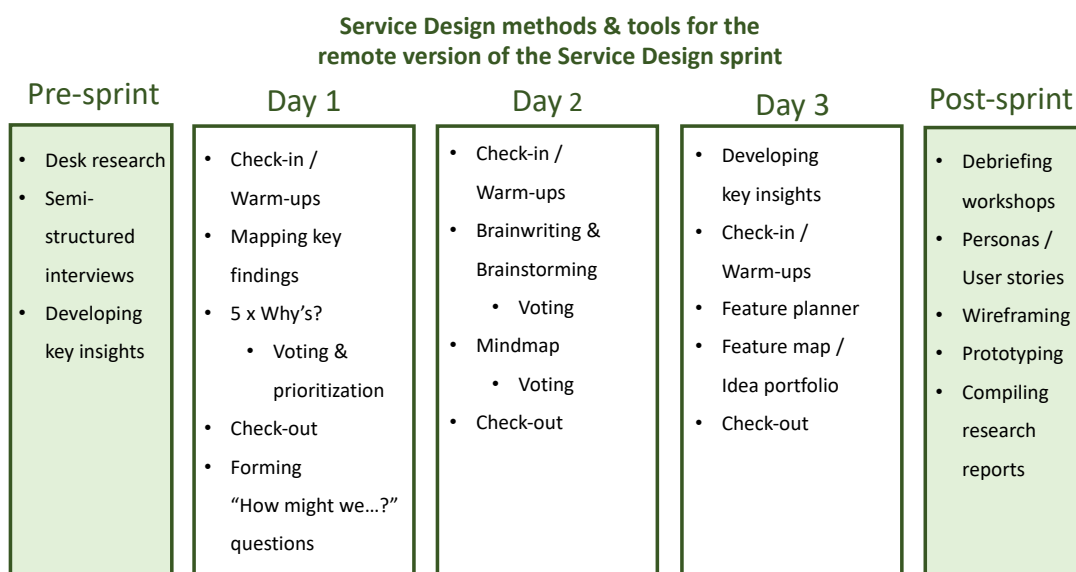


Figure 9 Selected tools and methods for the remote Service Design sprint.

The methods and tools presented in Figure 8 and Figure 9 are divided based on the Sprint Day that they would be utilized on. Day 1 and Day 3 methods and tools are applied during internal sessions and Day 2 methods and tools are used during the workshop with the customers and end-users. The duration of the internal sessions on Day 1 and Day 3 are around a half-day and the workshop on Day 2 should last a full day in the traditional face-to-face version of the sprint and around a half-day in the remote version. In addition, pre-sprint and post-sprint methods and tools were added to the remote version. The use and purpose of the above-mentioned methods and tools for this case study will be described in Chapter 4.

### 3 EMPIRICAL RESEARCH DESIGN

#### 3.1 Research method: Action Research

Action Research is a methodology that aims to support organizational learning to develop practical outcomes. In the end of the 1990's the importance and popularity of Action Research in information systems increased notably. One basic principle in Action Research is that the best way of studying complex social processes is changing these processes and observing the results and effects of the implemented changes. (Baskerville 1999, 2.)

Common characteristics of action research are widely identified, even though action research refers more to a class of research approaches than a single method. The four common characteristics of action research are an action and change orientation, a problem focus, an "organic" process involving systematic and sometimes iterative changes and collaboration among participants. (Baskerville 1999, 9.) Action research links theory and practice through an iterative process. The most commonly known approach by Susman & Evered (1978) divides the approach into five phases that will be followed in this research as well. The five phases are:

- diagnosing,
- action planning,
- action taking,
- evaluating,
- specifying learning.

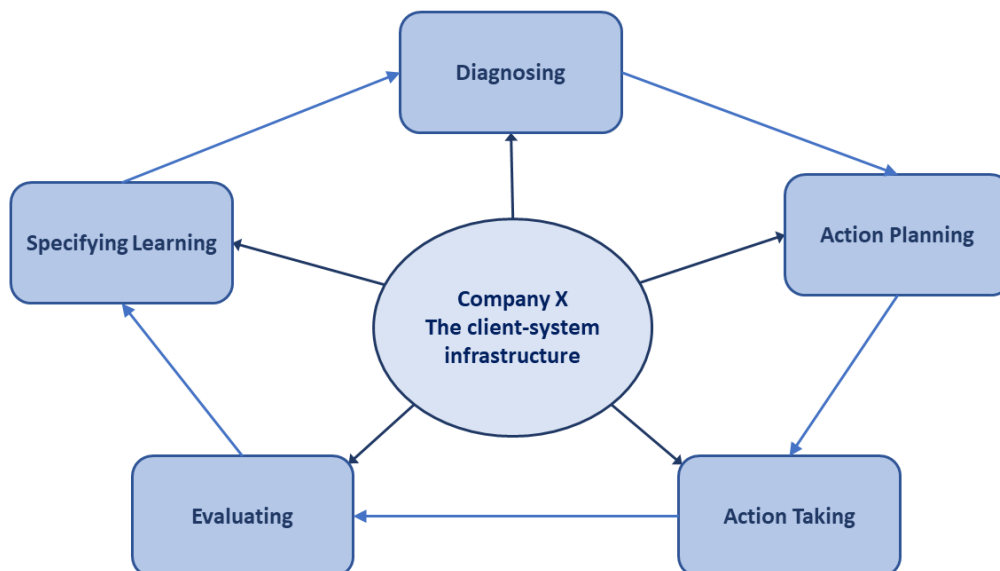


Figure 10 The iterative process of action research (adapted from Susman & Evered 1978).



Diagnosing involves recognizing the primary problems that provoke the need of change in the organization. This phase should generate theoretical assumptions of the organization and its problem domain. In this research the diagnosing phase includes the literature review, a focus group interview and analysis of relevant documents. Action planning and action taking are collaborative phases, where the researcher and practitioners work together. First, they plan the actions that are required to achieve the planned future state and solve the problem. The action planning in this research will consist of planning the Service Design sprint for the case study. The planning phase is followed by action taking, where the planned actions are implemented. In this research the action taking phase will be based on the Service Design sprint pilot project.

After the implementation of the required actions comes the evaluation phase. Evaluation includes critically questioning the outcomes and consequences of the actions made. In this research evaluating will be done in collaboration with different stakeholders included in the Service Design sprint. Even though Specifying Learning is the final phase of the cycle it should be an ongoing process. Identifying the findings and impacts of the process are in a key role in this phase. Continuing Action Research after the first cycle is finished will provide deeper knowledge and endorse organizational learning. (Susman & Evered 1978, 588-589.) If the researcher aims that the project will lead to practical improvement, in addition to the development of theory, it is crucial to acquire pre-change measures of the important variables for comparison (Mumford 2001). In this research these variables were selected during the diagnosing and action planning phases and based on internal and external assumption towards Service Design and the pilot project. These assumptions were later revisited in the evaluating and specifying learning phases.

The research environment in action research is based on a client-system infrastructure. The client-system infrastructure indicates the social system where members face challenges that need to be solved by action research. (Susman & Evered 1978, 588.) In this research the client-system infrastructure will be the environment of Company X. The researcher will collaborate with the client-system in all five phases of the action research, which is called “experimental action research” by Chein et al. (1948). The research environment of this master’s thesis is suitable for experimental action research as the researcher is actively involved and works closely with practitioners located in the client-system. Collaboration is crucial in action research and it extends the social scope of the research. (Baskerville 1999, 13-15.)

Frequently Action Research uses several different methods for the collection of data. Using multiple methods like analysis of relevant documents, in depth interviews and participative socio-technical design concurrently is encouraged. Similar methods are also utilized in Service Design and therefore the two approaches support each other. Service Design tools and methods are in line with qualitative research methods as both are holistic processes that require participation in a real-life setting. As Action Research focuses on

organizational learning through problem solving together with Service Design tools and methods it can provide a comprehensive way of collecting data. (Madden & Walters 2016, 43.)

The aim of this thesis is to find out how Service Design methods and tools can be implemented into B2B software development and what are the benefits, challenges and critical factors of Service Design implementation. Action Research can be applied to the research as the methodology will support the data collection and the iterative process which are in a key role also in Service Design. Developing practical outcomes is an important factor in Action Research and therefore it supports the focus of this thesis. Action research is also a convenient methodology when considering the role of the researcher and the environment of Company X.

## **3.2 Research process**

The research questions will be approached with the following process applying the five phases of action research introduced in the previous chapter. The main actions and data collection methods used in different phases of the project are described below.

### **1. Diagnosing (October-December 2019)**

Literature review

- Studying the prior literature on Service Design and the utilization of Service Design in software development. Selecting the best Service Design methods and tools for software development and the upcoming Service Design case based on the literature review.

Focus group interview, participant observation and analysis of relevant documentation

- Mapping out the knowledge base, attitudes and assumptions towards service design in Company X. Identifying the possible benefits, challenges and critical factors of implementing Service Design that come up in the focus group interview.
- Utilizing participant observation in internal meetings and going through relevant documentation related to design processes and principles followed in Company X to get a better understanding of the situation before the Service Design case project.

### **2. Action planning, round 1 (January-February 2020)**

Planning a suitable Service Design sprint for the case study

- Documenting and analyzing the results from the diagnosing phase, and based on the findings planning a suitable Service Design sprint.

- Applying the methods and knowledge base addressed in the literature review for planning the Service Design sprint.

### **3. Action taking (March 2020) → Modified and postponed to May 2020**

Case: Service Design sprint

- Implementing Service Design methods and tools into internal processes through the case. The original version of the Service Design sprint will be specified in Chapter 4.
- Observation will be used to perceive the attitudes and emotions participants, both internal and external, experience during the Service Design sprint.

Less than a week before the original action taking phase, which included the actual Service Design sprint, the situation regarding the Coronavirus escalated so that the Service Design sprint had to be postponed. The participants of the Service Design sprint were transferred to remote working so the workshops that the sprint included could not be held as originally planned. The evolving situation was followed carefully, and as the restrictions became more precise it became obvious that a traditional workshop with face-to-face communication could not be held during the following months. Hence, the core Service Design sprint team started to plan a remote implementation of the Service Design sprint, and the action research cycle took an iteration back to the action planning phase.

### **4. Action planning, round 2 (March-April 2020)**

Planning a remote version of the Service Design sprint

- Adapting the original Service Design sprint as needed.
- Communicating with stakeholders and participants of the original Service Design sprint.
- Taking into account what factors should be considered when running a remote workshop compared to a traditional one.
- Adjusting the methods and tools for a remote implementation as needed.

### **5. Action taking (May 2020)**

Pre-sprint research: semi-structured interviews with the end-users

- Carrying out interviews with the Day 2 external participants of the Service Design sprint

Case: 3-day Service Design sprint from 5<sup>th</sup> to 7<sup>th</sup> of May

- Implementing Service Design methods and tools into internal processes through the remotely carried out case. The remote version of the Service Design sprint will be specified in Chapter 4.

#### 4. Evaluating (May 2020)

Questionnaire survey for Service Design sprint participants

- Questionnaire survey for all Service Design sprint participants to collect feedback and thoughts about the remote Service Design sprint pilot project.

Internal meetings for debriefing and planning the next steps

- Evaluating how the Service Design sprint succeeded and how different stakeholders saw the benefits and challenges of the Service Design sprint with the help of the survey results and internal meetings.
- Going through the findings of the sprint and presenting the results for all stakeholders.
- Developing an improved version of the Service Design sprint based on the learnings and feedback.
- Comparing the results to prior literature and research.
- Considering how the remote implementation possibly affected the results of the Service Design sprint.

#### 5. Specifying Learning (May 2020 →)

Identifying the general findings and planning further actions

- Ensuring the process is iterative and adapted if needed (it already was adapted during the first iteration of the action research cycle).
- Documenting the next steps and actions, including how the methods and tools worked as well as what should be done differently in the next cycle.
- Standardization of the Service Design sprint.
- Embedding Service Design as an ongoing activity into Company X.

### 3.3 Data collection

Action research often includes several data collection methods that support the researchers work throughout the iterative process (Eriksson & Kovalainen 2008, 203). The data collection methods used to construct the knowledge base for this research consist of a literature review, focus group interview, participant observation, analysis of relevant documents, semi-structured interviews, a case study and questionnaire surveys. Collecting data from different sources enables supporting the findings and makes the data more comprehensive (Stickdorn et al. 2018, 108). See Appendix 1 for all research material used in this thesis.

### 3.3.1 *Literature review*

The literature review for this research was conducted by using several data bases offered by the University of Turku. The databases used include Volter, Finna, Scopus, Emerald, ProQuest, ScienceDirect and Google Scholar. The following keywords were used for searching the literature: *"Service Design"*, *"Service Design" AND "software development"*, *"Service Design" AND agile*, *"Service Design" AND agility*, *"Service Design" AND "agile software development"*, *"Service Design principles"*, *"Agile principles"*, *"Service Design history"*, *"Service Design implementation"*, *"Service Design" AND SaaS*, *"Service Design" AND "internal processes" AND "software development"*, *"implementing Service Design methods"*, *"Service Design methods" AND implementation*, *"Applying Service Design"*, *"Embedding Service Design"*, *"Service Design tools"*, *"Service Design" AND tools OR methods*, *"Service Design" AND design approaches*, *"Service Design comparison"*, *"Service Design" AND "remote work"*. The selected articles and books were mostly published during the past five years to assure the relevance of the material used. However, some selected older classic articles and books were brought in the literature review. The literature regarding the selected research methodology, Action Research, was mostly older as the distinguished researchers have done their recognized work already earlier.

### 3.3.2 *Focus group interview*

The qualitative interview is the most common data collection method in all kinds of qualitative research. It is also seen as one of the most important data gathering tools. (Myers & Newman 2007, 2-3.) Qualitative interviews have been used widely in numerous fields of science, including Information Systems (IS). Interviews differ from other research approaches by involving the participants directly in a conversation with the researcher in order to create profound and contextual narrations of interviewees' experiences and how they construe them. (Schultze & Avital 2011, 1-2.)

Services and software are intangible and often complex and therefore it is important to ensure that all participants are involved throughout the process (Stickdorn et al. 2018, 280.) Focus group interview as a data collection method is suitable for subjects that require profound knowledge gained from professionals in the field of the subject. Focus groups are convenient for understanding the interviewees' opinions and attitudes towards the given topic. (Stickdorn et al. 2018, 122.) In this research the aim of the focus group interview is to create a comprehensive conception about the internal knowledge base and assumptions on Service Design as well as the attitudes that employees in different roles have towards Service Design in the beginning of the project. An important aspect in this

research is involving different stakeholders and finding out how they see the benefits and challenges of implementing Service Design.

The focus group interview was held in a meeting room at Company X and the interviewees were employees of Company X who are working with the software in different roles. The interviewees were selected so that the sampling included employees from each role that will be included in the following Service Design Case. The length of the working experience the interviewees had in Company X varied to get more encompassing opinions and views on the subject. Two of the interviewees are from the organization's Design team, two are project managers, one is a front-end software developer, one is a back-end software developer, and two are external consultants who work with both back and front-end development. See Table 4 below for a combined summary of the interviewees.

Table 4 Focus group interviewees.

Interviewee	Job description	Time in Company X	Background regarding Service Design
A	Senior UX Designer	6 years	"Gradually Service Design is becoming more identifiable in our company and briefly I feel like everyone could benefit from Service Design"
B	UX / Service Designer	< 1 year	"Studied Service Design for a couple of years and been working as a Service Designer in a few projects"
C	Project manager	3 years	"Service Design is close to my own job description, but we haven't been actively focusing on it as a separate thing"
D	Project manager	3 years	"Service Design is related to our work, but not a thing that is consciously focused on"
E	Back-end developer	6 years	"Not familiar with the concept, but both service and design are closely related to software designers' work"
F	Front-end developer	3 years	"Not consciously thinking about Service Design, but developing UI is closely related to Service Design"
G	Consultant	< 1 year	"In my opinion our work as consultants is related with Service Design to a large extent"
H	Consultant	1 year	"Service Design as a term has been a part of many projects that I've been involved in"

The interview was semi-structured as the best way to get comprehensive answers is keeping the discussion open but asking well prepared questions. The interviewees have varying backgrounds in Service Design and therefore the questions were modified when needed. The interview started with an introduction to the topic and clarifying the ethical research principles, followed by a brief discussion of each interviewee's background regarding Service Design. The interview took a bit over an hour and was recorded with multiple devices to ensure the success of the recordings. The following question pattern was flexibly used to carry out the semi-structured interview.

1. What is your background regarding Service Design?

2. What do you see as the benefits of implementing Service Design methods into internal processes?
3. What do you see as the challenges of implementing Service Design methods into internal processes?
4. What do you see as the possibilities and impacts of implementing Service Design when considering your own work?
5. If you have experience in Service Design projects:
  - a. What kind of projects?
  - b. What tools/methods were in use?

The results of the focus group interview were carefully analyzed and coded by themes. The results will be presented in Chapter 4 in relation with the planning of the Case: Service Design Sprint, and in more detail in Chapter 5. The results were taken into account when planning action in the next step of the action research cycle.

### ***3.3.3 Participant observation and analysis of relevant documents***

Participant observation is a primary method of collecting information and data (Jorgensen 1989, 2). It can be seen as a set of data collection methods including interviewing (Whyte 1979, 56). The method is suitable for observing what people are doing, paying attention to body language and gestures, but an important aspect is also observing what people are not doing. When using observation, it is important for the researcher to differentiate between actual objective observations and the researchers' own interpretations. (Stickdorn et al. 2018, 120-122.)

In this research data was additionally collected by ongoing observations during the first phases of the research. Participant observation was focused on the time before transferring to remote working. As the situation required that the actual Service Design sprint case was to be held remotely, the researcher could not use participant observation in the same way as originally planned. For example, body language and gestures were remarkably challenging to catch through videocalls. However, participant observation was used as a supporting data collection method. The researcher participated in each phase of the action research cycle and in all of the interviews as well as the case study.

In addition, the researcher participated in relevant meetings concerning the pilot project and examined the internal development processes of Company X. The success of the researcher depends mainly on the ability to build a trustworthy relationship with the participants. A participant observer does research by participating into activities with the relevant participants in the study over an extended time period. (Whyte 1979, 64-65.)

An important part of participant observation is to become familiar with the environment where the observation takes place. However, the observation in this research will be mainly focused on specific matters, as the researcher is already familiar with the research environment. The selected matters should be conducted from the recognized problems. Concentrating on the specific problems will ensure more detailed knowledge. (Jorgensen 1989, 3-4.)

Collection and analysis of relevant documents was used as another source of data in the action research cycle. Viewing the relevant documentation aggregates knowledge on the design processes and methods that have been used in Company X before the project. This ensures focusing on the correct factors and applying the previous knowledge and lessons learned in the Service Design project. Relevant documents were also used for the research phase in the Service Design case. For example, a memo of a Design workshop that was held last year was studied to ensure the knowledge gathered earlier will be utilized in the planning of the upcoming Service Design workshop.

#### **3.3.4 *Semi-structured interviews***

Semi-structured interviews are a common interview type in qualitative research in information systems. In a semi-structured interview, the researcher has a preliminary script for the interview, but the interviews often involve some improvisation as well. The interviewer can be the researcher or a part of the team. The main benefit of utilizing semi-structured interviews is to leave space for development in the situation to obtain deeper understanding. (Myers & Newman 2007, 4, 12.)

In this case the interviewer was part of the core Service Design team as the researcher focused on taking notes during the interviews. Semi-structured interviews were held with each of the eight external participants of the Service Design sprint before the actual sprint. Audio recordings were left out to make interviewees feel more comfortable and willing to express their opinions and insights. Table 5 below shows the time each interviewee has worked with the software and which of the two software modules they are more familiar with.



Table 5 Interviewees and participants of Service Design sprint Day 2.

Interviewee	Utilized software for	End-user / familiar with
1	4 years	Workforce scheduling module
2	1 year	Workforce scheduling module & Staffing module
3	2 years	Staffing module
4	4 years	Staffing module
5	8 years	Staffing module
6	2 years	Workforce scheduling module
7	1 year	Workforce scheduling module
8	4 years	Staffing module

The following question pattern was flexibly used to carry out the semi-structured interviews.

1. How long have you used the software?
2. How much do you use the software in your daily work?
3. In which work tasks do you use the software?
4. Describe a typical workday and workflow.
5. Describe an optimal performance with the staffing module or the workforce scheduling module.
  - a. Which factors support the process?
  - b. Which factors complicate the process?
6. Describe a challenging performance with the staffing module or the workforce scheduling module.
  - a. Which factors effect this?
7. What stages do you need to do outside the software?

The results of the semi-structured interview were analyzed with the core Service Design team and coded by themes. The results will be presented in the subchapter *4.3.1 Pre-sprint research: Semi-structured interviews with the end-users* and in more detail in Chapter 5. The results were utilized when planning the remote version of the Service Design sprint and particularly in creating the workshop for the first day of the Service Design sprint.

### 3.3.5 *Case: Service Design sprint*

The Case will be specified in Chapter 4. The purpose of the case for this research was to experiment applying the selected Service Design methods and tools into the software development process. The selection of the methods and tools was done based on the information gathered in the literature review as different methods were examined as well as taking into account the factors that were highlighted in the focus group interview and the requirements of the examined problem. The case study will be based on the idea of the *Design Sprint* created at Google Ventures applying the Service Design approach presented by Stickdorn et al. (2018) in the book: *This is Service Design Doing*.

The Service Design sprint will include a Service Design workshop that will be held with customers of Company X including end-users of the provided software. Before the sprint brief semi-structured interviews will be held with each of the customers participating in the Service Design workshop. The Service Design sprint will be modified and planned to suit the needs of Company X.

### 3.3.6 *Questionnaire survey*

Questionnaire surveys are a suitable form of collecting answers in a standardized manner. Surveys are especially functional for measuring unobservable data such as people's preferences, traits, beliefs, behaviors and attitudes. Questionnaire surveys often consist of structured or unstructured questions. Structured questions ask the respondents to select an answer from given choices, whereas unstructured questions allow respondents to answer in their own words. (Bhattacharjee 2012, 73-74.)

In this research the questionnaire survey was used to collect feedback of the Service Design sprint from the participants. The questionnaire had both structured and unstructured questions. The same survey was sent to both internal and external participants, but they were collected with separate Google Forms sheets to differentiate answers between Day 1 and 3 participants to Day 2 participants. The results of the questionnaire surveys were reviewed and analyzed in the debriefing of the sprint.

## 3.4 **Data analysis**

As this research includes several different data collection methods it is also necessary to describe the analysis of the empirical results of each data collection method separately. However, the data analysis will not focus on the literature review as it was carried out to clarify the theoretical background of Service Design, whereas the other data collection

methods contribute directly to the empirical results of this research. Content analysis is utilized as an overall method for analyzing the data gathered in this research. The basic steps of content analysis include carefully going through the data, reducing the data, categorizing the data and summarizing the data. (Tuomi & Sarajärvi 2018.)

### **3.4.1 *Focus group interview***

The focus group interview was recorded with two devices and notes were made during the interview. After the interview the recording was transcribed on a precise level, excluding irrelevant comments or words regarding the interview. This was done with high caution to ensure that nothing relevant related to the feelings or assumptions of the interviewees was accidentally left out of the transcript. After the interview had been transcribed the transcript was read through several times by the researcher. On the third round of reading similarities and differences were highlighted from the text. This round of reading was repeated to make sure that nothing was missed. After this thematization of the findings was carried out by following the interview themes of the focus group interview. The structure of the results provided in Chapter 5 follows the structure of the interview conducted.

### **3.4.2 *Participant observation and analysis of relevant documents***

Participant observation and analysis of relevant documents were used as supporting data collection methods. The participant observation focused on the first phases of the action research cycle and the research process as from the action planning phase the research was carried out remotely. The observation was done both during the interviews and the actual Service Design sprint as well as during normal working situations. The researcher made notes whenever something relevant regarding the research questions occurred while observing participants of the Service Design pilot project. The notes were gone through and categorized as the action research cycle came to the evaluating phase.

The analysis of relevant documents took place in the beginning of the research process during the diagnosing phase. The analysis of relevant documents was done accordingly to basic content analysis. While doing the analysis the focus was on going through feedback and memos from the most recent design workshop and identifying the possible challenges that had occurred. The challenges were listed and taken into account when planning the Service Design sprint. The aim of this was to overcome the previous challenges and consequently improve the upcoming Service Design workshops.

### **3.4.3 *Semi-structured interviews***

The results of the semi-structured interviews were approached together with the core Service Design team. After the interviews were held each member of the core Service Design team read the interview notes carefully through. After this the team used a shared virtual whiteboard for categorizing the data on post-it notes. The data was first coded separately from each interview based on the interview themes. The themes were constructed around the challenging and supporting factors regarding the use of the software module. Finally, the post-it notes with similar themes were brought under same categories and divided based on the software module that they were related to.

### **3.4.4 *Case: Service Design sprint***

The analysis of the results gathered from the three workshops held during the 3-day Service Design sprint was done with separate sprint debriefing workshops. The participants of the debriefing workshops were part of the core Service Design team. The debriefing followed the principles of content analysis. First the data from the three workshops was gone through by the participants. This was followed by reduction of the data. The aim was to focus on themes that had raised in the semi-structured interviews and further wrought during the Service Design sprint. The content of the workshops will be handled in more detail in Chapter 4.

### **3.4.5 *Questionnaire survey***

The results of the questionnaire surveys were also handled within the sprint debriefing workshops. The answers to the structured questions were quantified to a more readable form. The answers to the unstructured questions were analyzed and categorized based on the theme of each unstructured question. The points and opinions that were repeated in the feedback were prioritized as most important factors to be paid attention to in the following Service Design sprints. These findings were also mirrored to the results from the focus group interview, and the similarities and differences were pointed out and documented.

## **3.5 *Evaluation of trustworthiness***

The classic evaluation criteria for quantitative research is often based on reliability and validity. However, for qualitative research the evaluation of trustworthiness can be seen

more suitable. The concept trustworthiness includes four aspects: credibility, transferability, dependability and confirmability. The evaluation of credibility should examine whether the reader of the research can conclude the same results based on the information and data presented in the research paper. Transferability can be evaluated by comparing the similarity with previous researches. Dependability is based on how logical, well documented and traceable the research process is. Confirmability depends on how findings and interpretations are linked together and how understandable these links are to others reading the research paper. (Eriksson & Kovalainen 2011, 294.)

The trustworthiness of this research will be evaluated through the above-mentioned four aspects. In doing so, it should be taken into account that the researcher is part of the organization where the case study was carried out. This may affect the objectiveness of the results to some point, but precautions were taken to ensure the objectiveness. The researcher for example did not facilitate the workshops of the case study to make sure that the workshops were not even accidentally directed to a desired direction from the researcher point of view.

The credibility of this research is desirable as the empirical material is rather inclusive and based on the empirical results another person could end up with the same findings and conclusions. The transferability of the research is reliable as the research is grounded on similar previous research. The results are examined in comparison to the findings of these previous studies, and similar findings from previous research are presented in Chapter 6 *Discussion*. Dependability is ensured by following a logical research process and carefully documenting each phase of the process. In addition, the confirmability of the research is ensured by presenting logical links between the results and conclusions.

## 4 CASE STUDY: SERVICE DESIGN SPRINT

### 4.1 Introduction to Company X and the case study

The research is based on a case carried out in a Finnish software development company, referred to as Company X. Company X follows the principles of agile software development and provides a Software-as-a-Service (SaaS) for human resource management. Company X provides two software modules that can be used together or separately. The other software module is intended for staffing and the other for workforce scheduling. Company X has several clients in the staffing industry as well as clients on labor-intensive industries. The customers use the company's software, but the customers and employees of Company X's customers also have their own portals for the software. The employee users have also a mobile application of the software.

As discovered by Junginger & Sangiorgi (2009, 4345) pilot projects can have an essential role in successful organizational change. Stickdorn et al. (2018, 456) also propose starting with small Service Design projects as these can be used to modify the Service Design process as well as the company's structures and culture. Therefore, a pilot project was carried out in Company X, to demonstrate and explore the benefits, challenges and critical factors that applying Service Design has in software development.

Service Design has not been applied to internal processes in Company X before this case. However, several different design methods such as user stories and prototyping have been utilized in the software development process already previously. Thus, it was also mutually agreed in Company X that the company would benefit more of examining the use of the Service Design methods and tools during the research and ideation phase, than in the prototyping and implementation phase. Hence, the Service Design sprint will focus on the first diamond of the Double Diamond model, which includes the phases *discover* and *define*.

The action planning closely involves the key individuals from Company X. This will ensure that the developed action plan will cover all different steps for change, including actions, resistance and commitment (Eriksson & Kovalainen 2008, 203). Therefore, employees of Company X with different job descriptions were engaged to different phases of the Service Design sprint. The core project team and the extended project team will be introduced in the next subchapter.

It is important to notice that the Service Design sprint itself strives to get an answer to a practical problem, but the case study in the research contest aims at answering the research questions of this thesis. The practical problem, which the Service Design sprint aims at answering, is examining the possibilities and challenges of combining two separate modules of the human resource management software: the workforce scheduling

module and the staffing module. The challenge is suitable for a Service Design case as the question needs deeper understanding and cannot be solved internally without involving customers and especially the end-users of the software. The goal of the Service Design sprint is to get an overview of the possible rationality and functionality of combining the two separate modules as well as ideas for the actual implementation. The Service Design Sprint aims at creating the baseline for whether combining the two modules is reasonable, as well as collecting ideas and insights of how this could potentially be done. In the ideal situation, after the Service Design sprint Company X will know how to further develop the congruence of the two software modules and also how to prioritize the combining of the two modules when considering the product backlog in its entirety.

The research question the Service Design sprint aims at answering is: *How can Service Design methods and tools be implemented into internal processes in B2B software development?* After the Service Design sprint an answer for the third research question: *What are the benefits, challenges and critical factors when implementing Service Design methods and tools into software development?* will be provided as the results gathered from the whole action research cycle will be interpreted and analyzed.

## 4.2 Service Design sprint

The research done in the diagnosing phase of the iterative action research cycle gave a comprehensive background for planning the actual Service Design case. As the results of the focus group interview show, most employees felt that the challenges of applying a Service Design process would be due to the lack of time and resources. Therefore, the selected approach for the case is a Service Design sprint, which can be carried out in just days. The Service Design sprint is based on the idea of Jake Knapp who invented the Design Sprint process for Google Ventures with John Zeratsky and Braden Kowitz for solving challenging problems and testing new ideas in a short time period. (Knapp, Zeratsky & Kowitz 2016, 1.) The Google Design Sprint assists participants to identify if a new idea gets support from the customers (Manson 2019.)

Breaking up projects to several smaller projects can reduce risk and uncertainty. In addition, a short but well-organized iteration may provide more clarity in reflections and decision making leading to preferable results. Different projects can also have variable emphasis on specific Service Design activities, which allows more flexibility. The main reason for iterative approaches such as the Service Design process is aiming at minimizing risks at each phase and simultaneously maximizing learning so that the following phases can be improved and enhanced. (Stickdorn et al. 2018, 344, 349.)

#### 4.2.1 *The Service Design sprint team*

The sprint team was decided based on mutual understanding of the employees that had the know-how and resources to join the Service Design sprint. Job descriptions of the people closely involved in the case included a Senior UX Designer, an UX / Service Designer, a project manager, a product owner / back-end developer and the Chief Executive Officer (CEO) of Company X. Stickdorn et al. (2018, 462) define that the core Service Design team usually consists of experts on Service Design who manage and endorse projects as well as facilitate workshops. It is also stated that not all members of the core project team need to be experts in Service Design, nor do they need to have expertise in the industry or deep organizational knowledge (Stickdorn et al. 2018, 342).

The core team in this case consisted of a Senior UX Designer, an UX / Service Designer and a project manager. Stickdorn et al. (2018, 463) define also the extended project team, which is composed from people that are directly affected by the problem or challenge the company is trying to solve. In this case, in addition to the core project team members, the extended team included project managers, a product owner and the CEO of Company X. The end-users who participated in the Service Design workshop during the Service Design sprint were also a part of the extended project team.

The role of the researcher in the Service Design sprint was the role of a project manager. The researcher was responsible of the process in its entirety, including the scope, budget, deadlines and reporting. The researcher did not facilitate or lead the sessions and workshops during the actual Service Design sprint to ensure as objective results as possible.

The roles of the core Service Design team were also partially overlapping. The Senior UX Designer and the UX / Service Designer shared the role of the *Facilitation Lead* and were responsible for ensuring continuous feedback and facilitating the workshop with the end-users as well as the workshop sessions with the extended Service Design project team. In addition, they shared the role of the *(Service) Design Lead* as they are both part of the Design Team of Company X. Consequently, they were responsible for focusing on the content and quality of the Service Design outputs as well as shaping the design concepts as needed. The three project managers that were included in the extended project team had a holistic perspective on the industry and important know-how related to the customers and end-users as well as specific use cases. The CEO of Company X and the product owner were in key roles when making decisions. They also assured the project fit with the strategy and had insights on the practical problem that the Service Design sprint strived to find solutions to.



#### 4.2.2 *Planning the Service Design sprint*

The planning of the Service Design sprint started with an internal meeting where suitable problems were handled and possible approaches for solving them with the Service Design sprint were discussed. The mindset for the planning phase was continuous iteration and reviewing the process as well as the content of the Service Design sprint along the way. Weekly meetings were arranged each Monday for planning the content of the Service Design sprint for a month before the actual sprint took place.

The participants in the meetings were also part of the core Service Design team. The results from the focus group interview were taken into account when planning action. The benefits that the employees of Company X saw that Service Design could bring were presented in the meeting. The identified benefits of the focus group interview included efficient resource allocation, delivering added value to the customer, identifying the actual needs and challenges of the customer and improving understanding of the customer and the typical use cases of the software provided. It was mutually agreed that the possible benefits were worth testing the implementation of Service Design methods and tools.

Possible challenges of the implementation of Service Design were also identified from the focus group interview. These included selling Service Design as a concept to the customer, internal assumptions, lack of time, involving the relevant people to the process and commitment. These challenges were noted and a plan for overcoming these challenges was made. The concept was sold to the customers with a focus on the benefits that the customers and end-users could gain from the workshop. Internal assumptions and lack of time were approached with an intense pilot project which could prove the benefits of Service Design in a short time period. Involving relevant people to the process turned out a minor challenge as all relevant people were open-minded and interested in participating to the Service Design sprint.

In addition, critical factors were identified after the focus group interview. The following factors were conducted from the factors the interviewees found important if applying Service Design methods and tools to the processes of Company X. The factors included finding a “lightweight” solution, focusing on correct matters, exploiting tacit knowledge and selecting suitable Service Design methods and tools. These factors were considered when planning the Service Design sprint as well as selecting the suitable methods and tools.

The planning phase of the Service Design sprint included several days of research work and was based on the knowledge gained from the literature review composed in the diagnosing phase of the action research cycle. When planning the specific content and the needed sprint supplies the checklists provided in the book “Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days” (Knapp, Zeratsky, Kowitz 2016) were utilized. Also, walk-throughs of each Sprint Day were done. See Figure 11 below for a

picture from the walk-through of Sprint Day 2 where the core Service Design team is testing the 5 Why's? -method and planning necessary templates for the methods and tools utilized in the original workshop.



Figure 11 Service Design sprint Day 2 walk-through with original workshop methods.

It was mutually agreed that the Service Design sprint would be carried out with the focus on the first diamond of the Double Diamond model. As covered in the subchapter *2.2.2 Service Design methods* of this thesis the first diamond in the Double Diamond model focuses on discovering and defining the challenge. The design methods previously used in Company X were mostly methods for prototyping and implementation. Methods and tools for research and ideation had not been exploited as decidedly, and therefore it was seen that the most added value would be brought by applying the research and ideation methods and tools that Service Design provides and examining how they work for Company X.

#### **4.2.3 Planning a remote version of the Service Design sprint**

The situation regarding Covid-19 and the global pandemic evolved so that the original Service Design sprint, including traditional workshop sessions with face-to-face communication, could not be carried out as planned. Less than a week before the original Service Design sprint was supposed to take place, the sprint had to be cancelled. All the employees of Company X were preferred to work remotely. The same situation prevailed in most of the customers organizations where the participants for the Service Design sprint Day 2 came from. The core Service Design sprint team started planning a remote version of the sprint as soon as it became clear the sprint would have to be postponed at least with

several months and still then it would be uncertain if it could be carried out with traditional workshop methods. Hence, the remote version of the Service Design sprint was created.

The core Service Design team had weekly meetings for planning the remote version of the Service Design sprint. A desk research approach was utilized as methods and tools regarding remote working were evaluated. As the initial plan was already finalized and ready for execution the team had a workable blueprint to start creating the remote version. Firstly, the team had to go through practicalities and other arrangements needed to be done before a remote version of the Service Design sprint could be held. This included finding out if the original participants still had the time and will to participate to a remote version of the sprint as well as mapping out tools for running remote workshops.

Everyone in Company X was already familiar with working remotely as the company offers remote working as an alternative for each employee. Some of the employees prefer remote working more often than others, but everyone was more or less familiar with the principles and practices of remote working. This was an advantage and the transfer to everyone working remotely happened rather smoothly in Company X.

However, workshops in Company X had mainly been carried out as traditional ones, so not many employees had experience on running remote workshops. Luckily, there are several advanced tools available for remote working nowadays. Tools for running remote workshops are also provided and even tools for running remote workshops with Service Design methods can be found. The core Service Design team of Company X mapped out several tools and platforms intended for remote workshops. The art director of Company X had participated in a successful remote workshop where a tool called Miro had been utilized. The core Service Design team got familiar with this tool and compared it to other tools that were recommended for remote Service Design workshops. After reading several reviews of different tools the core Service Design team decided to proceed with Miro.

As the participants had expressed their interest and the suitable tools were found the core Service Design team focused on planning the actual content of the sprint. The team agreed they would strive to include as many of the original methods and tools to the remote version but modify them as needed. The structure of the original Service Design sprint as well as the structure of the remote version are pictured in the next chapter.

### **4.3 Structure of the Service Design sprint**

The structure of the Service Design sprint was combined from different approaches and frameworks and further modified to best fit the needs of Company X. The structure of the Service Design sprint was mainly formed based on the idea of the Design Sprint developed at Google Ventures, the Double Diamond model designed by the Design Council

and the three-day Service Design session presented by Stickdorn et al. (2018). The final version of the Service Design sprint held in Company X was basically a combination of an internal design sprint and a co-creative workshop with the customers.

The actual sprint planned to be held in Company X consisted of three intensive days, which each had their own carefully planned agenda. The Service Design workshop with the end-users was held in the middle of the sprint. See Figure 12 below for the structure of the original Service Design sprint.

		<b>Service Design sprint</b>									
Time		8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	
<b>Day 1 Tuesday</b>	<b>What:</b> Service Design sprint kick-off <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, CEO, product owner, project managers) <b>Methods &amp; Tools:</b> Personas, Journey maps / mapping journeys, Stakeholder map, Brainstorming							<b>What:</b> Debrief of the internal session held in the morning and final preparation of the workshop <b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, project manager) <b>Methods &amp; Tools:</b> Mindmap			
	<b>Day 2 Wednesday</b> <b>What:</b> Service Design workshop with the customers and end users <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, project manager, end users) <b>Methods &amp; Tools:</b> Warm-up, Issue cards, 5 x Why?, "How might we..?" questions, Brainwriting, Prototyping										
<b>Day 3 Thursday</b>	<b>What:</b> Debrief of the workshop and final preparation of the internal session held in the afternoon <b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, project manager) <b>Methods &amp; Tools:</b> Idea portfolio, Synthesis wall							<b>What:</b> Debrief of the workshop and validation of ideas <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, CEO, product owner, project managers) <b>Methods &amp; Tools:</b> Personas, Quick voting methods, Decision matrix, Evaluation matrix			

Figure 12 Structure of the original Service Design sprint.

The structure of the remote version of the Service Design sprint changed slightly. The aim of the sprint stayed the same, but some methods and tools were updated and adjusted so that they served the remote version in the best possible way. Day 2 of the Service Design sprint was also compressed to a half-day session. The structure of the modified remote version of the Service Design sprint can be seen in Figure 13.

## Remote version of the Service Design sprint

Time	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00
<b>Pre-sprint</b>	<b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, researcher/project manager) <b>Methods &amp; Tools:</b> Desk research, Semi-structured interviews, Developing key insights								
<b>Day 1 Tuesday</b>	<b>What:</b> Service Design sprint kick-off <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, CEO, product owner, project managers) <b>Methods &amp; Tools:</b> Check in / Warm-ups, Mapping key findings, 5 x Why's?, Voting, Check-out				<b>What:</b> Debrief of the internal session held in the morning <b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, project manager) <b>Methods &amp; Tools:</b> Forming "How might we..?" questions				
	<b>What:</b> Final preparation of the workshop <b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, project manager) <b>Methods &amp; Tools:</b> Forming "How might we..?" questions				<b>What:</b> Ideation workshop with customers and end-users <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, project manager, end-users) <b>Methods &amp; Tools:</b> Check in / Warm-ups, Brainwriting & Brainstorming, Mindmap, Voting, Check-out				
<b>Day 2 Wednesday</b>	<b>What:</b> Debrief of the workshop and final preparation of the internal session held yesterday <b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, project manager) <b>Methods &amp; Tools:</b> Developing key insights				<b>What:</b> Debrief of the workshop and validation of ideas <b>Who:</b> Extended project team (Senior UX Designer, UX / Service Designer, CEO, product owner, project managers) <b>Methods &amp; Tools:</b> Check in / Warm-ups, Feature planner, Feature map, Check-out				
<b>Day 3 Thursday</b>	<b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, researcher/project manager) <b>Methods &amp; Tools:</b> Debriefing sessions, Personas / User stories, Wireframing, Prototyping, Compiling research reports								
<b>Post-sprint</b>	<b>Who:</b> Core project team (Senior UX Designer, UX / Service Designer, researcher/project manager) <b>Methods &amp; Tools:</b> Debriefing sessions, Personas / User stories, Wireframing, Prototyping, Compiling research reports								

Figure 13 Structure of the remote version of the Service Design sprint.

Due to the compact Day 2 with the end-users the core Service Design team carried out semi-structured interviews with each end-user on the week before the actual sprint. This ensured sufficient background for building a suitable sprint for the remote circumstances and enabled devoting Day 2 of the sprint for ideation. Even though the duration of the active sprint was three days, the sprint included preparation and research before the actual sprint and the interviews. Likewise, there will be further meetings after the designated Service Design sprint to debrief the sprint. The ideas and results will be carefully analyzed and further utilized in the product development process. Especially later when concentrating on the second diamond of the Double Diamond model, which includes the phases develop and deliver, the results of the Service Design sprint will be revised. When thinking about the entire process it is important to keep in mind that the Service Design process is iterative and adaptive. Different phases of the Service Design process may be repeated if an activity creates new insights or questions which make the team step back in the process and make a further iteration. In this case, the first step backwards was taken in the planning phase of the sprint as the situation required a remote version of the Service Design sprint.

The content produced with the actual methods and tools during the Service Design sprint and the workshops will not be translated to English as the content is not relevant regarding the research questions of this master's thesis.

### **4.3.1 Pre-sprint research**

During the previous week before the actual Service Design sprint took place the semi-structured interviews were held with each end-user participating in the Service Design sprint. The interviews were held by video calls via Microsoft Teams. All end-users were interviewed separately, and the interviews lasted around 30 minutes. The topics handled in the discussions were based on the two software modules and especially on how the users utilize the two software modules. The aim of the interviews was to identify critical factors regarding use cases that the end-users have with the software, as well as identify factors that support or complicate the process.

The core Service Design team carried out the interviews so that one team member facilitated the interview as the other two focused on taking notes. After the interviews were carried out the challenges and critical factors were transcribed and themed. The core Service Design team selected issues from the themes that were most repeated in the interviews for further examination. The results of the interviews were utilized in outlining the base for the Service Design sprint Day 1.

### **4.3.2 Day 1: Internal Service Design workshop**

Day 1 of the sprint was focused on the sprint kick-off and working with the results gathered from the interviews. The co-creative workshop session was held utilizing Microsoft Teams and Miro. The day started with clarifying the aim of the sprint and the goals of the Day 1 workshop among all participants. The goals on Day 1 were to find and identify the key challenges the customers expressed in the interviews. These findings would then be focused on in the ideation workshop with the customers on Day 2 of the sprint.

The participants of the sprint Day 1 were people included in the extended project team introduced previously. In addition to the core Service Design team, three project managers, a product owner and the CEO of Company X were involved in the workshop session of Day 1. All participants have insight on the subject and are experts considering the two modules of the software that were intended to combine. The importance of the participants attendance was highlighted, and their role was elaborated so that the participants were aware of the input that was expected from them. It was also reminded that the Service Design sprint is a pilot project and all results and conclusions regarding the implementation are possible.

The researcher opened and wrapped up the workshop sessions but focused otherwise on observing and taking notes. The Senior UX Designer and the UX / Service Designer facilitated the workshops together. The actual workshop part of Day 1 started with two warm-ups. The aim of the warm-ups was to relax the atmosphere and get the participants

in a creative mode. The first warm-up was a count-up game where participants strived to count up to ten while each participant was supposed to say a number at least once, but not more than twice. This warm-up worked as an energizer and was chosen due to challenges that remote working may cause in communication as people cannot see each other. The second warm-up was done with Miro which was used as the main tool during the workshops. Participants were asked to move their own post-it notes with their self-portraits to a desired point on a rollercoaster reflecting their feelings towards the Service Design sprint and explain why they chose this particular point. The self-portraits had been created as a pre-task before the workshop. See Figure 14 for the rollercoaster warm-up.



Figure 14 Rollercoaster warm-up.

After the warm-ups the team continued with the actual working phase of the workshop. The working phase started with going through a board of post-it notes with key findings from the interviews. These post-it notes were then moved one at a time by turns to a new board with two sections named by the two software modules. While moving the post-it note on the new board the participants read the post-it note out loud and placed it on the board based on which software module it was associated with. If the post-it note was related to both software modules it was placed in the middle of the board.

After this each participant selected one post-it note they personally saw as the most meaningful one and worth solving. These post-it notes were then transferred to a 5 x Why? board. In this phase the participants were supposed to dig deeper to the problem or challenge written on the post-it note and try to find reasons for the challenge. The phase had five rounds and on each round the participants had two minutes to think over for the reasons for the previous challenge. See Figure 15 for the frame of the “5 x Why?” -method.



Figure 15 Five x Why? -method.

The “5 x Why?” -phase was followed by a presentation round where each participant described the outline of their own chain of why’s. After this the participants voted on the best post-it notes with answers to the “why-questions” from the frame shown above. Miro’s own voting tool was utilized for this phase as it was discovered functional and easy to use. Three most voted post-it notes were selected for further elaboration for Day 2.

The workshop was finished with a check-out method to collect instant feedback on participants feelings. This was done through a “feeling canvas” where participants added images from Google search to represent their feelings. Then everyone explained why they had chosen those pictures. This was an effective way to reflect the success of the workshop on a feeling base as the entirety was still freshly in mind.

The core Service Design team continued their work in the afternoon with a debriefing session of the workshop held in the morning. The top voted post-it notes were adapted to “How might we?” styled questions and transferred to the Miro board dedicated for the



sprint Day 2. The team also did a brief walkthrough of the next day's plan to make sure that everything was ready for Day 2.

#### **4.3.3 Day 2: Service Design workshop with the customers**

The Service Design workshop with the customers took place on Day 2 of the sprint. The workshop was originally supposed to be held in a separate event venue in the center of Helsinki. Due to the remote implementation also the workshop with the customers was held via Microsoft Teams and Miro. The workshop started with stating the purpose, scope and context of the Service Design sprint for the participants. After this the goals of the day's workshop were clarified. The focus of Day 2 was on ideation.

The participants of Day 2 consisted of the core Service Design project team and eight end-users from three different customers of Company X. The customer participants' experience and amount of usage of the software differed between participants, but everyone had used either the staffing module or the workforce scheduling module. Most participants used it on a daily basis as their main tool and some randomly a few times per week. During the interviews held beforehand the core Service Design team gained a lot of insight from each interviewee and concluded that all were suitable participants for the workshop.

Ideation is usually an activity that is done within a day (Schwarzenberger 2018, 284.) Therefore, most of the ideation was placed to the workshop with the end-users. Due to the remote implementation the Day 2 needed to be shortened to a half day workshop. Hence, it became even more reasonable to focus on ideation during the workshop with the actual end-users of both software modules.

Day 2 started with the same warm-ups that had been done in the internal workshop on the previous day. In addition, one extra warm-up was carried out with the customers to set their minds on ideation. Each participant was requested to choose an object nearby. Then everyone was supposed to act as the "world's worst product designer" and come up with three things that would make this product they had chosen as terrible as possible. The purpose of this warm-up was to realize that this way of thinking can actually reveal the most important features of products.

After successful warm-ups the participants seemed more relaxed and excited on the upcoming working phase. The working phase was initiated with grounding the three "How might we..." -styled questions that were formed based on the top voted post-it notes from Day 1. This was followed by a 15-minute brainwriting session, during which participants wrote ideas regarding the three post-it notes. The ideas were factors that the participants experienced necessary in order that the question in the post-it note would be

possible to actualize. The participants were encouraged to get inspired by the ideas created by others and develop those ideas even further and better.

The brainwriting session was followed by a round of voting. The four most voted ideas were transferred to the next frame which was called the color board. See Figure 16 below for the color board. The aim of the color board was to elaborate the most popular ideas even further. The board had supporting questions in the middle to help the participants generate more ideas. The participants started ideation within the color section they found their own name from the righthand corner. The board was circled clockwise and each round of ideation per color section lasted for five minutes. Again, adding depth to other participants' ideas was encouraged.

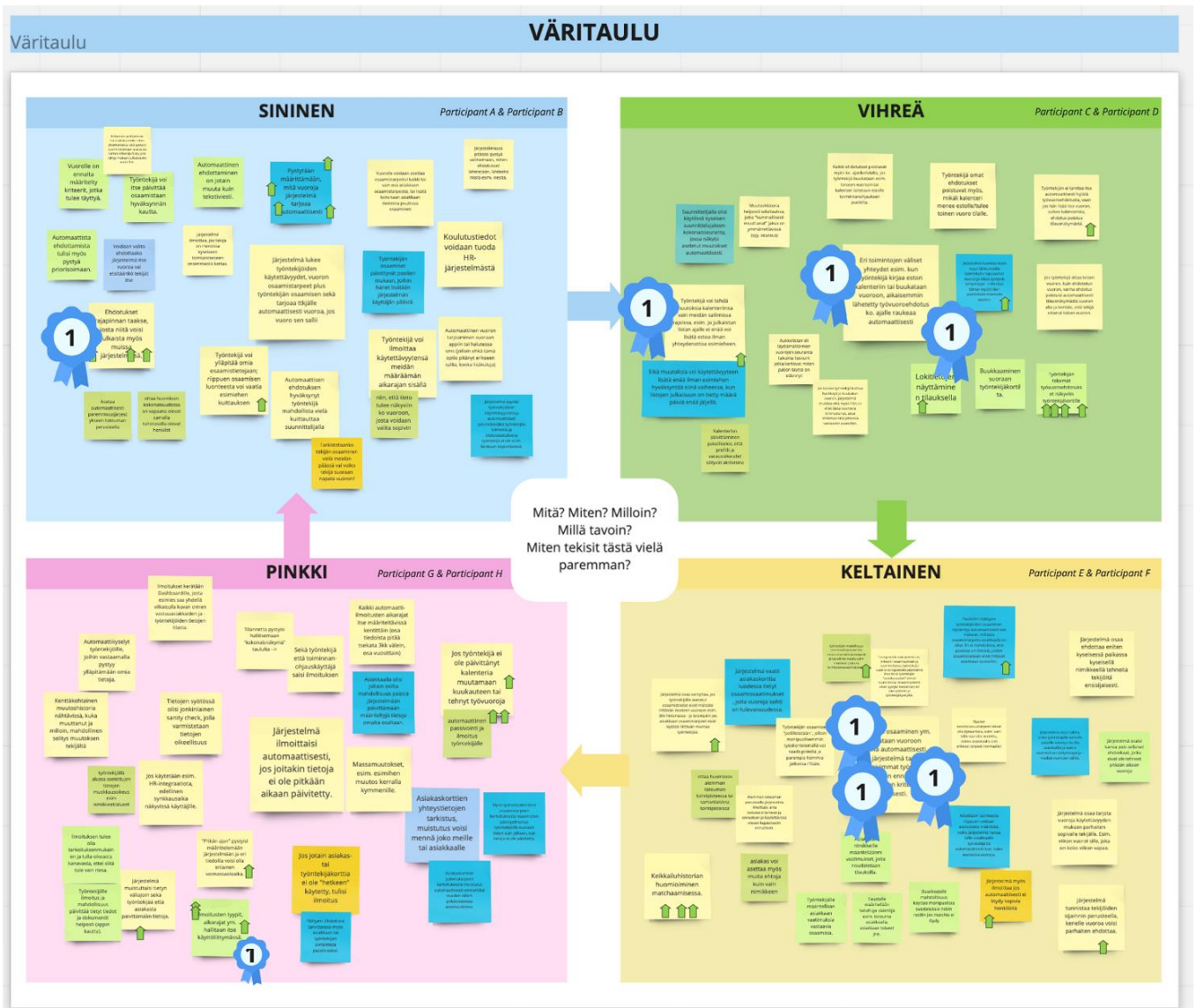


Figure 16 Color board for adding depth to ideas.

After four rounds of ideation it was time for the next voting. This time each participant had one upvote (green arrow) and one downvote (red-arrow) for each color section. None of the red arrows were used. In addition, everyone had one “best in show” -vote to indicate the best idea on the whole color board. The ideas that received most votes were selected for further examination to Day 3.

The ideation workshop with the customers was also finished with a feeling canvas. See Figure 17 for the pictures that the customers and the core Service Design team chose to represent their feelings after the second workshop of the Service Design sprint. The customers were very pleased and positively surprised with the facilitation and professional execution of the workshop. Miro was also found as a suitable and desirable tool and the core Service Design team received a lot of good feedback on the entirety.

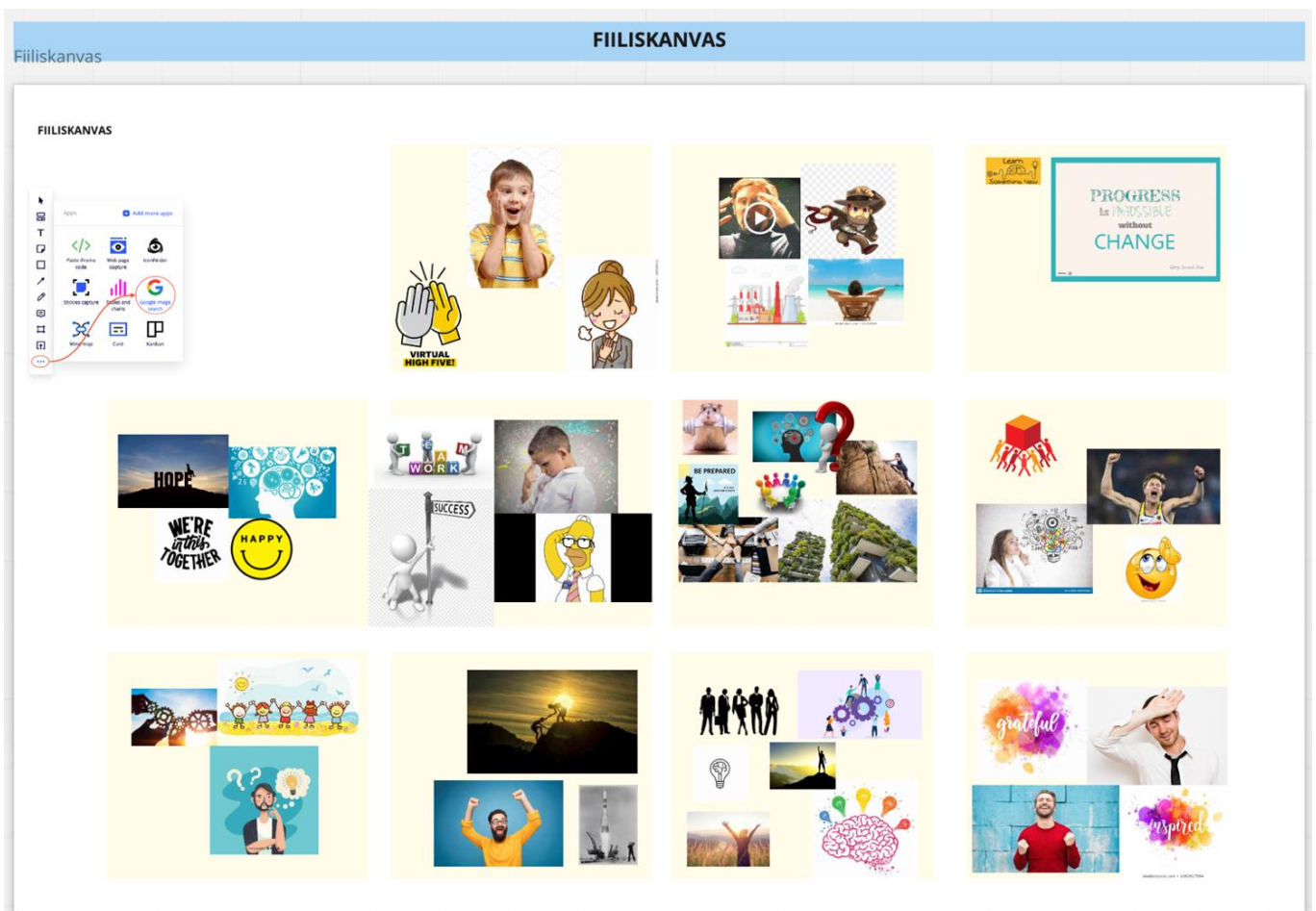


Figure 17 Feeling canvas of Service Design sprint Day 2.

The workshop of Day 2 was wrapped up by revising what had been accomplished during the workshop and how would these ideas be utilized during the sprint Day 3 and after. The participants were also reminded that all of the ideas would be gone through and taken into account in the product development. However, from the expectation management point of view, the customers were also reminded that this did not intrinsically mean

that all of the ideas would be new features in productization. The participants were also thanked for their time and wished to fill the feedback form that would be sent during the next day. The emphasis in the wrap up was that the customers voice was hence desired to be heard throughout the product development process.

After the workshop the core Service Design team went through the top voted ideas and rephrased six of them for the last workshop of the sprint. Some last-minute changes were done to the Day 3 workshop Miro board before the last workshop started. The structure of the third workshop day had been most challenging to create as the outcome of the two previous days could not be completely predicted. The core Service Design team faced the most challenges with the planning and execution of the third workshop.

#### **4.3.4 Day 3: Internal Service Design workshop**

The last day of the Service Design sprint started with reminding the participants of the results of Day 1 and summarizing what was done during Day 2. Then the goals for the last workshop, which were based on concretizing the most voted ideas from the Day 2 workshop, were stated. The participants of Day 3 consisted of the same extended project team that worked together on Day 1.

The warm-ups for the last workshop consisted of the “world’s worst product designer” warm-up along with a map warm-up. The map warm-up had the same idea as the roller-coaster but was even more interpretative and brought variability to the warm-ups. Participants placed their own self-portrait post-it notes to a place on the world map according to what they felt as the third day of the sprint was kicked off.

The working phase of the third workshop was started with a feature planner. The feature planner was approached by considering what would be required, regarding the software, in order that the features described in the post-it notes could be implemented. These requirements were then written under the features in question. After a 15-minute ideation session with the six post-it notes the workshop continued with each participant presenting one of the idea chains and describing for others what would be needed that the feature in the first post-it note could be implemented. This was followed by categorizing the post-it notes to relevant and irrelevant ones regarding the software and the aim of the workshop.

The final phase of the Day 3 workshop consisted of placing the post-it notes on a feature map showing the current situation of the software. The post-it notes were placed on the feature map based on whether they were old features or completely new features. The features that could be modified from the old software to respond to the new demand were placed in the middle of the map. The upper part of the map was for the ideas that were seen essential and the bottom part for “nice to have” features. See Figure 18 for the feature map.



- Where can I utilize the learnings?
- What felt challenging?
- How will I overcome the challenges in the next sprint?

The first debriefing session also included reflecting on the methods and tools as well as the facilitation of the workshops. The team went through the feedback that was collected with the Google Forms survey from all participants of the sprint. The idea was to generate ideas regarding the next Service Design sprint. The team members added post-it notes under three categories regarding the next Service Design sprint: what will we take along, what will we leave out, and new ideas. Taking into account the factors written on the post-it notes under the three above-mentioned categories the team created an improved plan for the future Service Design sprint.

In the next debriefing session, the team started with creating research-based personas of the end-users of the two software modules. The personas were created by utilizing a user story-based approach. Each persona was given a name, self-portrait, profile, wants, needs and things that made them annoyed using templates that had been built to the sprint debriefing Miro board beforehand. The personas were reviewed against recognized factors that the end-users had described important throughout the Service Design sprint. See Figure 19 for two of the created personas.

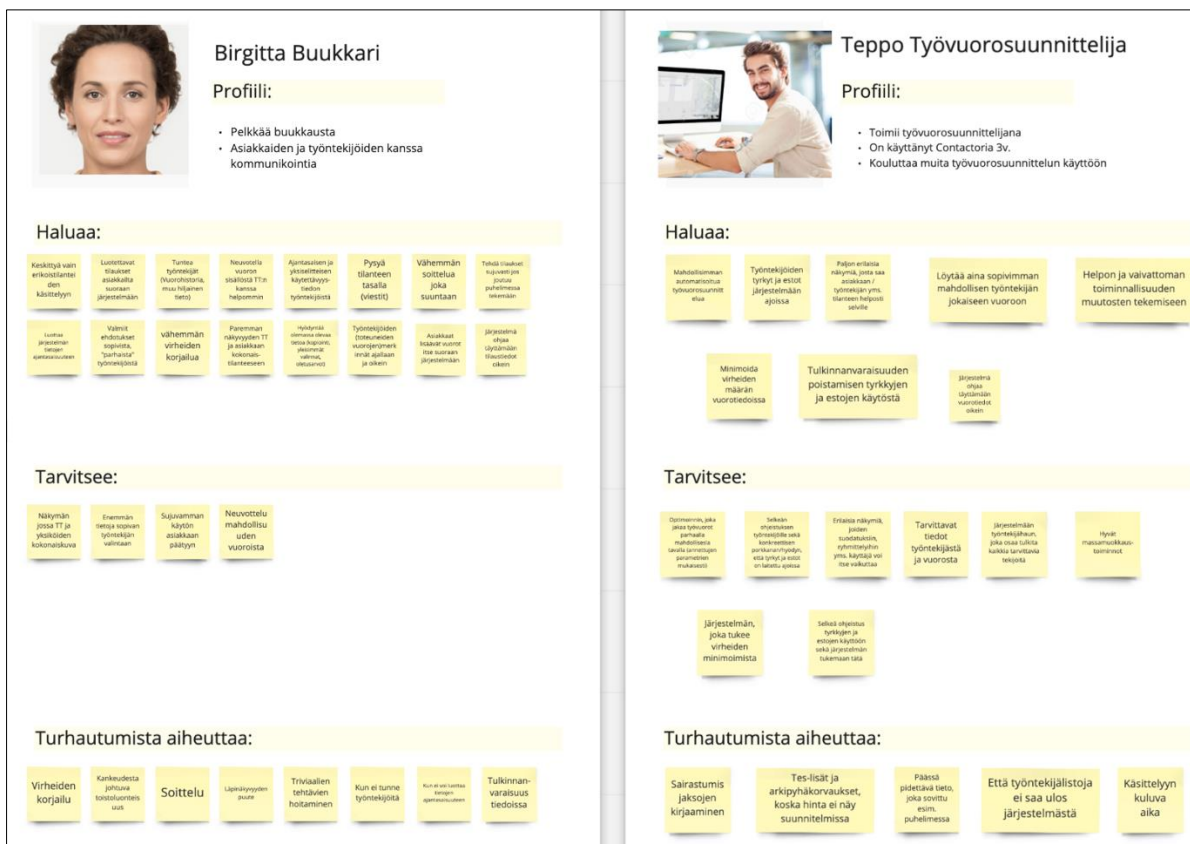


Figure 19 Research-based personas of a staffing module end-user and a workforce scheduling module end-user.

Based on these personas and user stories the Senior UX Designer and the UX / Service Designer had a wireframing and prototyping session. They created several low-fidelity prototypes of the features that had been mostly on display in different phases of the Service Design sprint. Also, a clickable prototype was created of the most voted ideas to be showed when the sprint results and findings were presented internally.

The next steps of the core Service Design team included planning a presentation of the findings for different stakeholders. The results and findings regarding the sprint were divided to the results regarding the combining of the two software modules, regarding the success of the sprint format, and to the results based on the feedback collected from the participants. In addition, all the feature ideas generated during the Service Design sprint were listed and gone through with the product owner of the software.

An internal presentation was held in Company X for all employees to share the findings of the sprint and what was learned during this pilot project. In addition, the results were sent to the customer participants of the sprint. The researcher also had a thorough discussion with the management of Company X to reflect how the pilot project succeeded and how the embedding of Service Design to Company X would be continued henceforth.

## 5 RESULTS

The results of each data collection method of the empirical research will be presented in this chapter separately. Key findings will be presented to support the answering to the three research questions. The results will be summarized in the following chapter *6 Discussion* and compared to previous findings.

### 5.1 Literature review

Service Design is partly an ambiguous concept that can be approached from several different aspects. While embedding Service Design to organizations it is crucial to clarify the meaning and purpose of Service Design for all stakeholders of the organization in question. It might not be worthwhile to put the term itself on a pedestal but to focus on the outcomes that embedding Service Design, including the principles, methods and tools, can bring to different stakeholders.

As identified in previous research (Junginger & Sangiorgi 2009; Stickdorn et al. 2018) pilot projects are in a key role when striving for organizational change such as embedding Service Design in a company. Pilot projects can minimize the risk of putting too much pressure on one project and in the worst case damaging the image of Service Design. Pilot projects can also assist in recognizing and engaging key individuals interested in Service Design and the possible benefits of utilizing it.

Possible benefits, challenges and critical factors of implementing Service Design have been identified in literature. The benefits include added value for all stakeholders as well as providing employees a common language. This can include a better understanding of the required process dependencies and stakeholder synergies to achieve specific goals. Challenges include possible change resistance and lack of resources. A critical factor when embedding Service Design to an organization builds up on finding the correct approach for the organization in question. Frederick Brooks (1986) stated that there is no silver bullet for the challenges of software engineering. Likewise, it could be stated that there is no silver bullet that works for all organizations when it comes to succeeding in embedding Service Design. Therefore, the significance of pilot projects is enhanced.

### 5.2 Focus group interview

The focus group interview gave insight to the assumptions and knowledge base the employees of Company X had towards Service Design. The results of the focus group interview were summarized to the potential benefits, challenges and critical factors that the



employees of Company X saw possible when utilizing Service Design. The general attitude towards Service Design was positive although the knowledge of Service Design differed between employees. They also acknowledged that Service Design was already utilized in the product development process to some level. However, it was stated that clear guidance and protocols were distinctly missing. The following quotation from the interviews supports the above-mentioned:

*“To some extent we might already execute Service Design but not very consciously. It could become more efficient if we would look into what the processes and tools could be – that could make our working more structured and meaningful.”*

Better and deeper understanding of the customers problem was also emphasized as a possible benefit of Service Design in several statements during the focus group interview. Employees and especially some developers highlighted that often they were not familiar with the actual use case and purpose behind the feature they developed. The employees of Company X experienced that Service Design could come in handy for understanding the customer better.

*“For me it’s motivating to know that you’re solving a real problem. It becomes more purposeful.”*

*“It’s important to know how to prioritize developing based on what is relevant and important. There’s no use developing a certain feature for weeks if it’s only used once a month. The effort is not worth the resources it takes.”*

The employees of Company X saw that Service Design could bring added value not only internally but for the customers and end-users of the software as well. The validation of the results was identified as a pain point in previous co-creation workshops with the customers which should be focused on in the future. Also, receiving feedback of the usability from the end-users in early stages of the development process was perceived beneficial. This would also engage the customers to the development process and possibly add customer satisfaction. The quotation below elucidates the viewpoint of an employee from the focus group interview:

*“When creating the final product as well as when using Service Design where the end results are a bit more abstract, validating and verifying would be very important.” ... “Previously the deal breaker has been that the customer, or all stakeholders, have not validated the results, if the outcomes are what is actually wanted.”*

Involving the relevant people to the project and overall commitment were seen as possible challenges when implementing Service Design to the processes of Company X. However, the employees of Company X saw the lack of time as the biggest challenge when talking about embedding Service Design. The employees were a bit doubtful of finding time for Service Design both internally and at the customers' end. Several employees highlighted the need of a lightweight approach in the beginning. However, some employees also identified the benefits of Service Design regarding efficient use of resources.

*“It’s also a lot cheaper to spend the time in the beginning to find out the needs so there won’t be unnecessary two weeks’ labor inputs.”*

Based on the findings of the focus group interview several critical factors were identified. The critical factors include finding a “lightweight” solution, focusing on correct matters, exploiting tacit knowledge and selecting suitable Service Design methods and tools for Company X. The following quotation from the focus group interview reflects the above-mentioned findings:

*“If the solution is lightweight, it also allows us to learn faster what works for us and at the same time we can also improve our approach as we receive feedback. As we talk, it seems that a light start could work best for all.”*

These above-mentioned possible benefits, challenges and critical factors were taken into account when planning the pilot project of Company X: The Service Design sprint. The findings of the Service Design sprint will be later mirrored to the assumptions pointed out in the focus group interview, which was carried out prior to the actual implementation of the pilot project.

### **5.3 Participant observation**

The findings from the participant observation are based on the researchers and the core project team’s informal interpretations on the stakeholders and especially the Service Design sprint participants’ feelings and preconceptions regarding Service Design. In the beginning of the action research cycle it became clear that Service Design as a concept was comprehended in varying ways. It was also noticed that several employees of Company X experienced that their work was closely related to Service Design, yet that Service Design was not actively considered. Overall Service Design was considered a positive and beneficial approach worth experimenting.

Based on the participant observation it can be stated that the researcher's notes support the findings of the focus group interview. Similar concerns such as the lack of commitment and resistance to change were raised in later internal meetings regarding embedding Service Design. On the other hand, the possible benefits identified by the management of Company X were also similar. The management perceived that Service Design could bring added value to several stakeholders. All in all, employees seemed interested of the pilot project and the upcoming Service Design sprint.

## 5.4 Semi-structured interviews

The actual findings of the semi-structured interviews contributed most to solving the practical problem of the Service Design sprint, which was finding the challenges and possibilities of combining the two software modules. However, from the point of view of research and experimenting different Service Design methods it can be concluded that the semi-structured interviews as a pre-sprint research method worked excellently. The effort and time used to conduct the interviews were rather low compared to the extent of the results. The amount of critical insight the interviews provided was as such a positive outcome of the pilot project. Figure 20 shows an example of how key findings from each interview were documented to a Miro board and classified based on the software module the challenge in the post-it note was related to.



Figure 20 Categorized findings from a semi-structured interview.

The key findings of the semi-structured interviews can be summarized to two fields. Firstly, from the viewpoint of research, Company X concluded that theme interviews via videocalls are very low-effort and provide plenty of information. In addition, the end-users and customers gladly share their knowledge and participate in such interviews. Similar interviews with the end-users had been done in Company X before but not remotely. The remote aspect brought its own benefits as the efficiency of time spent was increased for all parties.

Secondly, the key findings can be concretized to the challenges regarding the software that the end-users brought up in the interviews. The results from the semi-structured interviews were classified under frequently mentioned themes such as user errors, automation, outdated data, communication, ambiguousness, customer related factors, employee related factors, finding a suitable employee for shifts and orders as well as stages outside the software. The post-it notes under these themes were analyzed in detail and the similar ones grouped together. These were then carefully rephrased and transferred to the workshop board of Day 1. Consequently, the key findings of the semi-structured interviews were the starting point for the actual 3-day Service Design sprint.

## **5.5 Case: Service Design sprint**

The results of the Service Design sprint will be divided to the review of the sprint as a pilot project and the key takeaways of the sprint. The feedback regarding the sprint will be examined more accurately in the next subchapter. The main findings regarding combining the workforce scheduling module and the staffing module are left out of this research paper as they contribute to the practical problem rather than the actual research problem.

### **5.5.1 Pilot project**

The Service Design sprint as a first pilot project of embedding Service Design in Company X was a comprehensive and ambitious approach. The project was very fruitful and rewarding but occasionally also challenging and perhaps slightly too extensive. Based on the overall feedback several stakeholders of Company X learned a lot regarding Service Design during the action research cycle and the research process. The pilot project served as a successful kick-off for upcoming Service Design activities.

Nevertheless, it should also be stated that expectation management is in an essential role when carrying out a pilot project. Objectives and goals of the sprint in its entirety as

well as each workshop separately need to be clearly stated and communicated to participants of the sprint. In addition, communicating the findings and results to all stakeholders is crucial, in order that the stakeholders can evaluate the success and value of the pilot project. Consequently, it was noticed that the way how the discoveries of the sprint are reported and presented has a huge impact on the big picture that the stakeholders are left with of the pilot project.

Regarding the pilot project aspect, it was also discovered that the sprint challenge needs to be carefully evaluated and the scope narrowed down. It is also worth noticing that not all challenges are applicable for the sprint. If the scope and phrasing of the challenge are carefully thought and formed, the better results can be expected in the end of the sprint. Problems that allow and encourage innovative solutions are the most suitable for a Service Design sprint approach.

### **5.5.2 Key takeaways**

The key takeaways of the sprint will be further divided to the structure of the sprint and the success of the selected methods and tools. Firstly, regarding the structure of the sprint it can be stated that a 3-day Service Design sprint model including two internal workshops and one workshop with the customers worked very efficiently. Comprehensive understanding of the practical problems can be achieved through compact workshop sessions when participants are active and committed. The workshops were planned as efficient as possible as the core Service Design team wanted to optimize the allocation of time, which was highlighted as an important factor already in the focus group interview. In addition, the remote working also required shorter workshops as focusing on a full day workshop remotely could be too numbing.

However, based on the structure of the pilot project it can also be concluded that combining a design sprint and a co-creation workshop with the customers brought its own challenges to the execution of the Service Design sprint. As the knowledge from the second day was partly missing in the last workshop due to changed participants in the middle of the sprint, participants found it challenging to find the needed context on the background of the ideas that were supposed to be developed further. It was concluded that in the future it could be worthwhile carrying out separately an internal design sprint and a research phase and co-design workshop with the customers. This could ensure that ideas are not worked and designed too far with the customers, so that developing them internally is reasonable and meaningful.

It can be concluded that the sprint structure, including three intensive days of working with prework before and debriefing afterwards, is an efficient approach to implement Service Design to software development. Nevertheless, involving different participants

to different phases of the Service Design sprint needs to be carefully evaluated and if a similar approach with both internal and external participants is utilized during the next Service Design sprint, adequate transmission of background information between workshops needs to be ensured.

The methods and tools used during the pilot project were analyzed one by one. All of the check-in methods including the warm-ups were desirable and assisted in creating group commitment and presence in the start of the workshops. Also, the feeling canvas that was used as a check-out method was discovered functional. The feeling canvas focused on reflection and provided a way to receive instant feedback. Therefore, it was an excellent support for making interpretations of the participants emotions after each Service Design workshop.

The core Service Design team expressed that methods and tools used during workshop Days 1 and 2 were successful and functional as such. However, the methods and tools utilized during the working phase of the third workshop were considered unsuitable in the used format. The feature planner and the feature map were decided to be excluded from the next sprint and replaced with more suitable methods.

Regarding all work phases, it was discovered that phrasing the questions and goals was in a crucial role. The clearer examples of desired answers the facilitators gave, the better the participants were able to approach the methods and tasks and produce suitable answers. The core Service Design team established that the goal of every phase needs to be conveyed to participants better in the upcoming workshops.

The methods and tools that the core Service Design team used during pre-sprint and post-sprint activities were also decided to take along to the future sprints. As stated in the previous chapter the semi-structured interviews were an efficient research method. The debriefing board was a comprehensive approach that assisted in reflecting the sprint in its entirety. With future sprints, the core Service Design team decided to create the sprint debriefing board beforehand so that reflections could be added there throughout the sprint.

Lastly, as a key takeaway concerning the tools and methods it can be concluded that several remote work proofed methods and tools for future workshop activities were discovered. Carefully planned and professionally facilitated remote workshops can work as well as traditional ones. However, the planning of remote workshops may require extra care regarding the details as the communication between facilitators and participants is limited. Also, challenges regarding prototyping in remote workshops was noticed and therefore, this phase was left for the design team of Company X during post-sprint activities. It can also be pointed out that several stakeholders learned a lot regarding remote working practices in consequence of the remote implementation of the Service Design sprint.

## 5.6 Questionnaire survey

The key findings received through the questionnaire survey will focus on the questions that are relevant regarding the research questions of this thesis. Other questions will be left out of the evaluation. See Appendix 2 for the questionnaire in its entirety. The answers of the structured questions will be presented in the figures below and the results of the unstructured questions will be summarized under the main findings. The collection of feedback was separated between internal and external participants. The blue charts in the figures present the answers of the internal participants (Day 1 & 3) and the green charts present the answers of the customer participants (Day 2).

Based on the results from the questionnaire survey it can be stated that the customers saw the workshop more beneficial than the internal participants. Concluded from the results to the open-ended questions this may be due to the challenges faced with the last methods during the Day 3 workshop that affected the internal participants general view of the sprint. This finding highlights the importance of setting clear goals for each work phase, both while planning the workshop as well as during the actual workshop with the participants. See Figure 21 for the summarized results regarding how participants experienced the benefit of the workshop.

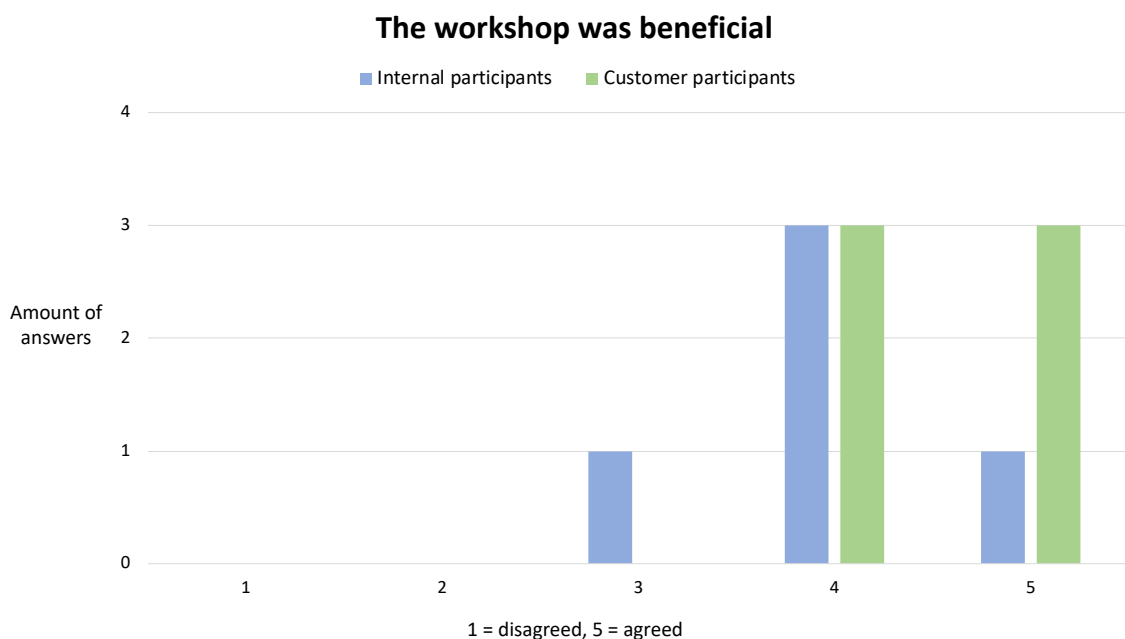


Figure 21 Survey results: the benefit of the workshop.

Both internal and external participants responded that they learned something new during the workshop. However, it was discovered that on average the customers felt that they learned more than the internal participants. This might be related to the fact that the

internal participants highlighted that the benefit of the workshop was mostly nice variation for a basic working day besides getting insight to the customers ideas and challenges. Whereas the customers emphasized more concrete factors such as learning new ways of utilizing the software from other participants and learning considerably of remote working. Figure 22 below presents how participants of the Service Design sprint experienced their learning.

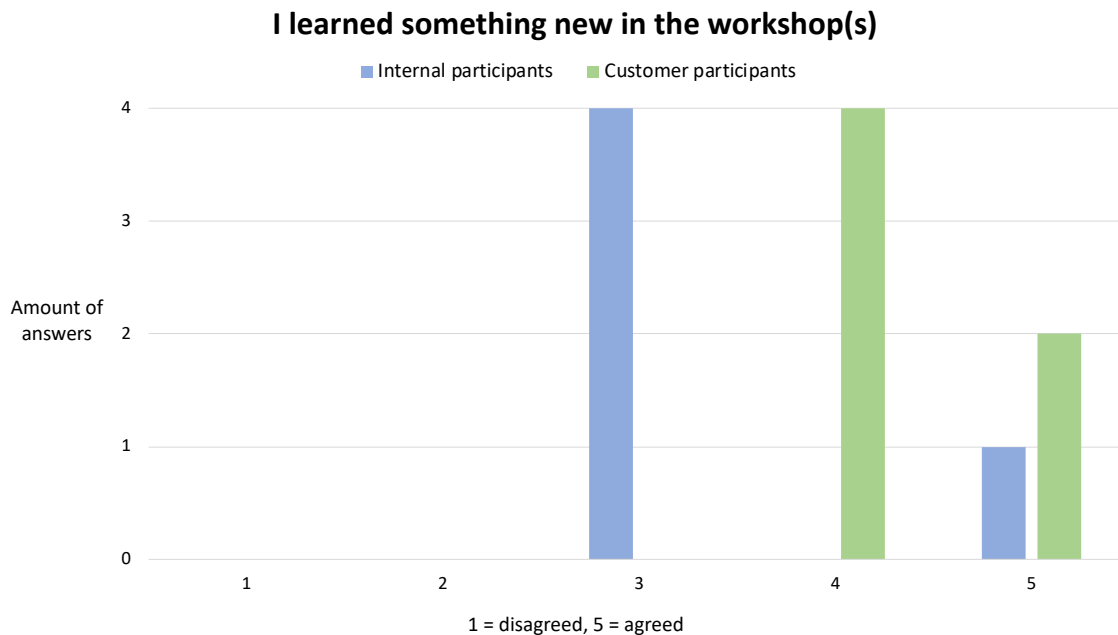


Figure 22 Survey results: learning during the workshop.

The participants were also asked about the diversity of the used methods and tools, regarding the resemblance of the approaches within each workshop. On average the internal participants were more satisfied with the diversity of the methods and tools as none of the external participants gave a five (=agreed) for this question. This might be due to the fact that the internal participants were involved in two workshops and more methods were utilized altogether. All the internal participants who answered the survey felt that the duration of the workshops was suitable whereas from the customers a few would have preferred a slightly longer duration. This may also be related to the amount of methods and tools utilized. However, most sprint participants were mostly content with the used methods. Figure 23 below presents the answers of both internal and external participants regarding the methods diversity.



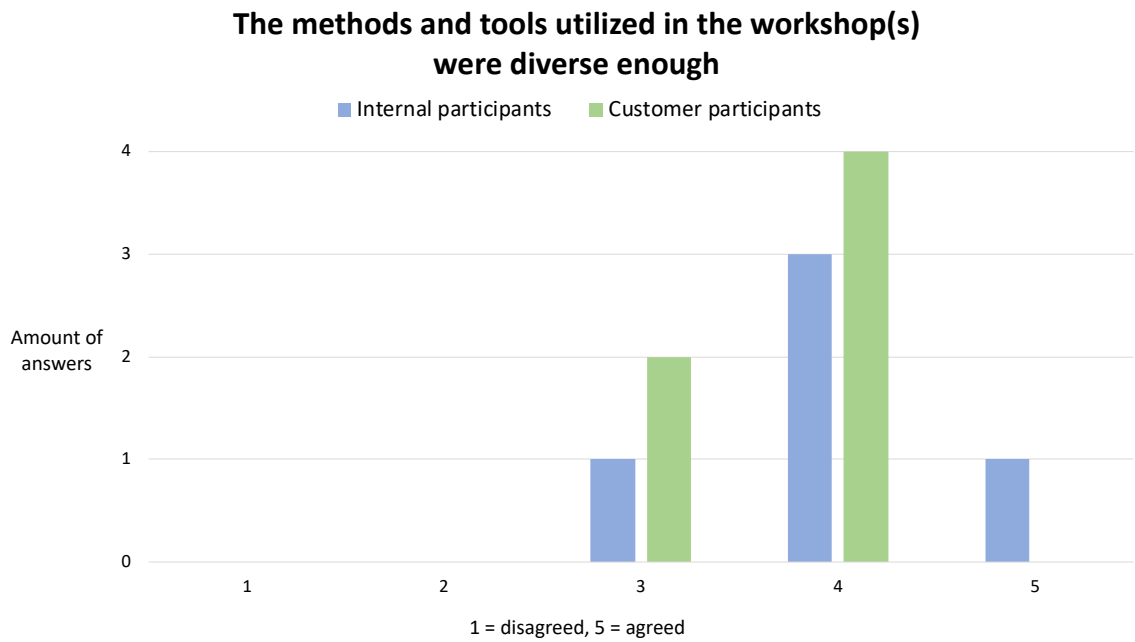


Figure 23 Survey results: variability of used methods and tools.

The feedback received through the open-ended questions was mostly positive. All participants highlighted that it is great that such workshops are held. The feedback from the customers side was very affirmative. All customers, who answered the survey, stated that the workshop was a positive experience as an entirety and that they were willing to participate in similar workshops in the future. In addition, the professionalism of the facilitators and the overall execution, especially taking into account the remote circumstances, was acknowledged.

However, the answers of the internal participants were more divided. Some highlighted that the challenges of Day 3 affected negatively the feeling of useful end results. Internal participants were partly also concerned how the final results of the sprint will turn out. This concern could luckily be helped with the final presentation of the sprint results for Company X. In addition, the results of the wireframing and prototyping were discussed with the product owner and the management in more detail, on a feature, view and function level. Internal participants also bore in mind that this was a pilot project and feedback and lessons learned would be utilized in the upcoming Service Design activities.

Lastly, it can be emphasized that all participants, both internal and external described the atmosphere of the workshops very positively. Internal participants used adjectives such as relaxed and excited, whereas the customers highlighted a supportive and pleasant atmosphere. All in all, the workshops were a success and served as a desirable starting point for embedding Service Design as an ongoing activity to Company X.

## 6 DISCUSSION

This chapter will bring together the key findings from the empirical research and compare these findings to previous research. The key findings and the discussion with previous research will be presented under three aspects based on the benefits, challenges and critical factors of implementing Service Design into software development. Each subchapter will be approached with the support of a table to present the key findings regarding the aspect in question.

### 6.1 Identified benefits

The benefits of Service Design that have been identified in previous literature regarding software development (Sauvola et al. 2018) include improved communication, instant feedback, increased motivation and innovation, mindset change, learning and decision making, identification and prioritization of features or potential market segments and value creation. The research done by Sauvola et al. focused on experimenting the prototyping methods of Service Design whereas this research had the focus on research and ideation methods. However, several similar benefits that Sauvola et al. (2018) have identified previously can be recognized based on this research. For example, improved internal motivation, delivering added value to the customer and improving the understanding of the customer and typical use cases of the software were identified based on the empirical research and are reminiscent to the benefits identified by Sauvola et al. (2018).

The activities of this research process had similarities with the activities mentioned in the framework by Furrer et al. (2016). The empirical research process was based on activities between the Service Design team and the customer. The activities were adapted from the framework by Furrer et al. (2016) and therefore the Service Design sprint included problem surfacing and structuring during pre-sprint research and the first day of the sprint, which was followed by innovation creating with the customers on the second day, with the ongoing aim of value delivering. One of the main benefits of Service Design identified in this research was delivering added value to the customer, which can be supported with the previous findings of Furrer et al. (2016).

Based on this research, the identified benefits that implementing Service Design can bring for software development are listed outright in Table 6 below. The key findings of this research are presented in the table with the information of the empirical data collection method which supports the finding as well as the reference of related findings in previous studies. The identified benefits of this research are based on the key findings of the entire research process.

Table 6 Identified benefits of implementing Service Design.

<b>Key findings – benefits</b>	<b>Provided empirical support</b>	<b>Related findings in previous studies</b>
<b>Improved internal motivation</b>	Focus group interview, Case: Service Design sprint	Sauvola et al. (2018),
<b>Improved understanding of the customer and typical use cases of the software</b>	Focus group interview, Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018), Furrer et al. (2018)
<b>Identifying the actual needs and challenges of the customer</b>	Focus group interview, Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018), Stickdorn et al. (2018)
<b>Efficient resource allocation</b>	Focus group interview, Case: Service Design sprint	Stickdorn et al. (2018), García et al. (2013), Sauvola et al. (2018),
<b>Delivering added value to the customer</b>	Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018), Furrer et al. (2016)
<b>Improved customer satisfaction</b>	Case: Service Design sprint, Participant observation, Questionnaire survey	Stickdorn et al. (2018), Furrer et al. (2018)

Improved internal motivation can be based on the results of the focus group interview as well as the Service Design sprint. Focus group interviewees felt that understanding the customer better would improve the meaningfulness and motivation of their own work. This was confirmed during the Service Design sprint as both internal and external participants stated that the approach was interesting and brought new insights to their work. Improved understanding of the customer and typical use cases as well as identifying the actual needs and challenges of the customer were reached during the Service Design sprint. Due to the professionalism and activeness of the customer participants stakeholders were able to learn a lot from each other. These benefits regarding understanding the customer comprehensively are closely related to the first benefit as the extensive understanding of the customer's needs and challenges was further discovered to improve the internal motivation of employees. The pre-sprint work of the pilot project, including the semi-structured interviews, had a great impact in achieving these above-mentioned benefits in the case study carried out in Company X.

Efficient resource allocation as an identified benefit of this research is based on the efficient structure of the Service Design sprint. The approach included recognizing the core problems the customer is facing during the pre-sprint interviews and focusing on gathering deeper insight to find out whether the problem can be solved or eased with the

software provided during the actual Service Design sprint. An approach, where the focus stays on the scoped challenge, enables comprehensive understanding of the challenge in question in a relatively short time period. Furthermore, this supports the finding of García et al. (2013) who stated that utilizing Service Design methods and tools saves time and resources as participants are able to frame, ideate and evaluate ideas more efficiently. The pilot project also proved that with Service Design workshops the amount of time used with different stakeholders can and should be optimized. This supports the finding of Sauvola et al. (2018) in respect of Service Design approaches based on collaborative workshops offering an abbreviated and efficient way of applying Service Design to software development. A compact design sprint can be used as a pre-development phase in agile software development. The remote implementation of the Service Design sprint supported the efficiency and saved time as stakeholders participated to workshops remotely and for example the time for travelling was avoided.

Delivering added value to the customer and improved customer satisfaction were identified based on the Service Design sprint and the questionnaire survey. The customers added their learning and positive feelings in the workshop through the feeling canvas check-out method. While going through the feeling canvas the customers also highlighted that the approach was very interesting and the implementation and execution successful. In addition, customers experienced that the remote implementation was very functional and that they were able to pick up several things to utilize in their own remote working.

In a way, the remote version of the Service Design sprint was also seen as forerunner. The feedback collected through the questionnaire survey strengthened the statements and findings received in the end of the workshop. The customers expressed that they would like to participate in corresponding future workshops and were satisfied with the entirety. All in all, it can be stated that the ideation workshop with the customers was a success from the viewpoint of all stakeholders.

## **6.2 Identified challenges**

The identified challenges of Sauvola et al. (2018) differ partly with the ones identified during this research. This may be due to the difference between the utilized Service Design methods. However, one similar challenge was discovered in this research regarding the finding of Sauvola et al. (2018) concerning stakeholder availability. In this research, the related identified challenges are commitment, selling Service Design as a concept to the customers and involving the relevant people to the process. Moreover, another discovered challenge of this research is that prototyping methods are difficult to execute in

a workshop context remotely. In further iterations, as prototyping methods are also experimented within the workshops, the findings can be more profoundly compared to the previous findings of Sauvola et al. (2018).

Junginger & Sangiorgi (2009) present possible challenges regarding organizational change and Service Design in their framework. The possible challenges are related to resistance to change, developing strong commitment and influencing the values, norms and assumptions in the organization. These can be associated with possible challenges identified in this research regarding commitment, internal assumptions and implementing Service Design as an ongoing activity. Similar challenges are also identified by Stickdorn et al. (2018), and especially identifying and engaging the key individuals to the Service Design project is highlighted. The possible challenges outright identified during this research, and that can be faced while implementing Service Design to software development, are listed in Table 7 below.

Table 7 Identified challenges of implementing Service Design.

<b>Key findings – challenges</b>	<b>Provided empirical support</b>	<b>Related findings in previous studies</b>
<b>Lack of time</b>	Focus group interview, Case: Service Design sprint	Stickdorn et al. (2018)
<b>Commitment</b>	Focus group interview, Case: Service Design sprint	Sauvola et al. (2018), Junginger & Sangiorgi (2009)
<b>Internal assumptions</b>	Focus group interview, Participant observation, Case: Service Design sprint, Questionnaire survey	Junginger & Sangiorgi (2009)
<b>Selling Service Design as a concept to the customers</b>	Focus group interview, Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018)
<b>Involving the relevant people to the process</b>	Focus group interview, Participant observation, Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018), Stickdorn et al. (2018)
<b>Prototyping methods in remote workshops</b>	Case: Service Design sprint	
<b>Implementing Service Design as an ongoing activity</b>	Case: Service Design sprint	Junginger & Sangiorgi (2009)

As opposed to the findings of the focus group interview the results of the pilot project advocate that the lack of time was not the biggest challenge of implementing Service

Design. Internal stakeholders as well as customers found the time for the workshops and were more than willing to participate to the Service Design sprint. Of course, it should be noted that finding the time for the first pilot project and getting stakeholders on board for workshops, does not directly denote that all stakeholders are now committed to implementing Service Design as an ongoing activity to the organization. Therefore, the lack of time and commitment should be considered as possible challenges when planning the implementation of Service Design.

Internal assumptions as well as selling Service Design as a concept to the customer were also highlighted as possible challenges in the focus group interview. Eventually, it was noticed that the concern regarding these two challenges turned out rather unnecessary during the actual Service Design sprint. Based on the results of the focus group interview the internal assumptions were seen potentially suspicious and skeptical toward Service Design. Also, reasoning the benefit of Service Design for the customers was considered as a possible challenge. The employees of Company X were concerned that the customers would not realize the benefit of Service Design and therefore neither find the required time for Service Design activities. Yet it turned out that all stakeholders, both internal and external, were excited and expectant regarding the Service Design sprint. However, it should be noticed that not all internal stakeholders participated to the pilot project and this might still arise as a relevant challenge in further iterations and actions regarding implementing Service Design as an ongoing activity to Company X. In addition, even if the customers were enthusiastic of the first Service Design workshop, it is not directly guaranteed that they will be as receptive in the future. Consequently, the importance of transmitting the benefits of Service Design for all stakeholders should be emphasized in the future.

Another possible challenge that is related to the ongoing implementation of Service Design includes involving the relevant people to the process. This was based on the findings of the focus group interview and implies primarily for the relevant people internally. Stickdorn et al. (2018) also emphasize the importance of identifying individuals who are interested of Service Design and involving them to the pilot projects. This might form challenges in the further activities of embedding Service Design, even though interested individuals were easy to find regarding the first project. The above-mentioned challenges should be taken into account as possible stumbling blocks while planning a pilot project for implementing Service Design, and equally concerning long-term plans for embedding Service Design.

### 6.3 Identified critical factors

Junginger & Sangiorgi (2009) recognize pilot projects as a seed for organizational change, which was further identified as a key critical factor regarding the implementation of Service Design during this research. The framework by Junginger & Sangiorgi (2009) presents three levels of depth that Service Design projects can reach in an organization. The depth of the level is related to the impacts and outcomes of the Service Design project. The impacts and outcomes of the Service Design pilot project carried out in Company X can be mostly placed on the first level of the framework. Most of the outcomes are based on the *Service interaction design* level which includes for example knowledge from the users and furthermore design ideas for the software interactions. The second level requires affecting the fundamental assumptions and the third level is related to organizational transformation. The Service Design pilot project was a successful starting point for both relieving the employee's assumptions regarding Service Design and initiating organizational change for adapting Service Design as an ongoing activity. Albeit, achieving the deeper levels of the framework will require further Service Design activities.

The most important critical factor when implementing Service Design to an organization can be perceived as carrying out a pilot project. In order to achieve the above-mentioned benefits and avoid recognized challenges this research suggests taking into account the following critical factors when implementing Service Design into an organization. The critical factors are proposed to be considered when planning and executing a pilot project for implementing Service Design to an organization. The critical factors identified by this research are listed in Table 8.

Table 8 Identified critical factors when implementing Service Design.

<b>Key findings – critical factors</b>	<b>Provided empirical support</b>	<b>Related findings in previous studies</b>
<b>Pilot project</b>	Focus group interview, Case: Service Design sprint	Junginger & Sangiorgi (2009), Stickdorn et al. (2018)
<ul style="list-style-type: none"> <li>• <b>Encompassing and detailed preparation</b></li> </ul>	Case: Service Design sprint, Questionnaire survey	Sauvola et al. (2018)
<ul style="list-style-type: none"> <li>• <b>Discovering suitable Service Design methods and tools</b></li> </ul>	Focus group interview, Case: Service Design sprint, Questionnaire survey	Stickdorn et al. (2018)
<ul style="list-style-type: none"> <li>• <b>Scoping the sprint challenge</b></li> </ul>	Case: Service Design sprint, Questionnaire survey	

<ul style="list-style-type: none"> <li>• <b>Focusing on appropriate challenges</b></li> </ul>	Case: Service Design sprint	
<ul style="list-style-type: none"> <li>• <b>Finding a “light-weight” solution</b></li> </ul>	Focus group interview, Case: Service Design sprint,	Stickdorn et al. (2018)
<ul style="list-style-type: none"> <li>• <b>Providing concrete results and findings</b></li> </ul>	Case: Service Design sprint, Questionnaire survey	Stickdorn et al. (2018)
<ul style="list-style-type: none"> <li>• <b>Taking into account the possible impacts of a remote implementation</b></li> </ul>	Case: Service Design sprint	

The findings of the empirical research of this study support the above-mentioned critical factors. Similar factors have been highlighted in previous literature (Junginger & Sangiorgi 2009; Stickdorn et al. 2018) regarding Service Design as well. However, this research presents the critical findings in respect of software development and hence supports the corresponding findings of Sauvola et al. (2018).

Ensuring a successful pilot project for implementing Service Design to an organization requires careful planning and professional execution. During the pilot project in Company X it was discovered that the planning phase required considerably more time in comparison to the actual execution of the Service Design sprint. This was partly due to situation regarding the global pandemic, which resulted in returning to the action planning phase and creating a remote version of the Service Design sprint. The remote implementation required a different approach for selecting the Service Design methods and tools for the workshop as well as finding the best practices and tools for remote workshops in general. Provided that Service Design is implemented in a remote working environment extra attention should be paid into planning the big picture as well as the details and purposes of each method and tool utilized during the Service Design pilot project.

Discovering the suitable Service Design methods and tools demands that methods and tools are experimented. Consequently, they can be proved practical or alternatively taken under further revision and developing them more suitable if possible. Therefore, the methods and tools selected for the first pilot project must be chosen based on the Service Design know-how of the team working on the pilot project as well as on the literature and other information regarding the Service Design methods and tools available. Discovering suitable methods and tools was discovered to be related with the following two critical factors: scoping the sprint challenge and focusing on appropriate challenges. As stated in the results chapter, not all problems are ideal for the Service Design sprint approach. Scoping the sprint challenge is in a crucial role regarding the success of the sprint. The better the challenge is specified and narrowed down, the preferable results and findings



will be received in the end of the sprint. This also applies to the use of the Service Design methods and tools. The purpose of each method and tool needs to be clearly planned and expressed to the participants. The above-mentioned can be associated with focusing on appropriate challenges in the similar way. During the pilot project it was discovered that the more the challenge allows innovative solutions the more convenient it is to approach with the Service Design sprint.

Finding a light-weight solution was proposed as a starting point for implementing Service Design during the focus group interview. Albeit, the Service Design sprint approach that was carried out as the pilot project in Company X was rather comprehensive and extensive, a light-weight approach is worth considering. On the other hand, if the purpose of the pilot project is clearly communicated to all stakeholders and the possibility of results of all manners is emphasized, also a more extensive pilot project can be carried out. The importance of communication is highlighted during the pilot project and especially presenting the results and findings of the Service Design pilot project for all stakeholders is essential. Moreover, expressing what was learned from the pilot project and what will be done differently in the next iteration of Service Design is important in order to assure all stakeholders of continuous improvement. As follows, the next iteration of implementing Service Design can begin and the benefits of Service Design will be concretized in the organization even better over time.

## 7 CONCLUSIONS

### 7.1 Conclusions

Service Design is a relatively novel concept in the entirety of various design approaches. The implementation of Service Design into software development has been only partially studied. Research regarding the benefits and challenges concerning the utilization of Service Design precisely in software development is likewise rather deficient. The aim of this research was to experiment applying Service Design methods and tools in software development through a pilot project carried out in a Finnish software company. By means of the research process outright, this master's thesis aimed to answer the following research questions:

1. **What is Service Design?**
2. **How can Service Design methods and tools be implemented into internal processes in B2B software development?**
3. **What are the benefits, challenges and critical factors when implementing Service Design methods and tools into software development?**

The results from the literature review answer the first research question of this master's thesis: "*What is Service Design?*" The key findings based on the literature review can be summarized by stating that Service Design is a comprehensive approach that includes several methods and tools for the improvement of a new or an existing service. Service Design emphasizes a holistic and collaborative approach which enables co-creation of value between the service provider and the customer. The principles of Service Design concretize the aim that Service Design aspires for. They are based on a human-centered, collaborative, iterative, sequential, real and holistic approach for creating value for all stakeholders.

The second research question "*How can Service Design methods and tools be implemented into internal processes in B2B software development?*" was addressed by mapping out a suitable way of experimenting the implementation of Service Design to the case company. The research question was first approached with the focus group interview in order to acquire understanding of the assumptions and knowledge that the employees of Company X had related to Service Design. The results of the focus group interview disclosed that employees of Company X saw potential benefits regarding Service Design such as improving internal motivation and understanding the customer more profoundly. However, employees were simultaneously concerned of the lack of time and commitment regarding both internal and external stakeholders. The factors that were highlighted in the

focus group interview were taken into account while planning the pilot project for implementing Service Design methods and tools in Company X. In addition, the literature review supported initiating the implementation of Service Design with a pilot project.

The Service Design sprint was created based on the knowledge gained from the literature review as well as utilizing the know-how of the employees of Company X. On the grounds of the research process it was discovered that implementing Service Design methods and tools into internal processes requires Service Design to be considered as an ongoing activity in the organization. This means that in order to embed Service Design to the organization permanently further Service Design iterations are required. The Service Design activities should be continuously improved and modified if needed to achieve even better results.

It can be stated that a carefully planned pilot project is in a key role when implementing Service Design into B2B software development. Regarding the second research question it can be concluded that Service Design can be implemented to B2B software development through a pilot project, for example a Service Design sprint, which involves both internal and external stakeholders. Moreover, it was experimented that a compact Service Design sprint can be used as a pre-development phase in agile software development. In addition, to be able to carry out a successful Service Design pilot project it is crucial to communicate the objectives of the pilot project as well as the results and findings to all stakeholders.

The third research question *“What are the benefits, challenges and critical factors when implementing Service Design methods and tools into software development?”* was first addressed through the focus group interview by initially mapping out the benefits, challenges and critical factors that employees of Company X saw possible regarding the implementation of Service Design. These findings were then taken into account while planning action and creating the pilot project which was based on the three-day Service Design sprint. Lastly, the final results of the pilot project were mirrored and compared to the previous findings of the focus group interview while evaluating and specifying learning.

Regarding the third research question it can be concluded that the possible benefits of Service Design in software development include improved internal motivation, improving understanding of the customer and typical use cases of the software, identifying the actual needs and challenges of the customer, efficient resource allocation, delivering added value to the customer and improved customer satisfaction. Furthermore, achieving all these benefits while utilizing Service Design can simultaneously assist the organization in finding a common language between different teams and stakeholders. On the other hand, the possible challenges that may be faced when implementing Service Design in software development are related with the lack of time and commitment, internal assumptions, selling Service Design as a concept to the customer, involving the relevant

people to the process, prototyping methods in remote workshops and implementing Service Design as an ongoing activity.

Related to the identified benefits and challenges it can be further concluded that the motivation or reason behind the above-mentioned factors often depends on the stakeholder in question. For example, the lack of time for Service Design activities from the developers point of view may be related to the pressure of delivering new features promptly, whereas from the customers point of view this may be due to the fact that they might need a permission for participating to a Service Design sprint from their superiors, who might not realize the value of Service Design activities with the service provider. In order to truly understand the motivations behind the identified benefits and challenges, further research about the background of different stakeholders may be required. The findings could then be advisable to consider while planning the pilot project for implementing Service Design.

This research proposes that by taking into account the following critical factors when implementing Service Design into software development the above-mentioned challenges are more likely to be overcome and consequently the above-mentioned benefits are more likely to be achieved. The critical factors when implementing Service Design are composed on the pilot project carried out in Company X. The key critical factor identified by this research is starting the implementation of Service Design through a pilot project. Other critical factors identified are suggested to be considered while planning and executing the Service Design pilot project in question. The critical factors regarding the pilot project consist of detailed and encompassing planning, discovering suitable Service Design methods and tools, scoping the sprint challenge, focusing on appropriate challenges, finding a lightweight solution and providing concrete results and findings.

In addition, this research demonstrated that carrying out a design sprint remotely is possible and profitable. While planning a remote implementation of Service Design the remote aspect should be consciously investigated as working remotely may bring its own challenges to the implementation.

The theoretical contribution of this thesis is based on guidelines for carrying out a pilot project for implementing Service Design in B2B software development. The identified benefits, challenges and critical factors are presented to support the findings in previous research as well as to offer new insights. The practical contribution of this research can be associated with Company X and its customers. Company X may utilize the original plan of the Service Design sprint as well as the remote version, for approaching and solving future challenges. In addition, the concrete results of the Service Design sprint will be useful for the product development of Company X. The pilot project also served as a desirable basis for embedding Service Design to Company X as an ongoing activity. The customers of Company X will benefit of a more customer centric approach and have the chance of co-creation with the service provider through future Service Design workshops,

resulting in a better product. In addition, the practical implications of the findings may also be useful for other software companies striving to implement Service Design.

## **7.2 Limitations and future study**

The limitations of this research include that the research was carried out in a case company, which means that the results may differ in distinct circumstances. Therefore, generalizations based on the results of this research are limited. Albeit, the results provide an approach for implementing Service Design to software development, the sprint was just one way of carrying out a pilot project. Different approaches may be discovered more suitable and functional in other organizations. Therefore, each organization should discover the best practices for embedding Service Design in the organization in question.

For future studies this research suggests validating the Service Design sprint model. It can be stated that the Service Design sprint model presented in this research requires further iterations before it can be considered practical. For example, experimenting the Service Design sprint as the first phase in agile software development could be further studied. The way Service Design and agile software development may be able to complete one another is worth examination in practice. In addition, evaluation of combining a design sprint and a co-creation workshop would be interesting.

Another topical subject of research would be comparing the results of traditionally held workshops to the remote workshops. The remote working aspect is truly actual considering the current situation globally.

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**APPENDIX 1 – INDEX OF RESEARCH MATERIAL**

<b>Material</b>	<b>Date</b>
Focus group interview	28.10.2019
Weekly Service Design sprint planning meetings	24.2. – 12.3.2020
Weekly remote Service Design sprint planning meetings	23.3. – 27.4.2020
Semi-structured interview 1	27.4.2020
Semi-structured interview 2	27.4.2020
Semi-structured interview 3	28.4.2020
Semi-structured interview 4	28.4.2020
Semi-structured interview 5	28.4.2020
Semi-structured interview 6	28.4.2020
Semi-structured interview 7	29.4.2020
Semi-structured interview 8	30.4.2020
Service Design Sprint	5.– 7.5.2020
Survey for Service Design sprint participants	Sent 7.– 8.5.2020
Debriefing sessions of the Service Design sprint	11.– 15.5.2020

## APPENDIX 2 – QUESTIONNAIRE SURVEY

### Service Design sprint – Day 1 & 3

Kiitos osallistumisestasi Service Design sprintin työpajoihin! Arvostaisimme, jos jättäisit nopean palautteen tämän lomakkeen kautta, jotta seuraavaa sprinttiä voidaan kehittää. Day 1 koostui pohjalla olevien ongelmien työstämisestä ja syvemmän ymmärryksen hakemisesta ongelmaan asiakkailta kerättyjen haastattelutulosten pohjalta. Day 2 fokuksena asiakkaiden kanssa oli ideointi. Day 3 koostui edellisen päivän asiakastyöpajan eniten äänestettyjen ideoiden konkretisoinnista. Vastaathan kyselyyn molempien päivien perusteella, kiitos!

1. Workshop oli hyödyllinen

*Mark only one oval.*

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

2. Workshopin ohjeistus oli selkeää ja riittävää (fasilitointi)

*Mark only one oval.*

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

3. Opin uutta workshopissa

*Mark only one oval.*

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

## 4. Miro oli työkaluna helppo oppia

Mark only one oval.

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

## 5. Workshopissa käytetyt menetit olivat riittävän monipuolisia (vs. metodien toistoluonteisuus)

Mark only one oval.

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

## 6. Ongelman asettelu oli selkeää

Mark only one oval.

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

## 7. Workshopin kesto oli

Mark only one oval.

- Liian lyhyt
- Hieman liian lyhyt
- Sopiva
- Hieman liian pitkä
- Liian pitkä



12. Osallistuisin vastaavaan workshopiin mielellään jatkossakin

*Mark only one oval.*

	1	2	3	4	5	
Eri mieltä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Samaa mieltä

13. Kuvaile lyhyesti workshopin ilmapiiriä

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14. Kuvaile workshopin antia/hyötyä itsellesi

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15. Kehittäisitkö/muuttaisitko jotain?

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16. Muuta? (risut ja ruusut)

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