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SERVICE DEVELOPMENT IN A LARGE MANUFACTURING FIRM

A qualitative study of how the NBCS team at Volvo Cars can work with service development from a perspective of user-oriented approaches

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ABSTRACT

The environment for manufacturing firms is changing due to numerous factors, and the firms can no longer compete by solely offering physical products. Servitization is the process where manufacturing firms transform to compete through both physical products and services. Therefore, it is essential to have a process for developing services in place. This qualitative case study aims to identify an appropriate way for the NBCS team at Volvo Cars to work with service development from the perspective of user-oriented approaches, while considering the trend of servitization. The result has identified certain characteristics of user-oriented approaches suitable to include in typical stages, as well as throughout the whole service development process. The certain characteristics are based on theory and are further extended based on empirical findings. Findings for example show that the process as such should be of iterative design, have a high customer involvement, and include extensive experimentations. To be able to work as fast, flexible, and iterative as needed when developing services, top management support is essential, and a culture of risk and failure acceptance is considered favorable. The findings in the study have together been summarized in a model for service development, which outline an appropriate way for the team to adopt.

Key search words

Servitization, Service development, User-oriented approaches, Lean start-up, Design thinking, Lean service creation, Service development process

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List of Abbreviations

NBCS	New Business and Connected Services
NPD	New Product Development
NSD	New Service Development
MVP	Minimum Viable Product
BMC	Business Model Canvas
LSM	Lean Start-up Methodology
DT	Design Thinking
LSC	Lean Service Creation
F2F	Face-to-face

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1. INTRODUCTION

1.1 BACKGROUND

Today's global competitive environment is recognized with new challenges. According to Fischer, Gebauer and Fleisch (2014), product manufacturers invest heavily in developing new innovations and product technologies with the aim to reduce time to market and to achieve cost optimizations. However, over the last decade, the business environment for manufacturing firms has undergone a major change. New technology solely is therefore no longer enough to differentiate manufacturing firms' offerings (Gebauer, Gustafsson & Witell, 2011; Kowalkowski et al., 2012), and solely focusing on the traditional elements such as owning tangible assets, controlling costs and maintaining quality will no longer be sufficient for business success. Business success is rather dependent upon invention of new business models, protection against imitation, and discovery and development of opportunities (Teece, 2009). Manufacturing companies in developed economies need to move up the value chain and thus compete with the value delivered, rather than on the basis of cost (Martinez et al., 2010). Forces of deregulation, globalization, technology evolution, and fierce competition pressure manufacturing firms to more drastically move into offering services. The consumption behavior that historically has been driven by production and consumption of tangible goods is changing, as services now are dominating the world economy (Vandermerwe & Rada, 1988). According to the World Trade Organization (WTO), the service sector is accounting for as much as 70 % of the world GDP, and is today the fastest growing sector globally (WTO, 2015). The companies of the future will be those who manage to identify the opportunities in developing and offering services, as these companies therefore will retain customers and thus sustain a competitive advantage (Vandermerwe & Rada, 1988).

The term 'servitization' was coined by Vandermerwe and Rada (1988), and refers to the process where manufacturing firms transform to compete through physical products and services, rather than competing with physical products alone. Servitization is thus a strategic innovation by an organization that is deciding to shift capabilities and processes from selling physical products into selling an integrated product-service offering that deliver value to the customer (Martinez et al., 2010; Baines et al., 2013; Vandermerwe & Rada, 1988). The main focus has earlier been on satisfying the customers' needs through core business activities, while the main emphasis is, to a larger extent, now focused on the establishment and maintenance of the relationship between the organization and the customer (Vandermerwe & Rada, 1988). The traditional balance between the supplier and the customer has changed in the global economy due to increased transparency as a result of technological developments. New solutions within communication and computing have lead to a better bargaining base for the customers, since the customers are more informed than ever and are thereby aware of their options. The way of doing business must therefore transform to be more customer-centric (Vandermerwe & Rada, 1988; Teece, 2010).

1.2 VOLVO CARS AND SERVITIZATION

The automotive industry has historically been one key field of production of physical goods (Mahut et al., 2016). The industry is under transformation due to the four technology-driven trends of *mobility, connectivity, electrification* and *autonomous driving* (McKinsey & Company, 2016), as well as the trends of globalization, digitalization, individualization, demographic changes, new ways of consumption, and constraints of sustainability (Mahut et al., 2016; IBM, 2004). Benefits associated with being a company of large size, are no longer a guarantee for success, and only those companies who find new ways of creating value will prosper in the future (IBM, 2004). The product side of the car manufacturing industry is mature, whereas the service side is currently on the rise (Mahut et al., 2016). Every contact with the customer is a chance of building a valuable relationship, and the service business can therefore become a brand-building factor (PWC, 2014).

Volvo Cars is today one of the most well-known and respected car brands in the world, with sales in approximately 100 countries. Ever since Volvo Cars was founded in 1927, the company has manufactured and sold vehicles to enable transportation and facilitate people's everyday life while having a strong focus on innovation. Volvo Cars' philosophy is, besides facilitating people's everyday life, to put people first and to develop and deliver solutions, while at the same time strengthen their own commitment to quality, safety, and the environment (Volvo Cars, 2017).

Throughout the years, Volvo Cars has strived to constantly improve their cars in order to retain their global position, and thereby their main focus has been on physical products. However, various external factors such as changes in demographics, customer preference, and environmental aspects are increasingly putting pressure on Volvo Cars to change in order to stay competitive in the fast changing environment (Volvo Cars, 2016a). This has resulted in Volvo Cars no longer being able to solely compete with their cars, they must rather be able to provide and sell a concept of integrated products and services. One example of how Volvo Cars has adapted to the trend of servitization is the digital service Volvo In-car Delivery that was launched in November 2015 as the world's first in-car delivery service available commercially (Volvo Cars, 2016b).

1.3 PROBLEM DISCUSSION

Due to Volvo Cars' long history of being a company offering inflexible physical products, developing and offering services is not that simple. Service development is a fairly new and unexplored area within the company, however Volvo Cars must and have realized that they have to successfully develop services in order to stay competitive in the industry. The New Business and Connected Services (hereafter named 'NBCS') team at Volvo Cars works with the acceleration of connectivity enabled services and offers. Today, a clear approach or procedure of how to work with service development has not yet been incorporated, and the

team therefore seeks to understand how they could work with service development in an appropriate way[1].

In order to investigate current processes for service development at Volvo Cars, a pre-study was conducted where five employees working with service development at other departments than the NBCS team participated. The understanding of the subject from an internal point of view will enhance and make the recommendation to the team more suitable. Through the findings from the pre-study it was clear that the company is fragmented regarding service development. A lack of collaboration, a common process, and an aligned strategy, was evident. (See Appendix B for the full version of the empirical findings from the pre-study.)

In an initial discussion with the supervisor at the NBCS team, it was expressed that the team wanted to learn more about how the development methods *lean start-up* and *design thinking* could be used when developing services. It was also expressed that the team was interested in insights regarding how other large manufacturing firms, currently undergoing the same transition, in various industries work with service development[2]. According to Mueller and Thoring (2012), both lean start-up and design thinking are classified as *user-oriented* approaches, which involve potential users, customers, or other stakeholders in the development process. 'Customers' and 'users' will hereafter be treated equally, as customers also are included in the user-oriented approaches, as well as the fact that customers are also often the user. To dig into the user-oriented approaches even further, the authors will therefore aim to include a recently established approach within the field. These factors all together initiated the setup for this thesis project.

1.4 RESEARCH QUESTION

The objective of this thesis is to support the NBCS team at Volvo Cars in investigating how they could work with service development in an appropriate way. Considering the current situation for large manufacturing firms regarding servitization, combined with the problem discussion, the resulting research question has been formulated accordingly:

- What could be an appropriate way for the NBCS team to work with service development from a perspective of user-oriented approaches?

To answer the research question, the two best practices within the area of user-oriented approaches (i.e. *lean start-up* and *design thinking*) together with a newer research derived from the literature review, will be brought forward in the theoretical framework. Moreover, individuals at external case companies will be interviewed to find out how other large companies currently in the same situation as Volvo Cars work with service development and identify how these undertake a perspective of user-oriented approaches.

[1] Interview with Lina Bakker, Consultant, New Business & Connected Services, Volvo Cars, 2017-01-21
[2] Interview with Lina Bakker, Consultant, New Business & Connected Services, Volvo Cars, 2017-01-21

1.5 DELIMITATIONS

The context in which the case companies operate in will not be investigated or discussed, as focus will be on internal structures and processes for developing services. However, it will be important to bear in mind that the context in which the case companies operate in most likely will have an effect on their way of working with service development. Another delimitation for this study is that the authors will not focus on investigating areas regarding the launch of the service, and therefore this will therefore not be discussed with the respondents or in the analysis.

1.6 DISPOSITION

The outline of this thesis is summarized in Figure 1, where the relevant content for each section also is included.

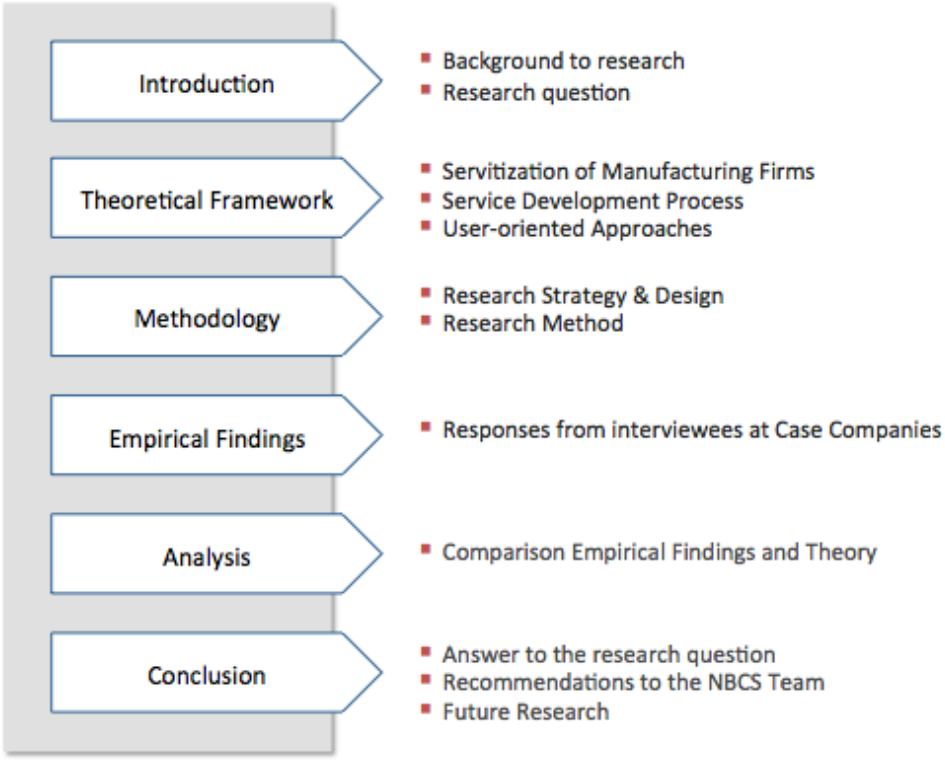

Figure 1. Outline of Thesis

2. THEORETICAL FRAMEWORK

Figure 2 has been included to facilitate the reader's understanding of how the theoretical framework is structured.

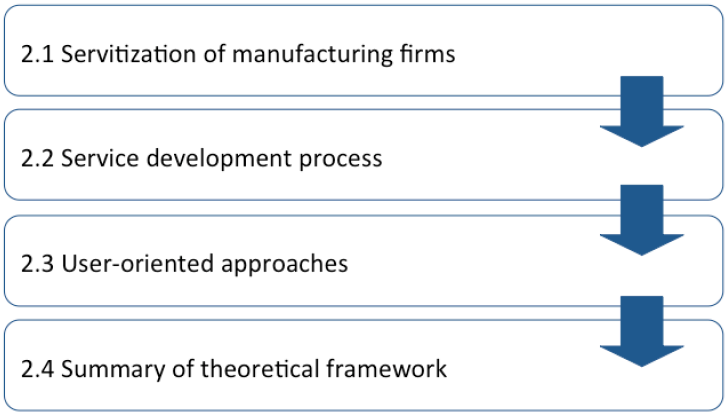

Figure 2. Disposition of theoretical framework

2.1 SERVITIZATION OF MANUFACTURING

Servitization is the process where manufacturing firms transform to compete through physical products and services, rather than competing with physical products alone (Vandermerwe and Rada, 1988), and according to WTO, the service sector is today the fastest growing sector globally, and accounted for approximately 70 % of the world GDP in 2015 (WTO, 2015).

Companies can successively move from being a product manufacturer towards being a service provider, and there are different levels in the movement (see Figure 3). When a manufacturer is servitizing - the company moves down the ladder towards offering pure services (Fischer, Gebauer & Fleisch, 2014; Kotler & Keller, 2016).

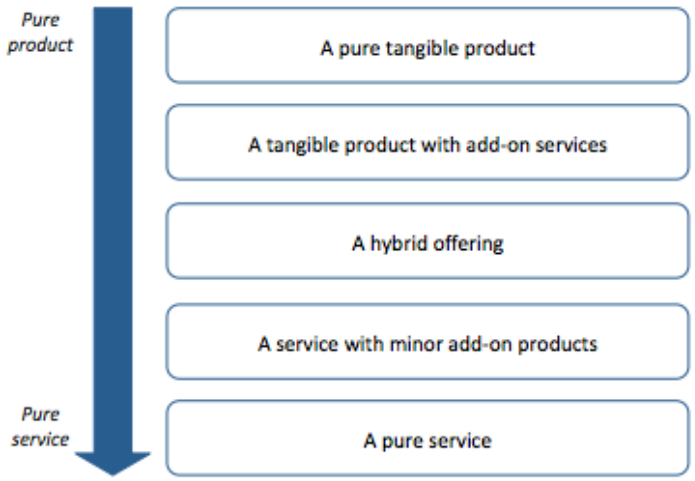

Figure 3. Levels from pure product to pure service (Kotler & Keller, 2016)

Why firms are servitizing depend upon various reasons. Some might see it as the natural progression for their business, and others as the obvious way of creating new opportunities (Vandermerwe & Rada, 1988). In some industries, manufactured products are sold to the customers at cost price, since intense competition results in a situation where the product price almost equals the manufacturing cost. Adding services to the company offer can therefore be a potential solution to the eroding product margins (Fischer, Gebauer & Fleisch, 2014). To servitize can also be a strategic innovation in order to capture market share, to create competitive advantage (Martinez et al., 2010; Baines et al., 2013; Vandermerwe & Rada, 1988; Fischer, Gebauer & Fleisch, 2014), and a way to differentiate against competitors (Fischer, Gebauer & Fleisch, 2014; Vandermerwe & Rada, 1988). The adding of services can thus defend the company against competitors by locking-in and retaining customers, which in turn also lock out competitors (Lightfoot, Baines & Smart, 2013). According to Fischer, Gebauer and Fleisch (2014) and Valtakoski (2016), services are also seen as a more stable source of revenue than physical products, and stated to be more profitable.

Many manufacturing firms have recognized the strategic advantages of providing services to their customers (Martinez, et al., 2010; Vandermerwe & Rada, 1988), and in order to stay competitive, it is essential for companies to understand how to optimize the process for new service development (NSD) (Fitzsimmons & Fitzsimmons, 1999). However, the transition constitutes some major challenges for the product manufacturer, since the organizational structures, principles, and processes needed for service development are new to the product manufacturer (Oliva & Kallenberg, 2003; Brax, 2005), and product manufacturers currently undergoing the transition find it difficult to know how to work with service development in the most appropriate way (Vinnova, 2009).

2.2 SERVICE DEVELOPMENT PROCESS

There are inherent differences between physical products and services that can aggravate the adding of services to the manufacturing firms offering. Services are, compared to physical products, *intangible* and also differ in terms of *inseparability, variability* and *perishability* (de Brentani, 1991). The application of a new product development (NPD) models to services might therefore not be sufficient in describing how services are optimally developed (Fitzsimmons & Fitzsimmons, 1999). The NSD process is defined as a set of broader stages that moves the service from idea to final launch (Fitzsimmons & Fitzsimmons, 1999).

How the process for service development look like can however vary. Fitzsimmons and Fitzsimmons (1999), Bowers (1987), and Scheuing and Johnson (1989) have all constructed processes for service development (see Table 1). In the attempt to identify common and generic stages of a service development process, the process models presented in Table 1 have been studied for their similarities. The authors of this study thereafter decided to create own generic stages based on the process models presented.

Processes for service development		
Bowers (1987)	**Scheuing & Johnson (1989)**	**Fitzsimmons & Fitzsimmons (1999)**
Developing a business strategy *- Formulation of long-term strategic direction*	Direction *- Formulation of new service objectives or strategy* *- Idea generation* *- Idea screening*	Design *- Formulation of new services objective/strategy* *- Idea generation* *- Concept development and testing*
Develop a new service strategy *- Plan the outlines the type of services to be developed*	Design *- Concept development* *- Concept testing* *- Business analysis* *- Project authorization* *- Service design and testing* *- Process and systems design and testing* *- Marketing and program design and testing* *- Personnel training*	Analysis *- Business analysis* *- Project authorization*
Idea generation *- Formal process for soliciting ideas for new services*	Testing *- Service testing and pilot run* *- Test marketing*	Development *- Service design and testing* *- Process and system design and testing* *- Marketing program design and testing* *- Personnel training* *- Service testing and pilot run* *- Test marketing*
Concept development and evaluation *- Refining and developing the concept of the new service*	Introduction *- Full-scale launch* *- Post-launch*	Full launch *- Full-scale launch* *- Post-launch review*
Business analysis *- Determining the profitability and feasibility of the new service*		
Service development and testing *- Developing and testing prototypes*		
Market testing *- Limited testing of both the service and the marketing mix variables*		
Commercialization *- Full-scale introduction to the public*		

Table 1. Three processes for service development (Fitzsimmons & Fitzsimmons, 1999; Bowers, 1987; and Scheuing & Johnson, 1989)

Firstly, all three models start with some kind of ***Opportunity identification***, where ideas for new services are generated and screened. Secondly, all models have elements of ***Evaluation***, where concepts are formed and business analyses are performed. Thirdly, the models all have ***Development*** embodied in the form of service testing, prototypes and pilot runs. And finally,

the models all have a ***Launch*** stage, in which the service is commercialized and fully introduced on the market (Fitzsimmons & Fitzsimmons, 1999; Bowers, 1987; Scheuing & Johnson, 1989). Out of these four identified stages, the first three will hereafter be used as generic stages of a service development process. As mentioned before, the investigation of the service launch lies outside the scope of this thesis, and will therefore not be discussed.

2.3 USER-ORIENTED APPROACHES

According to Mueller and Thoring (2012), lean start-up and design thinking are both classified as user-oriented approaches, as both involve customers, potential users, or other stakeholders in the service development process. The approaches also focus on extensive testing in order to improve the concepts under development (Mueller & Thoring, 2012). *Lean service creation* represents newer research on the subject of user-oriented approaches, and is a methodology that combines lean start-up, design thinking and the agile philosophy (Futurice, 2017a).

2.3.1 LEAN START-UP

Lean start-up is a methodology that favors experimentation, customer feedback, and iterative design, over elaborate planning, intuition, and "big design up front" development (Blank, 2013).

2.3.1.1 BACKGROUND

The name of the method is derived from the principles of the Toyota Production Systems's lean manufacturing philosophy. In lean manufacturing, focus is put on the identification and minimization of waste in the production process (Emiliani, 2006). Anything that provides benefit to the customer is considered valuable - anything else is waste (Ries, 2011). The traditional way of launching a new enterprise starts with the founder writing a business plan that can be pitched to investors. After the entrepreneur has received enough investment capital from the investors, the development of the product or service starts. In the traditional approach, you are not provided with the possibility to receive customer feedback until after the product has been built and launched. At the time you receive the customer feedback, you have already put an extensive amount of time and effort on a solution the customers might not even want. One of the most critical differences between the traditional approach and the lean start-up approach is therefore that the founders of lean start-ups do not start with writing a business plan, - they start searching for a business model (Blank, 2013).

Even though the lean start-up methodology by name sure sound like a method mainly suitable for start-ups, studies have shown that there might be large benefits to be gained by large organizations as well by practicing lean start-up thinking (Croft, 2016; Panetta, 2016; Innovation Leader, 2016; Kirsner, 2016; Blank, 2013). By practicing the principles of lean start-up, large companies will be able to get customer feedback sooner - before an extensive amount time and resources are spent - and receive actual important data from the outside

world when developing solutions, rather than relying on their own forecasts and projections (Innovation Leader, 2016). Gartner estimates that by year 2021, more than 50% of the established companies in the world will be leveraging the techniques of lean start-up (Panetta, 2016).

2.3.1.2 THE LEAN START-UP PROCESS

The lean start-up methodology has three key principles. Use the framework *business model canvas* to frame your hypotheses, *customer development* to "get out of the building" and test the hypotheses, and *agile development* to build the product or service incrementally and iteratively (Blank, 2013).

In the lean start-up methodology it should be accepted that all you have on day one is a number of untested hypotheses. Instead of writing a business plan, the hypotheses are summarized in a framework called business model canvas (BMC) (Blank, 2015), such as the one including nine building blocks of interconnected components developed by Osterwalder and Pigneur (2010). The BMC is a visual chart that represents all the elements of a business model, and explain how a company creates value for its customers and for itself. The nine building blocks are: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure (Osterwalder and Pigneur (2010). In the lean start-up methodology, each of these components is filled with a number of hypotheses that need to be tested, and the hypotheses thus span everything from who the customer is to what distribution channels to use. A BMC can be used to develop new business models, or develop already existing business models since it can help users understand the organization's current business model (Blank, 2015; Joyce & Paquin, 2016). These will thereby also serve as guidelines for designing the business model of tomorrow (Blank, 2013; Osterwalder & Pigneur, 2010).

To test the hypotheses framed in the BMC, the companies who are practicing lean start-up methodology use a "get out of the building" approach named *customer development*. A series of experiments are developed and tested outside the building in order test real customers' reactions to the hypotheses and turn them into facts during an iterative process (Blank, 2013; Blank, 2015). One of the major benefits of involving customers in the development process is that it can combat some of the internal beliefs and biases an organization might have about customer demand and behavior (Innovation Leader, 2016). To determine whether the hypotheses regarding the customer, the problem, and solution in the BMC are correct, the company must find potential customers for evaluation (Blank, 2007). Blank (2007) argues that the company can create and use a so called 'innovators list' that contains customers who are smart, respected, and usually early adopters of new things. Complex hypotheses might require several interviews with the same respondent, where the first one is focused on the most essential questions, while the latter more on understanding customer behavior and to investigate the market (Furr & Ahlstrom, 2011). It is therefore also important to gain market knowledge by looking at industry trends and such (Blank, 2007).

The most effective way to start learning is to test the proposed solution on the customers by building a minimal viable product (MVP) (Blank, 2015; Ries, 2011). An MVP is a version of the solution that contains just enough features for customers to be able to evaluate, which is built with a minimized development time and least amount of resources (Croft, 2016; Ries, 2011). It can be very beneficial since many customers do not acknowledge what needs to be improved until they get the proposed solution in front of them (Ries, 2011). Therefore, companies at this stage create an MVP to facilitate potential customers' understanding of the solution in order to gather validated learning about the solution and its future development (Blank, 2013; Blank, 2015). When testing the MVP, agile development is practiced. Agile development is an approach to project management, derived from the world of software engineering, and works hand-in-hand with customer development (Blank, 2013). In comparison to traditional year long product development cycles where customers' problems and needs are assumed, agile development develop the solution incrementally in short and repeated cycles, which eliminates wasted time and resources (Blank, 2013; Blank, 2015; Stickdorn & Schneider, 2012; Cline, 2015). Agile development is therefore a "back-and-forth process", where small improvements are made aligned with the customer feedback received on the way to a finished solution (Blank, 2013; Blank, 2015). By using adaptive planning, which means that only essential requirements and designs are used, the first version of the solution (MVP) can be built very fast. In a traditional approach, you would have to wait before certain requirements and specifications are approved before starting. Also, by working iteratively and by reviewing the solution periodically, the cost of change is significantly lower than in traditional product development processes where extensive work are done early in the process and the cost is thus increasing exponentially. Through these periodic reviews, there is also a high level of customer interaction in the agile development approach. The traditional approach lacks customer interaction, and therefore there is a high risk that once the solution is finished, the customers do not even want it, and thereby the resources invested will be wasted (Cline, 2015). However, it is worth to note that the requirement of close collaboration with customers and their active involvement throughout the whole process is very demanding on the their time, and require a big commitment from the customers for the duration of the project. Also, working agile means that requirements will emerge and evolve over time, and it is thus essential that the company can be flexible and is able to change course when needed in order to be able to deliver the right product or service (Waters, 2007; Haunts, 2014).

The *build-measure-learn* feedback loop (see Figure 4) is at the core of the lean start-up methodology (Ries, 2011).

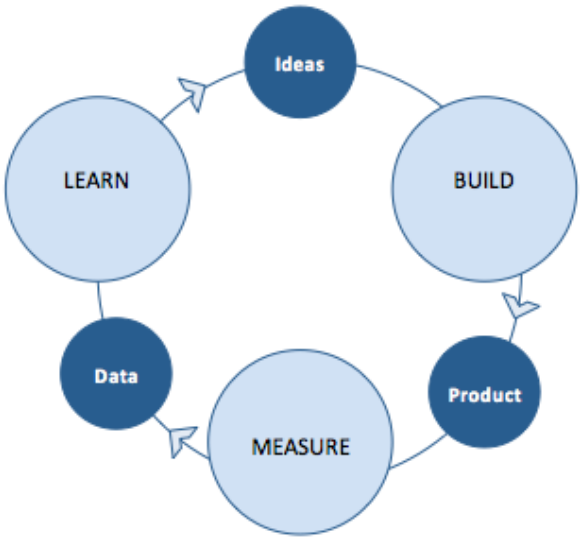

Figure 4. The build, measure, learn feedback loop (Ries, 2011)

The feedback loop is a learning cycle, and the idea is to get the product to customers as quick as possible in order to receive feedback about the solution, which can be used to validate or reject assumptions. In other words, companies quickly *build* an MVP out of an idea, *measure* the MVP's effectiveness in the market through customers' behaviors and reactions against the solution, and finally *learn* from the pursued experiment in order to decide whether to preserve to the original strategy or pivot (Ries, 2011). A pivot is a decision to make a major change in one or more hypotheses in the BMC based on learnings from customer interactions (Blank, 2013; Blank, 2015). The goal of the lean start-up methodology is to minimize the time through the feedback loop, which implies that the company needs to *build*, *measure*, and *learn* faster (Ries, 2011), and the MVP is thus essential to be able to scale up the production later on (Blank, 2013; Ries, 2011; Blank, 2015). If you after the pursued experiments successfully have identified a stable group of profitable customers and a large enough market, also referred to as finding product/market fit, you can start to scale up the business (Blank, 2007).

2.3.1.4 ENABLERS FOR LEAN START-UP

There are some factors that are important in order for a lean start-up methodology to be successful. Ries (2011) argue that a combination of flexibility and perseverance is needed, and you cannot give up at the first sign of trouble. If the test results from your MVP turn out to be negative, you must see it as a first step on a journey of learning, and use many iterations in order to finally achieve your vision. Also, the lean start-up teams need complete autonomy in order to be able to develop and market new solutions. When developing and testing the MVP, they must be able to conduct experiments without having to obtain an excessive number of approvals. Ries (2011) further strongly recommend the teams to be completely cross-functional. By having full-time representation from each functional department in the company, the whole company will be involved in the creation and launch of the early products or services. Then you can hold the cross-functional team responsible for certain learning milestones instead of hold each person accountable for performing well in their own

specific area. Teams that are cross-functional are forced to achieve validated learning and are more productive if you measure productivity as the ability to create customer value (Ries, 2011).

2.3.1.5 CHALLENGES WITH LEAN START-UP

In May 2016, Innovation Leader conducted a survey with 170 participating executives at large organizations regarding benefits and challenges of practicing the lean start-up methodology in large organizations. The most frequently mentioned challenge was the concern of showing the product too soon. Marketing or sales people feel like they own the customer relationship and are afraid of the branding risk that an MVP might cause (Innovation Leader, 2016; Kirsner, 2016). Ries (2011) also discusses the dangerous branding risk if the MVP is not very well received, and argue that a potential solution to this challenge is to launch the MVP under a different brand name. A long-term brand damage can thereby be avoided if a product/service fails to live up to the expectations (Ries, 2011). Innovation Leader (2016) additionally argue that the concerns can be counteracted by demonstrating that customers want to be involved in the whole development process. The result from the study also showed that it can be challenging for the companies to create MVPs for regulatory, manufacturing/operational complexity, or compliance reasons. Other challenges with practicing the principles of lean start-up mentioned is that the company does not have the people or funding required, that the current business model is inflexible, and that it can go against the cultural grain of the corporate culture or threaten the authority of decision makers (Innovation Leader, 2016).

2.3.2 DESIGN THINKING

Design thinking is a methodology that penetrates the whole spectrum of innovation activities with a human-centered design philosophy (Brown, 2008), and is also described as “a human-centered approach to problem solving” (Brown, 2009).

2.3.2.1 BACKGROUND

Design thinking can be traced back to the 1960s and Herbert Simon. Even though the context back then was more within architecture and engineering fields this is the first recognized attempt to fully understand the aspects, influences, processes and methodology of design. In the 1990s, the company IDEO, with CEO Tim Brown, was formed and is seen as the company that brought design thinking to the mainstream (Friis Dam & Yu Siang, 2017a). The design thinking approach calls for continuous feedback between the developer and the potential end users and the design thinkers does not solely rely on interviews but are rather stepping into the users’ shoes and closely observing their behaviors. The ideas are communicated in form of early prototypes to enable testing and gain feedback from customers (Hasso Plattner Institute, 2017). Moreover, design thinking can be described as an open-minded, open-ended, iterative process that differs from the traditional linear, milestone-based business practice (Brown, 2009). Although much of the work around design thinking focuses on product innovation, the focus on human experience makes it a natural tool for service innovation as well (Gobble, 2014). Any established company that has moved from hardware

to software or from products to services must once again focus on user experience (Kolko, 2015).

Acceptance of competing constraints is the foundation of design thinking and the initial stage of the design process is to discover which constraints are of importance and then evaluate them. The constraints can best be visualized as three overlapping criteria for successful ideas (see Figure 5). *Feasibility* represents what is technologically and functionally possible within the near foreseeable future. *Viability* represents what is likely to become a sustainable business model and business strategy. Lastly, *desirability* represents what is desirable from a human point of view and what make sense to and for people. However, this does not imply that the three constraints are all created equal. This will vary between organizations and projects as some might be restricted by technology, a budget or a mix of human factors. However, the focus on human needs is what drives design thinking to deviate from the status quo (Brown, 2009).

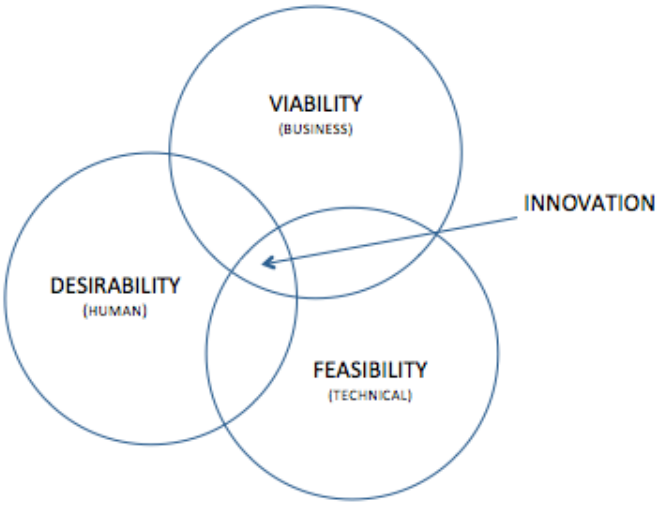

Figure 5. The three competing constraints (IDEO, 2017)

2.3.2.2 THE DESIGN THINKING PROCESS

There are many different variants of the design thinking process. Although these processes differ somewhat in stages and activities they are all based upon Herbert Simon's principles from 1969 (Friis Dam & Yu Siang, 2017b). Simon's early model of the design thinking process consists of seven stages: *define - research - ideate - prototype - choose - implement - learn.* This model more or less still represents the prototypical and generic design thinking process. Within this model designers can frame problems, ask the right questions, create even more ideas and choose the best answer and solution (SAP, 2012).

Authors / Prototypical Stages	Herbert Simon	Tim Brown – IDEO	Hasso Plattner Institute	Hasso Plattner Institute - Bootcamp	Mark Dziersk – Fast Company
Understand the problem	Define	Inspiration	Understand	Empathize: Observe, engage, immerse	(1) Define the problem
Observe users	Research		Observe		
Interpret the results			Point of View (POV)	Define – problem statement	
Generate ideas (Ideate)	Ideation	Ideation	Ideate	Ideate	(2) Create and consider many options
Prototype, experiment	Prototype	Implementation	Prototype	Prototype	(3) Refine selected directions
Test, implement, improve	Choose **Implement** **Learn**		Test	Test – includes refine and improve solutions	(4) Pick the winner, execute

Table 2. Prototypical stages in the design thinking process (SAP, 2012)

SAP (2012) has summarized and listed some of the most famous design thinking processes (see Table 2). The table has been modified by the authors in order to solely include the relevant sources mentioned in the theory below. The generic stages are as seen on the left: *Understanding the problem - Observe users - Interpret the results - Generate ideas - Prototype, experiment - Test, implement, improve.* These six stages will be discussed more in detail below as the different design thinking processes are compromised into these six generic stages.

The first stage, **Understanding the problem**, is concerned with the initial understanding of the problem takes place and the problem space is set (SAP, 2012; Hasso Plattner Institute, 2017). This space is according to Brown (2009) the problem or opportunity that motivates the search for the solution. Understanding the problem might sound simple, but doing it is probably the most important step in the process and the 'right' problem to solve must be defined. Design thinking thus needs a team that always question the brief and the problem to be solved (Fast Company, 2006). In the first stage the focus is on empathy. Empathy is the centerpiece of a human-centered design process and the work here is focused on understanding people, why they do what they do and why, their emotional and physical needs and what is meaningful to them. The problems you are trying to solve are rarely your own and as a design thinker you must thus gain empathy for them whose problem you are trying to solve (Hasso Plattner Institute, 2010a). Traditional techniques, such as focus groups and surveys will rarely yield the important insights needed as these in most cases simply ask people what they want. People do not always know what they need and want. Hence, if Henry Ford would ask his customers what they wanted they would most probably answer "fast horses". Conventional market research will not lead us to game-changing and rule-breaking

breakthroughs. Finally, success should be expected from the beginning and implementation resources should therefore be accounted for in the plan (Brown, 2009).

The second stage is **Observe users**. Observations should be made about of what people do, need and want (Brown 2009). As mentioned in the above stage, empathy is in focus. To empathize, one can observe people in the context of their lives, engage with people through conversations/interviews and combine the two by watching and listening in order to get a deeper understanding (Hasso Plattner Institute, 2010a). Observation takes the center stage in design thinking as observation can discern what people really do in relation to what they are told that they do (Fast Company, 2006). Shadowing is an observation technique that enables observation of users' behavior and experience and allows the researcher to spot when problems occur (Stickdorn & Schneider, 2012). It is fundamental to get out of the cube and involving oneself in the product or service experience and thereby getting personal experience in the design space (Fast company, 2006). To emphasize the designer should experience what the user experience (Hasso Plattner Institute, 2010b).

The third stage is **Interpret the results**, this is where the empirical findings is construed (SAP, 2012). According to Brown (2009) it is important that the information gathered is organized to facilitate the possibility to synthesize. Fast Company (2006) discusses that cross functional insight and various perspectives are required as well as relentless questioning. The right problem to solve should then be targeted and the problem should be framed in a way that invites creative solutions (Fast Company, 2006). Furthermore, this stage is about making sense of the information that has been gathered in the earlier steps and the goal is to create and define a guiding problem statement - called 'point of view' (POV). The POV is the explicit expression of the problem strived to address and defines the right challenge to direct based on the new understandings of people. A good POV is one that for example inspires the team, provides focus and frames the problem and is also something you revisit and reformulate as the learning goes forward (Hasso Plattner Institute, 2010a; Hasso Plattner Institute, 2017).

The fourth stage is **Generate ideas (ideation),** this is where as many ideas as possible are evaluated in order to expand the solution space (SAP, 2012). In early phases of design projects ideation is thus more about pushing for a wide range of ideas from which you can later select rather than focusing on a single solution. Fast Company (2006) discusses that even the most talented team may fall into the trap of solving a problem the same way every time. Design thinking requires that even though the solution might seem obvious many solutions should be created for consideration as looking at a problem from more than one angle always yields richer results. Multiple perspectives and teamwork are essential and crucial, suggested is that a better answer will be found if five people work on a problem for one day than if one person is working on the same problem for five days (Fast Company, 2006). Brainstorming is a great way of coming up with lots of ideas that would not be generated by solely using pen and paper (Hasso Plattner Institute, 2010b). Recommended is to bring multiple ideas forward into the next step of the process to avoid losing all of the innovation potential that has been generated through the ideation (Hasso Plattner Institute, 2010a).

The fifth stage is **Prototype and experiment,** this is where prototypes are built and shared with other people (SAP, 2012). A handful of promising solutions need to be embraced, nurtured and protected since even the strongest idea can be fragile at first. At this experimental phase mistakes are all right as these can enable the out of the ordinary results (Fast Company, 2006). This mode is intended to narrow down the solution space further and get you closer to your final solution (SAP, 2012; Hasso Plattner Institute, 2010a). The prototype should command only as much effort, time and investment that is necessary to generate useful feedback and thus drive the idea forward (Brown, 2008). Prototypes are important as they enable interaction with the future users, the possibility to test and if failing - doing this quickly and cheaply (Hasso Plattner Institute, 2010a). According to Brown (2009) a common belief in design thinking is to fail early to succeed sooner and the author further states that a nimble design thinking team is prototyping from day one. A prototype can be anything that the user can interact with - ideally something the user can experience. Techniques as role-playing, a wall of post-it notes and storyboarding are examples of sources of emotions and responses (Hasso Plattner Institute, 2010a). Storyboarding is a series of drawings and does exactly what the title implies - they allow stories of user experience into the design process. Even if the product or service is still a prototype that does not 'physically' exist yet - storyboards can be used in order to evoke relevant analysis, discussions about problems and opportunities (Stickdorn & Schneider, 2012).

The sixth and final stage is **Test, implement and improve**. This is done as to iteratively narrow down the solution space even further (SAP, 2012) and in this stage even more feedback about the prototypes is solicited and there are further opportunities to gain empathy for the users. If testing an experience - try to create a scenario that captures the real situation. A rule of thumb when prototyping is to prototype as if you know you are right - but test as if you are wrong. Testing is a chance to refine the solution and make it even better and also a chance to refine your POV if the test reveals that you did not get the solution right (Hasso Plattner Institute, 2010a). Enough road has at this point been traveled in order to insure success and at the end of this stage the problem is solved (Fast Company, 2006). The implementation represent the path from idea to market and the vision is executed. The word is spread through a marketing communication strategy (Brown, 2009).

Hasso Plattner Institute (2010a) states that the design thinking process is visualized as a linear process, notable however is that this only is for simplicity, and that design challenges can be taken on by using the modes and steps in various orders. Cycling through the process will narrow down your scope from a broad concept to nuanced details (Hasso Plattner Institute, 2010a). The reason behind the nonlinear nature of the design thinking process is that the process is exploratory in its nature and unexpected discoveries can be made along the way (Brown, 2009).

2.3.2.3 ENABLERS FOR DESIGN THINKING

There are some important factors behind making design thinking successful in an organization (Hasso Plattner Institute, 2017). The complexity of most projects today is relegating the work of the individual, also know as the lone inventor. A popular saying at IDEO is that "all of us are smarter than any of us" (Brown, 2009). Multidisciplinary teams are seen as an important factor behind successful design thinking. Innovations, new ideas and answers to complex questions are best generated in heterogeneous teams composed with a variety of professional backgrounds. Curiosity and openness for various perspectives lay the foundation of the design thinking's creative working culture (Hasso Plattner Institute, 2017). Brown (2009) discusses the attitude of individuals, teams and organizations who have mastered design thinking. These are open to new possibilities, always willing to propose new solutions and are alert to new directions. Moreover, great projects are according to Kelley and Littman (2001) achieved by great teams, which the authors refer as 'hot groups', who start with a clear goal and a serious deadline. Characteristics of a 'hot group' include for example dedication, no doubt of failure (Kelley & Littman, 2001) and thus expecting success from the beginning (Brown, 2009), connection to the outside world as they understand the answers do not lie within and a nonhierarchical structure (Kelley & Littman, 2001).

Besides the verbal sharing of thoughts the creative teams also need to be able to share thoughts visually and physically. A spatial space where thoughts can be shared on a whiteboard, on post-its and with photos is needed. In order to be creative, the place does not have to be kooky, crazy and located in the northern California. However, an enabler is a social environment where the team members know they can experiment and take risks. The creative team must be given the budget, time and space to make mistakes (Brown, 2009). A favorable culture is the one that rewards people for success but also gives the permission to fail - it is thus better to ask for forgiveness afterwards rather than permission before (Brown, 2009). If you do not take risks you will not succeed and successful companies therefore embrace a culture of mini-failures. This is seen in the prototyping effort as features and capabilities are tried out rapidly in rough form (Kelley & Littman, 2001). Noticeable is that the design culture does not encourage failure, the iterative nature of the design thinking process however acknowledge that it is rare to get things right on the first try (Kolko, 2015).

2.3.2.4 CHALLENGES WITH DESIGN THINKING

As discussed above risks are encouraged and needed in order to succeed (Kelley & Littman, 2001; Brown, 2009). Many however fear risk-taking, and thinking about what might be lost may nearly stop you from taking the leap and testing. For a bigger, established company the penalties associated with the risk are often larger as market share, revenue and status is at stake. This is why new big ideas usually come from smaller companies, or from larger ones who have managed to act small (Kelley & Littman, 2001).

It can be difficult for a company coming from a culture of meetings and milestones to change and support an exploratory and iterative process and in the beginning the design thinking process can feel chaotic. How to incorporate a creative problem solving in companies'

strategic initiatives is a challenge associated with design thinking (Brown, 2009). Also, in any company there is a pressure for return on investments. It is however difficult to calculate the return on an investment in creativity and understand the excess value that will be delivered through a better experience (Kolko, 2015). Ideas can therefore be smothered before they get the chance to come to life as leaders steer away from projects with uncertain outcomes out of fear (Brown, 2009). The challenge here is thus to accept more ambiguity (Kolko, 2015).

2.3.3 LEAN SERVICE CREATION

Lean service creation (LSC) is a methodology that combines lean start-up with design thinking and the agile philosophy (Futurice, 2017a).

2.3.3.1 BACKGROUND

The customer- and user-centric methodology LSC originates from the company Futurice, who designs and builds creative businesses and services (Futurice, 2017b; Futurice, 2017c). The method was founded in 2013 and uses lean start-up methodology to identify business need and create business plans through fact-based decision making, design thinking to create service concepts through iterative processes using prototypes and the customer's perspective, and agile methods for small and just enough releases (Pasanen, 2016). The initiative to the method was grounded in a problem of companies wanting to develop successful service, but did not know where to start due to the many methods available. Therefore, a set of tools was constructed based on commonly accepted best practices within the field and what was found useful (Sarvas, Nevanlinna & Pesonen, 2016).

The now rapid digitalization requires a new take on how businesses are created and managed and the speed of change is too fast to have separate approaches (Hartikainen, 2015). As you cannot plan the digital future, the companies must build the future themselves, and as the companies do not know what to build, they will have to experiment, fail fast, and maximize learning (Futurice, 2017c).

2.3.3.2 THE LEAN SERVICE CREATION PROCESS

The LSC methodology have four basic principles: *Find a problem worth solving* - *Get out of the building* - *Love the problem not the solution* - *Build, measure, learn* (Sarvas, 2016). The company Futurice offers a handbook, which contains canvases that work as a comprehensive and holistic checklist ensuring that all possible angles of the service are looked at. In addition to the basic principles and the canvases there are also seven stages in the LSC program (Sarvas, 2016).

The first stage, **Immersion,** concerns the introduction and homework done before taking the deep dive into creating new business. Doing this beforehand will save a lot of time later, and will enable the possibility to build on top of others' work. Write down best guesses, or hypotheses, of the problem that is worth solving, investigate the public debate around the topic and keep an eye on competitors (Sarvas, Nevanlinna & Pesonen, 2016) in order to really

analyze the market and thus understand the current state, customers needs, and future potential (Pasanen, 2016).

The second stage, **Insight,** can be seen as one of the most important stages in the process (Pasanen, 2016). In order to get insights about the customers, to verify their needs, to find a problem worth solving and to verify the point of view on the problem the company should get out of the building and meet real people. In the insight stage, deep understanding of the customers is gathered and a business opportunity could be unlocked. The first interviews are so called 'problem interviews' and important here is to forget about the current state and status quo and thus not ask the customers about the ideas, services or solutions, as unexpected things can be learned. If focusing on already predefined hypotheses the interviews with the customers can easily turn out into confirmations on an already decided direction (Sarvas, Nevanlinna & Pesonen, 2016; Pasanen, 2016).

In the third stage, **Ideation**, ideas can be created for solutions that solve the problem worth solving for the customers (Sarvas, Nevanlinna & Pesonen, 2016). The information gathered in the immersion and insight phase are used to do the ideation. Select the needs, emotions and problems that is going to be solved and then during this ideation stage groups are brainstorming to find ideas focusing on positive emotions (Sarvas, Nevanlinna & Pesonen, 2016; Pasanen, 2016). The ideas should be categorized based on importance and features to visualize the various value propositions and concept sheets for the service. Post-it notes and PowerPoint slides should created and used in this stage (Pasanen, 2016).

In the fourth stage, **Business planning**, ideas generated from the brainstorming should be selected and full concepts of them should be formed. Focus should be on the value to the end user, feasibility and the business potential. When having the initial concept ready it is important to slow down to check if the concept still fits the original business need. Decision should be made regarding if you are ready to proceed or if you should iterate and take steps backwards. When the concept is in place, assumptions must be tested to see if they are correct. Everything needed to write in a value proposition should now be in place and the value proposition should then be tested using interviews (Sarvas, Nevanlinna & Pesonen, 2016). Part of the business planning is the business model creation where the problem first is understood, the solution is defined, the business assumptions is documented using the BMC. The information described in the BMC should have been found in the immersion, insight and ideation stages and the business model should be validated based on systematic testing and iterative development of the business plan (Pasanen, 2016). Jumping into costs and revenues earlier in the process to see if the idea makes any sense is considered dangerous. The danger lies in calculating the business without a good understanding about the customers and the actual product or service you are building for them (Sarvas, Nevanlinna & Pesonen, 2016).

The fifth stage, **Service design**, is used to visualize the concept. The concept is at this stage drawn into a so-called service blueprint (Pasanen, 2016). The service blueprint is a more exhaustive customer journey and is a great tool when figuring out the interconnections

between parts of a service from a step-by-step perspective. The service blueprint connects the customer's steps (the customer journey) with the touch points and, with internal and external processes (Sarvas, Nevanlinna & Pesonen, 2016). Essential parts of this phase is to map the customer journey through the customer touch points in the different stages, such as how the customer buys, finds, uses, and ends the service (Pasanen, 2016).

The sixth stage is **Prototyping** and the concept is here put to test (Pasanen, 2016). Up to this point a lot of guesses and assumptions have been made and now it is time to validate if the main assumptions are correct. The main assumptions should be gathered, creative experiments should be made, and success criterias should be decided in order to measure if the prototype really answer the demand. To tackle the most critical assumptions a (MVP), or a so-called minimum lovable product (MLP), can be built. The MVP/MLP is focused on building the minimum of what the customer will fall in love with. The key findings gathered are valuable knowledge and contains communication of the value proposition, choices in building the experiments and learnings from the customers participating in the experiments. The key findings are the starting point to formulating a backlog of the service. The backlog works as a to-do list moving from planning to really doing and the focus is rather on getting the things done than having the backlog structured (Sarvas, Nevanlinna & Pesonen, 2016).

The seventh and last stage is **MVP & Analytics**. The MVP backlog is the process in between the current state and the launched MVP. During this stage the build - measure - learn feedback loop is used in order to iteratively improve the MVP. In this phase it is also important to define the analytics, what and how to measure and which KPIs proves that the MVP is succeeding in the market as wanted (Sarvas, Nevanlinna & Pesonen, 2016; Pasanen, 2016).

The seven stages discussed should be seen as a loop and the LSC handbook clearly states that you should be doing what is important, and not on what is stated to be the next step in the process (Sarvas, Nevanlinna & Pesonen, 2016).

2.3.3.3 ENABLERS FOR LEAN SERVICE CREATION

Futurice's Handbook for LSC brings up some basics needed before getting started with LSC. A result-oriented and creative mindset is essential, as the tools brought up here will not on them own create success, instead the team have to create it. A humble attitude, being able to accept feedback and critiques and be ready to throw away 'darling ideas' is seen as important when building new business with the LSC methodology. Also, a multidisciplinary team who uses a common language and a common methodology is favorable. Last but not least is an area, more or less looking like a kindergarten, that is filled with pens of different colors, sticky notes, paper and empty walls beneficial (Sarvas, Nevanlinna & Pesonen, 2016).

2.4 SUMMARY OF THEORETICAL FRAMEWORK

In Table 3, key findings from the three user-oriented approaches are gathered and sorted under the first three generic stages of the service development process found in section 2.2.

	Opportunity identification	**Evaluation**	**Development**
Lean Start-up Methodology (LSM)	- Frame hypotheses regarding the problem - Frame hypotheses regarding the solution - Get out of the building and interact with customers when testing hypotheses regarding the problem	- Use BMC for business analysis in order to understand how the solution creates value for the customers and the company	- Use adaptive planning to build the first version of the solution (MVP) very fast - Test MVPs on real customers to generate feedback - Agile development to build solution incrementally in short and repeated cycles - Build - measure - learn feedback loop used to iteratively improve MVP and to get feedback from customers
Design Thinking (DT)	- Empathy - understand the people - Observe and step into the users' shoes - Push for wide range of ideas	- Evaluate the viability, feasibility and desirability	- Prototypes are built and tested on an appropriate group of future users - The solution is iteratively improved through continuous customer feedback
Lean Service Creation (LSC)	- Write down the best guesses of the problem - Get out of the building and meet real people - verify need - Ideas created for solutions that solve the problem	- Focus on value for user, feasibility and business potential	- Build MVP to test on customers and tackle the most critical assumptions made - Use prototyping to test the proposed solutions on the future users - Build - measure - learn feedback loop used to iteratively improve MVP and to get feedback from customers

Table 3. Elements from user-oriented approaches sorted under the generic stages of the service development process

Table 4, 5 and 6 describes and further presents how the findings summarized in Table 3 are brought forward to facilitate the analysis in the study. The findings that are brought forward into the analysis are presented to the right in the table and the user-oriented approaches supporting that finding are presented to the left.

Opportunity Identification			
LSM	DT	LSC	To Analysis
- Frame hypotheses regarding the problem		- Write down the best guesses of the problem	**Write down best guesses/hypotheses regarding the problem**
	- Empathy - understand the people - Observe and step into the users' shoes		**Understand the problem by observing and stepping into the users' shoes**
- Get out of the building and interact with customers when testing hypotheses regarding the problem		- Get out of the building and meet real people - verify need	**'Get out of the building' to involve and interact with customers to verify the need**
- Frame hypotheses regarding the solution	- Push for wide range of ideas	- Ideas created for solutions that solve the problem	**Create/frame multiple ideas of a solution to the problem**

Table 4. Opportunity identification, elements brought forward to analysis

Evaluation			
LSM	DT	LSC	To Analysis
- Use BMC for business analysis in order to understand how the solution creates value for the company	- Evaluate the viability, feasibility and desirability	- Focus on value for user, feasibility and business potential	**Evaluate viability**
- Use BMC for business analysis in order to understand how the solution creates value for the customers	- Evaluate the viability, feasibility and desirability	- Focus on value for user, feasibility and business potential	**Evaluate desirability**

Table 5. Evaluation, elements brought forward to analysis

Development			
LSM	DT	LSC	To Analysis
- Use adaptive planning to build the first version of the solution (MVP) very fast - Test MVPs on real customers to generate feedback	- Prototypes are built and tested on an appropriate group of future users	- Use prototyping to test the proposed solutions on the future users - Build MVP to test on customers and tackle the most critical assumptions made	**Prototype/MVP of solution is built and tested on future users**

- Build - measure - learn feedback loop used to iteratively improve MVP and to get feedback from customers - Agile development to build solution incrementally in short and repeated cycles	- The solution is iteratively improved through continuous customer feedback	- Build - measure - learn feedback loop used to iteratively improve MVP and to get feedback from customers	**Solution is improved through customer feedback**

Table 6. Development, elements brought forward to the analysis

Table 7 and 8 presents how the enablers and challenges are brought forward into the analysis. The enablers and challenges that are brought forward into the analysis are presented to the right in the table, and the user-oriented approaches from where these are derived from are presented to the left.

Enablers of the service development process			
LSM	DT	LSC	To Analysis
- Cross-functional teams	- Multidisciplinary teams - Heterogeneous teams	- Multidisciplinary teams	**Mix of competence and people in the development team**
		- Common language - Common methodology	**Speak the same language**
	- Take risks - Permission to fail - Budget, time and space to make mistakes		**Risk taking mentality, have the permission to fail**
- Flexibility	- Alert to new directions - Open to new possibilities, willing to propose new solutions	- Be able to 'kill your darlings'	**Open and flexible mindset**
- Perseverance - Not give up at first sign of trouble		- Be able to take critique	**Perseverance, do not give up after setbacks**
- Complete autonomy - Experiments without excessive number of approvals	- Experiment		**Autonomy, be able to experiment without excessive number of approvals**

Table 7. Enablers, elements brought forward to the analysis

Challenges with the service development process			
LSM	DT	LSC	To Analysis
- Branding risk if the MVP is not well received - Concern of showing the product too soon			**Fear of showing the solution to customers too soon if the company fail to live up to the expectations**
- Lack of people or funding required			**Lack of the resources required**
- Inflexibility of current business model	- Difficult coming from a culture of meetings and milestones to change into having an exploratory and iterative process		**Inflexibility of current business model and difficult to change from milestone culture into an exploratory and iterative process**
- Go against the cultural grain of the corporate culture and threaten the authority of decision makers			**The way of working with the development process can threaten the authority of decision makers**

Table 8. Challenges, elements brought forward to the analysis

3. METHOD

3.1 RESEARCH STRATEGY

The main research strategy that has been used in this thesis is a qualitative research strategy. According to Bryman and Bell (2011), the main difference between a qualitative research strategy and a quantitative research strategy is that a qualitative strategy usually put emphasis on words, while a quantitative strategy usually emphasizes quantification in the collection and analysis of data. Another important difference is that the gathered data is not locked into predetermined goals in a qualitative strategy, as in comparison to a quantitative strategy (Bryman & Bell, 2011). This means that the research has been open to new data and information, which had not already been predicted. The purpose of this study is to investigate how the NBCS team at Volvo Cars could work with service development in an appropriate way. In order to recognize this, the authors of this study needed to obtain information about current processes at different departments within Volvo Cars, as well as in depth information about how other large companies work with service development. Therefore, a qualitative study with an inductive approach was found most suitable. According to Bryman and Bell (2011), an inductive approach means that the authors aim for an in depth understanding, and that there is a possibility for new theory to be developed. A qualitative methodology also provides a certain degree of flexibility, for example to adjust interview questions during the interview as new discoveries are made, in contrast to testing an already stated hypothesis as when using quantitative methodology. One must bear in mind that the downside of the qualitative research strategy is that the results will be analyzed and interpreted by the authors solely. Generalization is therefore often a concern with this strategy, and there is also a risk of biased results (Bryman & Bell, 2011). This aspect was considered when analyzing the data.

3.2 RESEARCH DESIGN

This study is considered explorative since the authors have collected data from a number of cases studied. The method of using case studies and qualitative interviews was chosen in order to create a holistic view over how service development teams at other large manufacturing firms work with their service development process, in order to thereafter investigate how these undertake the perspective of user-oriented approaches. The authors wanted to be provided with a general understanding about the subject, and also be able to, to some extent, conduct a comparative analysis, which is why a multiple case study was considered most suitable (Bryman & Bell, 2011).

The theoretical framework in this study is designed based upon theories from different fields of research. The theoretical framework was constructed after three main building blocks, where the first aim to provide the reader with an understanding about servitization of manufacturing, the second is focused on the service development process as such, and the third on the user-oriented approaches. In the second block, the authors constructed own generic stages of a service development process by dissembling and grouping common parts of existing models regarding service development from literature. These generic stages were

in turn used as sub-sections to the block regarding the service development process in the compilation of the empirical findings and the analysis. In order to make the theories in the third block regarding user-oriented approaches applicable in the generic stages of a service development process, the authors identified main elements in the different approaches, and further merged them together when possible. These were then brought forward and used in the analysis when comparing the empirical findings to the theory.

3.3 RESEARCH METHOD

3.3.1 PRIMARY DATA COLLECTION

Due to the explorative nature of this study, the primary data was collected through qualitative interviews. Eliasson (2010) states that a qualitative research strategy can provide the authors with a deeper understanding for individuals' thoughts. The technique applied was semi-structured interviewing due to its flexibility. By using this approach, attention can be given to the respondents' perception and interpretation of a context, and the authors will be able to guide the respondents into a subject or area, while still leaving room for the respondents' own personal reflections (Bryman & Bell, 2011). Semi-structured interviewing allows the authors to cover a broader area, and also provides the authors with the opportunity to explore interesting topics and answers from the respondents, which can enable the researcher to obtain richer information. It also opens up the possibility to receive information or discover new areas that the authors have not thought of and thus provide a more complete picture (Bryman & Bell, 2011).

The authors wanted to structure the interview guide in accordance with categories from the theoretical framework in order to facilitate the analysis part of the study. The interview guide, found in Appendix A, was therefore based upon the two first building blocks and sub-sections in the theoretical framework. Out of eleven conducted interviews, the authors conducted six interviews in a face-to-face (F2F) setting. This setting facilitates the interpretation of additional impressions, such as facial expressions, during the interviews (Bryman & Bell, 2011). According to Saunders, Lewis and Thornhill (2009), the risk of misinterpretation of respondents' answers is also reduced at a present observation, and the observer is provided with the opportunity to render a nuanced picture of the interview. However, in the case of geographical distances, the authors conducted the interviews by phone or through the communication tool Skype.

In order to be able to collect high reliability answers and to validate and extend transcripts afterwards, the authors took notes simultaneously and recorded the interview sessions. The recording tool "AudioNote" was used, in which all notes are linked to the exact time they were written during the interview, which allowed the authors to backtrack important parts of the interview. According to Bryman and Bell (2011), recording is important in order to facilitate coding and categorizing of the qualitative data. It also relieves some pressure on the author responsible for taking notes during the interviews. After each interview, the authors

summarized the answers to establish a good overview of the collected data, which Jacobsen (2002) also argue facilitates the coding and categorization of answers.

3.3.1.1 SELECTION OF CASE COMPANIES AND RESPONDENTS

To gather information about current service development processes at different departments at Volvo Cars for the pre-study, interviews were conducted with employees at the company. In order to collect the external input needed, interviews were conducted with representatives from other large manufacturing firms. When searching for potential case companies to include in the study, the authors used the following selections criteria's:

- Large companies, >20 000 employees & 2bn EUR in revenue.
- Companies with history in manufacturing, which in the recent years have started to provide services as well.

Thereafter, the authors listed potential companies and consulted the supervisor at the NBCS team and the master thesis supervisor about the selection. Almost all respondents from the different case companies have been identified through the social media network LinkedIn. Moreover, the respondents were selected based on the criteria of having some kind of leading position within the company and who also was working directly, or indirectly, with service development. When approaching the potential respondents, the authors asked if the approached person could refer to some other colleague or contact if they, themselves, were not able to participate. The authors also asked for additional recommendation of contacts after conducting each interview.

The potential respondents were contacted by email, in which the authors included information about the study, other companies contacted, time proposal for meeting etc. Reminders where then sent out after around seven working days if the authors had not received a response. In total, 25 emails were sent out to 11 external case companies, where 11 respondents agreed to participate, resulting in a total of six external case companies. The 11 respondents have in the study been treated as individuals working with service development at one of the case companies. Table 9 provides an overview of the interviews conducted.

Position of Respondents	Date (2017)	Length (mins)	Channel
Global Service Technology Manager	23/3	60	F2F
Global Product Manager Services, Service Development	23/3	40	F2F
Global Brand Innovation Manager, Services	23/3	50	F2F
Research Engineer, Transport Solutions	21/3	90	F2F
Business Analyst/Service Designer			
Project Manager, Customer Solution and New Service Development	27/3	50	F2F
Service Business Leader	6/4	30	Telephone
Process Development Leader	28/3	30	Telephone
Senior Business Strategy Manager, Connected Services and Solutions	14/3	60	Skype
Digital Service Development Manager	22/3	60	Telephone
Head of Asset Management	7/4	50	Skype

Table 9. Overview of interviews

3.3.2 SECONDARY DATA COLLECTION

To gather the secondary data, a Systematic Literature Review (SLR) was conducted. According to Petticrew and Roberts (2006), the SLR approach facilitates the selection and identification of high quality theory, which is relevant to the research question. The authors of this study identified relevant literature to answer the research questions by using different kinds of databases. To avoid using databases with lower quality and reliability and to increase the trustworthiness, the authors have used databases recommended by librarians and professors at Gothenburg School of Business, Economics & Law. The databases used are GUPEA, GUNDA, ScienceDirect, Business Source Premier, and Emerald. The newer research on the subject, not found in databases, have been approved by the authors' supervisor. Furthermore, certain key and search words were used to ensure that the most appropriate and relevant data for the study was collected.

3.4 DATA ANALYSIS

After the authors wrote the theoretical framework, tables have been constructed to provide an overview of the key findings. The same structure was thereafter used for the empirical findings in order to facilitate the analysis part of the study, where the theoretical and empirical key findings were compared. This could be seen as a way of coding and categorizing data, aligned with the qualitative method guidelines.

3.5 QUALITY OF THE STUDY

3.5.1 RELIABILITY

Reliability refers to if the study can be replicated by another researcher and still yield the same result (Bryman & Bell, 2011), and is an important aspect to bear in mind when evaluating the quality of the study. Due to problems of creating the exact same interview settings under investigation, this is characteristically problematic within qualitative research (Bryman & Bell, 2011). For example, if the interviews would have been conducted with other respondents, the results may differ even if they have similar roles within the company, since people have their own perceptions and experiences, which lay the foundation for their answers. The multiple cases studied in this study will be affected by various factors, and it is therefore possible to find differences in a replication study. However, the authors argue that the explanations over how different procedures and choices that are made in this study, e.g. recording of interviews and coding, increase the reliability. Furthermore, the lack of internal reliability have been reduced due to that the authors of this study validated each other in what was observed and heard during the interviews, thus ensuring inter-observer consistency (Bryman & Bell, 2011). To enhance the quality of the report even further, the authors have aimed to ensure that the questions are posed as equally as possible to the different respondents, and the authors have also maintained the same roles throughout all of the interviews, where one have asked the questions, while the other acted as observer and took notes.

3.5.2 VALIDITY

Validity refers to the evaluation of the methodology, to investigate if it measures what it is supposed to measure (Bryman & Bell, 2011). The validity has a key impact on the credibility of the research as it states whether or not the results can be generalized, and thus be applicable to other cases. To ensure validity within qualitative research is however generally problematic, and especially related to the evaluation of a relatively small sample (Bryman & Bell, 2011), which is the case for this study. However, the authors claim that the validity of the study is increased due to that the respondents that participated in the study all have some kind of leading position within the company, and are also working directly, or indirectly, with service development.

Also, to ensure creditability, the respondents were told that they would be treated anonymously, which according to Saunders, Lewis and Thornhill (2009) can increase the validity since the respondents then do not feel pressure from their employer to answer in a specific way, thus generating more sincere answers. The respondents moreover represent firms that are not competitors to Volvo Cars, which further is argued to improve the credibility of the interviews, since close competitors probably would not reveal as much.

3.6 OVERVIEW OF METHODOLOGY

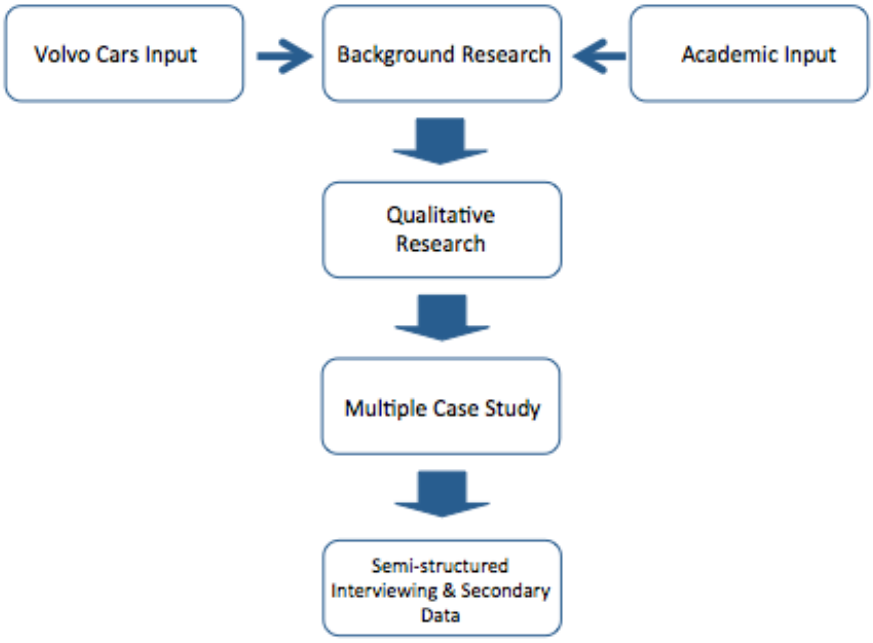

Figure 6. Overview of methodology

4. EMPIRICAL FINDINGS

4.1 INTRODUCTION TO EXTERNAL CASE COMPANIES

AB Volvo

AB Volvo, founded in 1927, is a manufacturer of trucks, buses, construction equipment, and marine and industrial engines. The company sells its products in more than 190 markets and has the vision of being the most desired and successful transport solution provider in the world[3]. Volvo Trucks are developing services that will keep the truck moving and states that their services are helping the driver, the owner, the transport manager and the fleet manager to get the most out of their vehicle. One example is Volvo Truck's fleet management system, Dynafleet, which is available for a monthly fee and enable the transport company to monitor individual trucks and drivers[4].

Hilti

Hilti is a family owned company founded in 1941. The company manufactures and designs industry leading technology, software and services for the professional construction industry and is today a global company with the presence in 120 markets[5]. An example of a service that Hilti offers is ON! Track Asset Management, which gives the customers complete clarity into what assets they have, where they are, who are using them and when they need maintenance[6].

IKEA

IKEA is a home furnishing company with a vision of creating a better everyday life for the many people. The company founded in Sweden in the first half of the 20th century has today 375 stores in 46 markets and employs 172,000 people[7]. At IKEA you can do it yourself, but you do not have to. IKEA Services offer services such as for example delivery, assembly, home furnishing advice and customization of kitchens[8].

SCA

SCA is a global company within hygiene and forest products that sustainably develops, produces, markets and sells forest products and personal care tissue. The company, founded in 1929, has sales in about 100 countries under many strong brands[9]. SCA's vision is "Dedicated

[3] Volvo Group (2017)
[4] Volvo Trucks (2017)
[5] Hilti (2017a)
[6] Hilti (2017b)
[7] IKEA (2017a)
[8] IKEA (2017b)
[9] SCA (2017a)

to improving well-being through leading hygiene and health solutions"[10]. To strengthen SCA's position in the service industry the company has e.g. launched two innovative IT-based services to enable cleaner washrooms[11].

Scania

Scania is a provider of transportation solutions delivering trucks, buses and industrial and marine engines. Founded in 1891, the company now operates in more than 100 countries and employs 46,000 people[12]. The company's vision is to drive the shift towards a sustainable transport system and to create a world of mobility that is better for business, the environment and society. Scania offer services such as maintenance plans, driver training and coaching, and a service called Scania Fleet Care that make sure each vehicle is performing at peak condition[13].

Siemens

Siemens, founded in 1847, is a global powerhouse in electrical engineering and electronics. The company has core activities in the fields of electrification, digitalization and automation and has 351,000 employees in more than 200 countries[14]. An example of a service offered by the company is the app 'Home Connect', which let people steer their Siemens appliances when being away from home to facilitate household work and provide new opportunities that make everyday life more efficient and comfortable[15].

Company	Industry	Revenue (2016)	No. of employees	No. of interviews
AB Volvo	Automotive	31.9bn EUR	95,000	3
Hilti	Construction Technology	3bn CHF	24,000	1
IKEA	Home furnishing	33.8bn EUR	172,000	2
SCA	Hygiene and forest	12.4bn EUR	46,000	3
Scania	Automotive	103bn SEK	46,000	1
Siemens	Electrical engineering and electronics	79.6bn EUR	351,000	1

Table 10. Overview of external case companies

The 11 respondents in the empirical findings are representing the six large manufacturing firms above. Each of the respondents has been assigned a letter and Table 11 below show what position is held by each of the respondents.

[10] SCA (2017b)
[11] SCA (2017c)
[12] Scania (2017a)
[13] Scania (2016)
[14] Siemens (2017a)
[15] Siemens (2017b)

Assigned Letter	Position of Respondent
A	Global Service Technology Manager
B	Global Product Manager Services, Service Development
C	Global Brand Innovation Manager, Services
D	Research Engineer, Transport solutions
E	Business Analyst/Service Designer
F	Project Manager, Customer solution and new service development
G	Service Business Leader
H	Process Development Leader
I	Digital Service Development Manager
J	Senior Business Strategy Manager for Connected Services and Solutions
K	Head of Asset Management

Table 11. Assigned letter and position of respondent

4.2 SERVITIZATION OF MANUFACTURING

This section addresses reasons for why firms are servitizing and main challenges associated with the transition.

Reasons for servitizing	
Respondent	***Response***
A	- There is a pressure that companies must start working closer with the customers to understand their needs better, and to be able to plan, develop, and implement in a better way. - The company both wants to strengthen the relationship with the customers, strengthen the existing product offer, and differentiate against competitors. - It is also important to know why the company is moving into services. Is it to protect the traditional affair, strengthen it or to differentiate or create new business?
B	- Create new means of value in order for the company to make a larger share of profit. - Increase value of existing concepts.
C	- The company wants to find new areas of value creation. - By servitizing, the company will be able to offer a broader spectrum of solutions to the customers.
D	- Opportunity for the company, the society, and for the world, since manufacturing companies will need to think the whole way and not sub optimize.
E	- Look beyond the physical products and see what kind of complete offering the company can offer the customers.
F	- Can use services to get leverage and additional sales. - A generation and competence shift in the customer base, where the customers more look at the total cost of ownership. - Provide a complete offering to the customer that is better than the competitors'. - Offering services is a way to survive. The company is today making money out of products, but services will be more important than products in the future and the company will thus not survive offering solely products.

G	- Services make the products more accessible. - The market is changing and the company must thus change and add services to reach a wider audience or make existing customer more satisfied. - Trying to stay ahead to have the services needed to sell the products.
H	- Customers are requesting services and the company must sell, package and deliver as the customer wants it. - Services are a potential source of income.
I	- It is a way to create a partnership with the customers to avoid competition.
J	- A possibility to create new means of value for the customers by selling capabilities rather than a physical product. - Meeting the market trend. Servitization is crucial when having a strategy that builds upon profitable customers. The company can help the customers to become more efficient by helping them to consume the company's offer in a better way.
K	- The firm servitize to drive loyalty from the customers, which is the core of the company's whole strategy. - It is a way to drive the degree of differentiation from competitors. A service requires a closer relationship with the customers and also requires more components, which is hard for a competitor to copy. - It is important that the service development is anchored in the strategy in order for everyone to understand why it is done.

Challenges of servitizing	
Respondent	***Response***
A	- Given the company's product-oriented history, it has been challenging to understand how to charge for services. This has resulted in that value creating activities that provides the customers with large savings and efficiency gains have been given away for free, which in turn have resulted in that service development has not been prioritized.
B	- It is challenging for a company with a product-oriented history to learn how to charge for services. A service-oriented company knows better how to charge for the time with the customer.
C	- The biggest challenge is the mental models within the company. People are raised in a world where physical products are in focus. The existing structures and processes within the company are nailed and woven together and are difficult to change.
D	- The company is confused regarding how to address the servitization trend. People at the company have different views on it.
E	- The company is currently product-centric and incredibly strong within products. It is difficult to understand how to deal with the servitization trend - it is a balancing act. - The company is currently making money out of products, and it is a challenge in daring to see things from a different perspective.
F	- Hard to find the right services and to know which ones the company should invest

	in. - Cultural difficulty as the company is currently making money out of physical products, and thereby the company has difficulties to prioritize the development of services over physical products.
G	- Must challenge established patterns and shift the business concept as the company now is living on the concept that the customers do some of the work themselves. - The customers do not expect that the company offer services, which leads to that the customers turn to other companies for that assistance.
H	- The company has a long history of developing physical products.
I	- When providing services, a whole different approach is required. Having a long history of being a product-oriented company makes is difficult to change the way of working.
J	- The current organization is entirely focused on constructing and selling physical products, and it is difficult for a whole organization to realize that new factors and dimensions are becoming important. Must change the mindset and understand how the company can sell the product in another way.
K	- It is difficult to understand how the company should dare to charge for services. Have a history of offering some services for free, and therefore the company must think about how the company can make profit out of services and how to charge for them. - The company has for long identified itself with physical products, so a big part of why this whole transformation is difficult is that the mindset and how the company view itself must change. - Challenging to know how to sell a service in comparison to a product. It is easier to sell something that customers can have in their hands rather than a service.

4.3 SERVICE DEVELOPMENT PROCESS

This section addresses the three generic stages of the service development process.

Opportunity identification	
Respondent	***Response***
A	- Initiative to service can come from many various sources. - An internal idea about a service. Could for instance start as an R&D project where a stated problem needs to be solved. - Feedback from customers about their need. - We can also 'live' as a customer in order to identify the real need and problem. By living as a customer you are able to see and experience things from reality and not from a company perspective. - Open innovation important, a lot of potential partners approach the company with ideas. Collaborations and partnerships will drive innovation in the future. - Try to make a selection of different possibilities that meet the same need to know how to steer the direction. Often bring 4-5 different sketches of solutions and discuss if they are of any interest.
B	- Ideas can come from various sources. - Ideas often come from a steering group or from top management.

	- Idea generation workshops internally. - Ideas are increasingly situation-based, based upon customer feedback.
C	- The ideas can come from various sources. - Needs can be identified by contacting customers, or by a customer contacting the company. - Ideas can emerge from technological developments. The company can generate more ideas based on technological aspects. - Can also have employees working with the customers in a specific area to be able to recognize the 'real' customer need and problems. - Market research can give rise to idea generation.
D	- A possible service idea can come from various sources. - Possible starting point for a service can be that other companies have mentioned the service. - Few service ideas are made up totally by the company itself. The ones that are however are based on a seen opportunity or gap.
E	- Try to create customer insight and look at what is happening, what is not good, and how to serve the customer better. - When it comes determining which service ideas to move forward with it is a bit like 'survival of the fittest'.
F	- Initiative to a service can come from various sources, there is no clear pipe. - Technology, market, or legal requirements can be the reason for a new service. - Can start with a problem or an opportunity.
G	- The customers might feel that something is missing and input from the market can lead to the development of new services. The company is listening to the market that is the most picky, want everything as quickly and cheaply as possible and with as high quality as possible. - Work closely with partners as these can tell about what they have seen and heard.
H	- The company has a large identified need of various services that must be developed gathered in a backlog. - Uses monitoring to see what is happening on the market. - Identify what type of services the competitors offer.
I	- The initiative can come from various sources. - Sometimes the initiative is created locally on a certain market, where the company has close customer contact and can more easily relate to the customer's problems and opportunities. When the company recognized that the customer needs help with something, the company must compensate that. - The initiative can come from the headquarter. - Listen to the customer and understand the customers' challenges and come with solutions.
J	- A common start is that someone at the company has an idea of something that can create added economic value. - Can start from recognizing a customer need or demand. Talking to customers is extremely important in order to understand how they work and how they operate their business. Might have a certain belief internally of how things should work, but involve customers and other stakeholders early in the process to validate the problem first.

	- Idea from a local market.
K	- Initiatives can come from many different sources. - Feedback from the market. - Strategy from top down. - Ideas can come directly from customers through feedback.

Evaluation	
Respondent	***Response***
A	- Investigate the business potential of the service, what values the services are likely to generate and the costs of it. - Investigate customer value by analyzing willingness to use and willingness to pay.
B	- Not entirely sure if and how this is done. Often the business potential is overrated or poorly substantiated since implementation has not been considered from the beginning. - The management or steering groups decide which idea to proceed with and not.
C	- A business case is conducted to evaluate the monetary value of the service for the business. The total amount of money generated for the company is the most important aspect to investigate. - The portfolio chosen to develop further is the one with the highest monetary value. There should be a high potential for the service to generate a large amount of money, and therefore it is also important that the service will work globally. Behind all that there are also other values that need to be considered, but those are not the most prioritized. - When having a service idea, a feasibility study is made in order to map the opportunities. The various studies available are thereafter prioritized by the management team.
D	- Ultimately it is about calculating the value of the service. How useful is this service and how much money will it save for our customers? - Pre-studies to understand the economic benefits. Have interviews with customers and analyze old data. - Must understand if there is a value for the customers. - Usually there are a few managers that decide if an idea is worth moving forward with.
E	- Investigate if there is a win-win situation for the company and the customers.
F	- Conduct a feasibility study, understand and get an estimate of the customer need and how the company can solve that need. - A clear business case before the project starts. How much will the development costs be, how much revenue will the service generate for the company and how much customer value will be generated? - The idea is to evaluate both emotional and rational value of a service. However, the rational value is the most important since the company wants to make money on the service.
G	- Make a business case. Must be a business model and economics behind the service idea as the company cannot only make nice-to-have-services. - The service should raise the amount of the average receipt or make customers

	return. - Internal estimate of what value the service could give.
H	- Make a business case, is there a risk that customers are lost or is there a potential for the company to make money?
I	- Start by defining the customer value of the service. Essential to understand what value it will create for the customer. - Despite defining the customer value the company must also decide the value for itself. This value is always determined by money, - what the volume and profit growth is. Have certain parameters to evaluate customer value and economic value. - Also evaluate the long-term aspects of a service, "one day product" will not be something of value.
K	- Sets up certain criteria to determine whether a service is attractive or not in order to know which ideas to proceed with. - Look at many different dimensions, but basically it is about relevance for the customer, if there is a big or small problem to be solved, and if it concerns many customers or just a small segment. - Also look from an internal perspective: is this something the company can be good at? Can the company make money out of this? Is it attractive? - The analyses are quite detailed, but the company does not have any standardized model that is used for this, it varies from project to project.

Development	
Respondent	***Response***
A	- Prototyping is used when testing the service. By using prototypes, interaction design can be tested, and also all the different touchpoints. When developing services, it will always be some kind of touchpoint that can be tested. - The prototype can be anything from 3D-printed objects to objects connected to different touchpoints. - It is only when the customer gets the solution in its hands and can act with it that the customer can detect the value. Early feedback from customers who are willing to participate in the development process is very important to iteratively improve the solution. - The 'softer' the offer is, the more important it is for the company to go out and test it with customers, otherwise the company will not even know by itself how the solution works. - A pilot is always run in order to test the whole service process. Up to this point, a lot of tests have been done together with the customers but here the company will also be able to identify frictions in the internal system that needs to be improved.
B	- Use MVP to test the solutions on customers to understand what needs to be improved. The key to success is to reach a point where all customers are happy even though they will use the service more or less in the end. - Mockups, storyboards and applications are most commonly used when testing. - A pilot run is made before full launch on a chosen customer group, and when the MVP is good enough the service is launched in full scale. The service does not have to be completely finished when it is launched, iterations are done afterwards as well.
C	- Prototyping is not used in a very structured way. In some service elements some

	kind of prototyping is used, but in others it is not. - Test the solution together with the customers in order to ensure that the service is working, is easy to use, and is creating the value is supposed to create. - When the service is piloted, it is usually completely finished, and it is then tested on a lead market to be able to evaluate the sales process, not different service components.
D	- Sometimes representatives from the company have followed a customer to truly understand how their business works. - A pilot run i made before full launch, as the solution is never totally right straight away. - In the current service development process the company receives feedback from customers in order to be able to iteratively make improvements.
E	- Some kind of prototype is built, as it is important to try making it tangible and visual. - Tests on customers are made and the company sits down together with the customers to iteratively elaborate on the solution. - Try to visualize the idea early in the form of storyboarding or a drawing to better comprehend the service idea before moving on to a concrete concept.
F	- The usage of prototypes varies from project to project. The company's history of using waterfall methodology hold people back from showing anything to the customers before it is fully developed. The company however is trying to move away from this behavior. - Ask the customers for quick feedback. All ideas are good until they get punched in the face, meaning that few ideas survive the first contact with customers. The faster you can kill an idea the better, since the development process' costs are rising exponentially as the project goes on. - Pilot on a group of customers on a market when the service has reached a high level of maturity. Test in smaller scale to get an understanding and minimize the consequences of not providing the right customer value or making big unnecessary investments. - Before full launch the customers' desirability, organizational feasibility and business validity must be in place. The customers' must want the solution, the resources to make it must be in place, and it need to be profitable for the company.
G	- Tries to test at an early stage, but the service should at the testing point be fairly complete. 80 % should be done at this point so the customer do not get a bad meeting with the company. - The customers are today concerned about time and money and the company are therefore working with 'first time right'. As long as you pay for something the quality should be in place. - Tests are run at one department store first, followed by customer surveys and customer interviews to find out their opinions. - If the service is not received as desired, steps backwards are taken and the solution is changed.
H	- Pilot in small scale and evaluate.
I	- Always runs a pilot in order to find unpredictable things or suggestions for improvements that the company had not thought of from the beginning when the service is developed. - The customer will tell you what is good and bad with the service, and then small

	adjustments are made during and after the pilot.
J	- Use prototypes when testing the service under development. Start with some kind of paper prototype, PowerPoint, or similar, that not really works, but just enough to be able to put something in front of the customers as fast as possible to receive feedback about and then move it forward step by step. - Strive to work with customers in the development process as early as possible in order to receive valuable feedback. - The customers involved in the process should be interested and willing to put their time and effort in the development process. Do not want early adopters since they tend to think that everything new is good and valuable no matter what. Focus on early majority, who to some extent are resistant to change. - By using prototyping, the company is able to receive instant and direct feedback from customers, what they think about the service and if it is user-friendly. Will be able to develop the solution so it fits as many customers as possible.
K	- Use MVP to as fast as possible get something that is good enough for customers to try it so the company can receive feedback and improve the solution. - The prototype should be something that is visual. It can for instance be a mockup, meaning prototypes you can click on where you develop something that looks like and works like the potential solution. By letting customers test and use this, the company receives a lot of valuable feedback about if the solution you are developing is intuitive or not. - Involve lead customers in the testing, meaning involve customers to whom you have a good relationship to and who are interested and willing to participate in the development process. The customers must be aware of that this is a whole process, and that what they test will not be a finished solution from the start. - By using an iterative process and customer feedback the company will be able to find a good solution with a minimized development time. Might have to use several iterations before something good is developed. - Pilot the service on some customers first in order to control the risk. Can use modules where the service can be activated or deactivated with a click and on a chosen group of customers.

4.3.1 ENABLERS FOR THE SERVICE DEVELOPMENT PROCESS

This section addresses the enablers for the service development process.

Enablers	
Respondent	***Response***
A	- Must dare to work iteratively and accept that not everything will be perfect from the beginning. Should rather take small steps forward than working on what you believe is the perfect solution. Must have an understanding that what you though from the beginning might not be the same as the end result. Not the same as for physical products. - Iteration together with customers is absolutely essential to ensure that the right solution is created based on high quality feedback. Need to be able to have an open and honest communication with the customers. - Need to able to take high risks when working with these kinds of projects. - That the team is given freedom and that the top management accepts that they work differently from the rest of the traditional organization.

	- Involve employees in the daily work of the customers in order to receive valuable input to truly understand the customer's' real problems and needs. That the company's perception of the customer's problem might actually be false. - Work cross-functionally to include more 'brains' from the company. Include people from R&D, product development, IT etc. Want to include even more functions such as legal and logistics to identify even more opportunities and obstacles. - A more floating organization where it is accepted to work in new different ways is a requirement in order to work with service development in an efficient way. - Need acceptance and support from top management. Top management set the direction for the company, and it is important that they communicate the prioritization. If it is not established from the top, nothing will be done.
B	- It is very important that the customers are involved on the service development journey. - Must realize that you cannot fall in love with the different concepts. For various reasons they might not work in reality, and it is important to remember that. - Iterative approach and make small adjustments after customer feedback. - Work in cross-functional teams. By including everyone from the beginning in the development process, an alignment between the different departments will be reached throughout the process. - Need people in the team who are inclined to change and are open-minded. - Continuously find the right customers to involve in the process, find early adopters. - Work with iterative agile development when developing the service. By working iteratively and making small adjustments aligned with customer feedback, the service will be easier to scale later on.
C	- The key to success is to dare to work outside the established structures within the organization. - Work in cross-functional teams to get a team with broader knowledge base and to include people with different backgrounds when developing the service. Need different kinds of input. - Need entrepreneurial logic where users are included in the development process, where it is allowed to try things out, and where the company dare and are allowed to take risks. - A vital part of the solution is that the company needs to think from the beginning that the service is scalable. - Top management support is very important. Service development must be encouraged and supported. - Flexibility is needed to be able to work with service development in the most efficient way.
D	- Need cross-functional teams, hard if everyone sits in their chamber and try to develop something on their own. - Very useful with feedback and input from the real world. - It is great to include people from the real world as it is hard to internally understand the customer's and user's situation.
E	- Need young influences, as the company is still very traditional, having challenges with innovative thinking. - Must work iteratively and as agile as possible when developing services. Must reach production state much sooner and in order to do that the team must be flexible and work iteratively (back and forth). - Cross-functional team spanning multiple organizational units including people who

	think new and differently. - In order to be able to work iteratively and agile it is important that the team is joined together and thus co-located. - Must dare to think differently and think outside the box. - The organization need entrepreneurship as it is important to have the endurance to take a service though the whole development process. - Important to involve reference customers who have an understanding of that the pilot is not totally done, so the customers do not get a lot of expectations. - Must be a good cooperative working environment.
F	- Must understand the customer as well as the customer understands him or herself. Be customer oriented. - Use iterative thinking throughout the development process and get quick feedback from customers, as the company does not know much about the future. - The team needs to be cross-functional in order to find sweet spots between what is feasible and what generates value to the customers. - Have a mindset that speed is sometimes more important than quality. - Dedicated resources in the projects are important as well as team autonomy and management support.
G	- Work cross-functionally as a broader view and more competence will result in a better service. Many perspectives are important. - Must have clear decision-making in cross-functional teams. - Try to see what the market need, work more from a customer and an outside-in perspective.
H	- Teams are put together with the different competences needed for the project, the advantage of this is a complete delivery.
I	- Dialogue and good communication between different levels in the organization is very important in order develop the right service to the market. - It is a requirement to involve customers since that is how the company can identify the real needs. - Strong leadership is important. - A broad knowledge base is important in the development teams and in terms of competence, more than one person must be involved in the development process. - Must have a customer-oriented mindset and think that it is fun to help a customer with its challenges and its situation.
J	- Try to start small and make incremental changes instead of starting big from the beginning. - Involve customers in the whole process. If the customer cannot absorb the service, it will not succeed. - Use cross-functional teams to involve people from the whole organization from the beginning who have competence within different areas.
K	- Involving customers in the development process is a key success factor in service development. - Use cross-functional teams. Have people from marketing, IT, markets, product development etc. This is very important since many different elements need to be considered throughout the process, how the service should be marketed, what billing system to use, and where many different competences are needed. - Need people who are more motivated than the average person, and have the drive and will to think outside the box.

	- Need strong top management support both strategically and long-term to overcome a lot of barriers along the road. If the team does not get the support needed, there will be a great risk that these projects get abandoned in favor of easier ways of making money. - Freedom is very important. If the team had worked in the traditional way, everything would have taken too long. In service development, it is extremely important that you are able to be fast and flexible, and therefore it is important that the team is given freedom to make its own decisions. Let the team act like a start-up within the large organization. - Be brave, and dare to show something to customers that is not perfect. - An iterative approach and customer proximity is key to success.

4.3.2 CHALLENGES WITH THE SERVICE DEVELOPMENT PROCESS

This section addresses the challenges associated with the service development process.

Challenges	
Respondent	***Response***
A	- A challenge with developing services is that you do not know from the beginning where you will end due to the extensive amount of customer interactions, in comparison to developing physical products. Thereby, the risk also increases. - Some things can be hard to achieve due to regulatory reasons. In order to move forward with service development and to drive a big change the organization must get legislators on board on the journey. A lot of different organizations are affected by the new service must be on board. - Hard to find the right customers to involve every time. Some customers are not ready to be included in the development process. - Currently many middle managers and decision processes to go through to get commitment and priority. - Organizational functions sit in silos. Other projects might get the priority and the resources for the service project might therefore not be sufficient in order to develop the service.
B	- Need more understanding for agile development and the usage of MVPs in the development process. The company must understand that everything does not need to be perfect from the beginning, or that the service must be completely finished when it is launched.
C	- Involving customers in the development process is time and resource consuming.
D	- Given the company's history it is challenging to show something to the customers knowing it is not totally finished. - Due to the size of the company and projects it hard to have someone in the project all the way from idea to launch.
E	- Challenges in finding the right reference customers who the company also dares to be more open minded with. The company has a history, which is of rigid character. - Challenge in being a global company as the service might be developed and tested on one market, and then it should work on the intended global market. - Challenging to feel comfortable when showing the customers something that is not completely ready. - Risk that the customers get too excited about the concept and that the company

	promise something too soon when the service might not later be developed or might be developed into something different. - Internal jealousy inhibits the development. Good ideas are killed due to the 'not invented here' principle.
F	- Hard to get everyone to speak the same language in a cross-functional team. - Used to silos and not used to work cross-functional. The project manager does not have full control over the resources in the project as the resources report to the line manager. - If showing a semi-finished service to the customers they will react more to the bugs than the value the service offer. And if showing a power point, the customers will find it hard to imagine the value. Challenging when the customer wants something hands-on, but hands-on is not finished yet. - Internal struggle for the employees to deliver something with bugs that they know will crash, partly due to one of the company's core values: quality. - There is a business risk if early pilot fail.
G	- The company is large and slow moving which makes it hard to be in the forefront. It is easy to be reactive, but then the company is already two years too late. - Hard to get market input of what is needed. - Challenging with cross-functional teams as it is hard to find time to get together, different functions may have different focus, purpose and goal. - The company is bureaucratic and there are a lot of decision-making forums to get through. - Lose momentum, as there are so many people who think and feel.
H	- The time to market aspect and the speed is challenging. Must be able to develop the services quickly enough for them to be relevant. - Challenging with cross-functional teams as people have different expectations and might lack understanding of what each part of the organization is doing.
I	- The process requires customers' time and commitment if they are to come back with reflections and suggestions for improvement. - Challenging for a large company to be fast enough. The company is like an Atlantic steamship, it takes longer to turn than a rowboat.
J	- One of the most difficult challenges with prototyping is to dare to let the customers see something that is not completely finished. Have a tradition of completing a product to 100% before you show it to the customers. To show something that is not finished is very emotionally difficult for managers. They see it as a branding risk since quality and premium are connected to the brand. - To involve customers in the development process is very time and resource consuming. - Directives and policies affect the team's ability to do things. - The responsibility and decision points move with the transition, and middle managers feel threatened since they feel that they lose control and power. Today, there are too many middle managers in the organization.
K	- Involving customers might raise their expectations about the service, and it can thus become a disappointment among the customers if the service does not come out as delivered or the development time is longer than they expect. - Working in cross-functional teams can be challenging since it requires that people work in the same direction.

5. ANALYSIS

5.1 SERVITIZATION OF MANUFACTURING

Reasons for servitizing

Reasons behind why the firms are servitizing and factors mentioned by theory somewhat differ. Reasons mentioned in theory that is not supported in practice and by the respondents are that services are a potential solution to eroding product margins (Fischer, Gebauer & Fleisch, 2014), that services are more profitable than physical products (Fischer, Gebauer & Fleisch, 2014; Valtakoski, 2016), and that services are added to capture a larger market share (Martinez et al., 2010; Baines et al., 2013; Vandermerwe & Rada, 1988; Fischer, Gebauer & Fleisch, 2014). The literature further discuss that by servitizing, firms can create a competitive advantage (Martinez et al., 2010; Baines et al., 2013; Vandermerwe & Rada, 1988; Fischer, Gebauer & Fleisch, 2014), and differentiate against competitors (Fischer, Gebauer & Fleisch, 2014; Vandermerwe & Rada, 1988), which was also mentioned and supported by some respondents. Respondent *K* discussed the fact that servitization is a way to drive the degree of differentiation from competitors as a service requires a closer relationship with the customers, which is harder for the competitors to copy, in comparison to physical products. Respondent *I* was in line with this discussion, and said that one reason for why the company is servitizing is to create a partnership with customers in order to avoid competition. Respondent *F* took the discussion further by understanding the urge of adding services to the company offer as the company will not make enough profit and survive if only focusing on products, thus making the offering of services a way to survive. The respondent also highlights that services will be more important than products in the future, which can be linked to the literature as according to WTO, services is the fastest growing sectors globally and accounted for 70 % of the world GDP in 2015 (WTO, 2015). A majority of the respondents focused on the creation of new means of value to the users, which is not explicitly mentioned in theory. Respondents *G* and *H* are for example explaining how the changing market influence the company to add services to make existing customers more satisfied, and said that the customers are requesting services and the company must deliver what the customer wants. Respondent *F* identifies a generation and competence shift in the customer base where the customer more looks at the total cost of ownership and the company must therefore provide a complete offering to the customers.

An interesting finding is that some of the respondents are discussing servitization from the perspective of the company's product offer, and are thus seeing the adding of services as a potential way to get leverage and sell additional products, increase the value of existing products, or make the products more accessible to the customers. This indicates that some of the firms rather see services as something that can strengthen their already existing products, and not as an important offering in itself. The literature (Fischer, Gebauer & Fleisch, 2014; Kotler & Keller, 2016) discuss how a company can move from being a product manufacturer towards being a service provider, and the above discussion can thus recognize that the firms are satisfied with having their tangible products with add-on services and not reach the final

offering of a pure service. Respondents *H* and *C* are however discussed the reason for adding services as a potential source of income and a new area of value creation. It is thus clear that the objective of the strategic decision to add services to the offering can vary between companies.

Challenges of servitizing

It is the history as a product manufacturer that mainly makes servitization challenging for the firms, if leaning on theory and the answers from the respondents. The organizational structures, principles and processes are new to the product manufacturer (Oliva & Kallenberg, 2003; Brax, 2005). This statement is confirmed by Respondent *C* who said that the existing structures and processes within the company are nailed and woven together and therefore difficult to change, and that the mental models within the company is the biggest challenge. Several of the respondents discussed the fact that the history of the company makes it challenging to understand how to charge for services. Respondent *K* is for example having a history of offering some services for free, and the respondent discussed the difficulty of understanding how the company should dare to charge for services. The company must think about how they can make profit out of services, and thus charge for them.

In some cases, it has also been found that service development is given low priority by the organization. Respondent *A* discussed that value creation activities for the customers have historically been given away for free, which in turn has lead to that service development has not been prioritized by the company. Respondent *F* also discussed the prioritize question by saying that the company has difficulties to prioritize the development of services over physical products, as the company currently are making money out of the latter. The challenges of charging for and to prioritize services are particular important if referring back to Respondent *F* and WTO (2015) who discuss that services will be more important than products in the future and that service today is the fastest growing sector. Therefore, in order for the company to prioritize services, it is argued that the ability to charge for services will be of great importance depending on the strategic objective for why the firm is servitizing.

Important takeaways

- Reasons for why firms servitize vary.
- Main challenges lies within the history of being a product manufacturer.
- Ability to charge for services highly important depending on the strategic objective for why firms are servitizing.

5.2 SERVICE DEVELOPMENT PROCESS

Opportunity identification

According to literature of user-oriented approaches, one way that the company can initiate a service is that the company can start with writing down guesses, hypotheses, regarding the problem (Blank, 2015; Sarvas, Nevanlinna & Pesonen, 2016). However, during the interviews

none of the respondents explicitly mentioned that hypothesis framing or guessing is practiced, but rather point out that an initiative to a service can emerge from various sources. For instance, several respondents mentioned technological developments, market requests, and direct customer feedback as common sources when identifying problems or opportunities, but several also mentioned that the process also often starts with ideas provided by top management. Some also mentioned internal workshops where brainstorming is occurring around ideas to develop, which is a technique also mentioned by Hasso Plattner Institute (2010b). Thereby, even though the respondents did not explicitly mentioned that hypotheses framing or guessing is practiced, it can still be argued that that is what they do in their brainstorming sessions, and for instance when ideas emerge from technological developments or top management. Keeping an eye on competitors (Sarvas, Nevanlinna & Pesonen, 2016) and analyze the market to understand the current state, customer needs, and future potential (Pesonen, 2016), was further supported by some respondents as ways of identifying opportunities. One can thus argue that one should not wait for competitors to do something, but rather aim to lie one step ahead in order to create competitive advantages.

The literature further discuss the possibility to 'step into the user's shoes' (Hasso Plattner Institute, 2017) and experience what the user experiences (Hasso Plattner Institute, 2010b) in order to gain empathy for them whose problem you are trying to solve in order to identify the problem that needs to be solved (Hasso Plattner Institute, 2010a). However, only two of the respondents, *A* and *C*, said that this is a practice used. According to Respondent *C* the company sometimes have employees living or working as a customer in order to identify the real need and problem. Respondent *A* explained that the company then is able to see and experience things from a perspective of reality instead from a perspective of the company. A possible explanation to why not a greater number of respondents are identifying problems worth solving by stepping into the user's shoes' could be that customers directly are often the ones approaching the company with their needs, and therefore the firms might not experience this part as necessary. On the other hand, the literature of user-oriented approaches is, as mentioned, discussing the opportunity identification from a search perspective where you are trying to understand (SAP, 2012; Hasso Plattner Institute, 2017) or make hypotheses (Blank, 2015; Sarvas, Nevanlinna & Pesonen, 2016) about the customers' needs or problems. It can therefore be argued that the literature imply that the customers should not need to approach the company with their problems or needs, but rather that the company should be the one identifying these. Also, by lying one-step ahead of the customers, it is also argued that the company easier will be able to create a wow-effect with the customers, and possible also a competitive advantage against competitors. Another interesting finding is that even though only two respondents practice 'step into the user's shoes' when identifying problems or opportunities, a large majority still mention that they are involving customers when verifying the problem or need, which according to literature (Sarvas, Nevanlinna & Pesonen, 2016; Pasanen, 2016; Blank, 2007) is described as important in order to ensure that the right solution is being developed. Respondent *J* said that it is extremely important that they involve customers early in the process to validate the problem, despite that they often already might have an internal belief of how things should work. The authors of this study argue that it is

beneficial to 'step into the user's shoes' to identify the right problem from the beginning, rather than make a guess about it which might force you to go back and change your idea about what the problem might be if the guess or initial thought turn out to be incorrect when validating.

Mentioned in the literature is also that multiple ideas of a solution to the problem are created (Blank, 2015; Hasso Plattner Institute, 2010a; Sarvas, Nevanlinna & Pesonen, 2016). Fast Company (2006) states that one should push for a wide range of ideas rather than focusing on a single solution and that even though the solution might seem obvious, looking at a problem from various angles always yields richer results. Respondent *A* supported this statement, and explained that you should try to make a selection of different possibilities that meet the same need. The other respondents do not explicitly point out the importance of working on multiple solution ideas simultaneously, but they do not stress that one should focus on only one proposed solution at a time either. In order to avoid making a pivot when validating the problem or need, it is argued that multiple ideas should be created from the beginning. By being open to multiple solution ideas from the beginning, it is argued that the it is less likely that you will realize later in the process that a better solution than the one initial thought of existed.

OPPORTUNITY IDENTIFICATION	Theory	Empirics
Write down best guesses/hypotheses regarding the problem	✓	***X***
Understand the problem by observing and stepping into the users' shoes	✓	✓
'Get out of the building' to involve and interact with customers to verify the need	✓	✓
Create/frame multiple ideas of a solution to the problem	✓	✓

Table 12. Opportunity identification in Theory and Practice

✓ - mentioned
X - not mentioned

Important takeaways

- Be open to a wide range of ideas and the sources from where these emerge.
- "Step into the user's shoes" to lie one step ahead both customers and competitors, and to increase the chance of identifying the right problem to solve from the beginning.
- Verify the problem through customer involvement to ensure that the right solution is being developed.

Evaluation

Evaluation should according to the literature involve evaluation of the viability and the desirability (Brown, 2009) and the focus should thus be on the business potential and the value to the end user (Sarvas, Nevanlinna & Pesonen, 2016). A majority of the respondents

discussed the evaluation in the same terms as the literature by saying that the potential of the service is either determined by customer value or money. It is however clear, that the largest focus for the respondents lies with the monetary value. Respondent *C* described how the total amount of money generated for the company is the most important aspect to investigate, and Respondent *G* discussed the fact that the company cannot make 'nice-to-have-services', but rather make services that raise the average amount of the receipt. Respondent *H* is looking at the evaluation from a risk perspective of losing current customers or at the possibility of making money, rather than actually focusing on current customers or new potential customers. However, in user-oriented approaches the human need is what is in focus (Brown, 2009). Customer feedback should be solicited before extensive amount of time and effort have been put on a service that the customers might not even want (Blank, 2013). Respondent *F* discussed that both the emotional and rational value of the services idea should be evaluated. However, the respondent continued and stated that the rational value is the most important as the company wants to make money on the service. Respondent *K* is more in line with the literature and is firstly focusing on the customers, and said that it is basically about the relevance for the customers when evaluating an idea. After that the company looks at the internal perspective, if the company can be good at it and make money of it. The discussion above regarding the respondents' focus on the money value can be related to an interesting aspect from the literature saying that jumping into costs and revenues early in the process can be seen as dangerous as the business will be calculated without a good understanding about the customers and the actual service that is built (Sarvas, Nevanlinna & Pesonen, 2016). It can be argued that the respondents focusing on the monetary value before the customer value therefore are taking unnecessary risks and might not be aware of it. Focus should be on both company and customer value, however it is argued, leaning on the user-oriented approaches, that the initial evaluation is favorably concentrated on desirability since if the customers do not value the service the company will not be able to make money out of it.

None of the respondents are articulating that a BMC is used as a tool to evaluate the business potential. The BMC may be used at the companies, but is not a standardized tool used in the service development process. In literature the BMC is explained as a visual chart that explains how a company creates value for its customers and for itself (Osterwalder & Pigneur, 2010). As previously stated, the theory of user-oriented approaches focus more on customer value while the empirical findings show that the respondents focus more on the monetary value. It can thus be argued that it could be beneficial to use the BMC as a tool when evaluating the business potential to ensure that both company and customer value is being considered in the evaluation.

An aspect that is not discussed in the literature of user-oriented approaches, but however is brought up by three of the respondents, is that management decides whether to proceed with a service idea or not. Respondents *D*, *B* and *C* all discussed this matter and said that management prioritizes and decides if and what ideas that are worth moving forward with. Even though these three respondents in particular did not bring up low prioritization of services when talking about servitization, it can nevertheless be argued that it could pose

some difficulties moving forward with a service idea if the decision is in the hands of the management, who also might be giving services lower priority.

EVALUATION	Theory	Empirics
Evaluate the viability	✓	✓
Evaluate the desirability	✓	✓
Management decides if the solution is worth moving forward with	***X***	✓

Table 13. Evaluation in Theory and Practice

✓ - mentioned
X - not mentioned

Important takeaways

- Evaluate viability and desirability to ensure that both business value and customer value is taken into consideration. However, initial focus should be put on desirability since viability would most likely not be fulfilled if desirability is not.

Development

Testing is an effective way to learn about the proposed solution (Blank, 2015; Ries, 2011) and a chance to refine the solution through customer feedback (Hasso Plattner Institute, 2010a). A widely discussed element in literature of user-oriented approaches is to test the solution on future users with some kind of prototyping (Blank, 2015; Ries, 2011; Sarvas, Nevanlinna & Pesonen, 2016; Hasso Plattner Institute, 2010a), which, a large majority of the respondents confirmed is done in the service development process. Both the term 'MVP' (Blank, 2015; Ries, 2011; Croft, 2016) and 'prototype' (Sarvas, Nevanlinna & Pesonen, 2016) is used in literature when discussing prototyping of the solution, which is recognized to be true in practice as well after interviewing the respondents. According to the literature a prototype should only command as much effort, time and investment that is necessary to generate useful feedback and thus drive the idea forward (Brown, 2008). This description is not far from the description of an MVP as it is described as a version of the solution which contains just enough features for the customers to be able to evaluate it, which is built with minimized development time and resources (Croft, 2016; Blank, 2015; Ries, 2011). One can therefore argue that an MVP and a prototype as such are similar. However, like theory, the respondents do not make any clear distinction of the difference between the two, and therefore the interpretation is that these are only different ways to express oneself about the same thing. Ries (2011) means that the use of prototyping when testing the solution can be very beneficial since many customers do not acknowledge what needs to be improved until they get the proposed solution in front of them. This aspect is also mentioned by some of the respondents, and Respondent *A* said that it is only when the customer gets the solution in its hands and can act with it that the customer can detect the value. According to theory, a prototype can be anything that the user can interact with, ideally something the user can experience (Hasso Plattner Institute, 2010a), or that it should be a version of the solution that contains just

enough features for customers to be able to evaluate the solution, which is build with a minimized development time and resources (Croft, 2016; Ries, 2011). Respondent *J* said that the prototype can be something that does not really work, but just enough to be able to put it in front of the customers as fast as possible in order to receive feedback about the solution. The respondent mentioned paper prototypes and PowerPoints when exemplifying what the prototype can be, and storyboarding, drawings, mockups, and 3D-printed objects are further brought up by other respondents as additional examples of prototyping techniques for services used by the companies.

The literature on user-oriented approaches is keen to point out that the solution is developed through small improvements aligned with customer feedback on the way to a finished solution (Blank, 2013; Blank, 2015; Stickdorn & Schneider, 2012). Cline (2015) means that a high level of customer interaction throughout the process minimizes the risk of investing a lot of resources in developing a solution that the customer does not even want in the end. By testing early, the company can thereby, if failing, do it quickly and easily (Hasso Plattner Institute, 2010a). Respondent *F* discussed these arguments, and said "all ideas are good until they get punched in the face", and explained that few ideas actually survive the first contact with customers, which is why it is good to kill an idea as early as possible since the development costs are rising exponentially as the project goes on. Even though the other respondents who involve customers do not explicitly mention that the reason for involving customers is to avoid unnecessary resources being spent, it is however brought up intuitive from their reasoning around receiving valuable feedback from the customers about the solution as early and quick as possible. Our logic is that by focusing on developing what the customers want and satisfy their needs, they will indirectly save money by not developing the wrong solution. Respondent *J* stated that customer feedback is considered important to be able to develop a solution that will fit as many customers as possible, which can be seen as a desire to facilitate the up scaling of the solution. This could also be found in theory, where some authors argue that the building and testing of an MVP on customers is essential to be able to scale up production later on (Blank, 2013; Ries, 2011; Blank, 2015).

An interesting finding is that several of the respondents brought up piloting as an important element in the development phase in the service development process, while the literature however, does not put much emphasis on discussing this at all. The respondents discussed reasons such as wanting to test the service on a pilot group of customers or a pilot market before full launch in order to receive suggestions for improvements from the customers, to test the whole process to identify frictions in the internal system, and to control the risk when launching. A possible explanation to why the literature does not bring up this explicitly might be that the user-oriented approaches all put great emphasis of involving customers early and throughout the whole development process, and might therefore not consider piloting as something especially needed since the solution after extensive feedback and iterations should be ready for full launch. Also, it can be argued that the literature does not put much emphasis on the integration of the user-oriented approaches in the service development process at a

large existing organization, which could also be a reason for why the respondents working at large organizations bring up piloting as important in comparison to the literature.

DEVELOPMENT	Theory	Empirics
Prototype/MVP of solution is built and tested on future users	✓	✓
Solution is improved through customer feedback	✓	✓
Use pilot runs before full launch	***X***	✓

Table 14. Development in Theory and Practice

✓ - mentioned
X - not mentioned

Important takeaways

- Test prototype/MVP early on real customers in order to receive feedback about the proposed solution to ensure that the right solution is being developed and to facilitate up scaling.
- Piloting could be beneficial for a large firm when testing the final solution in order to identify frictions in the internal system.

5.2.1 ENABLERS FOR THE SERVICE DEVELOPMENT PROCESS

Projects are today complex and the individual's work is thus relegated (Brown, 2009). The literature discusses multidisciplinary (Hasso Plattner Institute, 2017; Sarvas, Nevanlinna & Pesonen, 2016), heterogeneous (Hasso Plattner Institute, 2017) and cross-functional teams (Ries, 2011), and thus the enabler of having a team with a mix of people and competence. All the respondents also see a cross-functional team as an important factor for service development, and Respondents *A, B* and *C* discussed that a broader knowledge base and people with different backgrounds should be included from the beginning in order to have an alignment between different departments throughout the process. The other respondents are agreeing upon that different competences are needed and will result in a complete delivery and a better service. According to Ries (2011), teams that are cross-functional are more productive if you measure productivity as the ability to create customer value. For a large manufacturing firm, it can further be argued that cross-functional teams would be beneficial since the organization as such then will be more prepared for the new service when it is complete. Even though both theory and practice point out the importance of the team and the various competences needed, the respondents put more emphasis on the several functions that should be involved, rather than focusing on the heterogeneity of the team. It is however argued that teams would benefit from having a heterogeneous team to avoid groupthink and to be more open and flexible to alternative directions and solutions. Moreover, a non-hierarchical team structure (Kelley & Littman, 2001) and the importance of speaking the same language within the team (Sarvas, Nevanlinna and Pesonen, 2016), is not brought up by the respondents but is however mentioned in literature. Sarvas, Nevanlinna and Pesonen (2016),

discuss that it is favorable if the team both use a common language and a common methodology. Respondent *I* did however bring up good communication and dialogue between the different levels in the organization as an enabler for service development. To be able to work cross-functionally, it is therefore argued that a common language would be preferable to have in place.

Some of the respondents stressed the importance of top management support in order to successfully work with service development. Respondent *C* underlined the importance of top management support, and explained that service development must be encouraged and supported from a higher level. Respondent *K* also highlighted the importance of strong top management support both strategically and long-term and stated that if the team does not get the support needed there will be a great risk that the projects get abandoned in favor of easier ways of making money. Top management support is not explicitly mentioned as an enabler in theory, but importance of team autonomy is (Ries, 2011). Ries (2011) argue that complete autonomy is needed for the team in order to be able to develop and market new services, and also that experiments then can be conducted without excessive number of approvals. Brown (2009) further argues that it is better to ask for forgiveness afterwards rather than permission before. Respondent *K* stated that it is very important that the team is given freedom to make its own decisions and explained that if the company had worked in the traditional way everything would have taken too long. Freedom is also acknowledged by Respondent *A* who said that an enabler for service development is that the team is given freedom and acceptance from top management to work differently than the rest of the organization. Respondent *C* further stressed that the key to success is to dare to work outside the established structure of the organization. In order to be able to work fast, flexible, and agile, like the respondents pointed out as needed, it is therefore argued that top management support is needed so that the team is given the allowance to break the old traditional ways of working. In the service development process it is further favorable to have a risk taking mentality where failure is permitted (Kelley & Littman, 2001; Brown, 2009), and it is important that the team is given the budget, time and space to make mistakes (Brown, 2009). The importance of a risk taking mentality is supported by Respondent *K*, *A* and *C*, where the latter respondent said that the logic of trying things out, to dare, and to be allowed to take risks, are enabling factors in the service development process. Why not a larger number of respondents highlight risk-taking might be rooted in fear of doing things wrong. Therefore, once again, top management support is argued to be of high importance in order to break the old traditional ways of working and foster a working environment where failure is permitted.

Two important enablers brought up by the respondents are the usage of an iterative approach throughout the development process and high customer involvement. It has been cleared that user-oriented approaches are centered around iterative process design and customer involvement, and therefore these are not explicitly emphasized on as enablers of the process but rather as fundamental cornerstones of the approaches. One argument in favor of the iterative design found in literature is that it eliminates wasted time and resources (Blank, 2013; Blank, 2015; Stickdorn & Schneider, 2012; Cline, 2015). Since the solution is reviewed

periodically in an iterative process, the cost of change will be significantly lower in comparison to traditional development processes where extensive work are done early in the process, and the cost thus increase exponentially (Cline, 2015). Kolko (2015) means that it is rare to get things right on the first try, and that this is why the development process is iterative in its nature. Respondent *F* explained that the work put in must be iterative since the company does not have much knowledge about the future. Respondent *B* also mentioned that by working iteratively and making small adjustments aligned with customer feedback, the service will be easier to scale later on. As mentioned earlier, theory argues that building and testing of an MVP on customers is essential to be able to scale up production later on (Blank, 2013; Ries, 2011; Blank, 2015). Respondent *A* stressed that the company must dare to work iteratively and accept that everything will not be perfect from the beginning. This goes in line with what the theory stress about the perseverance needed, and that you cannot give up after the first sign of trouble (Ries, 2011). It is however suggested that a non-hierarchical team structure, team autonomy and the support from top management could facilitate iterations in the development process, since it would probably be easier to work iteratively when the team does not have to ask for permission all the time.

Furthermore, an open and flexible mindset is considered favorable (Brown, 2009; Ries, 2011) since organizations, teams and individuals then are open to new possibilities and alert on new solutions and directions (Brown, 2009). During the interviews, some of the respondents stressed the need of flexibility, speed and agility in the service development process. Sarvas, Nevanlinna and Personen (2016) mean that it is important to be ready to throw away darling ideas when building new businesses, which was confirmed by Respondent *B* who claimed that you must realize that you cannot fall in love with different concepts since they might not work in reality. Therefore, it is argued that it is important to have an open and flexible mindset to not get stuck with certain ideas, but rather to be open to new possibilities and solutions in order to rapidly move forward in the process and to be able to work iteratively. Being able to 'kill you darling' is also argued to save development costs by ensuring that the wrong solution is not being developed.

The literature on user-oriented approaches is keen to point out that the solution developed is improved through customer feedback in an iterative (Blank, 2013; Blank, 2015; Stickdorn & Schneider, 2012) and agile process (Cline, 2015). As mentioned, the respondents also frequently discussed customer involvement as an important enabler for the service development process. Respondents stressed that the importance of understanding the customers, the need to be customer oriented and that the involvement of customers in the development process is the key to success. Respondent *D* said that it is great to include people from the real world, since it is hard for the company to internally understand the real customer and user situation. This could be linked to one of the major benefits of involving customers in the development process brought up by Innovation Leader (2016), saying that it can combat some of the internal beliefs and biases an organization might have about customer demand and behavior. Other benefits of customer involvement and customer feedback can be found in the section above regarding development. However, Respondent *B* also stressed the

importance of finding the right customers to involve in the process, and also to find early adopters. Respondent *E* instead stated that it is important to involve reference customers who understand that the service might not be totally done.

ENABLERS	Theory	Empirics
Mix of competence and people in the development team	✓	✓
Speak the same language	✓	X
Risk taking mentality, have the permission to fail	✓	✓
Open and flexible mindset	✓	✓
Work iteratively	✓	✓
Perseverance, do not give up after setbacks	✓	X
Autonomy, be able to experiment without excessive number of approvals	✓	✓
Top management support	X	✓
Customer involvement	✓	✓

Table 15. Enablers in Theory and Practice

✓ - mentioned
X - not mentioned

Important takeaways

- Have cross-functional teams to deliver a more complete and better service.
- Top management support essential to foster a working environment suitable for service development.
- Use iterative process design to minimize development costs and to facilitate the upscale of the service.
- Have an open and flexible mindset to be able to work fast and iteratively, and to ensure that the wrong solution is not being developed.
- Involve customers to understand the real customer need.

5.2.2 CHALLENGES WITH THE SERVICE DEVELOPMENT PROCESS

Several of the respondents highlighted challenges of working cross-functionally, while theory put more emphasis on the benefits. Respondent *F* mentioned the difficulty of 'speaking the same language' when used to sit in silos, Respondent *G* said that is difficult since different functions may have different focus, purpose and goal, and Respondent *H* said that one might lack understanding of what each part of the organization is doing. This is an interesting findings since all of the respondents consider a mix of competence and people essential to include in the development process, and focus on the several functions that should be

involved in the development process, as discussed earlier under section *5.2.1*. Thereby, even though all the respondents consider cross-functional teams important for the service development process, it is still one of the largest challenges, which could possible be connected back to the respondents' reflections about the current inflexible organization and the history of the organization.

Fear or concern of showing the solution to customers too soon if the company fails to live up to the expectations is a challenge a large company can face according to Innovation Leader (2016). Innovation Leader (2016), Kirsner (2016), and Ries (2011) discuss the potential branding risk if the MVP for instance is not very well received on the market. The concern of showing the solution to the customers too soon was confirmed during the interviews. Respondent *J* said that it is a great challenge to dare to let the customers see a solution that is not completely finished when having a tradition where the company is used to completing a product to 100% before showing it to the customers. The respondent further explained that this is very emotionally difficult for managers since they consider it to be a branding risk when 'quality' and 'premium' are connected to the brand. However, Ries (2011) argues that a solution to this challenge can be to launch the MVP under a different brand name, since brand damage then can be avoided if the MVP is not very well received. Moreover, Innovation Leader (2016) discusses that the concern of showing the solution to customers too soon can be counteracted by demonstrating that customers want to be involved in the process. Many of the respondents have during the interviews mentioned the importance of involving customers early in the process, and one could therefore assume that the companies also make sure to carefully select customers who are willing to participate, and also will be well-informed what to expect. This could therefore potentially explain why not a larger number of the respondents mention fear of showing the solution to customers too soon as a great challenge. Two of the respondents, *E* and *A*, however said that it is challenging for the company to find the right customers to involve in the development process. The literature does not put much emphasis on discussing exactly how the right customers to involve should be identified, but Blank (2007) mentions that the company can create a so called 'innovators list" that contains customers who are smart, respected, and usually early adopters of new things.

Theory on user-oriented approaches also brings up lack of resources as a potential challenge (Innovation Leader, 2016), but that statement is not brought up by any of the respondents. However, even though lack of resources is not an identified challenge in the empirical findings, several of the respondents said that involving customers in the development process is challenging since it is time and resources consuming. Respondent *A* explained that the extensive amount of customer interactions required in the development process results in that you cannot know from the beginning of the process where you will end up, like you mostly know with physical products. The fact that some of the respondents consider customer involvement as a challenge due to that it is time and resources consuming could indicate that the organization does not prioritize service development enough.

It can be challenging for large companies that the current business model is inflexible (Innovation Leader, 2016) and that it is difficult to change from a milestone culture into an exploratory and iterative process (Brown, 2009), which a majority of the respondents confirmed. Exemplified by the respondents is the slow decision making processes and the many levels of authority needed to go through when moving forward in the process. Respondent *G* said that the fact that the company is large and slow moving makes it hard to be on the forefront, and that it is easy to be reactive but then you are already too late. Respondent *H* agreed and said that the company must be able to develop services quickly enough for them to be relevant. It can be argued that fewer levels of authority would result in a faster decision making process, which could enable the company to act quicker to avoid being too late. The new way of working with service development can threaten the authority of decision makers (Innovation Leader, 2016), which is confirmed by Respondent *J*, who said that middle managers feel threatened of losing control and power since responsibility and decision points move with the transition. Our argument regarding fewer levels of authority could therefore possibly be hard to achieve as current managers oppose.

CHALLENGES	Theory	Empirics
Alignment of cross-functional team	X	✓
Fear of showing the solution to customers too soon if the company fail to live up to the expectations	✓	✓
Lack of the resources required	✓	X
Inflexibility of current business model and difficult to change from milestone culture into an exploratory and iterative process	✓	✓
The way of working with the development process can threaten the authority of decision makers	✓	✓

Table 16. Challenges in Theory and Practice

✓ - mentioned
X - not mentioned

Important takeaways

- Alignment of the cross-functional team is considered challenging due to language barriers and different focus.
- Showing the solution to customers too soon is a common concern due to the branding risk that might be caused if the solution is not well received.
- Involving customers in the development process is considered time and resource consuming.
- Current business model is considered inflexible, and it is difficult to change from a milestone culture into an exploratory and iterative process due to slow decision-making processes and many levels of authority.

6. CONCLUSION

This thesis has demonstrated how service development can be managed from the perspective of user-oriented approaches while considering the trend of servitization. The research question that guided the approach of this thesis was stated as following:

- *What could be an appropriate way for the NBCS team to work with service development from a perspective of user-oriented approaches?*

In order to be able to provide the team with an appropriate recommendation, the authors had to take into consideration the aspect that the team operates within a large manufacturing firm. The starting point was therefore structured around servitization, and more specifically in investigating reasons for why large manufacturing firms servitize and main challenges with it. Both literature and empirics revealed that reasons for why firms servitize vary, but differentiation against competitors in order to create competitive advantage was supported by both. The study further revealed that main challenges for firms that are servitizing lie within the history of the company of being a product manufacturer. For instance, from the empirical findings, it was clear that many do not know how to charge for services. Since it has been stated from literature that the service sector is the fastest growing sector globally, it will be of great importance that firms are prioritizing service development, and are able to adapt the way they do business in order to stay competitive in the future, especially since research further consider services to be more profitable than physical products.

During the literature review, it was revealed that there is currently no widely adopted process for working with service development, and therefore the authors of this study constructed own generic stages of a service development process based upon similarities in different service development processes from other contributions. Due to the lack of earlier academia of how a perspective of user-oriented approaches can be applicable in a service development process, the authors further had to fit common features of the different approaches into the previously identified generic stages. With roots from literature and empirical findings, a suggested way of how the NBCS team in an appropriate way could work with service development from a perspective of user-oriented approaches, while considering the trend of servitization, is summarized in the model presented in Figure 7.

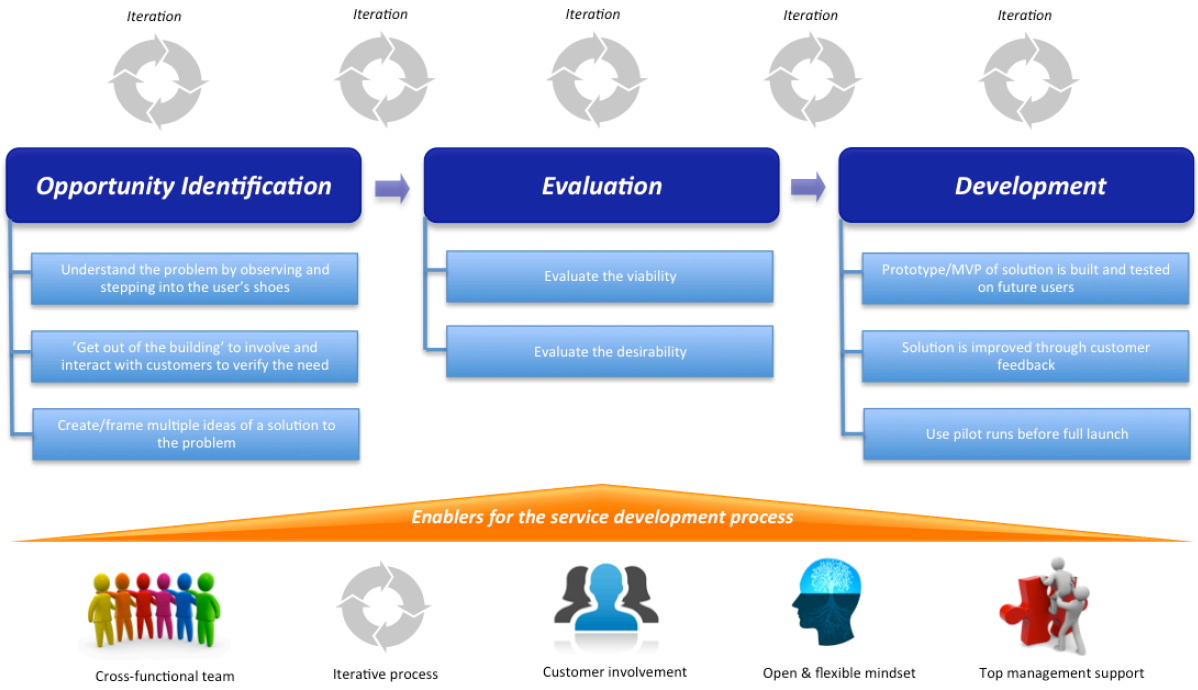

Figure 7. Suggested way for the NBCS team to work (Authors, 2017)

It can be concluded, that during *Opportunity Identification* it is favorable if the team is open to a wide range of ideas and the sources from where these emerge when identifying problems or opportunities. Workshops internally where brainstorming is practiced can be a good way for them to make hypotheses or guesses about problems or opportunities. However, by investing time and resources to closely observe, and to really 'step into the user's shoes', the team will be able to lie one step ahead both customers and competitors when identifying problems or opportunities, which can enable the company to create a wow-effect with the customers and a competitive advantage against competitors. Furthermore, the team will more likely be able to identify the right problem or opportunity from the beginning, since the organization then can truly experience reality from a customer perspective, rather than from a company perspective. Thereby, the company can save time and resources by avoiding doing a 'pivot' about the idea of the problem if the guess or initial thought turn out to be incorrect when validating the problem. The validation of the problem was found to be of high importance in order to ensure that the right solution is being developed, and can be done by 'getting out of the building' and involve real customers in the process. The study furthered revealed that it is favorable to create multiple ideas that solve the same problem, since the initial or most obvious solution might not always be the best.

Furthermore, during *Evaluation* it is important to evaluate both viability and desirability to ensure that both business value and customer value is taken into consideration. However, from the perspective of user-oriented approaches, the initial evaluation is advantageously concerned with the desirability since viability would most likely not be fulfilled if desirability is not. To ensure that both company value and customer value is taken into consideration

when evaluating the business potential of the solution, the BMC has been suggested as a suitable tool to use.

During *Development,* the study showed that the solution should advantageously be tested on real customers by using prototyping. The solution should not be closed to finished when testing it on customers, but rather just be a version of the solution that contains just features necessary for the customer to be able to experience it. Examples mentioned were storyboarding, 3D-printed objects, and mockups, among others. The purpose of testing the solution on real customers is to be able to receive valuable feedback about the solution you are developing in order to drive the solution forward in the right direction. Therefore, prototyping is considered to be a good approach since it is easier for the customers to understand what needs to be improved when they are able to see or experience the proposed solution. By making small improvements aligned with customer feedback, the team will minimize the development costs by developing the right solution from the beginning. Therefore, it is also favorable to involve customers in the testing of the solution as early as possible. It has also been found that developing the solution together with customers will facilitate the up scaling of the solution later on, since the solution will then already be developed with consideration to fit as many customers as possible. However, the empirical findings also showed that showing the solution to customers too soon is a common concern among the respondents with involving customers due to branding risk that might be caused if the solution is not well received. It is therefore important that the team make a careful selection to identify suitable customers to involve in process. Furthermore, even though the user-oriented approaches do not emphasize piloting of the solution, it is still considered a part beneficial to include in the service development process in order to take the large size of the company into consideration. By piloting the solution on a smaller group of customers before full launch, the team will be able to identify frictions in the internal system within the large organization that might not be entirely connected to the service as such, but still important for the service to work.

The study has also revealed some factors, or enablers, important for service development. A team of mixed people and competence, and especially to have a *cross-functional team*, was found to be of high importance. The study revealed that the broad knowledge base and the involvement of different functions in the company enable the organization to deliver a more complete and better service. However, working cross-functionally also pose some challenges, and the alignment of the cross-functional team due to language barriers and different focus between the different departments was one of the challenges most frequently mentioned. To be able to work cross-functionally, it is therefore important that there is a good communication and dialogue between the team members from the various functions, and a common language is thus further preferable to have in place.

An *iterative process* and high *customer involvement* was also found to be of high importance, which are both central elements of user-oriented approaches. As mentioned before, through customer interactions, the identification of the right problem is facilitated, and the company

can also later on ensure that the right solution to the problem is being developed. From the empirical findings, it was however found that involving customers in the development process is considered time and resource consuming. However, the study also showed that by using an iterative approach throughout the process, the solution is reviewed periodically and improved aligned with customer feedback, which minimize the development costs and will facilitate the up scaling of the service. Therefore, it can be concluded that even though customer involvement might cost time and resources, it will still be less than the time and resources saved by developing the right solution from the beginning. It is therefore further concluded that it is important that the organization accepts and understands that everything does not have to be perfect from the beginning, and adapt to this new open way of developing. In line with this, it was found that it is important that the team members have an *open and flexible mindset* in order to fast be able to abandon darling, - but wrong ideas and be open to new possibilities and solutions in order to rapidly move forward in the development process and work iteratively. Especially from the empirical findings, it was also clear that *top management support* is absolutely essential in order to foster a working environment suitable for service development. To be able to work fast, flexible, and iteratively, the team must be given the allowance to break the old traditional way of working and be given the time, resources, and space to make mistakes and not be required to constantly ask for permission when conducting experiments. It was found that one of the most frequently mentioned challenges in the service development process was that the current business model is inflexible and the difficulty to change from a milestone culture into an exploratory and iterative process due to slow decision-making processes and the many levels of authority. Since it was earlier stated that the biggest challenges for large manufacturing firms when servitizing lies within the history of being a product manufacturer, it can finally be concluded that top management support is absolutely essential in order to prosper in the increasingly growing service area.

6.1 RECOMMENDATION TO THE NBCS TEAM

An appropriate way of how the NBCS team at Volvo Cars can work with service development from a perspective of user-oriented approaches is presented in Figure 7. To be able to provide the team with a clear picture of how to proceed, we have made a breakdown of the recommendation into short-, mid-, and long-term recommendations.

Short-term recommendations

From the pre-study, it was clear that the company is currently fragmented regarding service development and the processes for developing a service differ to a large extent between different departments, as well as the perceived objective for why the firm is servitizing. Therefore, first of all, it is important that the team gets a clear view of why the company servitize, and what the main purpose for the team is, or should be, by developing and delivering services. This study has revealed that the reason or main objectives for why firms are servitizing differ, but one of the main challenges pointed out has been that firms do not know how to charge for services. If the purpose for providing services is mainly as add-ons to

the physical products, the issue of how to charge for and make money out of the service does not have to be considered, since other values then will drive the choice to transform. However, it is worth to note that the service sector is the fastest growing sector globally, and if Volvo Cars does not prioritize the development of services, there is a high risk of eventually falling behind and lose competitive edge. Therefore, if the profit is the main purpose with the service development activities, it is recommended that the team further investigate and evaluate revenue models suitable for services.

High customer involvement was also found to be of high importance, but at the same time, the pre-study revealed that there is a concern among the respondents from Volvo Cars about showing the solution to customers too soon, and also the challenge of finding the right customers to involve. It was also found from the pre-study that tests sometimes are conducted with employees. With consideration to the Volvo Cars brand, it is recommended that the team carefully select suitable customers to involve in the process. However, even though it might be tempting to involve customers who are also employees, or relatives to these, due to convenience, we strongly encourage the team to involve customers completely outside of the organization in order to avoid biased feedback or results. The team should thus prioritize to identify suitable customers to involve. From the pre-study, it was further understood that the idea to a service can emerge from various sources, and we did not get the perception that there was a lack of good ideas to develop within the organization. Therefore, at the teams' current state, we encourage the team to prioritize already existing ideas about opportunities or problems to be solved, but however stress the importance of validating the problem by involving the customers to ensure that the right solution is being developed. The validation could possibly be done by inviting customers to workshops, or by conducting interviews. Moreover, from the pre-study it was clear that the extent to which customers are involved in the development of the solution as such varies between teams, as well as the usage of prototyping. This study has clearly shown that the solution should advantageously be tested on real customers by using prototyping. The study has also shown that the prototype should only be a version of the solution that contains features necessary for the customer to be able to experience it, to provide the team with valuable feedback about what needs to be improved. One way to collect feedback from the customers about the solution in an efficient way could be thought the usage of an app, or similar, connected to the service under development, where customers can leave suggestions for improvements. We strongly recommend that the team aim for having at least one employee with experience within prototyping techniques when setting up development teams. It is however favorable if all team members possess knowledge about prototyping techniques to be able to work as efficiently as possible, which can possibly be achieved by having workshops or seminars where experienced people within the area are invited to share their knowledge.

The recommended way of working with service development sure is different from the incorporated linear traditional ways of working within the company, and it is therefore important that the team stress the importance of being provided with top management support. Despite that quality and premium are at the core of the Volvo Cars philosophy, the team must

be allowed to take risks and not have to ask for an extensive number of approvals when developing the service, in order to be able to work as fast, flexible, and iteratively as needed for service development. Therefore, we moreover stress that the NBCS team must dare to work differently than they are used to. Through transparency, an allowing attitude from managers, and by handling risk-taking as a shared decision by the team, the NBCS team can create a culture of risk and failure acceptance.

The study also showed that a cross-functional team is favorable in order to deliver a more complete and better service, while at the same time one of the major challenges found was to align the cross-functional team. This was also the case for Volvo Cars found in the pre-study. In that sense, the NBCS team should work on creating and maintaining good relationships with different functions within the organization to enable knowledge sharing and transparency, which will facilitate understanding of the other teams and minimize language barriers and thereby also facilitate the alignment of the cross-functional development team. It is also recommended that the team aim for increasing the collaboration between the different service development teams at the company to facilitate knowledge sharing of best practices and to avoid reinventing the wheel by developing the same solution. This could for instance be achieved by having monthly or quarterly meetings together.

Mid-term recommendations

As previously mentioned, during the pre-study we did not get the perception that there was a lack of good ideas to develop within the organization, and therefore short-term recommendations focus more on developing already existing ideas. However, in order to lie one step ahead both customers and competitors, the team is encouraged to aim for observing, and ‘stepping into the user’s shoes’ to identify problems or opportunities as a next step. One potential way for how the team can manage this is through the usage of customer clinics. We therefore further recommend the team to investigate the possibility of using already existing customer clinics within Volvo Cars in order to identify problems or opportunities suitable for services.

This study also showed that it is important to evaluate both viability and desirability to ensure that both business value and customer value is taken into consideration when evaluating the business potential of the service under development. As another next step, we encourage the team to use the BMC to explain how the company, through the potential service, creates value for itself and for its customers. One way of facilitate the usage of the BMC for the team members and make them find it valuable is to arrange workshops or training activities around the usage of it.

Long-term recommendations:

Since the recommended way of working with service development is very different from the old, linear, traditional ways of working when developing physical products, the team would most likely benefit from including people in the team who are experienced of working with

service development. The study has shown that and open and flexible mindset is needed in order to be able to kill darling, - but wrong ideas and be open to new possibilities and solutions. By including people who are experienced of working with service development, the transition might not be as challenging. It is furthered recommended that the team hires people from outside the organization to further ensure that that these are not 'colored' by the organization and its history in the way they work. Being able to be objective and question old ways of working is the key to true change.

Time frame for recommendations	
Short-term	• Align purpose and objective • Find revenue model • Identify 'real' customer suitable to involve • Find suitable ways to let customers validate the problem • Learn about prototyping techniques • Probe for top mgmt. support in order to be able to work differently than the rest of the org; create a culture of risk and failure acceptance • Create and maintain good relationships with other functions • Increase collaboration with the other service development teams
Mid-term	• Investigate possibility to use existing customer clinics for problem or opportunity identification • Practice the usage of the BMC to evaluate business potential
Long-term	• Include people in the team who have experience of service development

Table 17. Time frame for recommendations (Authors, 2017)

6.2 FUTURE RESEARCH

As discussed under section 1.5 Delimitations, the context in which the case companies operate in lied outside the scope of this study. However, since the context most likely will have an effect on their way of working with service development, further research may potentially investigate how external factors, such as sustainability matters, competitive landscape, or regulations, affect how large manufacturing firms choose to work with service development.

Moreover, the empirical findings in this study showed that top management support is vitally important for the service development process, which was not explicitly mentioned in literature of user-oriented approaches. Research could therefore aim to investigate more specifically how top management support affect the service development process when working from a perspective of a user-oriented perspective.

Lastly, as discussed under section 1.5 Delimitations, the investigation of the launch of the service lied outside the scope of this study. A suggestion to further research is therefore to investigate more specifically how the perspective of user-oriented approaches can be applied when launching the service to the market.

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8. APPENDICES

APPENDIX A: INTERVIEW GUIDE

RESPONDENT BACKGROUND

The reason behind the background questions was to get a better understanding of the respondent's background and current position/job.

- Role/position.
- Year at company.

SERVITIZATION OF MANUFACTURING FIRMS

The goal with the initial questions regarding servitization was to understand why firms are servitizing and what the identified challenges are with it.

- What is your perception about the main reasons for why Company X is servitizing?
- What is your perception about the main challenges for Company X with servitizing?

SERVICE DEVELOPMENT PROCESS

The questions regarding the service development process were separated under the three generic stages. This information was shared with the respondents before the questions were asked. Before asking the questions regarding the process, the respondents were asked about current ways of working. This was done to get a richer understanding about the respondents' processes and make them talk more freely.

- How would you describe the current way of working with the development of services at Company X? Do you have a process incorporated?

Opportunity Identification

- Where does the "initiative" to the service comes from?
- How do you select/decide which idea/ideas to continue to work with?

Evaluation

- How do you evaluate a service concept?
- What are the most important factors to consider when the evaluating the potential?
- Are you using any specific tool or method for evaluation?
- How do you select/decide which concept/s to continue to work with?

Development

- How do you test the service under development?

- Are you working with prototyping? Why/why not?
- How do you know when the service is ready for up-scale?

ENABLERS AND CHALLENGES WITH THE SERVICE DEVELOPMENT PROCESS

The respondents were asked about enablers and challenges with the service development process in order to understand fundamentals needed and what is most challenging. Certain areas were also touched upon in order to understand the area better and keep the respondents somewhat on track and within the boundaries of the service development process.

- What would you say are the most important enablers when working with the service development?
- What are the main challenges working with the service development process, now and in the near coming future?
- How are the service development teams organized?
    - What are the main benefits?
    - What are the main challenges?
- How are customers involved in the development process?
    - What are the main benefits?
    - What are the main challenges?
- What kind of working environment would you say enables your current service development process?
- What kind of mindset would you say enables your current service development process?
- If you could change the way you work with service development today, how and what would you change?

Lastly, the respondents were asked if they had any tips for other firms in the same position. The goal with this question was to investigate if the companies had made mistakes before or if they had done something that had been very successful that they could share.

- Overall tips/recommendations for other large manufacturing firms?

After the interview, the authors asked the respondent about future contact.

Can we contact you again if we would have any further questions?

APPENDIX B: PRE-STUDY AT VOLVO CARS

The empirical findings in the appendix below has been used as a pre-study where key findings are brought forward in the introduction and further used as a foundation to the recommendation to the NBCS team at the company.

Assigned number and position of respondent	Date (2017)	Length (mins)	Channel
(1) Director Corporate Innovation Office	14/3	40	F2F
(2) Director Digital Innovation and Partnership	14/3	50	F2F
(3) IT Director APAC Consumer IT Services	15/3	50	Skype
(4) Manager IT Innovation Office	14/3	60	F2F
(5) Senior Group Manager Ownership	4/4	40	F2F

SERVITIZATION OF MANUFACTURING

Reasons for servitizing	
Respondent	***Response***
VCC (1)	- The company's product is expensive. Servitization opens up the possibility to have another business model and to use another approach to reach the market and thus another market segment. - Services enable the business to stay alive though the whole product life cycle.
VCC (2)	- Possibility to move up the value chain and create new means of value for both the company and the customers. - The greater the value is for the customer - the greater share of wallet for the company.
VCC (3)	- Services can be a solution to eroding product margins. - Services will make you closer connected to the end users. - Will not make enough profit and survive if only focusing on products. - Competing only on hardware level will be hard as competitors can make cheaper products. Adding services to the offer is thus critical for the company's survival.
VCC (4)	- Physical products are becoming more similar - companies must differentiate through services. - Completely new business potential if the service can be decoupled from the physical product since the service then can be sold to new customer segments.
VCC (5)	- Customer preferences are changing. The customers do not want to own things in the same way anymore, and the companies must thus adapt to this. - Servitization is a way to prevent customers from going to the competitors

Challenges with servitization	
Respondent	***Response***
VCC (1)	- Good at developing physical products - no clue of how to manage services, as this is a whole new unexplored area.
VCC (2)	- To do the business fast and effective requires a whole new culture and a rebalancing of the competence base. - This area is totally new and untested.

VCC (3)	- Everyone at the company does not realize that the company is in the transition period and that a change and transformation is needed. - Management must change their mindset and come up with a better strategy. - It is a dilemma, the company needs to save money and at the same time invest for the future.
VCC (4)	- Organization must realize that services need to be prioritized and understand the value of developing services. - The company does not prioritize services. Should there be savings, it is the development of services that would be away prioritized. - Organization not yet mature for developing services, do not really have a business unit for services in place.
VCC (5)	- The organization has a long tradition that is built into the walls, which is not that easy to change. The company is not equipped to handle services. - The transition is not only affecting our company but our whole network of contacts, which needs to be carefully considered during the transition process.

SERVICE DEVELOPMENT PROCESS

Current Service Development Process	
Respondent	***Response***
VCC (1)	- The 'DIA-model'. Discovery – Incubation – Acceleration.
VCC (2)	- Scope – Pilot – Scale
VCC (3)	- No model.
VCC (4)	- 'The fish'. Input – Insight – Ideation – Prove the value
VCC (5)	- BMS old offer development process.

Opportunity identification	
Respondent	***Response***
VCC (1)	- Internal idea about a service. - Hypotheses about what the customers' problem might be. - Open up the area, are there other solutions to the problem than the one the company initially have thought of?
VCC (2)	- Understand what is broken and then create a value hypothesis - how can the problem be fixed? - Interaction with the customers is a direct source of data when identifying problem. - Essential to understand the real problem that the customer needs solved. - Identify various solutions to the problem and ways to meet the need.
VCC (3)	- Identify the customer's need and how the customer's life can be better and easier.
VCC (4)	- Focus on understanding problems or identifying opportunities within a certain area. - Always start from the user's perspective. - Be around the end users and 'live that life' in order to truly understand the customers' greatest challenges and needs. - Use input from strategies and trends - build knowledge about a field in the first stage. - Innovation workshops both internally and together with customers on different themes where a variety of ideas are generated through brainstorming.

VCC (5)	- Internal identification of a business opportunity or a request from the market through e.g. customer clinics. - External analysis and market research are conducted initially to determine if there is a potential for the service.

Evaluation	
Respondent	***Response***
VCC (1)	- Evaluate the customer value of the solution and how it should be created. - Customers can help determine whether the solution will be valuable for them or not. - Understand whether the hypotheses were right or not, or if something new can be understood on the area.
VCC (2)	- Evaluate the value of the potential solution, why will customers pay for it? - Use "first stage" MVPs, such as power points, to show the idea to our partners and management in order to validate the value hypotheses.
VCC (4)	- "Prove the value" from a business model perspective before turning the idea into a concrete concept. How will this be valuable for the company and for the customers?
VCC (5)	- Conduct extended analysis, which includes market intelligence, market figures, best practices in markets etc. to investigate if there is existing data that can be used when evaluating business potential. - BMC used when evaluating business potential. - Depending on the agenda from top management, business potential of a service is either determined by customer value or money.

Development	
Respondent	***Response***
VCC (1)	- If the service under development is within an area where we already feel comfortable, we do not run tests. - The service is usually tested internally, where employees are also customers. - Testing the service on customers iteratively will provide you with fast and genuine feedback to help you steer improvements in the right direction. - Prototypes are used, but not to the extent as wanted. - Test as early as possible on customers to avoid an unnecessary amount of resources being spent.
VCC (2)	- Try to think about what level of abstraction is enough to make somebody understand. - Use MVPs when testing on real customers to in the most simple way iteratively test what we think is the solution to the problem, - our value hypotheses. - Pilot in small scale to receive in depth information from customers to validate your improvements. Thereby, it will also be easier to identify a suitable operations model with your partners. - Customer feedback might reveal a whole different answer than what you want to hear. By facing this pain early in the process, the 'ownership' will be removed and the risk of people fighting for "their darlings" can be avoided when presented with facts. - Testing your solution on customers provides you with stability through predictability. To involve customers is the only way to validate our assumptions against reality since they are the only ones with the right answer.
VCC (3)	- It is a must to work with the customers when testing the solutions, the customer is the judge and will tell you whether the service is good or not and if they will consider to buy it. If they want A, you should not create B. - From customer feedback you will find out how the customer thinks differently than the organization.

	- Prototype and test in small scope. Incremental changes are always required - continuous improvement change is ongoing. - After testing there are two ways to go - iterate and develop further or realize it will not work and stop. - When the service is "approved" you pilot it to a group of customers.
VCC (4)	- Involving customers in the testing is essential in order to receive instant feedback about your concept to be able to adjust and then test again. It is the customer that evaluates whether the service is valuable or not. - Involving customers in the testing will lower the development costs since resources will not be spent on developing something that later turn out to be the wrong thing. - To test different business models and to test many times during the process makes it easier to upscale the solution later on. - Putting a prototype in front of the customer makes it much easier to explain the solution to the customer who has no idea what to expect. - The prototype could be anything from a piece of paper to an app, as long as it is something visual and is able to capture the experience. The experience is what is important in a service offer. - It is extremely important to test fast, and if needed reject fast before great risk has been taken.
VCC (5)	- A pilot run is made on chosen market. - The concept is almost completely finished when the pilot is run. Financial and budget constraints result in that no early testing of the solution can be made, which means that only fine tuning and market adaption is made. So if there are improvement possibilities we can go back and fix them, but the pilot can also fail.

ENABLERS FOR THE SERVICE DEVELOPMENT PROCESS

Enablers	
Respondent	***Response***
VCC (1)	- Should not be afraid. - Work iteratively, taking small steps and thus not having a long plan. - The different organizational functions must speak the same language. - Be transparent, no reason to be secretive internally. Better to know in what phases others are in, and when and where help might be needed.
VCC (2)	- Work iteratively, build-measure-learn. - Put development in the context of learning instead of ownership. - No project owner - easier to 'kill your darlings'. - Need mixed competence to work agile, cannot rely on experience and intuition. - The team is extremely important, as you will always be limited by the people you are. - Important to have a cross functional team - as the problem is multidimensional. Great when the team is breaking the templates and the team members can understand the context of other functions and even come with suggestions to other cross functional roles. - Having a marketer embedded in the team will validate that the service is communicated correctly from the beginning. - Focus should be on learning rather than doing right on the first try. - Important to include early adopters who have a genuine interest to be a part of the development. Have a rich and open dialogue with these people instead of having shut doors. - Decisions should be based on facts and data rather than on instincts. - Need people who have an entrepreneurial mindset. - The company must be fast, confident, and flexible in how problems are attacked.
VCC (3)	- Cross-functional team is needed, as no single function can do things by themselves. - Have a service owner who is responsible to listen to customer feedback and find the resource to resolve problem if occurring.

	- Motivation in teamwork is important. - The customer should be involved in the whole process. - Important to think from the customers' perspective. - Top management support is important. - Use an iterative process.
VCC (4)	- Must be brave and dare more. - Cross-functional team to gather different perspectives and competences, which enable faster development. Working cross-functional will also ease the scaling as the organization will be ready for the service. - That the team is given freedom is important. Management controls with the budget but should not interfere in the details. - Creativity and positive spirit important for the development. - Important that everybody speak the same language and knows how to proceed with a certain thing. - Must think from the beginning that the service is scalable. - Important to include the customers in the whole development process. - When developing the service it is important to work iteratively and jump "back-and-forth" in the process. - Need support from top management.
VCC (5)	- The process would never work if we did not work cross-functional since the concept concerns many different parameters within the organization. If not all players such as people from communication, technichs, IT, financial departments, etc., are on board, we will not be able to move forward. - It is important that the company has a working system that is ready for service development so the team is not forced to take detours on the way forward which causes extra manual work. - Must dare to think outside the box.

CHALLENGES WITH THE SERVICE DEVELOPMENT PROCESS

Challenges	
Respondent	***Response***
VCC (1)	- Listening to customers can make you wiser but it can also mislead you. - Afraid that customers will not take the company seriously and also of showing a service too soon as it might be of bad quality. - Fear of 'promising' the customers' something/a service that might not even be developed in the end. - Hard to find the right customers as these might not be the same as the traditional customers. - The company is not used to develop services. A service changes a lot during the development process in comparison to a physical product. - No help internally to find the right customers to test the solution on. Can therefore not guarantee that the tests are run on the 'right' customers.
VCC (2)	- Homogenous team - good consensus but will lead to groupthink - knows very little about the service being developed for someone else.
VCC (3)	- Challenging to work cross-functionally as different departments speak different languages and do not really understand one another. Communication is critical. - Financially and pace constraints. - Communication with customers is challenging as it is not about talking but rather to convey a message.
VCC (4)	- Working cross functionally is challenging, since goals, time perspective etc. differ between functions.

	- Internal politics challenging, managers feel that their area of responsibility is intruded on. - Too many managers and levels of authority are not good for innovation. - Challenging to find the right customers to test on in order to receive a trustworthy result and also challenging to find customers who actually want to be involved.
VCC (5)	- The company is not flexible and mature enough at this point. - A lot of internal beliefs about what service is needed and not, which in the end can turn out to be totally wrong. - Tests of the solution during the development process are hindered by financial and budget constraints.

OTHER FINDINGS FROM PRE-STUDY

Other findings	
Respondent	***Response***
VCC (1)	- Want everyone to agree on a process. - Transparency, have a joint logbook in order to know when and where one can help out instead of doing thing twice. - Transparency in order to know what resources are need in different stages of the process. - Smart to test different solutions on different customer groups as that would not be quality affecting.
VCC (2)	- To attract entrepreneurs, the company needs to refocus and make the workplace attractive. - If management does not understand that the MVP could have a lousy outcome and thereby start to question the service – that could have a huge negative effect on the process.
VCC (3)	- Should have one strong organization, one strategy, and one team to do things. Instead of scattered everywhere.
VCC (4)	- There is a possibility for the company to offer services coupled to the company brand instead of solely to the cars, and the company must realize the value of this. - Cut off services from the rest of the organization, e.g. “Volvo Cars Services”. - Understand the value of services as “small money with many transactions” versus the car that is one major economic transaction. - Understand that the company in the future cannot solely be a car manufacturer.
VCC (5)	- Fragmented at the company when it comes to service development. Many players within the organization are developing services, there is a must to develop the collaboration. - There is a need of having someone who actively scan ideas and also having a receiving organization that can take the ideas and drive them to implementation. - Tied in robust systems and can therefore not charge for services at this point.