Servitization and its Effects on the Business Model
– The Transition from Hardware Products to Software Services in Manufacturing

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Executive Summary

Companies within the manufacturing industry is undergoing changes in their business models to adapt to changing external environments and trends – whereas one general trend is toward servitization, the transition from hardware products to software services. These software services have shown to have an increasingly impactful role for former product-based firms to ensure future reliable profits and revenues. This thesis aims to contribute to the academical field of servitization and business model literature, within the context of a non-disruptive industry with a slow technological development rate. This is done by addressing the following purpose: to understand how hardware manufacturing companies can integrate software services in their existing business model. In order to fulfill this thesis’ purpose, the research questions answered address how a hardware manufacturing company’s business model can be affected by servitization, but also how the process of business model innovation can be facilitated in the organization.

This master’s thesis is anchored in a qualitative, interpretive case study – where the empirical data has been gathered from semi-structured interviews and internal case company documents. The findings from this thesis show that servitization can affect company business model in several ways. The first one is the shift towards customer-centricity, both in terms of the design of the value proposition and the way of working with the customers. However, the findings show that companies in this context may experience difficulties with designing a value proposition that is desirable to the customer. Problems with demonstrating the benefits of the servitized value proposition might also arise. Furthermore, this thesis also concludes that there can be issues in translating a manufacturing company’s value proposition into concrete revenue streams and moving from traditional cost-based pricing methods to value-based pricing strategies. Also, manufacturing companies in this context might struggle to realize its value proposition if there is not a sufficient amount of dedicated resources, competences and activities dedicated to completing the transition.

This thesis also concludes that in order to facilitate the process of business model innovation within the organization, there needs to be a supportive culture to the innovation, but also clear goals and strategies that fits the overall strategies of the company. These strategies also need to be appropriately communicated within the organization. Companies might experience difficulties in rooting the business model in the overall strategy, and failing to do so can affect the internal perception of the innovation in a negative manner.

This thesis aims to contribute to the understanding of the concepts of the business model and innovation of the business model in the context of servitization. This study is performed as a context-specific study within a non-disruptive industry with a slow technological development, which differs the study from earlier research within this research field.

**Keywords:** Servitization, Business Model Innovation, Value Proposition, Customer-Centricity, Value-Based Pricing.
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1 Introduction

This chapter explains the background of this thesis. The background introduces business models as a concept and how companies are developing their business models as a result of the rise to prominence of software and services. Accordingly, a short presentation of the employer and case company follows, which intersects into a problematization that lays the basis for this thesis’ academical contributions. The chapter ends with a presentation of the purpose, delimitations and the disposition of the thesis.

1.1 Background

A business model can be referred to as a representation of how an organization creates customer value (Fielt, 2014; Magretta, 2002; Osterwalder et al., 2005). Other definitions include the ways in which an organization along with its stakeholders create value for each party involved (Stähler, 2002; Andersson et al., 2006) and “the firm’s underlying core logic and strategic choice for creating and capturing value within a value network” (Shafer et al., 2005, pp. 202). The common denominator of several of the recognized definitions is that they in some way include the creation of value, often called customer value (Fielt, 2014). However, multiple recognized definitions focus on the company, where the business model is primarily mentioned as a means of gaining revenue (Chesbrough & Rosenbloom, 2002; Mahadevan, 2002). These business model definitions (e.g. Shafer et al., 2005) contrast with the common perception concerning business strategies, which seem to have a closer connection to attaining a competitive advantage but does not work as a description of the actual business (Magretta, 2002; Porter, 1996; Richardson, 2008; Teece, 2010).

A good business model is essential to every successful organization (Magretta, 2002). When talking about a market where there is heterogeneity among consumers and producers, consumer choice, transaction cost and competition, an organization must have a business model in order to compete with its competitors (Teece, 2010). The same idea or product may not always yield the same value as the business models that commercialized the product and brought it to market is not necessarily the same (Chesbrough, 2010). According to Zott et al. (2011), the business model concept has gained significant ground in recent years and is now a unit of analysis when determining business success.

A business model often facilitates a systemic understanding of how the organization designs its processes and activities in order to create value (Massa & Tucci, 2013). This means a business model description can include explanations of suppliers, partners, distribution channels but also the value proposition (Chesbrough & Rosenbloom, 2002; Osterwalder, 2004; Osterwalder & Pigneur, 2010). For a business model to be successful, it is important that all the different pieces of the business model are coherent, that they fit (Magretta, 2002; Morris et al., 2005).
Certain industries are undergoing changes in their business models to adapt to external environments and trends – in the case of the manufacturing industry, the trend is including software and services in hardware and products (Neely, 2009; Wise & Baumgartner, 1999). This shift is in part caused by the change of customers’ demands, with increasing interest in software (Andreessen, 2011; Gebauer et al., 2005). With regards to financial performance, there are several indicators that software and services get an increasingly impactful role for product and manufacturing firms to ensure reliable profits and revenue (Suarez et al., 2013). Neely (2009) and Wise & Baumgartner (1999) refer to this matter in terms of the importance of including services as a part of a manufacturing or product firm’s business model. The authors claim that services tend to be a more stable source of revenue as product firms mature and decline. Massa & Tucci (2013) also provide details about business model innovation, as a tool to tackle company maturity and decline, which in a product firm’s case can be initiated through investments in service development.

To further encourage the idea the service and software movement, Suarez et al. (2013) state that it earlier was led by former manufacturing firms such as IBM, Cisco, Hewlett-Packard, Dell etc. – where IBM derived 60% of its revenue from services solely in 2013 compared to 35% in 1996. However, there are also several other practical examples of companies today that promote the idea of software and services over, or integrated with, hardware and products (Iansiti & Lakhani, 2014). This phenomenon has a vast set of names throughout the literature of scholars, among these are servitization (Baines et al., 2009), service transformation (Adrodegari & Saccani, 2017), transition from products to services (Oliva & Kallenberg, 2003) and service infusion (Kowalkowski et al., 2012). The term ‘servitization’ is used by Baines et al. (2009) among others, which they refer to as the integration of software service components into manufacturing or product-based companies. This is also the terminology that will be further on be used to describe the phenomenon.

Andreessen (2011) states that there is a revolution of servitization, with the increasing impact of software companies over hardware companies as there seems to be greater potential for growth in software products and services. Furthermore, in manufacturing businesses, digitalization, connections, sensors and data are revolutionizing the markets. Iansiti & Lakhani (2014) exemplifies this through the former manufacturing company General Electric (hereinafter GE) which have now transitioned to be a more software-oriented business. Enabling digital transformation and including software in its value proposition in a manufacturing business helped GE generate different paths for their revenue streams (Iansiti & Lakhani, 2014). Other former major hardware companies such as Microsoft and SAP are also investing heavily in infrastructure to support software and analytics; substituting product to service income (Ibid.). Yet, Iansiti & Lakhani (2014) state that this software-orientation clearly pressures the firm in question’s business model, where they must compete by rethinking and identifying opportunities for revenue and profit through new value creation and reorganization.
Regarding the matter of integrating business models with a company’s products and services, Barquet et al. (2013), Schuh et al. (2009) and Tukker & Tischner (2006) are coherent in their idea of initially adapting product and services to business models or vice versa. However, Schuh et al. (2009) state that success comes from a company’s operations, strategy and networks. As told by the authors, products and services are components or results found in these parts of the company. Schuh et al. (2009) further describe that a change within these ‘success factors’, implies that the business model needs to be reconfigured accordingly to support a new type of offering based on new operations, strategies or networks.

1.2 Case company and employer

The case company of this thesis is a world-leading global manufacturing company of solutions for industrial applications. Recently, the case company introduced software services to complement its hardware dominated product portfolio. The developed software service can be integrated and used with hardware that the case company manufactures. In basic form, the service software grants the possibility for customers to analyze data that each piece of hardware can provide. However, since different applications can be integrated with the hardware, the data provided can be customized. The introduced software service also includes a platform which gives the customer an opportunity to develop integrable applications own their own, in exchange for an annual licensing fee. However, the software service is in many regards is loosely rooted in, and coupled with, the existing business model. The company supervisor also mentions that the revenue provided from the software service is negligible as the case company did not carefully reason about its economic value and how to realize this potential. The software service has not yet been properly analyzed from a business model point of view as there is no formalized business model description.

The presented case company can primarily be seen as a hardware manufacturing company acting on the global market. There are several examples of global companies within the same industry that earlier have gone through the process of servitization to support customization through the integration of software and hardware (Iansiti & Lakhani, 2014). Since the case company’s journey toward becoming a more software service-oriented and solution-based company is in progress, the company is seen as an adequate representation of a company that follows the general trend of servitization in the hardware manufacturing industry.

1.3 Problematization

When looking at the manufacturing field of business, there are obvious patterns in present time that the industry is changing to become more software-oriented (Andreessen, 2011; Iansiti & Lakhani, 2014; Suarez et al., 2013). Moreover, there are also patterns within several manufacturing markets that point towards an orientation which promotes services over products (Ibid.). Furthermore, Neely (2009) and Wise & Baumgartner (1999) declare that this shift pressures manufacturing product companies to act accordingly – since
contemporary trends show that greater potential for growth and a more stable or reliable revenue lies within software (Neely, 2009; Wise & Baumgartner, 1999). As an example of a company working within the manufacturing field of business, the case company of the thesis is finding itself following the industry trend of becoming more software- and service-oriented.

To act according to ongoing trends toward servitization in this case infers that companies which are set out to or has initiated a business change from product to service or hardware to software (or the complete integration of hardware & products and software & services), need to focus and adapt their business models (Barquet et al., 2013; Iansiti & Lakhani, 2014; Schuh et al., 2009; Tukker & Tischner, 2006). Succeeding within the software or integrated product-software business lies within adapting the business model (Barquet et al., 2013), where new financial opportunities need to be considered and formalized inside the business model (Iansiti & Lakhani, 2014).

The previously described shift in form of servitization presents several issues for contemporary hardware manufacturing companies (Gebauer et al., 2005). First, they must consider if they have a relevant product or service offering considering the heavy shift in demand toward software and services (Ibid.). Secondly, it might not be the case that their existing business model is suited to create value to their customers, given a change of their product or service offering (Kindström, 2010). If their product or service offering has changed recently, they must consider if their old business model is still relevant and provides significant value to the customer (Ibid.). If the company’s business model is not suited for the technology it is combined with, the company might not be able to capture the value the technology is able to provide (Chesbrough, 2010). The failure to capture technology value could be attributed to the non-coherence of the business model, meaning the different parts do not constitute a logical and consistent whole (Magretta, 2002; Morris et al., 2005). The case company in question is an example of the described phenomenon as they have not yet seemed to find a sound business model in terms of making the best use of their newly developed technology.

The question the problematization excavates is how a hardware manufacturing company’s business model can be changed in order to better suit a new product and service offering, or more specifically, an ongoing servitization of the company. When studying these types of questions, it is important to conduct the study in a context-specific manner (Teece, 2010). While empirical research also studying the company business model and change of the business model exists, Lambert & Davison (2013) found in their literature review that this research often studies companies acting in industries such as the information, telecommunications and biotechnology industry. These types of industries differ from the one that the case company is active in, as they are considered more disruptive in their nature as new technology can rapidly change the industry. This is not the case when looking at the
industry of the case company, which acts on a relatively steady market with few technological disruptions. Furthermore, these industries are also more technologically advanced than the one the case company is acting in. Due to this, it is therefore deemed that the context of these studies differs from the context of the case company in a way that enables this study to contribute to the understanding of the concepts of the business model and change of the business model. Furthermore, these concepts will be explored in the context of company servitization and this thesis therefore, more specifically, aims to contribute to the understanding regarding the concepts of the business model and change of the business model in the context of servitization.

1.4 Purpose
Many scholars, such as Barquet et al. (2013) and Iansiti & Lakhani (2014), state that the transition from hardware products to software services (i.e. servitization) can implicate there might be cause for necessary changes in a manufacturing company’s existing business model. Therefore, this leads to the purpose of this thesis which can be seen below;

“To understand how hardware manufacturing companies can integrate software services in their existing business model.”

1.5 Research questions
In line with the purpose of this thesis, it is necessary to fully investigate the concept of servitization and its relation and interactions with the business model. As many scholars argue, among others Baines et al. (2009), Johnson (2010) and Neely (2007), servitization affects manufacturing companies in many senses – e.g. changes the product portfolio, customer interaction and revenue streams. It is therefore also considered necessary to understand how servitization can affect a company’s specific business model. This reasoning leads to the first research question seen below;

– How can servitization affect manufacturing companies’ business models?

Servitization often implies that companies move forward in the value chain and transform their logic of earning, but also their logic of dealing with the product or service portfolio (Storbacka et al., 2013). Oliva & Kallenberg (2003) state that companies in such situations need to manage the transition, or the change of which is implicated when moving from products to services. Storbacka et al. (2013) declare that in such situations, a change in the business model is needed, as the business model specifies the underlying logic of earning, the company’s position in the value chain and the company’s internal and external capabilities. This can be referred to what Amit & Zott (2012) define as business model innovation, which relates to activities of which fundamentally redirect the core or the earning logic of the company. In this case, business model innovation refers to the act of changing, adding or re-linking activities within the business model (Amit & Zott 2012; Massa & Tucci, 2013). When a service is integrated into a business model of manufacturing
companies, certain changes can take place in its different components, in order to accommodate such integrations – which constitutes a form of business model innovation. In implementing changes with regards to strategic initiatives, such as business model innovations, the empirical findings of Foreman & Argenti (2005) indicate that companies need to put effort into establishing internal communication. Cavalcante et al. (2011) also stress the need for changes in communication and internal coordination upon creating or refining the company business model. Cavalcante et al. (2011) also state that upon a change in the existing business model, there is a need for development of new organizational structures that facilitates the coordination of activities surrounding the new business model. Accordingly, it appears reasonable to understand how business model innovations can be facilitated in the organization. Due to the above-seen reasoning, the thesis hereby aims to answer the research question seen below;

- How can the business model innovation process be facilitated in the organization?

1.6 Delimitations
This thesis will be delimited to studying hardware manufacturing companies or former hardware manufacturing companies that have been, or are, in the process of servitization. Because of the feasibility of this study based on the case company, this study will be delimited to business model innovation with regards to introducing new software services into a company’s product and service portfolio. Hence, business model innovations caused by other products or services other than the one already mentioned in the background will not be further discussed.

1.7 Disposition
The following chapters and their respective content are briefly described below.

Chapter 2: Frame of reference
This chapter presents the result of the literature study that was performed. The chapter starts with describing the concept of the business model and follows with a presentation of a business model framework that was later used to explore and assess the current company business model. The chapter continues by describing how servitization has affected the manufacturing business and the reason behind its current prominence. Following, a presentation of how the company servitization affects the business model design is shown. The chapter concludes with an analytical model that is to be used for analyzing the empirical data that is collected.

Chapter 3: Methodology
This chapter describes and motivates the research methodology and process of the study. The chapter also discusses the consequence of the methodology choices in terms of how they affect the quality of the study.
Chapter 4: Empirical data

This chapter describes the case company, its software service and the business model surrounding the software service.

Chapter 5: Analysis

This chapter presents an analysis of the collected empirical data. The analysis concludes by revisiting the analytical model and presents a revised version of the model.

Chapter 6: Conclusions

In this chapter, the purpose and the research questions of the study are answered. The chapter concludes with a discussion of the limitations of the study and suggestions for further research.
2 Frame of reference

This chapter includes the frame of reference that this thesis builds upon. The chapter begins with defining the approach to business models and the connection between strategy as a concept and business models. Furthermore, the concept of business models is detailed and discussed in order to form a basis for the unit of analysis. The concept of servitization is later clarified with its relation to business model literature. Lastly, a concluding analytical model for the study is proposed.

2.1 Theoretical background to the business model

The underlying theories with business models are among scholars seen from different perspectives. Two main ways of approaching the phenomenon are the strategic perspective and the institutional theory (Barringer & Harrison, 2000). The institutional theory represents the idea that organizations work as an institution, which focuses on social structures and stresses companies to conform to legitimacy and social norms (Ibid.). Due to the context in which this study is set and due to the problem presented, this theory will not be regarded further.

Some scholars state that the business model concept is widely regarded to build upon business strategy and strategic positioning (Morris et al., 2005; Porter, 1996). However, the concept is also considered from other perspectives, such as transaction-cost economics (Morris et al., 2005; Williamson, 1981) and resource-based theory (Barney et al., 2001; Morris et al., 2005). Morris et al. (2005) declare that on one hand the business model is associated with the value chain and sets out to drive value within the organization as a strategic incentive for management. Nevertheless, the concept of business models also involves firm tactics and decisions about boundaries in transactions (Morris et al., 2005), which makes it an element in the transaction-cost economics perspective (TCE), first presented by Williamson (1981). This perspective would rather consider a business model to be the ramification and tool to display all transactions within the company (Morris et al., 2005; Williamson, 1981). Barringer & Harrison (2000) and Williamson (1981) further describe TCE as a perspective that highlights using economic transactions and the cost of economic transactions to analyze firms and markets, in order to minimize and put up boundaries for organization costs. The resource-based view (RBV) offers another view of the company, as a product of its resources and capabilities, that together create a competitive advantage (Barney et al., 2001). Thus, as the business model can address internal competencies (Morris et al., 2005), the business model can be seen as a framework to structure capabilities and resources.

It is obvious that the above-mentioned perspectives intersect in many ways, as strategies on higher managerial levels can intertwine both external or internal transactions and internal resources or activities (Porter, 1996). However, Magretta (2002) and Richardson (2008) discuss strategy as a way of dealing with the external environment – a way of creating
competitive advantage. Due to the fact that the case company is a competing company within their industry – where a business model is strategically essential to gain competitive advantage (Magretta, 2002; Richardson, 2008), the business model concept will further on only be discussed in the light of the strategic perspective.

Many scholars state that using strategies as a company is a way of gaining competitive advantage (Magretta, 2002; Porter, 1996; Richardson, 2008). Porter (1996) clarifies that a competitive strategy or a strategy, in general, is about being unique and having unique defined activities within the company. These activities should also deliberately be set in order to deliver a unique mixture of customer value. Teece (2010) states that strategies are combined with external competitive forces. Furthermore, Teece (2010) believes that strategies are specific ideas of how the company segments the market, provides value to its customers and delivers that value, which in successful companies are unique and long-term sustainable activities.

The definition of the interconnection between the concept of strategy and business model differs among scholars. Richardson (2008) states that strategy is implemented and formalized through business models and that business models are frameworks used to execute organization strategies. On the other hand, Zott & Amit (2008) implies that business models and market strategies are complementary to each other. Both Richardson (2008) and Zott & Amit (2008) claim that business models explain the pattern of a firm’s transactions with external stakeholders, whilst strategies refer to the pattern of managerial actions of which a firm maintains and achieves a competitive advantage. Zott & Amit (2008) state that the two concepts are not elements in equivalently composed sets, they are incomparable in terms of entity – as business models focus on the exchange with external partners and the focal point for strategies is internal. Furthermore, Casadesus-Masanell & Ricart (2010) state that strategy refers to the way the company chooses a business model for its operations, and that the business model refers to the logic of the company and the way it creates customer value. This idea is one that Magretta (2002) adheres to, as the author states that business models reflect the strategic choices of a company, whereas strategy reflects how the competition is dealt with. In Table 1 below, a summary of the interconnection between business models and strategies, based on four articles with different approaches to each concept is presented. The presented opinions are considered to represent a holistic view of the conflicts within business model and strategy literature.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Business model</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richardson (2008)</td>
<td>Internal framework to execute strategy</td>
<td>Formalized and implemented through BM, external ways of competing</td>
</tr>
</tbody>
</table>
There are clear similarities and intersections between business models and strategies from a business point of view. Although Zott & Amit (2008) claim that business models are external patterns, there is nonetheless an interpretation that it can be seen as a framework which is used internally to understand and commit to all transactions with external stakeholders. With that point in mind, this thesis will hereby build upon the basic definition that business models are internal frameworks, systems, ideas, sets or templates that reflect or execute the company strategy, in terms of operations and activities. This thesis will thereby repose on the conceptualization that strategy is closely connected to the business model, since the business model either define what kind of strategy that will be implemented or vice versa – to achieve competitive advantage (Casadesus-Masanell & Ricart, 2010; Magretta, 2002; Richardson, 2008; Zott & Amit, 2008) and lay basis for creation of customer value (Porter, 1996).

2.2 Business models

The concept of business models is a much-debated term (Zott et al., 2011). According to several scholars, the concept is poorly defined (Chesbrough & Rosenbloom, 2002; Zott et al., 2011). There are however common themes when scholars discuss the concept of business models and what the actual purpose of a business model is (Zott et al., 2011). First, many authors seem to agree upon the notion that a defined business model is crucial for business success (e.g., Magretta, 2002; Chesbrough, 2010; Teece, 2010). Furthermore, Zott et al. (2011) state that the business model is a source of competitive advantage. Teece (2010) agrees with this statement, but also argues that a successful business model is not enough to secure a competitive advantage. He states that the business model also must be differentiated in order to protect from competitor imitation (Teece, 2010). This statement is also supported by Zott et al. (2011), stating a company needs to design a unique business model to fully realize its commercial potential.

Secondly, as previously mentioned, scholars seem to argue business models describe the company’s logic of creating and capturing value (e.g. Casadesus-Masanell & Ricart, 2010;
Fielt, 2014; Saebi & Foss, 2014). Both Osterwalder & Pigneur (2010) and Teece (2010) also put emphasis on delivering the value to the customer, in addition to capturing said value (e.g. earning revenues). According to Teece (2010), it is not enough to only do one of the two. Fielt (2014) does however not agree with including delivering value as part of the business model definition. He instead argues that “the separation of creating and delivering value as a supply-side perspective focusing on producers adding value” (Fielt, 2014, pp. 92).

However, defining how value is created and captured is not the only goal with creating a business model. Scholars such as Teece (2010) and Afuah & Tucci (2001) also signifies the importance of generating profits while doing so. Magretta (2002) agrees with this notion, as part of her definition of the business model is revolves around how the company will make money in providing value to the customers. This might sound like repetition from the last paragraph. However, there is a key difference between simply generating revenue and generating profits.

Another common theme when scholars discuss the concept of business models is how business models emphasize a holistic approach that offers knowledge regarding how value is created within the company (Zott et al., 2011). Chesbrough & Rosenbloom (2002) also denote the value of this kind of systematic description or representation of the business, where the business model grants understanding of the internal structures and processes. Furthermore, Al-Debei & Avison (2010, pp. 372) state that being able to explicitly describe the business model makes companies more competitive as they gain access to “appropriate and necessary level of information that the BM provides”. Al-Debei & Avison (2010) also consider the business model a versatile concept as it offers alignment of different functions.

Depending on the business context of the company, the business model may differ in design and composition (Fielt, 2014). With the premise of the purpose of the study, further discussions about business model design will be in accordance with, and in consideration of, the business context of the single case company that has been studied. This implicates that business model designs and compositions being relevant to government agencies or other non-profit organizations will not be evaluated or taken into consideration moving forward, as these are not deemed relevant in this specific context nor in regard to the purpose of the thesis.

2.2.1 Design and components
As stated previously, the business model offers a holistic approach regarding how the business functions (Chesbrough & Rosenbloom; Zott et al., 2011). The business model can be described as a “simplified and aggregated representation of the relevant activities of a company” (Wirtz et al., 2016, pp. 39-40). The business model can also be considered a framework (e.g. Fielt, 2014; Richardson, 2008) that can be considered to consist of different building blocks (Osterwalder & Pigneur, 2010), components (Pateli & Giaglis, 2004) or
functions (Chesbrough & Rosenbloom, 2002), depending on the terminology. These subsets of the business model framework are hereon mentioned as components.

There are several different frameworks used for describing the business model (e.g. Adredogari & Saccani, 2017; Fielt, 2014). The frameworks often differ, even sometimes only slightly, in the composition of the included components which constitute the business model framework (Ibid.). The difference is at times represented by a complete difference of properties described by the components, and at others only a difference in terminology (Fielt, 2014). However, when looking at proposed business model frameworks, there are components which are included more often than others (Adrodegari & Saccani, 2017; Fielt, 2014). Below, a compilation of business model components included in proposed frameworks is shown. The compilation is made by Adrodegari & Saccani (2017) and based on a rigorous literature study in the area of business model frameworks. Figure 1 displays the perceived relevance of different business model components among scholars.

One of the most common ways of describing the business model is with the Business Model Canvas (hereinafter BM Canvas) (Fielt, 2014). The BM Canvas framework includes 9 components that each describe different parts of the company’s business (Osterwalder & Pigneur, 2010). As is true with the general concept of a business model framework, the BM Canvas offers a holistic perspective of the company’s business (Fielt, 2014; Zott et al., 2011). In Figure 2 the components included in the BM Canvas framework is shown.
Figure 2. The Business Model Canvas as proposed by Osterwalder & Pigneur (2010).

Other presented frameworks (e.g. Al-Debei & Avison, 2010; Chesbrough & Rosenbloom, 2002; Osterwalder, 2004) include several of the components, or similar versions, that are presented in the BM Canvas framework. Al-Debei & Avison (2010), as a result of a systemic literature study of business model frameworks articles, propose a four-pillar ontological structure of the business model. In the proposed structure, the pillars are represented by the company's value network, value proposition, value finance and value architecture. In this case, the value network in the proposed ontological structure consists of different actors in the company's network, such as distributors and customers (Al-Debei & Avison, 2010). Fielt (2014), following a systemic literature review of business model framework articles (Al-Debei & Avison’s included), proposes a similar framework. Fielt (2014) proposes that the core elements of a business model should in some way address the customer, value proposition, organizational architecture and economic dimensions. The composition of these elements is very similar to the ones Osterwalder (2004) proposed in his original ontology - which the BM Canvas framework is based on - then referred to as customer interface, product, infrastructure management and financial aspects.

As result of work by previous scholars (e.g. Al-Debei & Avison, 2010; Fielt, 2014; Osterwalder, 2004) and their perceptions regarding of which components are needed to holistically describe how the business functions and therefore to be included in the business model framework, the business model concept will further on be discussed with notion to four components. These components will now be further explored and explained - and will hereon be mentioned as the value proposition, revenue model, customers and organizational arrangements.

2.2.1.1 Value proposition
Osterwalder (2004, pp. 43) defines the value proposition as “an overall view of a company’s bundle of products and services that are of value to the customer”. According to Fielt (2014), the value proposition conveys the company’s offering meant to solve the customer problem, often focusing on potential benefits. Several scholars, such as Zott et al. (2011) and Fielt (2014) argue value proposition is at the center of the business model. Zott’s et al. (2011) and
Fielt’s (2014) perception is further supported by the fact that the value proposition is the most included component when studying various business model frameworks (Adrodegari & Saccani, 2017). One example is the business model framework proposed by Hedman & Kalling (2003), who argue the company’s resources should be configured in a way that enables a competitive value proposition in the market.

Furthermore, customer value, value and value proposition are widely researched fields within marketing research and strategy literature (Smith & Colgate, 2007). There are several frameworks related to creating customer value (Smith & Colgate, 2007; Woodall, 2003), however, some are more comprehensive than others. Smith & Colgate (2007) state that a common definition that has been accepted after time is that customer value, from a customer’s own perspective, can be approached from two angles; value for the customer and value for the company in question. Value for the customer essentially covers perceived and received customer value, whilst the latter reflects the actual value for the customer (Smith & Colgate, 2007).

A later adapted concept related to customer value is value proposition (Anderson et al., 2006). A successful customer value proposition has been shown by practical cases to derive from stringent evaluations of customer value and made positive contributions to business performance (Anderson et al., 2006; Payne et al., 2017). Also, as mentioned in section 2.2.1, the concept of CVP or value proposition is key in evaluating and developing a business model – by the same token, Anderson et al. (2006) claim that it is a core element to be considered within business models. Early adopters of the concept of CVP state that it concludes the benefits – at what price, to what customer group, at what cost – that the company provides (Payne et al., 2017). Nevertheless, Payne et al. (2017, pp. 472) wrap up the concept of CVP as “… a strategic tool facilitating communication of an organization’s ability to share resources and offer a superior value package to targeted customers.”. However, Anderson et al. (2006, pp. 92) outlined other approaches to defining CVP; “all benefits, favorable points of difference, and resonating focus”, with regards to a company’s product and service portfolio. Rintamäki et al. (2007) address the concept of CVP from four different dimensions, namely economic, functional, emotional and symbolic. This is also something that is closely resounding to some definitions of customer value (Woodall, 2003; Smith & Colgate, 2007). In later days, ethics and environmental values are also widely considered as valid types or perspectives of value propositions (Payne et al., 2017).

2.2.1.2 Revenue model

Many scholars (see e.g. Afuah & Tucci, 2001; Magretta, 2002; Teece, 2010) highlight, in relation to the purpose of business models, the importance of generating profits. They argue one of the core goals with designing and implementing a business model should be to generate revenue. Their opinions are further reflected in Figure 1 as the revenue model is one of the most included components when studying various proposed business model
frameworks among scholars (Adrodegari & Saccani, 2017). According to Osterwalder (2004, pp. 43), the revenue model “describes the way a company makes money through a variety of revenue flows”. When deciding upon the company’s revenue model, decision variables such as sources of revenue and pricing methods are highly relevant (Morris et al., 2005).

2.2.1.3 Customers
Addressing the customer when discussing business models is almost unavoidable (see e.g. Magretta, 2002; Osterwalder, 2004). This is supported by the fact that scholars often mention creating and capturing customer value as the main purpose of designing a business model (e.g. Fielt, 2014; Magretta, 2002; Osterwalder et al., 2005). When addressing the properties of the customer component of the business model, Magretta (2002) highlights the importance of knowing who the customer is. Osterwalder (2004) also recognizes determining the target customer as a critical part of business model design, while defining the target customer as the entity the value proposition is offered to.

Furthermore, several scholars include the component of customer relationship when proposing business model frameworks (Adrodegari & Saccani, 2017; Fielt, 2014). Customer relationships can be strengthened with the help of different types of customer interactions, or mechanisms (Osterwalder, 2004). Being successful in strengthening customer relationships with customers may yield significant benefits for the company (Kindström, 2010). However, establishing good relationships with all customers might not always be efficient (Kindström, 2010; Osterwalder, 2004). The potential benefits of a deeper relationship with the customer need to be evaluated in relation to the cost of attaining that relationship (Ibid.).

There seems to be a consensus that the customer needs to be addressed in some way when doing business model design, considering statements made by scholars (e.g. Kindström, 2010; Magretta, 2002; Osterwalder, 2004) and statistics presented in Figure 1. Looking further into Figure 1, the company network also seems to be of importance in relation to business model design. However, the network component, terminology aside, in many ways address the same properties of the business that the customer component does (Fielt, 2014; Morris et al., 2005).

When discussing the business model component of customers further on, the definition is limited to the properties of the relationship with the customer and who the target customer is. Within the definition of the customer relationship, methods of attaining that relationship are also included. This implicates the inclusion of methods of marketing and other ways of establishing new relationships with customers may also be discussed when addressing the customer component of the business model.
2.2.1.4 Organizational arrangements

As mentioned previously, the company resources should be configured in a way that enables it to provide a competitive value proposition on the market (Hedman & Kalling, 2003). Osterwalder (2004) and Fielt (2014) state that this configuration, or arrangement, can be described as how the company creates value. Al-Debei & Avison (2010) share this opinion, also saying the concept presents a holistic, structural design of the organization. Furthermore, they conclude that within the design, components such as core company resources and competences are described. Both Osterwalder (2004) and Al-Debei & Avison (2010) highlight that the business model design should also address which activities are carried out with the help of the core company resources and competences. Osterwalder (2004) states that the performed activities should make the value proposition possible. Looking at Figure 1, the components discussed in this paragraph corresponds to internal competences and internal processes.

When discussing organizational arrangements further on, the discussion is limited to the activities and resources that are needed to support the value proposition, revenue model and customer related properties for a specific product or service. The activities and resources may be both internal and external, meaning activities include internal processes but also, for example, communication with external actors. In terms of resources, internal resources may constitute certain competences held by company personnel but may also include competences and resources of external partners, as these can also be deemed company resources.

2.2.2 Framework

Even though there are discrepancies in the work of previous scholars and their proposed business model frameworks, there are also several similarities. As result of the discussion and the synthesis of different business model components (see sections 2.2.1.1 – 2.2.1.4) and with basis in earlier work by various scholars (e.g. Al-Debei & Avison, 2010; Fielt, 2014; Osterwalder, 2004; Osterwalder & Pigneur, 2010), a proposed business model framework is presented below. As per reasoning of for example Al-Debei & Avison (2010) and Fielt (2014), the proposed framework offers a holistic and complete picture of the company’s business and its properties. The proposed framework will be used as a frame of reference in the context of the thesis moving forward.
Morris et al. (2005) state it is important that the business model is consistent. They argue that this consistency can be described in both internal and external “fit”. In their opinion, internal fit constitutes consistency between the different components in the business model. External fit is instead determined with regard to how the different components of the business model are consistent with the company's external environment (Morris et al., 2005). Magretta (2002) also highlights the importance of a coherent business model. Furthermore, she considers the business model a great tool for focusing attention on the different components of the business model makes for a working whole. However, Morris et al. (2005) recognize a strong internal fit between the business model components might weaken adaptivity of the company and in extension result in inadequate external fit, in case of a fast-changing environment.

In light of the previously presented statements made by Morris et al. (2015) and Magretta (2002), a favorable business model can be considered firm-specific. The reasoning rests on the assumption that each company has one or more distinction(s) when it comes to, for example, surrounding environment or product offering. If that is the case, a good business model design will, assuming it constitutes adequate external and internal fit, be unique. The connection between business model performance and its uniqueness is also supported by Teece (2010) and Zott et al. (2011) as they consider a good business model not to be enough to fully succeed, it also needs to be unique and differentiated.
2.2.3 Business model innovation and its organizational anchoring

If companies concurrently change their ‘logic of earning’ or create possibilities for a novel way of earning, it implies using or developing business capabilities that reflect the necessary changes made to the business model (Storbacka et al., 2013). The term business model innovation is, among many scholars, a diffuse term with different sets of meaning (e.g. Amit & Zott, 2012). Amit & Zott (2012) state that business model innovation relates to actions of which fundamentally redirects the activities that relate to the core or logic of the company, which also relates to the company’s way of dealing with its business toward customers, vendors or partners. Amit & Zott (2012), supported by Massa & Tucci (2013), further postulate that business model innovation can be achieved in three ways; (1) by adding new activities; (2) by linking activities to each other in a new way; (3) by changing the party of which performs a certain activity. To conclude, the interpretation of previous statements is that business model innovation in this study refers to the act of changing any properties of the components of a business model that state the logic of the company. In this case, these components are the value proposition, revenue model, customers or organizational arrangements.

There are several reasons to invest in business model innovation, among these is that it can cover up financial opportunities that are under-utilized (Amit & Zott, 2012; Johnson, 2010). Furthermore, Johnson (2010) claims that the action to innovate an existing business model can create opportunities for claiming new customer segments, enhancing the value proposition for existing customers and entering new industries. On the other hand – business model innovation can sometimes be a necessity at different occasions for companies in industries where the technological development rate is high (Johnson, 2010; Massa & Tucci, 2013). In markets where emerging technologies create some sort of technological discontinuity with radical innovations, business model innovation is necessary to support the business to be more uniquely suited to the customer needs and more inimitable to competition (Tucci & Massa, 2013).

Massa & Tucci (2013) state that whilst serving existing customers in new ways (e.g. through new value propositions, product features, etc.), developing new business models can be a necessity as a response to market opportunities. That is, if a market opportunity in a new offering is discovered, a new way of revenue generation, business model innovation can be a necessary response. One example can be seen in the early cell phone industry, where business model innovation was essential for companies to prolong their lifetime (Chesbrough & Rosenbloom, 2002; Hackling et al., 2018). Looking at companies active within the industry, the value within the businesses ‘migrated’ – from selling cell phone devices, calls and messages to weaving customers into an ecosystem of services and mobile applications (Hackling et al., 2018). Here, companies not only needed to claim power by inventing new revenue streams, but also needed to transform their whole way of doing business (Ibid.). An interpretation is that a similar transformation is now undergoing in the
manufacturing, as hardware is now being embedded with software and integrated solutions (e.g. Baines et al., 2009; Kowalkowski et al., 2012; Neely, 2007), i.e. the process of servitization.

The findings of Bucherer et al. (2012) proclaim that business model innovation and the idea behind the innovation itself from a process-related perspective needs to be deeply rooted and anchored in the overall long-term organizational strategies. The authors state this fact as their findings imply that business model innovation is dynamic and not an isolated activity. Derived from the findings of Bucherer et al. (2012) and Porter (1996), these strategies and the strategic incentives need to be consistent – and consistently communicated internally for employees to support the claim of the specifically undertaken business model innovation. However, this can turn out to be a problem as there are challenges in implementing new business model concepts, as key concepts within business model components are not always translatable into operational decisions (Morris et al., 2005).

Upon the implementation of business model innovation – there are several challenges to consider. Bucherer et al. (2012) state that business model innovation often involves the restructuring of internal processes and organizational structures. There is a need for creating independent and specifically dedicated business units, with ownership rights to handle the implementation of the new business model (Bucherer et al., 2012; Christensen & Overdorff, 2000). Bucherer et al. (2012) state that the fundamental issue to react to within this new dedicated business unit is new and emerging markets or segments.

However, all issues that arise from business model innovation in its implementation phase are not provided from the external environment. There are also issues internally, upon anchoring innovations of the business model (Bucherer et al., 2012). Bucherer et al. (2012) among others state that general problems in anchoring business model innovations within the organization are that employees lack willingness and knowledge within new benefits and values that are provided; the inability to leave older routines; and the employees misunderstanding of new markets or opportunities. Upon mitigating risks with internal anchoring of an innovation, there is a need for internal promoters of the idea (Bucherer et al., 2012; Jenssen & Nybakk, 2009). Bucherer et al. (2012) define two different types of internal promoters; (1) specialist promoters; and (2) power promoters. The former refers to people mitigating resistance based on insufficient knowledge, while the latter refers to people mitigating resistance based on lack of willingness to adapt to the innovation itself (Bucherer et al., 2012). The findings of Bucherer et al. (2012) in their case study in successful business model innovations, these types of promoters were crucial for implementing new business models within their case companies. However, the theoretical studies of Bock et al. (2012) claim that the company itself need to have a supportive culture for the innovation initiative to succeed. Bock et al. (2012) together with Bucherer et al. (2012) state that a
consistent, collective and creative culture is needed for innovation initiatives. Cultures encouraging innovation becomes crucial in fault tolerance, agility, responsiveness and working with common goals – as new offerings, which can constitute the emergence of business model innovations, tend to need time to be accepted by the market (Bucherer et al., 2012).

2.3 Servitization in the manufacturing business

As companies move towards services over simple products, Storbacka et al. (2013) discuss the need for change and innovation of the company business model. In management and marketing literature, servitization is a concept that relates to the transition from transaction-based products to service or solution provision (Kowalkowski et al., 2012; Wise & Baumgartner, 1999). Baines et al. (2009) state that the term is based on the belief that moving towards a more service-oriented or service-integrated manufacturing business is more distinctive, long-term sustainable and more inimitable in its nature in a competition-based market with low-cost economies. Neely (2007) states that the industrial sector by 2007 had lost product economies in the Middle East and southeastern Asia, and that US-based companies within manufacturing had to cut product costs by roughly 30% to be able to compete with Chinese factories. According to Neely (2007), a key strategy to tackle the emerging problems within the market was to combine products with services, by employing servitization within the manufacturing sector. Baines et al. (2009) also state that a key feature within servitized software companies is their customer-centricity, compared to other hardware product and manufacturing firms. In relation to the theories of business model innovation (Amit & Zott, 2012; Johnson, 2010; Tucci & Massa, 2013), introducing servitization in manufacturing companies may apply to the idea of innovating the existing business model. This is because the concept of servitization complies to the theory of adding or linking new activities (Amit & Zott, 2012) through a combination of product and service, as well as enhancing of the value proposition to customers (Johnson, 2010).

In the early days of servitization, companies still tended to view services as a necessary element for marketing strategies for products (Baines et al., 2009; Wise & Baumgartner, 1999). The main part of the business and value creation still belonged to the physical commodities rather than its surplus services (Baines et al., 2009). Later however, Baines et al. (2009) state that services turned out to be the differentiator as integrated product-service systems and offerings were provided. Furthermore, as for features of servitization, the value added to customers tend to become more specific and customer-centric – as an integrated module of product and service generally are more of a tailored solution for the customer (Oliva & Kallenberg, 2003). Baines et al. (2009) and Oliva & Kallenberg (2003) declare that the possibility of customer tailoring is also easier to achieve. This is in one way considered to be an effect of the shift of customer interaction from transaction-based to relationship-based (Ibid.).
2.3.1 Drivers of servitization

The process of servitization for companies is mainly driven by three factors; finance, strategy (as in competitive advantage) and marketing (Baines et al., 2009; Oliva & Kallenberg, 2003; Wise & Baumgartner, 1999). Wise & Baumgartner (1999) suggest that the financial drivers for servitization derive from profit margins and income stability. The authors also state that the magnitude of increased revenues with regards to services, in some sectors, is twice as great as revenues abstracted from new product sales. As for practical examples following this notion, Sawhney et al. (2004) identified GE, IBM, Siemens and Hewlett & Packard that enhanced the stability of revenues – notwithstanding the decline in product sales. With its customer centricity, the combination of product and service or the service alone is considered to be less sensitive in terms of price elasticity, which later turns into higher profitability (Baines et al., 2009; Wise & Baumgartner, 1999).

Oliva & Kallenberg (2003), supported by Baines et al. (2009), mention that services also enhance the differentiation of offerings within manufacturing, thus creating a potential for greater competitive advantages and opportunities. Oliva & Kallenberg (2003) also state that the potential competitive advantage is derived from the services’ increasing level of inimitability. Baines et al. (2009) suggest that the progressive commoditization of product markets is becoming a problem for hardware manufacturing companies as differentiation achieved by the innovation of products and technology as well as price-based strategies become harder to maintain.

As for marketing drivers and marketing opportunities, Baines et al. (2009) state that new service offerings in combination with products generally increases product sales. Furthermore, Oliva & Kallenberg (2003) state that this is considered vastly more true in business to business (B2B) and manufacturing markets, where the demand for services is rising. The reason for this matter is that elements in services provide increasing importance in purchasing actions (Baines et al., 2009). Baines et al. (2009) also indicate that services, in comparison to products, support customer loyalty, where customer become more of a subordinate to its supplier. Baines et al. (2009) and Mathieu (2001) declare that this type of relationship creates opportunities for upsell – although it comes with the cost of supplying more tailored service and product combinations, and in some cases creating systems for customer management.

2.3.2 Framework for the servitization development

Kindström & Kowalkowski (2009) have created a four-stage framework for the development of new service offerings, which is divided into the stages; market sensing, development, sales and delivery. According to the framework, there are several critical aspects and organizational challenges upon employing servitization within a manufacturing company. In terms of servitization, the framework also provides details regarding how the organization needs to adapt its routines, and in extension the business model, to align to resulting changes
of company servitization (Kindström & Kowalkowski, 2009). The framework by Kindström & Kowalkowski (2009) has been further developed in this thesis with supporting authors and additional challenges, aspects and activities as seen in Table 2 below.

Table 2: The servitization process (Kindström & Kowalkowski, 2009)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Challenges</th>
<th>Critical aspects and activities</th>
<th>Other supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development</strong></td>
<td>Problems in getting commitment and investment decisions.</td>
<td>Involve customers in the design process (allow customization).</td>
<td>de Brentani (2001)</td>
</tr>
<tr>
<td><strong>Sales</strong></td>
<td>Adapting the competence of sales personnel to service offerings, since there is a clear bias toward product sales.</td>
<td>Changing mindsets and values toward the servitization. Developing sales tools to promote service sales. Focus on value-in-use over value-in-exchange.</td>
<td>de Brentani (2001) Lapierre (2000) Ramírez (1999)</td>
</tr>
<tr>
<td><strong>Delivery</strong></td>
<td>Lack of infrastructure for the service. Enhancing customer relationships to ensure service quality and value-in-use.</td>
<td>Increasing visibility of the new services to customers that are accustomed to products.</td>
<td>Grönroos (2007)</td>
</tr>
</tbody>
</table>

2.3.3 Servitization and its implication on business model design
It is obvious that companies in process of servitization are affected in numerous ways – how they interact with customers, how value is delivered and captured, and how company resources are organized (see e.g. Baines et al., 2009; Kindström & Kowalkowski, 2009; Oliva...
& Kallenberg, 2003). Thereby, several parts of the business model design are affected by introducing integrated solutions for product and service offerings. The implications of servitization for the business model design will now be discussed further, with notice to the components in the proposed framework (see Figure 3).

### 2.3.3.1 Implications for the value proposition

As the integration of product and service turns the company portfolio complex into more inimitable for competitors (Oliva & Kallenberg, 2003), the clear implication is that servitization favors differentiation of the value proposed by the company. However, it also pressures the company to understand that the focal point for the value proposition will be more linked to value-in-use over value-in-exchange (see e.g. Kindström & Kowalkowski, 2009). That is, as new value is introduced by the integration of product and services, the value cannot simply rely on, e.g. product quality. The customer interaction with the service is continuous and the usage of a software service probes for continuous value deliverance under ongoing interaction with the service (Kindström & Kowalkowski, 2009). Kindström & Kowalkowski (2009) and Lapière (2000) state that the hardware products and its technical features become “qualifiers” rather than “order winners”, and antecedents for creating value in servitized companies. However, the nature of delivering products is fundamentally different from that of services (Vargo & Lusch, 2004). Offerings also tend to become more complex as the integration of product and services appear, which can resolve in long delivery (and life) time (Grönroos, 2007; Kindström & Kowalkowski, 2009). This could also affect the value proposition in such that the company needs to assure long-time sustainability in their new offerings (Kindström & Kowalkowski, 2009).

Anderson et al. (2006) and Grönroos (2007) state that servitization provides for the value proposition to not only cover technical and economic benefits, but also social benefits. As the service offering allows for greater interaction with customers, it pressures the servitized company to build their business upon trust, inter-firm cohesion and customization (Kindström & Kowalkowski, 2009). In contrast to product offerings, service offerings or the combination of product and service offering implies greater customization and contextual solutions based on customer preferences (Ibid.). Furthermore, Kindström & Kowalkowski (2014) state that companies in process of servitization need to understand the value proposed by a new offering, as well as the need for visualization of value to their customers to prove its value-in-use. This prompt can stress the company in process of servitization to consider making the value proposition comprehensible (e.g. visualizable, measurable, translatable).

### 2.3.3.2 Implications for the revenue model

As companies are in the process of servitization, they need to be innovative in terms of creating new ways of gaining revenue from their service portfolio (Kindström, 2010). Being innovative in creating these new revenue streams that are better suited with their service-
based business models should be of primary focus (Ibid.). If services, or other types of integrated solutions can be integrated into the existing business model successfully, otherwise product-oriented companies can secure more regular revenue streams (Sainio & Marjakoski, 2009). This is exemplified by looking at companies such as GE, IBM, Siemens and Hewlett & Packard which have all transitioned to be more service-oriented and therefore enhanced stability in terms of their revenue streams (Sawhney et al., 2004). Furthermore, introducing and integrating services as part of the company business model has shown to increase upsell (Baines et al., 2009; Mathieu, 2001). It is also shown customers seem to be less sensitive to price changes within these types of contexts, as services often offer more customizability and possibilities for tailored-suit solutions (Baines et al., 2009; Wise & Baumgartner, 1999).

As companies servitize further, many often implement more innovative revenue models and value-based strategies such as pay-per-use, pay-per-outcome or subscription-based models (Naor et al., 2018; Rapaccini, 2015). However, it is also seen that companies who are undergoing servitization still apply the old cost-based price methods as they do with their products (Ibid.). When looking at designing revenue streams for service-oriented business models, Kindström (2010) emphasizes having a value-based approach rather than a cost-based one. He states that the price should be developed with the value the service provides to the customer in mind. Kindström (2010) also declares as the customer becomes a more mature buyer in terms of services and the company acquires a better understanding of the customer’s needs, it opens possibilities for more advanced pricing methods. Kindström & Kowalkowski (2014) are of a similar opinion, saying customer product usage and process data are of significance when designing the revenue model. If this data is used correctly, they declare the revenue model can become more aligned with the customer’s value creation processes. Oliva & Kallenberg (2003) share this sentiment, stating when undergoing servitization, companies should transition focus to the service’s efficiency and effectiveness within the end-user’s processes.

Overall, revenue stream design and pricing method when in the context of companies in the process of servitization is highly dependent on the customer (Kindström, 2010; Oliva & Kallenberg, 2003; Rapaccini, 2015). Hence, flexibility is required when deciding upon the revenue model component within the business model (Ibid.). Additionally, in relation to servitization, several authors (Kindström, 2010; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003) stress the need for more innovative pricing methods, moving away from the traditional cost-based alternatives.

### 2.3.3.3 Implications for customers

As servitization is customer centric (Baines et al., 2009; Wise & Baumgartner, 1999), the part of the business model which addresses customers is highly affected by the phenomenon. Intertwined with what is suggested in section 2.3.3.1 about implications for the value
proposition, customization vastly affects the infrastructure around a service-based offering (de Brentani, 2001; Kindström & Kowalkowski, 2009). In fact, Grönroos (2007) and Kindström & Kowalkowski (2009) state that a critical challenge in delivering a servitized offering is making sure that there is no lack of infrastructure to support it. Baines et al. (2009) and Mathieu (2001) agree that this stresses a company in process of servitization, as there might be increased costs of supplying tailored service and product combinations – and that customer (relationship) management systems are preferred to handle the challenge.

Servitization establishes increasing importance for enhanced customer relationships, and that the supplying company needs to be aware that services are continuously developed in dialogue with customers (Day, 1994; Kowalkowski, 2008). This also complies to the idea that enhanced customer relationships supply notions for sensing opportunities available on the market (Kowalkowski, 2008). However, Payne et al. (2017) state that in the process of servitization, an important element is the co-creation of the value proposition, which means that there needs to be a substantial mutual understanding of the supplier’s and the customer’s usage situation and goals.

As for target customers, the immediate introduction of a new servitized offering from a company paves way for possible new target customers. Grönroos (2007) and Kindström & Kowalkowski (2009) unisonally declare that there is a need for increasing visibility on the market in general, to make possible customers (and clients accustomed to products) aware of the change. As business models are a way of delivering value and tempting customers to pay for this value (see e.g. Teece, 2010), the rearrangement of value as a result of integrating product and services provides for opportunities of new target customers. Logically derived, new target customer or customer segments could be based on their need for customized product and software solutions rather than a simple product for consumption.

2.3.3.4 Implications for organizational arrangements

As companies transition into more service-oriented offerings and in extent business models – they should identify what type of resources and capabilities are needed to complete the transition (Adrodegari & Saccani, 2017; Kindström & Kowalkowski, 2014). More specifically, this implicates that companies should identify and develop resources and capabilities to support their new value proposition, revenue model and customer properties (Adrodegari & Saccani, 2017; Kindström, 2010; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003).

As examined in previous sections discussing implications for the business model as a result of servitization, it is often argued (see e.g. Kindström, 2010; Oliva & Kallenberg, 2003) that a more customer-centric approach is needed. Kindström & Kowalkowski (2014) argue the importance of establishing new competences to support the change of the approach to the customer. Furthermore, Kindström (2010) argues one of the core goals of developing these customer developing competences is being able to capture customer needs. These
competences could for example be created by hiring new personnel, creating a new dedicated business unit or developing capabilities for further establishing customer relationships (Kindström & Kowalkowski, 2014). When undergoing servitization, companies should also aim to develop capabilities related to sales and delivery (Kindström & Kowalkowski, 2009). This includes developing tools to support sales of services and means to convey the value-in-use of the service (de Brentani, 2001; Lapierre, 2000; Ramírez, 1999), but also establishing sufficient infrastructure to deliver the service to the customer (Grönroos, 2007).

Kindström & Kowalkowski (2014) state that the resources and competences of the company should be tightly linked with the activities it carries out. As servitization requires developing customer-centric capabilities and competences (e.g. Kindström, 2010; Oliva & Kallenberg, 2003), these should be developed to enable carrying out a certain set of activities (Al-Debei & Avison, 2010; Osterwalder, 2004) - meaning the activities carried out by a servitized company should facilitate a customer-centric approach. Hence, customer-centric activities in a servitized company include such as ones that promote capturing customer needs (Kindström, 2010), mechanisms to strengthen customer relationships (Kindström & Kowalkowski, 2014) and creating innovative pricing methods (Oliva & Kallenberg, 2003).

2.4 Summary of the frame of reference

The frame of reference that is presented in this chapter will be applied for the remainder of this thesis. The chapter starts with a discussion of the concept of business models and what implications business model design has for the company. The chapter concludes that the business model offers a holistic approach of the business and that it can be seen as a way to describe how the company business functions (Chesbrough & Rosenbloom; Zott et al., 2011). It has also been made clear that the business model is essential for business model performance (e.g. Chesbrough, 2010; Magretta, 2002; Teece, 2010). Furthermore, the chapter presents a proposed business model framework to apply when trying to understand and study the company business. The framework consists of four components: value proposition, revenue model, customers and organizational arrangements. The proposed framework is based on earlier work by several scholars (e.g. Adrodegari & Saccani, 2017; Fielt, 2014; Osterwalder, 2004)

The frame of reference continues by describing the term business model innovation, in what context innovation of the business model might be needed and the process of organizational anchoring of new business models. Business model innovation refers to the act of changing the properties of one or several the business model component(s) (Amit & Zott, 2012; Massa & Tucci, 2013). Among the reasons to invest in business model innovation, one is that the action can result in covering up financial opportunities that are currently under-utilized (Amit & Zott, 2012; Johnson, 2010). Generally, business model innovations need to be deeply rooted in organization strategy (Bucherer et al., 2012) and communicated to the
organization (Porter, 1996). To complete business model innovation, a new dedicated business unit should be installed to handle the ownership of the innovation (Bucherer et al., 2012; Christensen & Overdorf, 2000). Furthermore, this section describes how business model innovation needs to be linked with internal promoters of the idea and the innovation (Jenssen & Nybakk, 2009), as well as a supporting, creative and collective culture (Bock et al., 2012; Bucherer et al., 2012).

This chapter also discussed the term servitization and what factors have driven and influenced the development of the manufacturing industry towards servitization. The servitization seems to be driven by increased customer demand for customized solutions (Oliva & Kallenberg, 2003) which in turn leads to increased financial viability for servitized companies (Baines et al., 2009; Wise & Baumgartner, 1999). The chapter continues by describing how company servitization affects the different components included in the proposed business model framework. Generally, servitization requires innovation of the business model in ways that promote a more customizable (Kindström & Kowalkowski, 2009), solution-based (Baines et al., 2009; Kowalkowski et al., 2012; Neely, 2007; Storbacka et al., 2013) and customer-centric (Kindström, 2010; Kindström & Kowalkowski, 2014) business approach. This includes actions such as new innovative pricing methods (Kindström, 2010; Kindström & Kowalkowski, 2014; Rapaccini, 2015) and building capabilities to support enhanced customer relationships (Kindström, 2010; Kindström & Kowalkowski, 2014). However, being able to demonstrate the actual value of the service, in contrast to a product, also requires a change in how companies demonstrate value to the customer (Kindström & Kowalkowski, 2009).

2.5 Analytical model

The concluding analytical model is a framework for approaching servitized business models. The analytical model presented in this chapter (see Figure 4) represents how organizations, based on combined theories of different scholars (see sections 2.3.3.1 – 2.3.3.4), should manage the transition from product to service offering (i.e. servitization). The analytical model presented in Figure 4 also represents the integration of traditional business model literature and its components (see e.g. Al-Debei & Avison, 2010; Fielt, 2014; Osterwalder, 2004; Osterwalder & Pigneur, 2010) and literature regarding the implications for the business model when introducing service and software into an organization (see e.g. Baines et al., 2009; Grönroos, 2007; Kindström, 2010; & Kindström Kowalkowski, 2009). Furthermore, the analytical model takes the organizational anchoring of a new business model into account, as proposed by Bock et al. (2012), Bucherer et al. (2012) and Porter (1996) among others. The organizational anchoring is hence not an actual business model component but instead addresses how the process of establishing the idea and concept of the servitized business model can be characterized within the organization.
Upon conducting the empirical research for this thesis, the analytical model is used as a framework for understanding and analyzing the existing business model and laying a basis for key areas within the company business to focus on. This is done by identifying patterns and themes of collected empirical data and categorizing it by what component of the proposed business model framework (see Figure 3) they adhere to. The properties of the identified patterns and themes are then compared to identified properties of the servitized business model design according to presented theory, also categorized by the components of the proposed business model framework. By doing this, the analytical model not only enables analysis and understanding of the existing business model, but also lays a focus on areas which theoretical evidence states are key in servitized companies. The analytical model also embeds the organizational anchoring of a business model, which is used to understand how the internal process of the business model innovation can be characterized within the company.

The analytical model lays a basis for further research in the context of this thesis and is considered a backbone when creating the interview template and identifying interview themes and questions. These are presented in the Methodology chapter.
Figure 4. The servitized business model design as an analytical model
3 Methodology

This chapter presents the general methodology and the foundations of the underlying research. As an introduction, the scientific approach for the research is displayed, followed by the descriptions and justifications of the working progress. Furthermore, this chapter includes a discussion regarding the quality and credibility of the study and its approach to moral and ethics.

3.1 Scientific approach

There are different approaches to knowledge understanding and different approaches to compiling empirics in general. A logical way of approaching research could be to that it is based on the nature of the phenomenon, subject of examination and earlier theoretical agreements within the subject matter. Bryman & Bell (2013) claim that there are two synoptic types of research to consider, quantitative and qualitative research.

In quantitative research, Sale et al. (2002) state that the phenomena of interest and its investigator are independent of each other. Thus, the investigation is capable of not being subjectively influenced by the investigator - which is the approach in quantitative research (Guba & Lincoln, 1994). One goal in quantitative research is to analyze causality in between variables and constructs within framework free from subjective values (Denzin & Lincoln, 1994; Sale et al., 2002). Therefore, quantitative research builds on larger sample sizes, which in many cases are statistically analyzed to prove a phenomenon's existence – that in turn builds upon randomization, structured templates and protocols (Carey, 1993; Sale et al., 2002). This is a way to make statistical methods applicable to the study (Carey, 1993). As quantitative research builds upon the concept that the investigator and the study are to separate and divided entities, the quantitative research perspective can be hard to apply if a study is based on phenomena that are socially constructed (Sale et al., 2002).

Sale et al. (2002) claim that qualitative research repose upon the assumption that the investigation and the investigator are linked and cannot be seen as separate entities. The ontological basis for qualitative research is that results from qualitative research are co-created by the investigator, the people linked to the study and its contextual surroundings (Denzin & Lincoln, 1994; Guba & Lincoln, 1994; Sale et al., 2002). Furthermore, Sale et al. (2002) state that reality and knowledge while looking through a qualitative lens are created through social actions. Knowledge or reality is not independent of mindsets and the intellect of each individual that pass the study in any sense (Sale et al., 2002). Common techniques and methods while performing qualitative studies are interviews and participant observation, where the focal point for sampling is based on the size of information gathered, rather than the size of population within the study (Bryman & Bell, 2013; Sale et al., 2002). Reid (1996) and Sale et al. (2002) claim that respondents in interviews are chosen due to their relevance and importance to the phenomena in question, rather than having a larger sample size with a bigger focus on achieving randomization and objectivity.
Upon the formation of this study, several sets of options and choices were considered, with the thesis’s purpose as a focal point, its fundamental conditions and discoveries from scientific research about how a scientific study should be performed. Yin (2003) states that qualitative studies are to be performed upon defining a purpose set out to explore “how and why”. Due to the exploratory nature of the purpose of this thesis and the underlying contextual conditions, the thesis work was designed and carried with a qualitative study approach.

3.1.1 Approach to data collection
There are two main paradigms or perspectives to understanding gathered empirics in research; interpretivism and positivism (Henderson, 2011). Lin (1998) states that the interpretive approach places the combination of sampled data into a system, where interpretations are made based on its coherence to the specific case being examined. Positivistic studies instead seek to understand data in a hypothesis-driven sense, where hypotheses and propositions are tested by comparing their coherence with other identified cases of the phenomena (Lin, 1998).

When conducting research and the phenomena in question are subjective to people and its contextual surroundings, the interpretive approach to knowledge is widely used (Bryman & Bell, 2013). Bryman & Bell (2013) describe the interpretive approach as a strategy for understanding the knowledge that takes social actions into consideration – as in the discrepancy between social context and theoretical concepts.

As for the many definitions of business models and servitization, together with the fact that successful business models are often firm-specific and need to be understood in its context, the approach to collecting data in this thesis was two-fold. While creating the analytical model with a basis in the frame of reference, one could argue that a positivistic approach was undertaken and must be undertaken in this context. This is the case as the analytical model was hypothetically produced through the literature study. However, while analyzing and compiling data an interpretive approach was used to create better contextual insight into the company’s business model – as supported by Klein & Myers (1999) theories about combining interpretivism and qualitative studies in the data collection phase. Also, as interviews underly the findings presented in this thesis, the interpretive approach was considered the easier choice. This is due to the fact that interviewees used different vocabulary and notions to explain what the authors of this thesis interpreted as the same opinions and ideas.

3.1.2 Reasoning and logic
In scientific research, there are essentially three perspectives of reasoning; deduction, induction and abduction (Kudo et al., 2009). Deduction is a top-down logical process of reasoning, where premises are built and tested, and conclusions can be drawn as all premises are proven true (Bryman & Bell, 2013, Kudo et al., 2009; Sternberg, 2009).
Deduction is also often coupled with reaching conclusions through experiments (Bryman & Bell, 2013). Bryman & Bell (2013) state that in inductive reasoning or the inductive approach to logic, knowledge rather derives from observation of empirical cases. In opposite to the deductive approach, induction builds upon providing general rules from specific facts (Kudo et al., 2009). By observing specific facts, general rules can be created if what has been observed is a distinct pattern throughout the research (Ibid.). Among scholars, abduction is explained as a type of mixture between deductive and inductive reasoning (see e.g. Kudo et al., 2009; Sternberg, 2009). Kudo et al. (2009, pp. 1216) state that abduction is a “... reasoning process for providing a hypothesis that explains a fact in the given typical situation.”.

As the study rests upon a deductive literature study which then builds toward a comprehensible analytical model, which is inductively used through qualitative interviews – this study was carried out with abductive reasoning. Kudo et al. (2009) state that one of the goals with abductive reasoning is to establish groundwork for hypothesis generation. In line with this statement, this thesis sets out to establish hypotheses within the intersection of the fields of servitization and business model innovation.

3.1.3 Type of study
There are underlying approaches to qualitative research that should be considered. Yin (1981) state that there are essentially two approaches to be considered; survey and case study (also experimental but that is not applicable to this study). The survey approach requires a substantive amount of data from different sources of which can be compiled into a coherent notion of the phenomena (Baxter & Jack, 2008; Yin, 1981; Yin, 2003). On the other hand, Gerring (2004) explains that a case study often is a research based on participant-observation of a field, in which the study investigates properties of a case related to the subject in question. Due to the context in which this thesis was set - with an employing case company and limitations in time and resources, the study was carried out as a case study. Theoretical concepts such as business models and servitization are each theoretically conceptualized in many ways, hence creating complexity in distinguishing the concepts from its context. The approach toward a qualitative case study was thereby also performed as it was deemed necessary to collect empirical data from a thoroughly investigated case and map out its underlying contextual conditions.

Case studies are common in research settings set out to detail new theory or new properties of theoretical fields (Eisenhardt & Graebner, 2007). Furthermore, Eisenhardt & Graebner (2007, pp. 25) explain that case studies from a theoretical standpoint involve the creation of “... constructs, propositions and/or midrange theory from case-based, empirical evidence”. Case studies are highly regarded as canonical theoretical research within academic work (Eisenhardt & Graebner, 2007; Gerring, 2004). However, within the field of case studies, there are multiple- or single-case studies to consider (Tellis, 1997). Tellis (1997) describes that the multiple-case study requires regard to replication, over the single-case study which
relies on a well-grounded sampling of the case. With multiple-case studies, the robustness of the research is greater than single case studies, however the single-case study can be robust if assessment and sampling of the case are well-grounded (Tellis, 1997). As this thesis relies on one single case company to examine, and its contextual setting is limited in time and resources, this study was carried out as a single-case study. This approach might impact the generalizability of the study compared to if a multiple-case study approach is taken. As a single-case study, scholars are relatively consistent in their perceptions regarding generalizability. Eisenhardt & Graebner (2007) and Tellis (1997) among others, state that the ability to generalize from single-case studies lies within the sampling logic, the richness of its data and its level of complete rendering within the text. Nevertheless, a single-case study has its boundaries regarding generalizing about theoretical concepts and creating new well-grounded theory (Eisenhardt & Graebner, 2007). However, as this thesis repose on an exploratory purpose – exploring how companies in the process of servitization can integrate software services into their business model – its academical record is rather supposed to generate hypotheses and lay groundwork for future research within the subject matter.

To conclude and summarize the scientific approach and this methodological section, this study is performed as a qualitative single-case study. The approach to collecting empirics was both positivistic toward creating an analytical model, and interpretivist toward compiling and collecting data. Furthermore, the reasoning for drawing conclusions and performing the analysis is with an abductive approach.

3.2 Research process
This thesis work was conducted in five stages; pre-study, literature study, creation of interview template, collection of empirical data and data analysis. Most of the stages were executed chronologically, but the literature study was carried out on a continuous basis throughout the entire thesis work (see Figure 5 below).
3.2.1 Pre-study
To establish an understanding of company servitization and how the phenomena can affect the existing business model, three pre-study interviews were held with representatives from the case company supervising this thesis. These company-specific pre-study interviews were held in order to grasp the essential problems with adapting the business model as a result of servitization within the case company. As a result of these interviews, basic knowledge of which theoretical areas to further investigate when conducting the literature review was granted.

The pre-study interviews were held in a manner following the theories of Bryman & Bell (2013) about semi-structured interviews. Bryman & Bell (2013) state that these types of interviews are held in a way to make the interviewee able to answer freely, on top-of-mind, with little recollection of field-specific terminology. Consequently, Bryman & Bell (2013) also claim that this method can be considerably trend-setting depending on the context in which the interview was set and the interviewee in question. The setting and context of the interviews might have affected the quality of the study, since company representatives may react and answer with a subjective bias to their employer (Elwood & Martin, 2000).

3.2.2 Literature study
An initial literature study was carried out in order to get a grasp of key concepts, earlier interpretations of these concepts as well as opposing views of the concepts (Bryman & Bell, 2013), primarily in terms of ‘servitization’ and ‘business models’. The literature study was built upon an iterative scheme, visualized in Figure 7.
The authors of this thesis had no knowledge within the field of servitization, with the exception of the information gathered in the pre-study. This may have affected the initial approach to the creation of the frame of reference, and thereby the empirics and analysis. However, to gain knowledge about the subject at hand, abstracts and conclusions from recognized articles were read and continuously documented. As an initial evaluation of gathered literature, cited articles were reviewed to support quality and credibility in the conceptualization of servitization and business models. After evaluation, literature was read and further documented. Within this phase, new key concepts, terminologies and reference were continuously noted and reserved to be investigated further through new evaluation or search of literature. This created an iterative loop of events, depicted in Figure 7.

As the literature study progressed, new types of terminology were introduced, such as; ‘service infusion’, ‘product-service system’, ‘business model innovation’, ‘value proposition’ and ‘customer value’. These terms were deduced from either servitization or business model literature and deemed relevant for gaining further understanding of the phenomena of interest. Used literature was essentially based on its recency, inter-dependence on other sources of literature, subjective bias to its purpose and type of study performed. These criteria worked as a backbone when evaluating the relevance of a specific article or source, however no criteria for discarding literature was set prior to the literature study.

3.2.3 Interview process and empirical data
The empirical collection process consisted of creating an interview template and collecting empirical data by conducting interviews with selected respondents. These steps are described below.
3.2.3.1 Creation of the interview template

The interview template begins with a short summary of the purpose of the interview as well as a short explanation of the purpose of the thesis and how the interviewee contributes to fulfilling said purpose by participating in the interview. The interview template continues with a few background questions to ensure that the interviewee and their perspective with certainty is relevant to the study and the subject matter.

The fundamental basis for the content in the interview template was the analytical model and its inherent components (in this context called themes): value proposition, revenue model, customers, organizational arrangements and organizational anchoring. Note that the business model consists of four components. The organizational anchoring was however not explicitly asked about, but conclusions about this area were instead drawn based on the consistency in the answers collected and what the answers indicated regarding the organizational anchoring. The interview template was formed with the purpose of investing how the case company fulfilled the theoretical claims and constructs brought up under each theme. These themes and their properties were based on the theory presented in the frame of reference. However, as the study is conducted as an interpretive study, the themes themselves were not explicitly brought up or explained in the interview template. Instead, questions relating to each theme were outlined in order for the interviewers to interpret interview answers and by doing this gain a picture of the case company's existing business model layout. Interview questions were outlined according to the theories of Bryman & Bell (2013) and Sjöström (2016) about starting with open and non-leading questions to later specify questions, which creates possibilities for logical digestion of each theme. Sjöström (2016) mentions that this method is used in order to minimize misdirection and misinterpretation of the themes presented in the interview template. Bryman & Bell (2013) also promotes roundup questions, where the interviewees would have the possibility to add something that was not brought up during the interview. Ending roundup questions were thereby included to promote the comprehensiveness of the interview template.

The interview template was revised several times after inputs from the supervisor of this thesis, but also after conducting the first few interviews. These revisions were based on the output from each question, and revisions were made if questions did not serve any meaning or if they did not give a reasonable or specific output. The final version of the interview template is found in
Appendix 1 – Interview Template.

3.2.3.2 Collection of empirical data

After creating the interview template, the wording was reviewed, a pilot interview was held, and results were evaluated. This created a possibility to restructure the interview template before conducting the following interviews. Criteria for eliminating questions from the interview template were essentially if a question were too hard to answer, if it deemed reasonable to answer and if it had any sort of contribution for the fulfillment of this thesis purpose.

Moreover, interviews were conducted as semi-structured interviews – as Bryman & Bell (2013) claim this approach creates space for the interviewee to speak freely about the company situation without the need to adapt to field-specific terminology. Furthermore, Klein & Myers (1999) state that this approach facilitates a qualitative interpretive research approach. Interviewees were asked for permission to record each interview, which Sjöström (2016) promotes as a reasonable action to take to ensure that the correct information was supplied. Interviewees were given a chance to take part in the compilation of the empirical data from their specific interview to guarantee its inherent quality, also promoted by Sjöström (2016). Due to geographical distances, 7 interviews were conducted face to face, and 9 via online meeting – which could have affected the outcome of each interview and the quality of the study, as Bryman & Bell (2013) and Sjöström (2016) claim face to face interviews are to be preferred. The interview sessions that were held lasted for 1-2 hours, with an average of about 1 hour and 20 minutes.

The collection of empirical data was based on primary sources in the form of interviews, but also secondary resources – i.e. annual reports, official statements made by the company but also internal documents.

3.2.3.3 Selection of respondents

All the respondents were currently working at the case company when selected for interviewing. In order to mitigate biases in the collected empirical data, numerous interviewees from numerous sets of departments were interviewed for the study, in line with the theories of Eisenhardt & Graebner (2007) regarding interview quality. Furthermore, it was deemed reasonable to gather diverse perspectives of the phenomena, i.e. the company business model. Therefore, the interviewees belonged to dissimilar corporate levels, functional areas and groups. This approach was taken in order to gain a holistic perspective on the phenomena of interest. An example selection of the interviewees is visualized in Figure 6 below.
16 interviews with 16 different respondents were held, which is within the limit of what is deemed fair for qualitative research (Kvale & Brinkmann, 2014, pp. 156; Sjöström, 2016). However, based on the size of the case company, some divisions and their inherent personnel were disregarded due to the lack of resources or their irrelevancy to the phenomena of interest.

3.2.4 Data analysis

Each interview was followed by a brief session of identifying the main themes and topics of interest. Furthermore, all findings were compiled into one document where data was documented. The collected empirical data was also presented to each interviewee, to validate what had been recorded and interpreted during interview sessions. This made room for additional data to be comprehended and collected as well as the exclusion of data that was incorrect. Yin (2003) proposes that this type of process supports validating empirical data and subsequently the result of the research.

3.2.4.1 Coding

To index the empirical data set, themes were coded in a framework. It was done with the intention of systematically discovering and distinguishing conflicts and commonalities in the

<table>
<thead>
<tr>
<th>Business Function</th>
<th>Number of interviewees</th>
<th>Company Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Development</td>
<td>7</td>
<td>Strategic Managers</td>
</tr>
<tr>
<td>Sales and Marketing</td>
<td>3</td>
<td>Sales Executives</td>
</tr>
<tr>
<td>Management</td>
<td>6</td>
<td>Global Product Managers</td>
</tr>
</tbody>
</table>

*Figure 6. Interviewees and their position within the case company*
information collected. This process is supported by the ‘Framework Approach’ (Ritchie & Lewis, 2003; Smith & Firth, 2011), which represents a way of managing qualitative data sets. Smith & Firth (2011) state that this approach is suited to qualitative data analysis where the empirical data consists of different perspectives of the phenomena of interests and where interviewee experience is to be taken into consideration. That is a notion that supports the idea of proposed by Eisenhardt & Graebner (2007) about collecting data from different hierarchical levels within the corporation under investigation. The framework approach resulted in a coding matrix, where patterns within each subject theme were coupled to the corresponding interview objects, as per the combined theories of Eisenhardt & Graebner (2007), Ritchie & Lewis (2003) and Smith & Firth (2011). This is visualized and exemplified in Figure 7.

### Figure 7. Developed framework for coding empirical data

From the frame of reference, five themes were identified to represent a holistic characterization of a business model and its organizational anchoring; (1) value proposition; (2) revenue model; (3) customers; (4) organizational arrangements; (5) organizational anchoring. This concept can help form the data analysis and support the interpretive approach to a qualitative case study (Eisenhardt & Graebner, 2007; Smith & Firth, 2011). Patterns were outlined in different ways with regard to each theme and interview object, where some themes suggested circumlocutory descriptions due to the ambiguity in collected empirical data. Patterns in this context are interpretations made by the interviewers during interviews and are based on opinions, ideas and thoughts expressed by interviewees. This type of coding also helped to fully investigate the organizational anchoring of the business model, as dissimilarities in data collected from different interviewees in some cases may indicate an insufficient organizational anchoring.
3.3 Quality of the research

The literature study, analytical model, interview template, empirical data and data analysis will hereunder be addressed in terms of their individual effects on this study’s quality. The purpose of the discussion is to evaluate if the study can be held as rigor for future studies within the subject matter. Rigorousness, in this sense, will refer to reliability and validity.

3.3.1 Reliability and validity

Gibbert et al. (2008) highlight the importance of high reliability and validity, especially in case studies. Case studies are particularly vulnerable to lacking rigor in terms of reliability and validity, even more in fields of new management theory (Ibid.). This is grounded in the area of usage for case studies, as they are key in setting and exploring fundamental variables and their relationships (Ibid.). The obvious problem is basically that lack of reliability and validity in early stages of theory development tend to ripple further stages in theory development as the theory is tested (Eisenhardt & Graebner, 2007).

Sjöström (2016) states that a prerequisite for high validity is guaranteed high reliability, although the reverse relationship does not apply. High reliability implies that what the study measures, is measured in a reliable and correct way, whilst high validity refers to ensuring that the measuring unit is valid and correct (Lekvall & Wahlbin, 2001; Sjöström, 2016). Sjöström (2016) states that there are two types of validity; external validity (generalizability in results) and internal validity (mainly content, construct and face validity). Content validity is self-explanatory, construct refers to the validity of proposed constructs and concepts within studies and face validity refers to perceived validity, in this case perceived validity and quality of empirics from interviews (Sjöström, 2016).

3.3.2 Literature study, analytical model and interview template

To facilitate the general validity of this study, the literature study, analytical model and interview template need to ensure that what has been measured, is measured in a valid sense (see e.g. Bryman & Bell, 2013; Lekvall & Wahlbin, 2001; Sjöström 2016). The literature study and its inherent concepts build upon triangulated theories of several authors, to ensure that what is said in the frame of reference can be supported by multiple theories within each field of research – which Sjöström (2016) claim is a requisite for high content and construct validity. Consequently, a pre-study was performed with interviews of regarded personnel at the case company to ensure that the initial approach to the problem proposal was within the scope of the sampled theory. The frame of reference essentially builds upon the initial problem proposal and the pre-study conducted at the case company. This created an embryo to an analytical model, which later was evaluated in the frame of reference with its coherence with contemporary research. According to Lekvall & Wahlbin (2001) and Sjöström (2016), this approach is a methodological way of promoting construct validity. The possibility to generalize about theoretical concepts lies within the grasp of creating a valid analytical model and measuring instrument (Sjöström, 2016), thus the analytical model to approach
the case in question was produced through an extensive and triangulated literature study in order to support both the construct and external validity in this study (Lekvall & Wahlbin, 2001). However, as this thesis is written by authors not particularly experienced within the concepts of business models and servitization on beforehand, the validity has been evaluated with caution because this matter can affect the quality of this study in terms of content and construct validity.

The creation of the interview template was based on the theory presented in the frame of reference and analytical model to ensure that the measuring instrument, in this case the interview template, was valid and credible. This is coherent with theories of Lekvall & Wahlbin (2001) and Sjöström (2016) about high external validity. To further promote external validity, the empirical data builds upon 16 interviews of 1 to 2-hour sessions with 16 different respondents, which lies within the interval of a general heuristic about generalizability proposed by Sjöström (2016) and supported by Kvale & Brinkmann (2014).

3.3.3 Collection of empirical data and data analysis
To support and leverage construct and content validity of this study, compiled empirical data was shown to interviewees to enable further evidence to be added to the material, which reduces vulnerability to distortion of the material (Yin, 2003). If permission was given, interviews were recorded to ensure that the information given was correct. Sjöström (2016) and Yin (2003) state that this facilitates construct validity, as information can be rendered with full transparency multiple times. Also, the framework approach to interpreting and analyzing data is in many senses something that supports construct validity (Ritchie & Lewis, 2003; Smith & Firth, 2011). This claim is supported by Eisenhardt & Graebner (2007) who state that the act of matching patterns in collected empirical data is good for ensuring validity and measurability – which was done in accordance with the framework approach to the analysis of the collected empirical data.

Upon conducting research, or collecting data with an interpretive approach, certain issues arise due to its subjective nature. Klein & Myers (1999) propose a set of principles to be regarded within this choice of methodology. These principles take several aspects of human understanding and interpretation into account. A fundamental principle is that understanding a problem lies within interpreting and observing coherent patterns (Klein & Myers, 1999). To fully understand the business model of the case company, its heritage and possible opportunities of change, interviews were conducted in line with the first principle by Klein & Myers (1999). Klein & Myers (1999) describe the significance of common understanding of the context between interviewee and interviewer, thereby a detailed setting and reflection on the current situation and the current problematization were presented as an initial approach to finding common ground with interviewees. However, due to interpretations made when collecting and compiling of empirical data from interviews,
the theories of Klein & Myers (1999) may suggest that the record from this study may have become affected the quality of this study in terms of interpretive bias.

Furthermore, Klein & Myers (1999) also suggest that preconceptions and previous experiences of the interview or interviewee are vastly affecting the interpretation of collected data and thereby the result. As the authors of this thesis share the same academical background and similar professional experiences, the preconceptions of constructs, notions and ideas may have misguided the result and interpretations made throughout the study. Due to this circumstance, there was a clear sensibility toward false preconceptions and biases throughout the thesis work.

Sjöström (2016) states that, in terms of reliability, there is a necessity for assurance that subjects interviewed have the right competence and experience within the phenomena of interest. Even if each interviewee were employees of the case company, this matter could not fully be ensured, which may conflict with the reliability of this study. Although the interviewees were experienced in their field of work within the company, some were not experienced in working with the constructs presented within the concepts of business models and servitization. However, latitude for speaking freely during interviews was given, hence making the information compiled from interviews more accessible and transparent, which also supports the act of rationally interpreting empirical data (Ritchie & Lewis, 2003).

To support the face validity, i.e. quality of the interviews and perceived validity (Sjöström, 2016), interviews were carried out anonymously, and each interviewee was encouraged to be honest and unbiased toward the company. However, as all interviews were conducted on company property, there might have been bias or dishonesty in general during interviews – because employees can have the urge to promote the company image.

### 3.4 Moral and ethics

Upon conducting this study, a non-disclosure agreement toward the case company was signed by the authors that performed the study. Thus, an agreement of not disclosing any sensitive company information, the company name or name of employees is anonymized throughout this thesis to comply with the agreement. Throughout the study, principles from The Swedish Council of Research was followed. These principles are presented in Table 3 below.

<table>
<thead>
<tr>
<th>Table 3. Ethic principles abided by throughout the study (Vetenskapsrådet, 2018)</th>
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<tr>
<td><strong>Principle of Information</strong></td>
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Each of the interviewees was presented with the purpose of the study as well as the groundwork for the thesis. All participants agreed to be interviewed and agreed to the fact that the result of the interview was compiled and analyzed in the study conducted. All personnel were, as earlier mentioned, anonymized in a way that they could not be single-handedly identified through this study. The empirical information that was compiled throughout the study was solely used for researching the phenomena of interest in the context of this study and will not be further used in any commercialized purpose or sense.
4 Empirical data

This chapter presents the findings gathered as part of the interview process and collection of empirical data from interviews as well as secondary data such as internal documents. This chapter includes a short description of the case company and the software service it provides, CSA. Furthermore, this chapter outlines the existing business model surrounding the software service, with the components of value proposition, revenue model, customers and organizational arrangements. Lastly, the organizational anchoring of the existing business model is described.

4.1 The case company

The case company is a global manufacturer of industrial hardware applications and solutions. The case company is mostly active in the business-to-business (B2B) sector and primarily supplies large and mid-range customers in diverse industries globally. A later focal point for the case company has been automation of different types, such as production and logistics automation. The case company is built upon a corporate group consisting of over 50 affiliates as well as co-owned companies. The affiliates and co-owned companies are located across the globe. The revenue of the company is above 1 billion euro and the company employs approximately 10 000 employees globally. Recently, the case company introduced a software service in their portfolio which can be integrated with its industrial hardware applications and solutions. This software service will further on be addressed as Company Software Application (hereinafter CSA).

4.2 CSA

The case company’s current product portfolio consists of several hardware products in the form of industrial applications and solutions. These applications and solutions are used to achieve automation within different types of industries, such as the production and logistics industry. In contrast to its otherwise hardware dominated product portfolio, the case company recently launched the software-based platform CSA globally. This initiative was in line with the concept of Industry 4.0 – when factories become smarter. Industry 4.0 basically means the fourth industrial revolution which is a concept about automation and industrial IT within manufacturing (Hermann et al., 2016).

CSA is a software service platform consisting of two software tools. The first one is called CSA A and is used to develop software applications that can be installed on hardware that the case company has created. Developing and using tailored suit applications enables users to modify the hardware’s functionality to suit the user’s needs. The other tool is called CSA B and supports service technicians with installation, implementation and management of software applications. Software applications created with the help of CSA A can be used on several different automation technologies that the case company provides to its customers.
CSA A is both sold to customers, letting them develop solutions themselves and selling to their own customers, and used as an internal tool for the development of solutions that the case company sells directly to customers. As of today, CSA A has not yet been financially successful as a software service on the market, nor has CSA A found a significant volume of customers. CSA and its inherent tools are visualized in Figure 8 below.

![Figure 8. CSA and its inherent tools A and B](image)

4.3 The business model surrounding CSA
The business model surrounding CSA will now be described. The presentation of the empirical findings gathered will be presented with regards to the structure of the analytical model (see Figure 4), i.e. with separate sections for the value proposition, revenue model, customers, organizational arrangements and lastly the organizational anchoring.

4.3.1 Value Proposition
All respondents answered that CSA offers flexibility to their customers. This is the case as the software enables users to both develop, sell and use customized applications and solutions to solve specific problems. These respondents also state that this is one of the main reasons why CSA is a good concept and what differentiates CSA from their other products – its high flexibility to customize to each specific customer’s needs. When asked about social benefits,
about 60% of the respondents answered that CSA may increase communication both within the company between different divisions but also between different customers of the company. The customer to customer interaction is caused by the different customers using CSA A sharing knowledge regarding the platform with each other. However, this type of developer community has not yet been steadily established. 50 % of respondents state that CSA offers economic benefits to their customers, both to the ones that develop applications and solutions to sell but also those that use the applications and solutions in their facilities. This is due to the fact that the customized solutions can solve very specific problems that would otherwise require more complex systems of hardware, which is something that makes CSA economically beneficial for both developers and end-users of the created solutions. All respondents state technical benefits include, as previously mentioned, the platform of CSA which makes it possible to develop customized and flexible applications and solutions. About 60 % of the respondents also say that the unique selling point of CSA is its wide applicability – as an application created with the CSA platform can be used on all the different automation technologies the case company provides. According to these respondents, no other competitor offers this type of flexibility.

About 90 % of respondents state that the developing tool in CSA is too complicated at the moment. According to them, the complexity of developing applications and solutions is too high, making it hard to attract customers who wish to develop customized applications and solutions and then sell them to end-customers. Furthermore, they state that if the process of developing would be easier to understand and complete, CSA would be more attractive to these types of customers.

Respondents state different means in ways that the case company demonstrates the benefits of CSA. The most common answer includes demonstrating the direct concept of CSA to the customer, how it works and what it can accomplish in terms of value-added or functionality. However, about 60 % of respondents also state there are too few concrete examples of CSA-created applications and solutions that have the possibility to demonstrate the benefits of CSA. This includes both the economic benefits and the technical benefits of CSA. As mentioned earlier, about 90 % of respondents also state that it is hard to demonstrate the benefits of CSA due to the fact that the platform is too complicated to use for most customers at the moment. This results in difficulties for the sales personnel to market and sell CSA. According to about 60 % of respondents, this fact has led to customers not being aware of all the benefits of CSA and the flexibility it offers. However, 90 % of respondents also state sales personnel are not sufficiently trained in how to sell CSA or software in general, making it hard to demonstrate the benefits in an effective way.

A summary of the empirical findings regarding the value proposition of CSA can be found below in Figure 9.
4.3.2 Revenue Model

The only direct revenue stream derived from CSA is a development licensing fee for CSA A. The fee applies on an annual basis for customers intending to use CSA as a developing tool. However, this licensing fee does not apply to customers who purchase an offering based on a combination of hardware and CSA, where significant changes to the functionality cannot be made. 63% of respondents state that specific software applications created with CSA A cannot be sold directly but need to be bundled with a hardware product in order to create an article number for a product that the case company then can sell. Around 50% of the respondents mention that CSA is not supposed to be a direct income-driver, but rather that the purpose of the software is to drive upsell of existing products that can be integrated with CSA.
There are no official coherent pricing strategies or methods with regards to the software service other than the development licensing fee. However, there are renewal discounts for a license after one year of usage of CSA. According to 69% of the respondents, the pricing methods for the offerings integrating CSA are solely priced upon the cost of the hardware plus a fixed margin. 38% of the respondents state that this neglects the increased benefits or value by integrating CSA into the hardware products. However, when creating offerings together with customers, the case company does charge a consultancy fee based on the amount of time spent developing. Within the group of respondents, there are several ideas of how to price customized CSA solutions, however, these have not yet been implemented or tested. These ideas span from pricing the offerings based on the hours used to develop them to create a system that uses customer-specific parameters to understand what value the offering provides to the customer and then base the pricing from the information gathered. 50% of the respondents mention that some sort of value-based pricing would improve the process of selling software, meaning that the case company could put a different price tag on an offering depending on what value it supplies to its customers.

The common ground on challenges with regards to the revenue model of CSA within the group of respondents is that there needs to be a separation of pricing between the hardware and the software, in addition to the existing licensing fee. About 50% of the respondents state the need for usage- or runtime-based licensing fee instead of the fixed annual development licensing fee. However, these respondents also state that many customers are not willing to provide processed data from their product line to the case company, due to possible contraction on security. Furthermore, 25% of the respondents see risks in competitive pricing with regards to CSA and software services in general. These respondents propose that pricing the software service may cannibalize on the hardware price, or that the existing hardware development costs can be too high to even consider pricing software services.

A summary of the empirical findings regarding the revenue model of CSA is depicted in Figure 10 below.
4.3.3 Customers

A compilation of the respondents’ answers together with internal documents indicate that CSA serves all the industries that the case company in general serves - i.e. companies working within industries such as production and logistics. However, a pattern in segmenting the customers seems to be built upon in what manner the customer is using CSA. About 50% of the respondents state that there are two customer segments, developing customers and configurating customers. Developing customers are those who are using CSA as a tool or platform to develop their own applications, thus purchasing a development license fee. The latter, configurating customers, are those who do not develop applications using CSA. These customers however use offerings created with the CSA platform, but they might not be aware that CSA is powering the solution. These customers are not purchasing a development license fee.

The other 50% of the respondents use the segmentation of end-users, system integrators and machine builders. End-users are customers buying the solutions powered by CSA, and are thus not paying the development license fee. System integrators buy development license fees to add value to solutions themselves, by configuring the actual code within the software. Lastly, machine builders are usually original equipment manufacturers (OEM), who create larger systems and use or configure CSA-powered solutions or offerings provided by the case company by adapting it to their own system. These customers could either be those who just use the solution and are not aware of that CSA is powering the solution, or be developers themselves, altering software code and therefore needing to purchase development licenses. One interpretation made is that end-users are configuring customers, while system integrators are developing customers, and machine builders could serve as both configuring and developing customers – however, moving forward, the
segmentation of end-users, system integrators and machine builders are used. These segmentations are visualized in Figure 11 below.

Figure 11. The targeted customer segments for CSA

No official data were given regarding the exact distribution of customers within these segments, however 63% of the respondents state that the group of end-users is the largest. The same group of respondents also state that this states a future risk, as this segment does not explicitly or knowingly interact with CSA, thus creating difficulties in branding and visualizing the value of CSA. Consequently, the entire group of respondents is rather coherent in their opinions about the fact that the company needs to extend its targeting towards system integrators and machine builders. However, according to about 25% of the respondents, CSA should be intended only for developing customers, focusing on building complete offerings and applications within the platform for independent sales.

Most of the respondents do not work in a position that implicates regular interaction with external customers. However, the 44% of the respondents that engage in customer interaction describe that the process of interacting with the customer initiates with finding a customer problem, at an existing or new customer. Customers are then contacted, whereupon a visit on-site is scheduled to create a requirements specification. Either the problem can be solved by the personnel currently on-site, or by another division within the case company. If additional support is needed from another division, that division is
contacted. The solutions that solve customer problems are mostly in co-creation between the customer and the case company. According to most respondents, these customer relationships are tightly bonded whereas developers and engineers from the case company are in direct contact to support the customer. In the case of developing customers, support also provided in terms of giving leads in regard to end-users that require customized solutions. However, according to about 50 % of the respondents, the business unit with ownership rights to CSA lacks proper customer interaction and knowledge of customer needs.

From a marketing perspective, CSA is according to about 50 % of the respondents not necessarily promoted in itself as a service or a product – but rather indirectly promoted through the specific applications within CSA. While marketing these applications, the case company sometimes does not mention that CSA is powering them. About 50 % of the respondents also do not know of any marketing with regards to CSA. According to 38 % of the respondents, the marketing message of CSA does not address the end-user segment, or those who does not directly interact with CSA.

The customer relationships and marketing in regard to CSA are summarized in Figure 12 seen below.
4.3.4 Organizational Arrangements

The respondents’ answers differ in what organizational resources they consider most important to support CSA and its further development. Some respondents state that there is a need for dedicated personnel working with CSA that has a proper understanding of CSA, something that is missing at the present time. All respondents state the need for more internal application engineers who can develop applications and offerings which can be used by the end-customers. A majority of respondents also state the need for sales personnel who are competent in selling software and communicating the benefits of CSA. About 30% of respondents state that there is a lack of infrastructure to deliver applications and offerings to the customer that are created with CSA, saying the delivery process is not intuitive and simple enough for the customer.

In terms of critical activities to support and develop CSA, several respondents state the need for proper communication between different divisions of the company. According to several
respondents, there is a lack of communication between company divisions, leading to different company divisions performing activities related to CSA in a non-optimal way. Several respondents also state the need for research and development of both the CSA platform and applications that are created with the platform. A majority of respondents consider current research and development insufficient. Some respondents also mention the importance of marketing CSA with the right message and making it easy for customers to use CSA, for example by creating instruction videos showing proof of concept.

In line with the critical activities and resources previously mentioned, all respondents state the need for more internal technical competence, both for developing the CSA platform but also the applications for the end-user. Respondents also state the need for competence regarding user experience design in terms of the CSA platform development. A majority of respondents also state the need for proper sales competence, something they consider is missing as of now.

The distribution of the answers in terms of the most critical organizational arrangements regarding CSA is depicted in Figure 13 below. The percentage amount shown next to each resource, activity or competence is the percentage of respondents that stated the resource, activity or competence was critical regarding CSA and its further development.

![Figure 13. The most critical organizational arrangements in regard to CSA](image)
4.3.5 Organizational Anchoring

There are no official strategy documents that embed CSA or the business model regarding CSA. Respondents working at different divisions postulate and communicate different opinions about the purpose and the overall strategic intents with regards to CSA as a company software service in the overall portfolio of products and services. 50% of respondents see it exclusively as an internal development tool for the case company to use in order to develop customer-specific offerings. The other 50% also lay focus on the external customers and how CSA could be developed to perform better on the market. Furthermore, respondents state that the business model surrounding CSA differs depending on the geographical location of the customer. Additionally, 25% of respondents state the need for the case company to clearly define strategy and goals in relation to CSA, as they consider company-wide strategies and goals to be missing as of now. The case company does, however, have dedicated employees to handle the creation and implementation of new business models. This process has however not been completed with regards to CSA.

There is a business unit holding product ownership for CSA. This business unit is also the one that is responsible for the development of the CSA platform in terms of, for example, platform functionality. However, 50% of respondents state that the business unit lacks customer communication and an understanding of what the customer and company departments using CSA values. According to these respondents, the business unit holding product ownership does not prioritize development tasks that are most important to increase the business value and improve the benefits provided by CSA. The respondents expressing this discontent are not all originating from the same company department, but several different ones. Furthermore, 75% of respondents state there is a lack of communication concerning the CSA subject. They state that there is no consistent communication regarding CSA that is carried out on a regular basis.

All respondents state different problems in relation to CSA and the surrounding business model, as stated in the previous sub-sections of 4.3. However, all respondents also state that CSA has the potential to contribute to company success, provided the most critical problems CSA and the surrounding business model are removed. About 70% of respondents state one of the great benefits with CSA is that it can be used on several different automation technologies that the case company provides to its customers. However, as not all company departments are working with CSA in their implementation of automation technologies as of now, one of the stated benefits with CSA is not currently taken advantage of. In addition, 50% of respondents state that there is an unwillingness among employees of the company to work with CSA, saying this has resulted in a lack of dedicated personnel that has sufficient knowledge of the platform. These respondents state that the unwillingness to work with CSA is due to the fact that the technical side of the platform is not currently up to sufficient standards. Furthermore, 50% of respondents state that the company lacks a supporting culture when it comes to software. They state that as the case company has always primarily
been a hardware manufacturing company, the introduction of CSA presents a problem considering people within the company are used to only working with and selling hardware.

A summary of the empirical findings regarding the organizational anchoring of the business model of CSA can be seen below, in Figure 14.

![Figure 14. Organizational anchoring of the business model of CSA](image)
5 Analysis

This chapter includes the analysis of each separate component in the business model of the case company: value proposition, revenue model, customers and organizational arrangements. Furthermore, the analysis of the organizational anchoring of the business model is also presented. The analysis builds upon a comparison between empirical data and the frame of reference, with additional regards to the contextual situation at the case company.

5.1 Value Proposition

Respondents identify one of the core benefits of the value proposition to be the flexibility of CSA and being able to create customer-specific offerings. Being able to customize offerings that are customer-specific is crucial in order to remain a greater interaction with customers, something that scholars (e.g. Kindström, 2010; Kindström & Kowalkowski, 2009) claim is an important factor to succeed when providing a service. When compared to more product-oriented offerings, service-based ones should not only address the technical and economic components, but also the social component of the offering (Anderson et al., 2006; Grönroos, 2007). Looking at the value proposition of CSA, respondents identify that the offering provides all three types of benefits. Looking at social benefits, one is the increased communication with the customers, which respondents identify as a result of the increase of flexibility offered in the proposition. The flexibility, both in terms of being able to create customer-specific offerings but also being able to use CSA to implement different automation technologies, is the most critical technical benefit that the respondents identify. Looking at the economic benefits of the offering, respondents state there are economic benefits for all types of customer segments.

However, CSA was also created with the thought of establishing a community between customers that develop end-user offerings. This has not been achieved due to not being able to attract enough developing customers, which respondents identify as a result of not being able to demonstrate the benefits of CSA. This can be seen as an example of failing to communicate the value-in-use of the offering, which Kindström & Kowalkowski (2009) state is critical when providing a service. Respondents identify that the CSA platform used to develop applications and solutions is not easy enough to use, making it hard to demonstrate the actual technical benefits (Anderson et al., 2006; Grönroos, 2007) of CSA. Respondents also state that the lack of already created applications and customers who use these applications makes it hard to demonstrate the economic benefits (Anderson et al., 2006; Grönroos, 2007) of continuously creating applications with the help of the CSA platform. As a consequence of lacking and not being able to demonstrate some of the benefits the offering is intended to provide, respondents identify the case company has also had problems with visualizing the value of the offering, also critical when providing a service offering (Kindström & Kowalkowski, 2014). However, visualizing the value of a service-based offering is more difficult compared to a product-
based one – which is caused by the intangibility the service performance constitutes (Kindström et al., 2012). In order to succeed in visualizing the value of a service, the case company could aim to implement visualization strategies or ways to make the service performance tangible (Ibid.). In the case of the case company, one way is to demonstrate how CSA interacts with the hardware products they are integrated with. This type of visualization will resonate more with the customers and make it easier for them to grasp the intangible service value CSA offers as it is then associated with a tangible product (Kindström et al., 2012).

To summarize, the case company has issues with demonstrating to the customer the different benefits that a service offering should provide (Anderson et al., 2006; Grönroos, 2007). This has led to the company having trouble with demonstrating the value-in-use (Kindström & Kowalkowski, 2009) but also visualizing the value (Kindström & Kowalkowski, 2014) of the offering. Respondents identify that this can be considered a result of the offering partly lacking some of the benefits CSA is intended to provide.

5.2 Revenue Model

The only direct revenue stream derived from CSA is the development licensing fee charged for CSA A, of which customers designated to further alter the functionality (such as system integrators and machine builders) pay for. The development licensing fee in itself for CSA A serves as a subscription-based model as proposed and exemplified by Naor et al. (2018). In contrast to the traditional cost-based models, one could argue that this serves as a more innovative pricing model – as it is an annual fee of continuous payments. However, sales of customized offerings provided to the end-users are based on traditional hardware or cost-based pricing models. Kindström (2010) and Oliva & Kallenberg (2003) encourage the idea of more innovative pricing models. Accordingly, the development licensing fee is not necessarily a problem – but selling the customer-specific offering without consideration of the value added by the software service is.

There is a lack of direct software service-related revenue streams derived from end-users, where the price of an offering is currently solely based on the hardware and development cost plus a fixed margin. As earlier mentioned, value-in-use is hard to demonstrate in CSA’s current state, therefore also creating issues upon applying any value-based pricing models. Another issue in applying value-based pricing is that customers need to be mature in terms of buying services, as it is seemingly more advanced in its nature (Kindström, 2010). As the pricing methods with regard to offerings created with the CSA platform belongs to the old traditional cost-based pricing, theories from Kindström (2010) and Oliva & Kallenberg (2003) among others, state that this area stresses for revision. Thereby, the larger problem is that end-users are not necessarily paying for the software services provided by CSA, and in extension not paying for the software service-based value added by integrating applications created in CSA into the case company’s hardware. Furthermore, different
customers also receive different value from the offerings they purchase from the case company. Theories by Kindström (2010) emphasize that in such situations, the pricing of the service need to be developed with the specific customer and its purchased offering in mind. However, this requires that the increase in value can be demonstrated and visualized to the customer.

To summarize, the case company follows theories by Naor et al. (2018) in regard to subscription-based revenue models, at least in terms of those customers that intend to develop their own applications with CSA A. However, the case company has no direct software service-related revenue streams from end-users and those customers that do not alter any software code with the help of CSA A. The revenue derived from end-users is solely based on the hardware cost of an offering. On one side, there could be a need for revision, as Kindström (2010) and Oliva & Kallenberg (2003) reject cost-based pricing models when looking at a servitized business model. However, as the purpose of CSA and the purpose of each customer segment has not been outlined officially, it could be that this customer segment should only satisfy the means of creating possibilities for upsell – which Baines et al. (200) and Mathieu (2001) support in their theories.

5.3 Customers

By launching CSA, the case company directed dedication toward creating more customer-centric relationships, where co-creation of offerings together with customer is common. These customer relationships are also tightly bonded, as developers and application engineers are in direct contact with the customers when they require support.

Kindström & Kowalkowski (2014) state that a general challenge for heavily engineering-driven firms in servitization contexts is to prioritize the market and customer over technology when developing an offering or a service. Although there is a market side to the case company's way of dealing with co-created offerings together with the customer, the challenge still seems to be apparent when looking at the case company. The business unit with ownership rights seems to lack customer interaction, thus creating problems in understanding the actual needs of specific customers and possibly also the marketing effort needed to support the software service. As the case company co-creates solutions together with the customer, the concern is to solve the problem for the customer – without consideration of what additional technical, economic and social benefits are provided. However, while co-creating offerings at customer sites, there should be opportunities for co-creating the actual value proposition with the customer, thus making it possible to understand usage situations and common goals – as proposed by Payne et al. (2017). This, could in extension make it possible for those that co-create customer offerings to understand the value added by the software. Consequently, one could argue that the co-creation of offerings could enable the case company to understand and visualize or demonstrate value,
which is a problem that the case company struggles with (see section 5.1). With that in place, the case company could be able to put a price on such a value, as discussed in section 5.2.

The biggest customer segment seems to be the end-users, which do not explicitly pay or are aware of the software services and benefits provided by applications within CSA. Logically, this could create future problems as system integrators and machine builders from a financial perspective are more lucrative, assuming the revenue model stays the same with the development licensing fee as only direct revenue stream. However, there are opportunities for upsell of other products while selling offerings based on CSA.

From a marketing perspective, the marketing message seems to be inconsequential. There seems to be little marketing directed to CSA itself, while most of the marketing is directed to applications created with the CSA platform. Another problem is also that the biggest customer segments benefiting from CSA are not addressed by the official marketing message, and they are not even necessarily aware of CSA and its role in creating their customized offerings. Grönroos (2007) and Kindström & Kowalkowski (2009) state that in order to make customers aware of the change toward servitization, there needs to be clear and increased visibility on the market, focused on explicitly demonstrating the change. This is something that has not yet been implemented in the case company, neither has the change toward software services been coherently demonstrated internally or externally. There is a risk, according to some respondents, that customers within these types of industries that CSA target are not yet mature for purchasing software. The same respondents also mention that these customers might not appreciate or evaluate the provided software services in a way that is desirable for the case company. However, this could also be applied to the context and the specific industry in general, as the competitors to the case company possibly also interact with the same types of customers. This could in extension mean that the context in itself does not provide plain opportunities of profiting from only the software-side of an offering. Yet, possible mitigation of this risk – considered in the theories of Grönroos (2007) and Kindström (2010) – is to develop more advanced customer partnerships. This could essentially infer that the customer co-creation that is in place as of today needs to be developed in a way to make potential customers aware of the benefits of adding software services to a hardware product offering. In that way, the customer might get a deeper understanding of what they are purchasing and gaining from that purchase.

To summarize, the case company co-creates offerings with customers, with tightly bonded customer relationships – as supported by Day (1994) and Kowalkowski (2008) among others. There is nonetheless an issue in the responsible business unit’s way of putting technology in the driver seat when developing the offerings, as they lack customer interaction and market understanding. This could also be related to the theories of market pull or push strategies by Horbach et al. (2012), where this represents using market pull strategies over technology push strategies. Furthermore, issues appear when actually co-
creating value propositions and acting on profiting on this matter. The change toward servitization for the case company is not explicitly demonstrated on the market, which is a matter that Grönroos (2007) and Kindström & Kowalkowski (2009) highlight as essential. One example coupled with this idea is that the official marketing message is not comprehensive enough to cover all targeted customer segments.

5.4 Organizational Arrangements
Scholars such as Adrodegari & Saccani (2017) and Kindström & Kowalkowski (2014) declare that when the company is transitioning into more service-oriented offerings and in extent service-oriented business models, resources and capabilities needed to complete the transition should be identified and acquired. Looking at the case company and the empirical findings of the study, this has not been the case. Statements from all respondents indicate that from the moment the case company launched CSA, it has not managed to dedicate sufficient resources to the CSA project. However, failing to dedicate sufficient resources to develop service offerings when historically having been a product company is not rare (Kindström & Kowalkowski, 2014). Companies in this position should maintain a long-term focus and create internal awareness of the service offering and its potential, in order to mitigate the lack of dedication of resources to the development of the service offering (Ibid.).

Furthermore, scholars such as de Brentani (2001) and Lapierre (2000) claim that it is crucial to develop tools to support the sales of the service offering. However, respondents state that there is a lack of sales competence when it comes to selling the service offering – stating that sales personnel have not been trained to deal with the transition from product to service. To further support the argument of the lack of company resources dedicated to CSA, respondents state proper communication paths and protocols have not been initiated, and that there is a lack of people that are solely dedicated to working with CSA. The case company does however boast dedicated sales units that are in close contact with the customers when developing end-user solutions, enabling a very customer-centric approach which scholars such as Kindström (2010) and Kindström & Kowalkowski (2009) promote when providing service offerings. The case company sales units existed before the launch of CSA but since the sales units now also employ application engineers, it can offer very specific customizations to each customer, working closely with them along the way.

The resources, activities and competences within the company should be structured in a way that enables the company to support the value proposition, revenue model and customer properties (e.g. Adrodegari & Saccani, 2017; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003). Looking at the value proposition, it can be said that this criterion is not fulfilled. This can be said to due to the fact that CSA has not been developed in a way that enables it to provide the benefits that it is intended to, and respondents state there is a lack of company resources dedicated to working with CSA. However, it is not clear if the lack of resources is a result of the company undervaluing and not prioritizing CSA development as
a consequence of traditionally having been a hardware company, or if it misevaluated the customers and their preferences. Either way, this demonstrates a lack of resources in terms of gathering sufficient information regarding capturing new customer needs, which Kindström (2010) claim is key if the company is to succeed in providing a service offering. The empirical findings indicate that there is an absence of sufficient, simple and intuitive infrastructure to support sales and delivery of the software services provided by CSA. This identified problem is a matter that authors such as de Brentani (2001), Grönroos (2007) and Lapierre (2000) state is key in conveying the value-in-use of newly introduced services. This could also advert to the issue of lacking sufficient resources that enables the company to especially support the value proposition and customers, which Adrodegari & Saccani (2017) and Kindström (2010) claim is of importance upon designing and implementing a business model.

To summarize, the case company has not been able to dedicate and structure sufficient resources, activities and competences in order to adequately support the other components of the business model, something which scholars (e.g. Adrodegari & Saccani, 2017; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003) state is the purpose of the of these properties. This phenomenon is not rare when looking at product-centric companies that now offer services as well (Kindström & Kowalkowski, 2014).

5.5 Organizational Anchoring
When introducing a business model innovation, scholars such as Bucherer et al. (2012) and Porter (1996) highlight the importance of having a consistent and clearly communicated strategy that is undertaken by all company employees. Respondents state that there is a lack of proper communication regarding the CSA subject and what the overall strategy and goals are and that there is a need for defining these. These statements coupled with the lack of official strategic documents in relation to CSA, one could argue that the communication regarding CSA and its overall purpose and strategy has been insufficient. This is reflected in the answers of many respondents when asked about the purpose and general strategy regarding CSA, as the properties of these answers differ among these respondents. In addition, several respondents claim that the dedicated business unit responsible for developing the CSA platform does not prioritize the most critical development tasks to increase the business value of, and benefits provided by, CSA. This also indicates that there is a discrepancy in what different case company employees consider is the right way for CSA moving forward. Furthermore, these statements also indicate that an initiation of closer collaboration between the business units could be beneficial, as it would help the case company better address customer needs while also preventing conflicts between the business units (Gebauer & Kowalkowski, 2012).

As of now, not all company departments have integrated CSA in their process of implementing their respective automation technology. This is the case even though respondents identify one of the great benefits with CSA is its flexibility to be used with all
types of automation technologies. The reason for some company departments not using the CSA platform in their development process is not clear. However, respondents identify a lack of people with knowledge and willingness to work with CSA as a problem, in part caused by the technical part of the platform not being up to standards. This empirical finding is in line with the findings of Bucherer et al. (2012), who state that one of the general problems in anchoring business model innovations within the organization is that the employees can lack willingness to work with the initiative. However, lacking knowledge of new benefits and values that are provided as a result of the innovation is also a common issue (Bucherer et al., 2012).

Respondents state that there is a lack of supporting culture when it comes to software, which CSA can, besides being a service, be defined as. Looking at statements made by Bock et al. (2012) the lack of a supporting culture could constitute a problem as these authors state that a supporting and creative culture is needed if to succeed with an innovation initiative as the one CSA constitutes. However, the empirical findings of the study are in line with the statements made by Kindström & Kowalkowski (2014), saying that many companies struggle with the cultural element. In order to create a supportive culture for services, companies should increase awareness of the service initiative and the potential it grants (Kindström & Kowalkowski, 2014). Hence, being able to visualize the value of the offering is not customer exclusive, it is also important to do so internally. Companies should also aim to develop service leadership capabilities and maintain a long-term orientation when evaluating the results of the initiative, as success derived from the service might not come directly (Kindström & Kowalkowski, 2014).

In general, as there is a positive perception regarding the possible opportunities with regards to CSA among respondents, resistance based on willingness to adapt to the concept of CSA cannot be determined to be significant. Respondents instead identify, as earlier mentioned, that the resistance to work with CSA might be caused by the fact that the technical aspect of the platform has previously not been up to par. However, the unwillingness to work with CSA could also stem from the lack of a supporting culture of the initiative and the potential it grants. Findings by Bucherer et al. (2012) and Jenssen & Nybakk (2009) indicate that when facing these types of resistances of the new innovation, internal promoters have been crucial in order to succeed in implementing the new business model. More specifically, as the resistance is not caused by insufficient knowledge of CSA but instead by the properties of CSA itself, power promoters (Bucherer et al., 2012) could be used to overcome the resistance.

The case company have a dedicated business unit holding ownership to CSA with responsibility for further developing the CSA platform. There is also a dedicated business unit handling the implementation of new business models, which Bucherer et al. (2012) and Christensen & Overdorf (2000) claim is needed when innovating the business model. This business unit has however not completed the process of the business model implementation with regards to CSA, and there instead exists multiple business models depending on the geographical location of the customer.
To summarize, there is no company-wide consistency in terms of goals, purposes and strategies in regard to CSA. There is a lack of willingness from company employees to be working with CSA, which could be helped with the use of internal promoters (Bucherer et al., 2012; Jenssen & Nybakk, 2009). Furthermore, there is also a lack of a supportive culture of the innovation. However, there is a designated business unit for handling the implementation of company business models, but this process has not yet been completed for CSA.

### 5.6 Synthesis of analysis

A comparison between the presented analysis (see sections 5.1-5.5) and the initial analytical model and its properties (see Figure 5) will now result in discussions regarding the relative importance of each component within the business model. The comparison will be discussed in light of company servitization and result in an analysis of what properties of the business model that has shown to be most critical for the case company when launching the CSA project. This section ends with a revised analytical model which is based on the empirical findings of the study and its following analysis.

#### 5.6.1 Importance of each business model component and its properties

Looking at the empirical findings, the case company follows the recommendation of several scholars (see e.g. Day, 1994; Kowalkowski, 2008; Payne et al., 2017) in the way they are working together with their customers, with tightly bonded customer relationships and co-creation of offerings. Despite this, it has not yet led to a phase where CSA succeeding on the market. This matter can depend on a number of things within the business model framework or the anchoring of the business model in the organization. Respondents have identified several problems with regards to the value proposition, more specific the benefits of CSA. Respondents mention, among other things, that the complexity of using CSA is too high. Although the benefits as of today seem to be partially lacking, the demonstration of the value is also a troubling issue – as the value-in-use and the value offered with CSA becomes hard to comprehend for the customer. Respondents identify that a part of why the value-in-use and the value offered with CSA is due to the fact that the benefits are partially lacking. However, the CSA platform and the benefits it is intended to provide if developed correctly does address all types of benefits that scholars (see Anderson et al., 2006; Grönroos, 2007; Kindström & Kowalkowski, 2009) claim a value proposition should. To be clear, it is first and foremost the benefits of CSA that is lacking as of now, making it hard to demonstrate the value-in-use of CSA to the customer.

The empirical findings regarding the value proposition show that value-in-use, customization, benefits and the visualization of value are critical factors when assessing a servitized business model design. Although sustainability might be a factor that could have substantial importance when evaluating the value proposition, the findings of the study indicate that this has not been a critical factor within this context when looking at integration of software services into the business model.
Looking at the customer component of the business model, the properties in the analytical model are enhanced customer relationships and increased visibility on the market. Both parts are of importance for the case company as of today, as customer relationships, co-creation of offerings and marketing are exhausted topics in the empirical findings. Although increased visibility on the market has been brought up as an issue, the problem for the case company has rather been that the marketing message is not comprehensive enough to address all target customer segments. Thereby, there is an enhanced relevance of the marketing message within the marketing sub-component – which is included in the revised analytical model.

Looking further into the empirical findings, the revenue model could also state a problem for succeeding with CSA on the market. Nevertheless, scholars such as Kindström (2010) and Oliva & Kallenberg (2003) recommend innovative pricing models, which the case company only partially has implemented into their business model. In regard to end-users and those machine builders who do not purchase a development licensing fee, the software services provided by CSA are not charged for. Therefore, this could not be considered as an innovative pricing model when looking at CSA - as software service revenue is not derived from these customer segments. However, for system integrators and those machine builders who do purchase a development licensing fee, there is a seemingly innovative pricing model with annual subscription-based payments. It could be that the general idea behind the existing revenue model, with subscription-based pricing of services, is not suited for any of the customer segments – however, this has not been identified in the empirical findings as a problem when it comes to attracting customers.

Looking at the findings of this study, there are no evidence that any sub-part of the revenue model is of higher importance than another. However, as gathered from the empirical findings, it is difficult to evaluate the interdependence of these sub-parts or their effects on the success of the business model, as there are problems in other parts of the business model which could set back the evaluation of the revenue model (e.g. not being able to deliver benefits, visualize these benefits etc.). Although value-based pricing has not yet been implemented at the case company, it has however been deemed important for the case company as a future implementation. The empirical findings thereby support the usage of value-based pricing, which deems it relevant as a sub-component of the analytical model.

The organizational arrangements within a company should be structured in a way that enables the company to support the value proposition, revenue model and customer properties (see e.g. Adrodegari & Saccani, 2017; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003). The issuing areas constituted in the empirical findings that embrace organizational arrangements are a lack of infrastructure to support sales and delivery; lacking resources dedicated to working with CSA; lacking sales competence and lacking communication paths and protocols concerning CSA. At a glance, these issuing areas are affecting the value proposition as it involves the realization of the value proposition of CSA.
as well as the delivery of that value. Nevertheless, the lacking infrastructure to support sales and lacking sales competence could also affect the customer component in terms of how visible or prominent CSA is on the market.

As the goals, strategies and purpose with CSA have not been clear and company-wide consistent, conflicts regarding how CSA should be utilized and further developed has arisen. Respondents identify that this has led to CSA not providing the business value and benefits they identify it can and should. As a result of this, there is also a lack of willingness of personnel to be dedicatedly working with CSA, which has resulted in a lack of resources and competences regarding the CSA project. The conclusion drawn is that the organizational anchoring of the CSA innovation and its business model has directly affected the structure of the resources, activities and competences surrounding CSA, in a way that does not enable it to support the other business model components. However, there is also a lack of a supportive culture of software services as well as consistent communication regarding the CSA project within the organization. It is therefore not possible to draw conclusions regarding which of these properties that are most crucial to properly anchor the innovation initiative within the organization. However, each one is identified as important when integrating software services into the existing business model.

To summarize, even though the case company does in part apply a customer-centric approach (see e.g. Kindström, 2010) and an innovative pricing method (see e.g. Oliva & Kallenberg, 2003), this has not granted financial success or helped to attract a significant number of customers. Instead, the most prominent factor identified for it not to have succeeded in the market has been identified to be the fact that the value proposition is lacking in terms of the benefits it provides. However, the idea and thought of the benefits CSA could provide is in line with what scholars (see Anderson et al., 2006; Grönroos, 2007; Kindström & Kowalkowski, 2009) promote, with its high flexibility and economic, social and technical benefits. The reason for the benefits of the value proposition not being provided have been identified to stem from the lack of resources, activities and competences dedicated to the CSA project. However, this has been identified to be caused by an insufficient organizational anchoring of the CSA innovation and the surrounding business model. In terms of the customer-component of the business model, it has been identified that addressing the target customers with a specific marketing message is critical. When looking at the organizational anchoring of the business model, it has been identified that consistent communication, a clear strategy and a supportive culture is of extra importance when moving to a servitized business model.

5.6.2 Revised analytical model
The findings of this study support arguments made by scholars (see Adrodegari & Saccani, 2017) that state there is a connection between the resources, activities and competences devoted to the initiative and the realization of the value proposition. Failing to dedicate and structure the organizational arrangements (i.e. the resources, activities and competences) in a sufficient manner may directly cause the realization of the value proposition to falter.
However, a common issue with innovating the business model is the employees’ unwillingness to work the business model innovation (Bucherer et al., 2012). As also stated by Bucherer et al. (2012), the findings of this study indicate it is critical to properly anchor the innovation initiative within the organization in order to be able to designate the proper organizational arrangements to the project. Moreover, in line with findings by scholars (see Adrodegari & Saccani, 2017; Kindström, 2010; Kindström & Kowalkowski, 2014; Oliva & Kallenberg, 2003), the results of this study show that the organizational arrangements also affect the customer and revenue model component of the business model. This is also true vice versa, but the customer and revenue model component rather affect the design of the organizational arrangements, while the organizational arrangements concern the realization of the other two. Additionally, it is found that the value proposition and customer component are related to each other, as value propositions with high focus on customer-customizable offerings will lead to enhanced customer relationships and vice versa.

With basis in earlier discussions, a revised form of the analytical model is presented in Figure 15 below, showing that the most critical factor identified when assessing a servitized business model design is the value proposition. The sustainability of the value proposition has been eliminated, whilst bolded and highlighted parts are newly developed matters that have been altered from the initial analytical model. The underscored parts shown in bold within each component are there to signify its importance in relation to the other properties of the same business model component, not the other properties of the other components. No changes have been made to the properties of the organizational arrangements or the revenue model. The inter-relationships between each component has also been altered due to the above-seen reasoning. The purpose of the revised analytical model is that it can be used in future studies with similar contextual surroundings, in order to evaluate critical factors when assessing a servitized business model and the organizational anchoring of said business model.
Figure 15. Revised analytical model
6 Conclusions

Throughout the research process, actions were taken toward understanding how hardware manufacturing companies can integrate software services in their existing business model. This was done by answering the two research questions presented in segment 1.5. In this chapter, the research questions are answered with basis in a combination of the empirical findings in chapter 4 and the analysis presented in chapter 5.

It is not safe to draw complete generalizations when answering the research questions investigated within this thesis. This is due to the fact that this is a contextual study which results are based on the empirical findings from one specific case company. However, companies in a similar situation can experience and percept the same effects and challenges from servitization within their company and their business models. One could argue that this is based on the premise that the theoretical background of this study is grounded in general theories in the manufacturing industry, which is later validated, discarded or further developed with empirical evidence found within the context of the case company. Furthermore, these concepts which are discussed and investigated in this study are general concepts commonly examined in studies within the field of servitization and business model literature. This further promotes the idea that companies in general could experience the same effects and challenges in relation to integrating software services into their existing business model. The research questions investigated within this thesis are outlined and answered below.

- How can servitization affect manufacturing companies’ business models?

The empirical evidence brought forward throughout this research has shown that servitization can affect the company and the existing business model in a vast amount of ways. Companies in this context might address flexibility, social benefits and customization in their value proposition. However, companies in this context could also struggle with issues in designing and realizing a value proposition that is desirable to the customer. It has also been shown that the visualization of such benefits is a somewhat laborious task. Another matter of which companies in this setting could experience is the shift toward customer-centricity. In earlier research by Kindström & Kowalkowski (2014), there seem to be a major challenge in putting the market and the customers in the driver’s seat instead of technology. This also applies to the context of this study, as the responsible business units for the software service can struggle to focus on the market over internally promoted technology. In another sense, servitization could affect companies in this context in ways of how their customer relationships are formed – as the empirical findings point to having tighter bonds with its customers can facilitate co-creation of offerings with said customers and support of the customer. This finding rather supports the idea of adapting to the market and the customers over putting technology in firsthand, related to the idea of prioritizing market pull...
strategies over technology push strategies (Horbach et al., 2012; Kindström & Kowalkowski, 2014).

The empirical findings and the analysis also imply that servitization might affect the company in terms of their revenue generation methods. One example is the step towards more innovative pricing methods. However, companies might find issues in transitioning from cost-based pricing models to value-based pricing models, in cases where value delivery and the visualization of that value is hard to apprehend for the customer. The empirical findings show that companies might also be affected by servitization through the way they structure their resources, activities and competences. Companies might struggle to realize their value propositions as there is not a sufficient amount of dedicated resources and activities to the task. Also, internal communication paths and protocols could be troublesome to implement. Companies in a servitized context might experience issues in finding the right set of infrastructures to support delivery and sales of the new offering. In addition to the infrastructure, another issue could also be to establish new sales competence focused on promoting and selling a new servitized offering.

- How can the business model innovation process be facilitated in the organization?

It has been shown that the process of business model innovation can be troublesome for an organization. This has at least been proved to be the case when the organization historically have been solely focused on selling hardware and is now integrating software services through innovations in the company’s portfolio of offerings. When innovating the business model, the organization should define clear goals and strategies of the innovation that fits the overall strategy of the company (Bucherer et al., 2012; Porter. 1996). These goals and strategies should be clearly communicated to assure that they are widely accepted across the company staff (Ibid.). It is also deemed important to properly root the business model in the overall strategy of the company. However, organizations might experience difficulties in doing this. Failing to properly define and communicate goals and strategies could result in conflicting views of how the innovation initiative should be handled. In extent, this could affect the overall internal perception of the innovation in a negative manner. This might lead to an unwillingness for company employees to dedicate resources to the initiative, making it harder to further develop the initiative. Furthermore, the findings of this study support the findings of Bock et al. (2012) regarding the importance of developing a supporting culture of the innovation initiative. However, as shown in this study, and in accordance with statements made by Kindström & Kowalkowski (2014), this could prove a difficult task.

6.1 Discussion
The purpose of this study was:

"To understand how hardware manufacturing companies can integrate software services in their existing business model."
To understand how that could take place in manufacturing companies, one needs to understand the effects of servitization on the existing business model – as servitization is directly linked to the integration of software services into an existing portfolio of offerings (see e.g. Baines et al., 2009). When understanding how servitization affects the existing business model, in terms of critical factors, challenges, risks and issues to consider – it seems reasonable to say that it is also easier to understand how the integration can take place. The first research question answers how servitization affects the existing business model, which also indicates how a manufacturing company can adapt their organization and business model to the transition from hardware products to software services.

To further deepen the study, the second research question answers how the business model innovation could be facilitated in the organization, which is considered needed as manufacturing companies become servitized (Cavalcante et al., 2011; Foreman & Argenti, 2005; Storbacka et al., 2013). This provides deeper insights into the process of implementation of the integration of software services into the existing business model. The answer to the second research question also considers potential intra-organizational challenges when integrating software services into an existing business model. Among other things, this implies understanding how the culture, communication and strategy affect the integration of software services into the existing business model. This could support the understanding of how the integration can be made, facilitated or obstructed within manufacturing companies.

This study outlines one way of understanding how hardware manufacturing companies can integrate software services in their existing business model. However, the purpose could be answered in several different ways depending on the outcome of the empirical data gathered or the theoretical lens used throughout the qualitative study. Therefore, the conclusions that have been drawn cannot be considered to cover all aspects of all critical factors and challenges when integrating software services into the existing business model of a manufacturing company.

6.2 Managerial implications

The results of this study suggest that when going through the transition from hardware products and services, managers should aim to define clear goals and strategies with regards to the transition. The results of the study also indicate that it is crucial to communicate these to the employees of the company and assure that the entire company is working towards the same goal. Furthermore, there seems to be a need to develop a supportive culture for the initiative and communicating and making employees aware of the potential the initiative brings. The results also suggest that it is important for the company to apply consistent communication regarding the service initiative. It is therefore recommended to implement communication protocols among other measures to enable close collaboration between company business units. If there are conflicting views regarding the overall goals and strategies of the transition, results suggest that company employees will gain a negative perception of the initiative and it might also create an unwillingness to develop the initiative.
When designing a service-oriented offering, the results suggest managers should aim to keep the customer in mind as well as their needs. Managers should also focus on being able to visualize and communicate the actual benefits granted by the offering and how it solves their needs. However, the results indicate managers should also aim to dedicate a sufficient amount of resources to be able to realize and deliver the service offering. If failing to do so, the results reveal that the company might find it difficult to find the return on investment of the offering to be satisfactory.

By looking at the revised analytical model presented in this thesis (see Figure 15), managers can gain an understanding of important areas to address when going through the transition from offering hardware product to software services to their customers. Although not all of these areas necessarily do have to be addressed in the transition, the findings of this study and earlier conducted studies within the subject matter indicate that doing so will facilitate the company succeeding with the transition. Furthermore, the revised analytical model also highlights the interrelationships between the different components of the business model. Hence, looking at the revised analytical model will allow managers to gain an understanding of how changing one of the components will require alignment of the properties of the other components of the business model.

6.3 Theoretical implications
There is already an extensive pool of theoretical knowledge regarding the concepts of business models and the integration of service offerings into an existing business model. This research validates many of the findings previous scholars have been within the subject matter while also showing their findings and conclusions can in many ways be applied to the context which this research was carried out. However, the research also granted new findings that can be added to the existing pool of theoretical knowledge regarding the subject matter.

The results, in terms of theoretical implications of this study, is a contribution to the existing sets of frameworks used to evaluate and map out servitized hardware manufacturing companies’ business models. However, in this case, it is limited to be used within non-disruptive industries with low technological development rate. Nevertheless, this is a context and an industry of which lack significant academical records. The results can also be used to understand how different components of the business model affect each other. Thereby, the results create opportunities to understand how future changes and innovations to one component within the business model could pressure the company to adapt relating components accordingly. The results also indicate that the anchoring of business model innovations, i.e. changing, adding or re-linking activities within the business model (Amit & Zott 2012; Massa & Tucci, 2013), is a critical factor to take into consideration when approaching the integration of software service offerings into an existing business model.
6.4 Limitations and future studies

As any academical study and scientific research, this study and its results come with limitations. Below, these limitations are discussed together with a proposition of how future studies could be designed in order to augment the result of this research.

One limitation of the research process was that the customer perspective was excluded. All empirical data that was collected came from internal documents or interviews with internal personnel. With the customer perspective in place, another nuance to the problem could have been analyzed, as the market situation for the new offering and the perceived customer value could be portrayed. For future studies, the customer perspective could also be included in order to depict a more holistic view of the servitized offering and its properties. Furthermore, this study did not consider or examine any competing companies on the market. This matter could be analyzed in future studies to create either a more market-centric study or a more comprehensive analysis of the problem.

Another limitation to this study was the time limit of five months. It could be an interesting factor to study this type of problem for a longer period, in order to get a deeper understanding of the process of which the case company was undergoing. By performing the study for a longer period, one could also apprehend a closer insight into the further development of the state of each component within the business model and its organizational anchoring. This could possibly result in a closer insight into the commitment it takes to undergo the process of servitization. In the case of not being limited by time, the problem that this study examined could also be examined in a more concrete manner, depicting the implementation phase of the business model but also its effects and originality.

As this study does not embrace services in general, but only software services, the revised analytical model and the conclusions that have been drawn are limited to one part of the servitization spectra. This is the case as one cannot directly imply that software services and services in general act unanimously. Hence, in future studies, an interesting perspective to examine is to apply this research to companies undergoing servitization, without the presence of software. That could also make this study more generalizable in terms of servitization.

This study was also limited to one specific case company in one specific industry. An interesting future study could be to find possible discrepancies in servitization between industries, meaning that you could perform the same type of study toward another industry. By performing more comprehensive research toward different industries, it could be possible to find a better understanding of the relationships between different components in the business model, but also gain a more significant analysis of the emphasis of each component.
7 References


Appendix 1 – Interview Template

The interview template was formed as a fundamental part of collecting empirics to conduct this study. The template was formed with a basis in the analytical model and the business model literature, in order to understand the layout of the existing business model at the case company and future possible opportunities.

Introduction

We are two students conducting a qualitative study and a master thesis with the purpose of:

“understanding how a hardware manufacturing company can integrate software services in their existing business model.”

We are both studying Industrial Engineering and Management at Linköping University with a master’s profile in strategy and control. We set out to understand the layout of your business model today and the reasoning behind its design in order to improve it by filling gaps where opportunities are found. The delimitation for this thesis is that it will only include the business model revolving the Company Software Application (CSA). Therefore, when you think of answering questions, you should consider ideas and notions relating to CSA.

All answers in this interview are anonymized and none of your answers will be presented in a way that makes it possible to associate them with you or your company position.

Background questions

1. Could you describe your company role?
2. What amount of time have you spent working for the company?
3. What working relation do you have with CSA?

Value Proposition

1. What problems does CSA solve?
2. What are the general benefits with CSA?
3. What are the social benefits that you offer by providing CSA to your customer?
4. What are the economic benefits that you offer by providing CSA to your customer?
5. What are the technical benefits that you offer by providing CSA to your customer?
6. Would you change the benefits provided by CSA in any way if you could?
   a. How?
7. How do you present, demonstrate or communicate the above-mentioned benefits to the customer?
   a. How would you suggest this presentation, demonstration or communication can be improved?
8. Are there any benefits of CSA today, that you think customers are not aware of?
   a. Could it, in its up-to-date form, solve more problems than customers are aware of?
9. What do you propose is the single most important thing that differs your product and the benefits it provides from other competing companies within the industry?
   a. Do you reckon this point of differentiation needs to be changed, now or in the future?

Revenue Model

1. What are the revenue streams for CSA today?
   a. How do you earn money from the offering?
2. Do you have any specific pricing methods?
   a. What are your pricing methods?
3. How would you suggest that your revenue model could be improved?
4. Are there any future opportunities/risks/challenges that will create a need for restructuring your revenue model that you can see today?

Customers

1. Who are your primary customers? Segmentations?
2. Who are your target customer segments for CSA?
3. What are possible future customers segments for the CSA?
4. Are you relying on existing customers or are you continuously selling your offering to new customers?
5. How do you work with your existing customers?
   a. How do you interact with your customers?
   b. Do you in any sense co-create solutions with your customers?
   c. Do you have any customer management system? (verbal interaction, platforms for communication, ERP, order system, CRM, etc.)
6. How are your customer relationships today? If there are different types, describe all of them.
7. Do you think your customer relationships and how you work with them needs to be changed in any way?
8. Do you market CSA?
   a. In what channels?
   b. With what message?
9. How would you suggest that the way you work with your customers could be improved?
   a. Target customers
      i. How to target?
      ii. Who to target?
10. Are there any future opportunities/risks/challenges that will create a need for dealing with customers in another way than you do today?

Organizational Arrangements

Within this segment, you should only answer taking your own division into consideration.

1. What resources (physical, infrastructure, server, client, inter-firm, social, relations) are most important to support CSA?
   a. Example: human resources, communication platform with customers

2. What performing activities are most important to support CSA?
   a. Example: Weekly meetings about progress, R&D, Customer support calls

3. What competences are most important to support CSA?
   a. Example: Specific knowledge within a specific programming language, sales competence

4. Within your division, do you see any lack of any of these three components?

5. Are there any future opportunities/risks/challenges that will create a need for restructuring with any resource, activity or competence that you see today?

Concluding questions

1. What do you think of CSA in general?
2. What are the possible opportunities with regards to CSA?
3. What does the internal communication regarding CSA look like?
   a. How is the idea of CSA been promoted internally?
4. How has the idea of CSA been established in the company?
5. In your opinion, what is the purpose of CSA?
6. Do you have anything to add, that you feel that we have not yet asked?