



UNIVERSITY OF GOTHENBURG  
SCHOOL OF BUSINESS, ECONOMICS AND LAW

MASTER DEGREE PROJECT IN INNOVATION AND INDUSTRIAL MANAGEMENT

*The Pains of Servitization*

-Finding the customers' pains of a servitization business model in the modular data center industry

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## Abstract

Increasingly more traditional manufacturing companies are adapting to the trend of bundling services around their core products and even going further towards defining their products and their surrounding services as a single service. This step of going from selling products to selling services is generally called servitization. Looking closer at consumer behavior it is evident that consumption is moving from patterns being characterized by purchasing tangible goods to intangible services.

Swedish Modules, a supplier of modular data centers, are looking into changing their business model from a traditional one to a servitized one. When changing a business model in an industry with strong traditions it is vital to establish a clear understanding of the customers. This process involves understanding the customer's benefits, but also its challenges with the new business model. Hence, in order for the case company, Swedish Modules, to create a servitized business model that is taking the customer's potential challenges into consideration and offers relievers for these pains this study is focusing on identifying these challenges and pains. To create this understanding, we have conducted interviews with actors along the value chain with a focus on the potential customers of their future servitized offering. These identified pains and challenges are anchored in theory and later compared with what the respondents present.

The findings show that the lion share of the identified pains are connected to the change from a traditional way of purchasing data center towards buying it as a service. Here pains such as *ownership*, *control*, *uncertainty of value* and *trust* are identified both in literature and among the respondents. Furthermore, it becomes apparent that it is vital that the *contract* is thoroughly designed in order to mitigate many of the identified pains but also to enhance the gains with a servitized offering. Also, many of the identified pains can be derived from either economic- or socio-psychological factors that affects the customer.

## **Keywords**

*Servitization, Product-Service-System, Business Model Canvas, Pains, Modular Data Center, DCaaS, Customer Centric.*

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## Abbreviations

- PSS** - Product Service System
- DCaaS** - Data Center as a Service
- IoT** - Internet of Things
- CapEx** - Capital Expenditures
- OpEx** - Operating Expenditures
- BMC** - Business Model Canvas
- VP** – Value Proposition
- DC** - Data Center
- B2B** – Business to Business

# 1. INTRODUCTION

*In this section we will present a background on the subject of this thesis, involving both an academic and corporate standpoint. After this discussion we will present the objective, research question, limitations and disposition of the research.*

## 1.1 Overview of Servitization

Globally, more firms are using the addition of services to their core offerings as a way of adding value for their customers, a process that is widely known as servitization (Vandermerwe & Rada, 1998). The servitization term was first mentioned by Vandermerwe & Rada in 1988, in their report “Servitization of business: adding value by adding services”, where the term is described as the process of “modern corporations that are increasingly offering fuller market packages or “bundles” of customer-focused combinations of goods, services, support, self-service, and knowledge”. Another way of defining servitization is the overall tendency of manufacturing corporations to broaden their product-based offers with integrated services (Tukker, A. 2006). The trend has been ongoing for quite some time and its unfolding has been developing across close to all different sectors and industries which highlights its importance as a tool for improving a company’s competitive edge. The trend towards a transformation of moving towards more services is driven by customer-demand and has resulted in new types of channels of communication and contact points with the customer (Baines, Lightfoot, Benedettini, and Kay, 2009).

Looking closer at consumer behavior it is evident that consumption is moving from patterns being characterized by purchasing tangible goods to intangible services. Furthermore, increasing deregulation, globalization, evolving technology, and intense competition are all driving factors of moving from offering products towards offering services (Vandermerwe & Rada. 1998). Also, the concept of servitization is being driven by the increased complexity of customer needs as well as an ever-increasing need to defend against competition from low-cost economies (Baines, Lightfoot, Benedettini, and Kay, 2009). The process of adding services results in a reconfiguration of the offering where the combinations of goods, services, support and self-service aim to provide a bundle that is characterized as a more complete and adequate for the customer (Vandermerwe & Rada. 1998).

The terminology for describing this process reaches beyond servitization, many researchers describe the bundling of products and services as a “Product-Service Systems: PSS” (Goedkoop et al, 1999; Tukker, A. 2004; Mont, 2002; Manzini et al, 2001; Baines et al, 2007). A PSS-system is according to Goedkoop et al. (1999) a tangible product that is surrounded by services and a system that enables the relationship between the services and the product. Hence the process of moving from providing products to providing a PSS offering is called servitization. The opposite way, going from providing services to bundle that with products is called productization. Ultimately, regardless if going from a product to a PSS system or a service to a PSS system, the end result is that the company becomes a solution provider (Leoni,



2015). Due to the characteristics of data centers as a product, we have in this thesis chosen to define servitization, productization and PSS offerings as the same ultimate thing, meaning that regardless if the company comes from a product or service-oriented business the move towards becoming a solution provider it will result in a servitization and PSS offering.

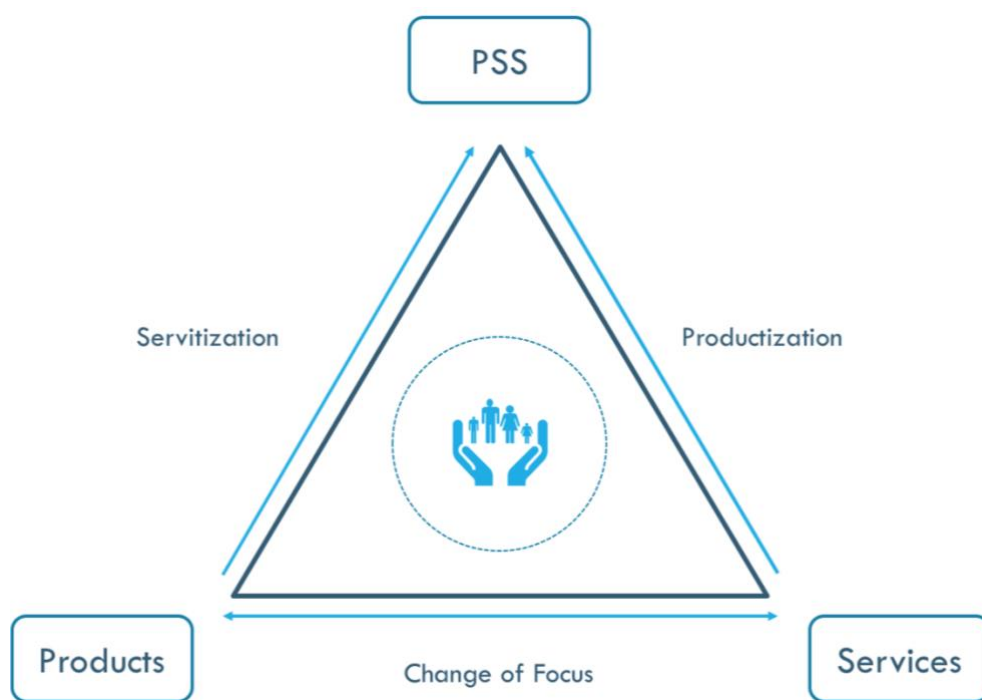


Figure 1. Illustration of ways to move towards a servitization solution Source: Leoni (2015)

## 1.2 Swedish Modules & Servitization

The case company, Swedish Modules, have for a long time been working with the development of modular units in different fields. They are currently operating in three fields, namely Industrial, Clean Rooms and Data Centers. All three business areas are based on the same infrastructure, “the modular room”. This modular room, which can be compared to a container in size, is built at Swedish Modules’ factory in Vara, Sweden and later shipped out to the customer, that install the equipment in it. This report’s field of study will be focusing on the data center area of the company, which is the area that Swedish Modules believe will grow the fastest the upcoming years. Essentially, Swedish Modules are building the frame for a data center at its factory and the modules are transported to the customer where they later are installed and equipped with servers and other systems necessary. This way of doing business will however change if Swedish Modules decides to implement a servitized business model for its modular data centers (Swedish Modules, 2017).

For the past years the demand for modular data centers has grown with double digits each year and is expected to continue growing at a rapid pace the upcoming years. Historically the demand for modular data centers has been driven by large data center operators that are in need

of excess capacity together with actors that are in need of disaster recovery and military deployments (Cruz, 2016). Today, however, new driving factors are emerging in a rapid pace which is increasing the demand for modular data center. The driving factors are mainly internet of things (IoT), an increasing amount of internet users, and the increased need for placing data centers closer to the end user (Cruz, 2016; van der Meulen, 2017; Shi & Dustdar, 2016). The need to place data centers closer to the end customer is a result of the high pressure on the existing data networks which to a large extent is related to the increased use of devices that are using internet of things. The increased pressure on the existing network can cause latency for the end user, but by placing smaller modular data centers at the edge of the networks latency can be decreased and the processing can be carried out closer to the source of the data, a method often called edge computing (Shi & Dustdar, 2016). In a report for IHS Markit, Cruze (2016) presents a number of factors of why modular data centers are suitable for edge computing. One of the factors is that the data centers are not in need of frequent maintenance by humans which allows a high level of autonomy. Also, many of the potential modular data center customers are already familiar with the concepts since they are currently using the centers as regular data centers. Therefore, it is plausible to believe that the transition towards using modular data centers in edge technology is rather small. Furthermore, due to the nature of a modular data center, it is possible to build a data center quickly at the manufacturers factory and ship it anywhere, which also implies that the manufacturers can reach economies of scale. Additionally, the design does not have to be too complex, meaning that the supply of material will most likely be constant (Cruz, 2016).

As a provider of this vital component for a technology that plays an important role in the future of computing networks, Swedish Modules are preparing for a global strategy which includes the process of implementing key changes of their existing business model. As of today, Swedish Modules are offering its modules, and their area of conducting business in the value chain ends when the modules are delivered to its customer. At that point in time it is the customer who will make the choice of how to equip the modular room, in this case with servers, switches and other systems. By implementing changes of their business model, Swedish Modules wishes to take a servitization approach by moving further down in the value chain and by that have the possibility to deliver a fully equipped modular data center as a service, where the customer only pays for as much computing power it uses. To do this they will have to partner up with companies in order to be able to deliver a fully functional data center. Hence, all the services and products will be bundled together which creates a new business model that is much more suitable for competing in the global arena. In this process, it is important for Swedish Modules to obtain a good understanding of its customers and their needs in order to identify and understand which contact points are vital and thereby understand the challenges for the customers with a servitization business model. To understand the customer, Swedish Modules wants to examine the underlying problems that the customer is experiencing, which are the customer pains. A *Customer Pain* explains or illustrates any aspect that causes any irritation or aggravation for the customer before, throughout, or after attempting to carry out the activity that is planned. Furthermore, a pain could also include the reason causing the inability of accomplishing the job.

Since Swedish Modules wants to establish a new business model it is important for them to gain insight of their new way of delivering value and therefore an increased customer knowledge is crucial. Based on the discussion above, the objective of the case company is to gain understanding of their customers in order to create a servitized business model that created as little pain as possible for the customer.

### **1.3 Research Gap**

When studying previous literature related to servitization, PSS and customer pains it becomes evident that a lot of research has been conducted around servitization and PSS with high focus on the suppliers of the service. Less research has been focused on the customer side, where the majority of it has shed the light on the possible gains for the customers (Halme et al., 2005; Hertwich, 2006; Mont, 2004b; Scholl, 2006; Schrader, 1999; Tukker and Tischner, 2006; Williams, 2007; Zaring et al., 2001; Östlin et al., 2005). In a study by REXfelt & Hiort af Ornäs (2009), they claim that it is still a great need of research regarding the relation between customer and PSS, especially in the B2B field. They further state that most of the literature is focusing on the positive aspects for the customer, and little attention is given to the possible pains or barriers. This is also mentioned by Mont (2002), who states that little research has been conducted in the field of delivering sustainable servitized offering to customers. It is evident that the acceptance of servitized business model differs depending on industry, hence Meijkamp (2000) claims that it is hard to generalize from empirical studies conducted in different fields. Therefore, this research that highlights the data center industry will shed light on the uniqueness of this industry and also contribute to the overall knowledge about customer's pains with a servitized business model.

### **1.4 Purpose and Research Question**

The purpose of this thesis is to a large extent twofold, first and foremost this is an academic report where the purpose is to contribute to the theory around servitization with a practical case, secondly the purpose is to help the case company to build a new servitized business model. As a result of the twofold purpose, a research question has been created that fits the needs and objectives of both the corporate and academic stakeholders.

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*What are the pains of a servitized business model for data center customers?*

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Considering the research question this thesis will provide science with a practical example of what pains can be identified in a servitized business model in the data center industry. It will also test pains identified in other reports, to see whether they can be found in this particular industry as well.

## 1.5 Delimitations

Due to the nature of the study, it is crucial to create rigorous delimitations of what to study and what not to study. This since there are, apart from the authors, two obvious stakeholders of this thesis, namely the institution at the university and the case company Swedish Modules. To make sure that these stakeholders are aware of the potential outcome of the thesis it has been important to mediate the intended delimitations of the thesis.

The case company Swedish Modules wants to look into the possibilities of creating a new business model that is focusing on servitization and this thesis will act as a piece in the process towards the new business model. It is plausible to believe that the case company cares less about the delimitations since the broader the research is the better understanding they can get. On the other hand, the institution cares more about answering the research questions in accordance with the presented limitations, hence the research must be in accordance with them. Due to this, the research is limited to focusing on business models and value proposition canvas with focus on how to identify potential challenges for customers with the new business model. The result of this thesis is therefore a piece in the forming of the case company's business model. Form an academic standpoint the research is limited to identifying potential challenges for customers in the business model and compare those with the challenges identified in the theoretical framework.

## 1.6 Thesis Disposition

The following illustration shows the outline of the thesis and its structure. After the introduction and research question, the theoretical framework introduces servitization as a concept to start off with before moving on to business model canvas which includes the value proposition as one of its areas, before finally reaching the value proposition canvas where the pains identified in literature is presented. Afterwards, the methodology chapter provides an explanation of how the research has been conducted and the underlying reasons for the methods chosen. The empirical findings present the interviews conducted with respondents in the industry. Following this, an analysis consisting of a comparison of the empirical findings and the theoretical framework. This analysis leads to a conclusion which focuses on answering the research question and present potential future research for others to conduct.



Figure 2. Thesis disposition, starting from the left.

## 2. THEORETICAL FRAMEWORK

*This section consists of the theoretical foundation which aims to provide an understanding of the previous research conducted in the relevant fields to answer the research question. It starts with a broader definition of servitization of manufacturing companies and narrows down to how to create a new business model using the framework business model canvas. The presented theories and frameworks are all linked to the purpose of the study and hence they are a vital component in the overall understanding. The theoretical framework will later be compared to the empirical findings in the analysis chapter.*

The figure below has been constructed with the aim of providing the reader with a more comprehensive understanding of the structure of the theoretical framework. It visualizes the disposition of the theoretical framework. The first part consists of a presentation of the concept of servitization for manufacturing firms, followed by a presentation of the service development process. Afterwards, the business model canvas is presented where it is narrowed down towards the value proposition canvas. The business model canvas and the value proposition canvas will be used as frameworks where the theory about servitization is applied. Lastly, the disposition is presented as a funnel, where it starts with the fundamental theory of servitization and ends with a more specific introduction of pains in the value proposition.

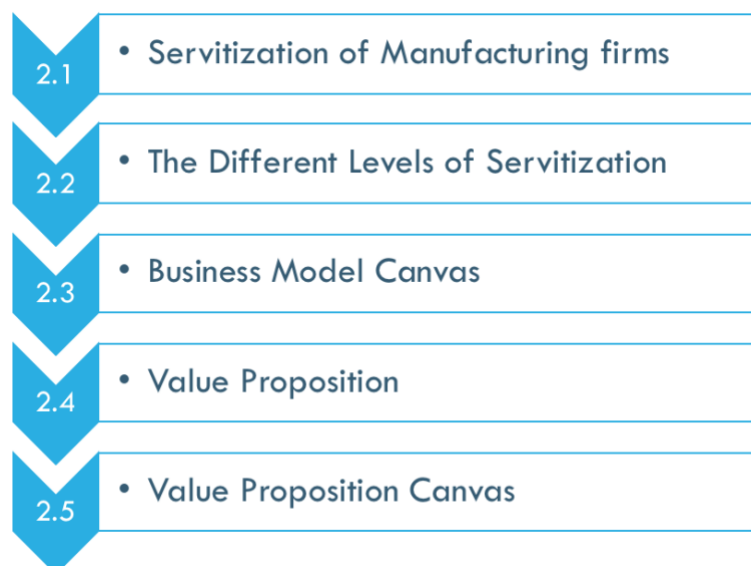


Figure 3. Overview of theoretical framework.

### 2.1 Manufacturing Firms & Servitization

In accordance with the research question, one vital component of identifying the pains of a customer in a servitized business model is to understand the concept of servitization. We have in this thesis decided to define servitization in accordance with Vandermerwe & Rada (1998), who states that it is the process of adding services to a tangible product as a way of offering

more value to the customer. For manufacturing firms increasing servitization results in a transformation of competing through the combination of their physical products and services instead of competing with the physical product on its own, this together with a higher focus on the customer. Stated by Mitchell (2004), the concept of servitization is in fact an innovation in the business model of a manufacturing firm, by adding services to an already existing physical product and by that offer a solution to the customer. Thereby, there has been a strategic shift where the previous importance of satisfying the customers' needs through one-off transactions has decreased relatively speaking. This has led to that the current focus is now more on the establishment and maintenance of the relationships with the customer (Vandermerwe & Rada, 1998). Hence servitization in itself is not necessarily creating any new physical innovation, it is rather the business model that creates that bundling of already existing products and services that is the innovation (Mitchell, 2004).

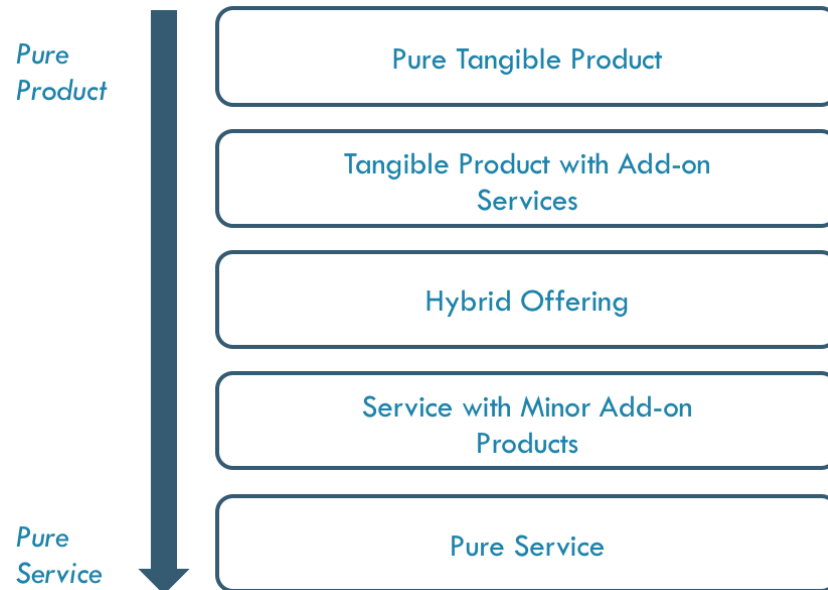
In servitization, there are different views regarding the flexibility of the bundled offers in terms of the ability for the customer to be able to choose certain parts of the value offering (Baines et.al, 2009). Some firms argue that that the customer should be able to choose an offer that is tailored according to their preferences. On the other hand, there are corporations that think the idea is to design a desirable bundle that integrates all the necessary requirements which offer a solution that combines all the elements to a satisfactory level even though not perfect on an individualized level. Thereby, the process of developing servitized offers can both be focused on standardized offers but also highly customized, depending on the strategy of the corporation (Vandermerwe & Rada, 1998).

The characteristics of services include being less visible and more labor-dependent which leads to its role as a strategic opportunity becoming more important in the business environment of today, and a potential way of creating and maintaining a sustainable competitive advantage for manufacturing firms (Gebauer, Gustafsson, Witell, 2011). However, the business environment for manufacturing firms is changing which is resulting in a changing role, in terms of importance, for technology. Therefore, the last decade has led to an environment where new technology on its own is not enough to differentiate against competitors (Gebauer, Gustafsson, Witell, 2011; Kowalkowski et al, 2012). As a consequence, the role of services has changed from being viewed as add-ons to the product, instead they have become the core of the total offering where sometimes products have become the add-ons to the services (Gebauer, Gustafsson, Witell, 2011; Kowalkowski et al, 2012).

### ***2.1.1 The Different Levels of Servitization***

Firms are often able to make the transformation of being a manufacturing firm to a provider of services in a successive manner. According to Kotler & Keller (2016) one could illustrate the process with the spectrum of pure product on one end and pure services on the other. When a manufacturing firm makes the choice of moving towards servitization, it results in a movement from the top of the ladder downwards towards the final level of servitization, pure services (Kotler & Keller, 2016; Fischer, Gebauer & Fleisch, 2014). This process is also illustrated in *figure 1*, which illustrates the move from either providing only services or product to providing

a product service system that consists of a bundling of products and services (Leoni, 2015). What can also be said about the move from a product offering towards different levels bundling with services is that the further down you go on the ladder in *figure 4*, the more value of the value offering can be derived from the service (Tukker, 2004).



*Figure 4. Pure Product to Pure Service (Kotler & Keller , 2016)*

### **2.1.2 Drivers of Servitization**

The use of services as a way of differentiating amongst manufacturing firms is one contributing factor that is driving the spread and use of servitization (Tukker, 2004). Furthermore, it has been reported that corporations that have services as a larger part of their business offering are performing better in terms of financial metrics such as return on sales (Gebauer, Gustafsson, Witell, 2011). Generally, there are the three different factors that are viewed as the key drivers of an increasing level of servitization amongst manufacturing firms. These key drivers are related to financials, strategic (competitive advantage), and marketing (Mathe & Shapiro, 1993; Mathieu, 2001; Oliva & Kallenberg, 2003; Gebauer & Fleisch, 2007). Regarding the financial drivers the main benefits discussed in the literature from servitization are improved profit margins but also a higher quality of the revenue streams as the predictability of them increases. The increased stability of revenues is a sought-after characteristic amongst manufacturing firms (Wise & Baumgartner, 1999). The combinations of products and services are generally less affected by competition that is price-based which means that they tend to result in higher profitability as opposed to selling the product and service on their own as well as reap benefits from a more sustainable competitive advantage (Malleret, 2006; Frambach et al, 1997). Furthermore, servitization has a tendency of being counter-cyclical, or at least more resistant, to macroeconomic conditions and their fluctuations (Oliva & Kallenberg, 2003).

The role of servitization is frequently discussed in the literature concerning the process of establishing and maintaining a competitive advantage (Gebauer & Fleisch, 2007). Manufacturing firms can use the addition of service elements as a way of differentiating themselves from their competitors which highlights its strategic importance (Gebauer & Fleisch, 2007). Differentiating by using services is often more sustainable as they are less visible and more dependent on labor and proprietary knowledge which makes it more complicated to imitate (Oliva & Kallenberg, 2003). Additionally, servitization may have a positive impact on the environment, which also can be seen as a strategic factor (Goedkoop, 1999). If the ownership of the product in the servitization solution is remained at the supplier, it is possible to utilize the same asset among more customers, which in the long run may lead to a more efficient use of the products and hence a smaller environmental footprint (Goedkoop, 1999; Baines et.al, 2007).

The knowledge of services' ability to influence purchasing decisions is well known in marketing literature and research, an area where this is especially applicable is within the B2B markets (Gebauer & Fleisch, 2007). The underlying factor for this development is the continuous increase of services within industrial and manufacturing related industries (Vandermerwe & Rada, 1988). From a marketing perspective the use of services is also a way of increasing the quality of the relationship with the customer as it can lead to the development of customer loyalty. As services tend to increase the level of communication and interaction with the customer it creates more opportunities to offer more products and services. Simultaneously, the acquisition of insights and an increased understanding of the customers' needs can be made (Vandermerwe & Rada, 1988).

### ***2.1.3 Differences Between Products and Services***

As there are far-reaching differences between products that are physical and services in terms of characteristics, the incorporation of services for manufacturing corporations can sometimes be challenging. When comparing them there are some key distinctions that should be highlighted in order to obtain a more extensive understanding of the different development processes. Services are not tangible, as physical products are, and they further deviate from each other in terms of inseparability, variability and perishability (De Brentani, 1991). Also mentioned by Hill, (1977) one prominent difference between services and products is that the producer works directly with the customer in services and directly on the product when producing products. The characteristics of a services implies a closer relationship with the customer since a service cannot be produced without an agreement or co-operation with the customer. Thereto, a significant difference is that services cannot be stored and are unable to transfer the ownership of, whilst products can be stored and transferred in terms of ownership (Hill, 1999).



## 2.2 Business Model Canvas

The following text will cover the theory of the “business model canvas” which will be used as a framework for answering the research question. Meaning, the business model canvas and its components will be used as a framework and the theory about servitization and its pains will be put into the framework.

To understand the business model of an organization Osterwalder & Pigneur (2010) have introduced a framework that consists of nine different building blocks that together builds an overview of a company’s business model. The concept has been named Business Model Canvas and consists out of four main areas of business which are: customers, infrastructure, offer, and financial viability. The concept can be used as a blueprint for the creation of a business model which is to be implemented throughout the processes, systems, and organizational structures of the company. Essentially it is a template over an organization’s existing business model or its future business model and helps the organization to get an overview of things such as its activities, stakeholders, and connections. The figure below is the authors’ illustration of Osterwalder’s & Pigneur’s (2010) business model canvas. It illustrates the different components and how they are interlinked.



Figure 5. Business model canvas (Osterwalder & Pigneur, 2010)

## 2.3 Value Proposition

The part of the business model canvas that is called Value Proposition (VP) represents the bundle of products and services that together can create value for a certain segment of customers. The aim of the Value Proposition is to solve the problems of the customer and satisfy the customer needs by presenting an attractive offering (Osterwalder & Pigneur, 2010). If well-constructed, the firm is able to make the customer choose their offering over their competitors'. The reason being that the total value a corporation is able to propose towards its customers is what causes the customer turn to one corporation over the other (Osterwalder & Pigneur, 2010). If a firm is unable to make a profit from its relationship with its customers it will most likely have a very tough time remaining in the long term, which implies the importance of having an alignment between the value proposed to the customers and what the customer really requires and demands. A well-constructed value proposition aspires to resolve the needs of the customer by providing an adequate combination of products and/or services (Osterwalder & Pigneur, 2010).

As every individual customer segment most likely have very different characteristics their requirements and demands will also differ which should be reflected in the configuration of products and services formed for each VP. The outline of VP's may be highly innovative and disruptive but could also be alike already existing offers in the market but with complementary features. The measurement of what is actually considered as value may vary, it can both be quantitative as well as qualitative. For example, it includes both quantitative values such as price and time of delivery but also qualitative values like customer experience and design (Osterwalder & Pigneur, 2010).

However there are opinions that are deviating regarding the scope of what value proposition actually includes. According to Harrington & Voehl (2016) the extent of value proposition reaches further than previously discussed. They argue that it can affect and apply to an entire organization, or parts of it, specific customer accounts, and internal processes of products and services.

### 2.3.1 Value Proposition Canvas

The Value Proposition Canvas consists of two major components: The Customer Segment/Profile & Value Map. The purpose of the customer profile is to examine and explain how the customer experience is during the existing offering with the company. The value map on the other hand considers the potential additional value which a different combination of products and services could deliver to the customer (Osterwalder & Pigneur, 2010).

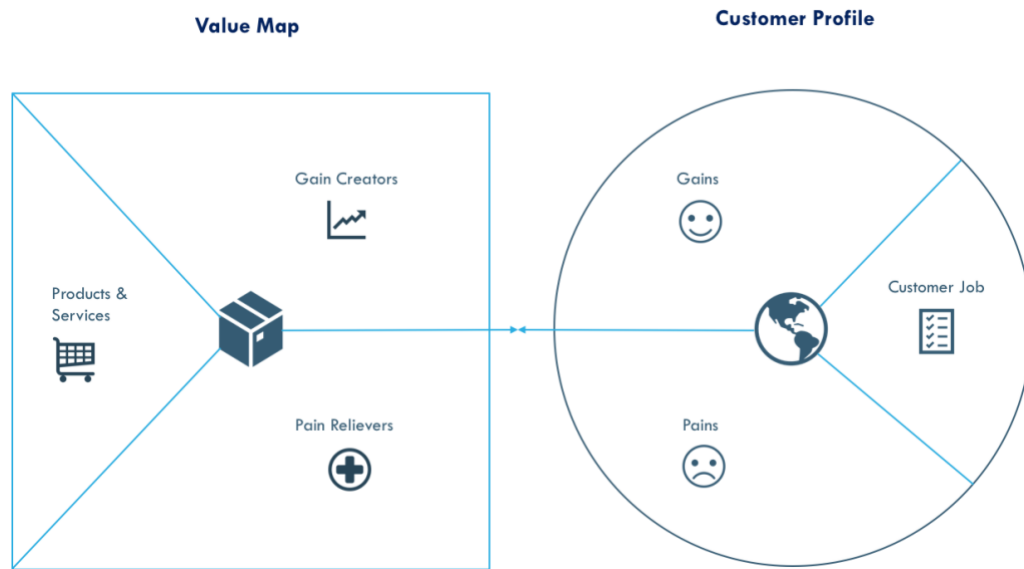
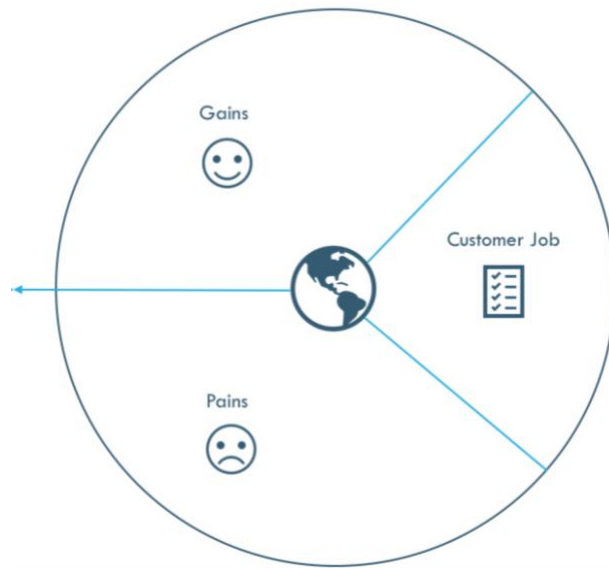


Figure 6. The Value Proposition Canvas

These two sides consist of three subsections. The customer profile is composed of *Customer Jobs*, *Pains* and *Gains* while the value map composed of *Pain Relievers*, *Gain Creators* and *Products & Services*. Ultimately, the goal of VPC is to achieve a fit between the value map and the customer profile, this happens when the products and services generate pain relievers and gain creators that mitigate the negative effects alternatively solve the jobs, pains, and gains that significant to the customer. The following part will present the different subsections in more detail where parts of the framework that are more important to the thesis will be given additional weight (Osterwalder & Pigneur, 2010).

### 2.3.2 Value Provision Canvas; Customer Profile



*Figure 7. Customer profile of the value proposition canvas*

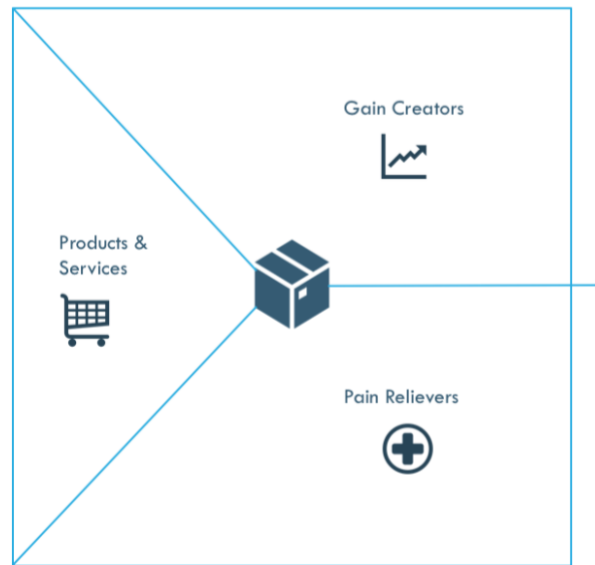
The customer profile is a tool to understand the specific chosen customer segment in a more organized way by breaking them down into three groups: Jobs, Pains, Gains. The Customer Jobs can include the activities that the customer is trying to carry out or complete. It could further include the problems that they are trying to solve or the needs that they want to fulfill. There are three main types of Customer Jobs, which are functional, social, personal/emotional. Important to emphasize is the need to take the customer's perspective as it is easy to move away and include personal values and thoughts (Osterwalder & Pigneur, 2010).

The Customer Pains explain and describe any aspect or step that aggravates the customer before, during, or after trying to carry out the activity that is intended. A pain could also include the actual prevention of being able of performing a job. Also, pains include the possibility or risk of potential negative outcomes where the job might be done poorly or not at all. When discussing Customer Pains there are three main types that are most commonly discussed. The first is Undesired Outcomes, Problems, and Characteristics, these can mainly be described as functional where e.g the existing solution doesn't work properly or is associated with severe side effects. Secondly, there are Obstacles which can be described as circumstances that prevent the customer from carrying out a job alternatively causes an increase in the time needed to complete it. Finally, there are Risks which look further into undesirable outcomes and their following negative consequences. E.g decreased trustworthiness and credibility are considered a risk (Osterwalder & Pigneur, 2010).

Customer Gains illustrate the results and benefits the customer desires. There are different forms of gains, some of them are expected or required while other may even surprise them.

Further Gains can include cost savings, positive emotions, societal gains, and functional utility (Osterwalder & Pigneur, 2010).

### 2.3.3 Value Proposition Canvas; Value Map



*Figure 8. The value map of the value proposition canvas*

As previously mentioned the value map aims to break down the offering of the company into products and services, pain relievers, and gain creators. By applying this view, a more structured and detailed understanding of the value proposition of the business model can be obtained.

The Products & Services can most easily be explained as a list of what the firm has to offer towards their customers. These can be either physical/tangible, intangible (digital), or financial and together they help the customer to complete their functional, social, or emotional jobs. Important to note is that products and services are not able to create value on their own, only by being in relationship to a certain customer segment with their associated jobs, pains, and gains. (Osterwalder et al, 2014)

The purpose of the Pain Reliever is described in what way the offered products and services help to alleviate and solve the specific pains of the customer. The section specifically highlights and outlines how the pain relievers aim to solve the pains that affect the customers before, during, or after they are attempting to complete the job. When designing the strategy of pain relievers, it is key to understand that the main emphasis should be dedicated towards the most critical pains. As there is no need to develop a pain reliever for every pain identified, neither are there usually resources available to complete this task. The most successful value

propositions have the tendency to focus on the most important pains and make sure that they mitigate their negative effects efficiently. (Osterwalder et al, 2014)

Gain Creators illustrate how the offered products and services of the company intend to generate benefits for the customer. These include aspects of functional utility, social gains, positive emotions, and improving cost structure. (Osterwalder et al, 2014)

## 2.4 Pains in Servitization

The following section moves away from to general presentation about the framework of business model canvas and servitization and instead presents the pains of servitization that has been identified in previous research.

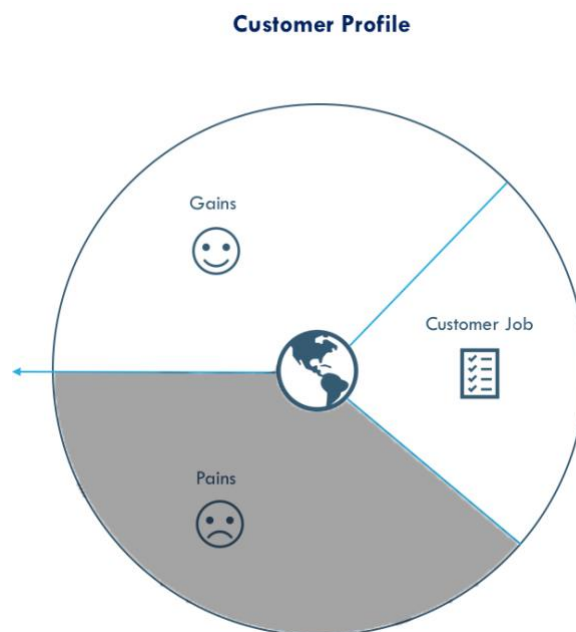


Figure 9. The customer profile in the value proposition canvas

The literature has generally highlighted the positive aspects of servitization for its customers, which namely consist of greater customer focus, higher degree of flexibility and a beneficial move from capital expenses to operational expenses (Baines et.al, 2009). Despite the general positivism, some authors highlight the possible challenges and risks for customers which consist of a concern that servitization will not perform in terms of reliability, responsiveness, assurance, empathy and its tangible components (Catulli, 2012). Ceschin (2013) writes about the potential barriers, which we regard as pains, for customers to adapt to a product-service-system, also known as a servitization business model. He claims that one might think that the choice of purchasing something as a product or a service is a highly rational choice from the customer, while in reality it is to a high extent affected by social norms and institutional settings. He further claims that this is affecting the diffusion of servitized solutions. Mont (2004) states that one can categorize the factors that can be pains for the customer, when changing from purchasing products towards purchasing services, into *economic factors* and

*socio-psychological factors.* Where the economic factors are connected to the monetary implications of changing the way of purchasing. These can for example be a change from capital expenses to operating expenses, possible uncertainty of the cost or value of a service and risk assessment of a service (Ceschin, 2013). The socio-psychological factors build on, what might be in contrary to economic studies, the belief that customers are not fully rational when making purchases (Ceschin, 2013). Here, Ceschin (2013) and Mont (2004) argue that a customer's purchasing behavior instead is highly influenced by prior consumption patterns, norms and institutional settings. The fact that a company might be unused to share a product with others, which might be the case in servitization, can make them hesitate to accept ownerless consumption (Goedkoop et.al, 1999).

*The following section consists factors found in various literature that the customer may perceive as pains or barriers to fully adapt to purchase or use services;*

#### **2.4.1 Ownership**

Even though there are many advantages of not owning the infrastructure, and by that using a servitized business model, consumers may not be enthusiastic about ownerless consumption (Mont, 2002). As mentioned above, literature is generally very positive towards servitization, both from the customer and supplier side. Mont (2002), explains that despite the positivism towards ownerless consumption there are many customers that feel an uncertainty towards this and rather wants to own their products or infrastructure.

Apart from the direct change towards an ownerless consumption, Mont (2002) claims that in order for this to work in a company that traditionally have bought products instead of services it is crucial to establish a new social system and infrastructure. This in order to create an environment that is capable of reaping the benefits from the servitized solution. A key hurdle for implementing servitization is the required shift in organizational culture on valuing the contribution that services can provide instead of owning the product (Mont, 2000; Mont, 2001; Wong, 2004). The need of adapting the organizational structure and processes in a way that is more suitable to working with services is a challenge of changes in ownership (Mathieu 2001, Gebauer & Friedli 2005, Olivia & Kallenberg 2003).

#### **2.7.2 Discrepancy between theory and practice**

Despite the vast amount of literature that praises the use of PSS systems and servitization business models, there is evidence that it could be a large difference between what the theory indicates and how the concept plays out in practice (Baines et.al, 2009). For example, the authors Maxwell & van der Vorst (2003) presents several positive environmental effects that servitization can generate, which in itself can be a reason for a company to move towards servitization. However, as described by Baines et.al (2009), it is hard to assure any generic benefits from a servitization system due to the many interdependent factors that influence the end result.

### ***2.4.3 Uncertainty of Value***

Generally, literature agrees that servitization has a positive impact on the profit for both the manufacturing company and the customer, in a sense that more manufacturers can compete with its services and focus is directed towards the customer since manufacturing companies are becoming more “customer-centric” (Baines, 2008, Neely, 2008). However, according to Min et.al. (2015), Rexfelt & Hiort af Ornäs (2009) and Ceschin (2013) customers to servitization companies may feel an uncertainty towards the potential profits resulting from servitization as well as the claimed win-win situation that both the customer and supplier can reap from the solution. This statement is further reinforced by the literature within servitization that questions the actual performance of servitization as a concept, where there is evidence that larger companies can struggle to make servitization profitable (Min et.al, 2015, Neely, 2008). This illustrates the underlying complexity of actually measuring the effectiveness of adapting the business model. Therefore, the customer will have a difficult time to comprehend if the servitized offer will result in more value. The situation of uncertainty will cause the customer to be unsure whether they are getting more value or not (Neely, 2008). This uncertainty is further reinforced by Mont (2002, 2004) who states that little research has been conducted on servitization and PSS’s influence on the customer’s profitability.

Catulli (2012) claims that one of the main reasons for customers to adopt to the servitization business model is the expectation to make financial savings, where it can be beneficial to pay a fee continuously instead of a higher fixed cost. However, studies show that some customer prefer having a fixed cost up-front since they believe they have greater control of their costs then (Rexfelt & Hiort af Ornäs, 2009). Furthermore, it is stated that customers generally believe that it is harder to evaluate the real value and outcome of a service compare to a product, meaning that when investing in a service it is crucial for the customer to reduce the potential risks and uncertainties (Rexfelt & Hiort af Ornäs, 2009).

### ***2.4.4 Complexity of Contracts***

Due to the often complex and tailored relationship between the service provider and customer, the process to establish a contract may be complicated both for the provider and customer. The level of complexity also depends on the degree of servitization offered by the provider. In some contracts the provider takes total ownership and the customer only pays for what it uses, whilst in other cases the ownership is shared to a certain degree, which oftentimes implies complex contracts. A key driver of the degree of complexity in the contract is the amount of specified regulations that need to be taken into consideration. When formulating contracts for the sales of services it is necessary to adapt the contracts according to the servitization context (Reim et.al., 2014).

The often-high level of complexity of the contracts will also put high pressure on both the manufacturer and the customer to develop an internal understanding and competence to create and follow the contracts connected to servitization (Baines et.al, 2011). Further, the contracts play a vital role in managing the long-term relationship between the two different parties, therefore it’s important to use contracts as a way of creating balance between the interests of



the customer and the supplier. Using incentives for both sides is a way of reducing these problems and simultaneously reducing adverse behavior from occurring (Reim et.al., 2014).

#### **2.4.5 Control**

The nature of servitization implies a certain degree of ownerless consumption which results in that the customer may have less control of the product and service compared to a traditional purchase (Rexfelt & Hiort af Ornäs, 2009). Even though a servitized solution can free the customer from a number of responsibilities such as maintenance and security the downside of this can be that customer feel that they lose the control of the service/product (Rexfelt & Hiort af Ornäs, 2009). Vezzoli et.al (2015) further reinforces this statement by claiming that studies show that one of the largest obstacles for a further spread of the servitized business model is that customers value control over things, and that many of today's solutions do not fulfill customer's control needs.

In a world where sustainability considerations are becoming more important for companies the lowered control from the customer may be seen as negative since they will have less control of the process (Maxwell & Van der Vorst, 2003). The importance of the triple-bottom perspective could be applied here as the ability to control these aspects are decreased as a result of purchasing servitized offers (Maxwell & Van der Vorst, 2003). As control decreases so do the ability to ensure that respectable working conditions are present which could impact brand reputation and credibility that are essential assets.

Not being as involved with the control over the key-lifecycle stages and the specifications of the product is also associated with negative consequences. As the ability to participate in all of the relevant stages of the supply-chain is decreased so does the customer's ability and power to enforce certain improvements, for example related to sustainability (Maxwell & Van der Vorst, 2003).

Determining the level of success of being introduced to a different level of control is heavily affected by the culture of the corporation. As most OEMs have a strong culture and heritage of procuring products instead of services it can be quite radical to proceed with a different strategy within this area (Dubruc et al. 2014).

#### **2.4.6 Trust**

The research of servitization is suggesting that the move from transaction-based economies raises management challenges that are linked to the progress of relationships within the business context. This implies that there is an ongoing increase in the value of social aspects and abilities as a tool of successfully developing businesses. One of these aspects that have been gaining importance is trust between the stakeholder in a transaction (Baines et al, 2013). In a study made by Catulli (2012) about what barriers customers perceive when considering servitization alternatives one of the most apparent one is trust. It is stated that customers need a big leap of trust to fully adopt to the business model, meaning it is crucial that the supplier is able to appear as a trustful partner (Catulli, 2012). Furthermore, when customers are moving

from purchasing products to services there is an underlying inertia related to the customer's belief in that suppliers are trying to maximize its profit and hence a suggested win-win situation can be difficult to grasp (Rexfelt & Hiort af Ornäs, 2009).

In the process of designing user-accepted complex computer systems trust has been identified as a key issue. There are quite many dimensions of trust which leads to its ability of being measure difficult to decide upon. E.g it can be examined from the perspective of reliability or functionality (Rindebäck & Gustavsson, 2005).

Due to the increased information sharing in a servitized business model Vezzilo et.al (2015) highlights the potential fear of sharing sensitive information amongst actors in the value chain. This together with a potential conflict of interest between the supplier and customer which boils down to that regardless if a good relationship is necessary the two parties needs to make money. Hence a high level of trust between the parties is vital for the business model to work properly. This is strengthened by Catulli (2012) who claims that many customers have low knowledge about the concept and therefore must trust their supplier to a higher extent.

#### **2.4.7 Co-Creation**

The structure and design of services naturally lead to a co-creation of value due to that the traditional boundary between the supplier and customer is becoming increasingly blurred. This results in a process of where value is created mutually, by interacting jointly between both providers and the recipients but also the ability for the supplier and customer to create value for themselves (Zine et.al, 2014). Therefore, the need to be adequately prepared in terms of working with partners can be a more important trait in servitized environments than others (Mont, 2002).

To be successful in performing and consuming a service in a way that is beneficial for both partners it is crucial to reconsider the interaction with other partners in order to be better situated with going from transaction-based to relationship-based. Besides from collaborating with other stakeholders there is also an increasing need of successfully integrating and coordinating work with third-parties. Prahalad et.al (2004) states that due to the increased need of co-creation it is vital for the customer to have a good relationship with its suppliers as well as other third-party stakeholders. The author further states that here is where the customer is able create their own unique value. Prahalad et.al (2004) claims that a successful co-creation environment consists of 5 building blocks namely, *Dialogue, Access, Risk Assessment, Transparency*. These can briefly be summarized by that it is vital to have a clear and transparent relationship with the suppliers if the customer wants to enable co-creation. As servitization advances, the task of managing these new types of networks and relationships is becoming a growingly complex task. The facilitation of the transfer of information between network partners is developing into an intricate and complex challenge (Schüritz et al, 2017). Furthermore, Mont (2002) claims that it may be complicated to use the service to other things than it was intended to do. These things could be to develop alternative service use etc. Mont

(2002) states that the largest barrier to this is the increased number of stakeholders that needs to be involved compared to a traditional solution.

#### ***2.4.8 Paradox of Choice***

When the level of servitization increases so will commonly the range of options that is available to the customer. The trend of more options works against scale effects for the manufacturing firm while creating a situation where decision making is more challenging and complicated for the customer. The development has been named individualization (Zimmerman et al, 2017). According to Komita & Shimomura (2009) servitization is partly a result of the demand for mass customization which in many cases results in longer lead times and higher prices than the oftentimes more traditional method of mass production. For the customer this situation leads to a state that is becoming increasingly complex as a result of the abundance of choices that are presented. There is often an assumption that more choices lead to improved satisfaction which is a dangerous supposition as it might create choice overload (Schwartz, 2004). Choice overload is a cognitive process in which individuals are in position where they have a tough time proceeding with a decision because of being confronted with too many options. Rexfelt & Hiort af Ornäs (2009) further claims that once the supplier implements a servitized business model both the supplier and the customer have to develop new capabilities. For the customer, one of these new capabilities is the knowledge of how to purchase services (Mont, 2001).

#### ***2.4.9 Environment & Sustainability***

An increasing adoption of a more sustainable approach towards manufacturing of products and its use will make the question of sustainability to one of the most important challenges of the 21st century. There are different structural changes that are putting pressure on firms to deliver more sustainable solutions which includes legal, social, financial aspects, amongst others (Utting, 2005).

Mont (2002) highlights the environmental benefits of servitization which is a result of the possibility to decrease total amount of products since servitization can enable sharing, renting and leasing schemes for customers. Furthermore, servitization can encourage suppliers to take back and upgrade its products instead of wanting the customer to discard the product and buy a new upgraded one. Despite the potential overall environmental benefits of a servitized business model a number of authors highlight challenges for customers regarding this area. This is namely related to the challenges of ensuring the extent of sustainability incorporated. As the customer does not own the question of sustainability in a servitized offering there can be issues in terms of confirming and guaranteeing the extent of sustainability in the offer (Maxwell & Van Der Horst, 2003; Mont, 2002). Further, Mont (2002) stresses the risk of having to do a trade-off between having high control on the environmental impact or relying highly on the supplier of the service when choosing a servitized solution.

#### ***2.4.10 Becoming over-dependent on suppliers***

Even though servitization is able to create a relationship that is often characterized by loyalty between the supplier and customer there are possible challenges of dependency present. As services usually tend to encourage recurring sales where the points of contact between the parties increases, simultaneously the balance of the relationship might become skewed. (Vandermerwe & Rada, 1988).

The skewed relationship can lead to a situation where the customer becomes too dependent on supplier which is highly disadvantageous from several aspects. The pricing and bargaining power decreases significantly while the ability to maintain a diverse set of suppliers is reduced (Correa et al, 2007). This could lead to supply chain risk as the level of control over external suppliers is lowered. If that happens and the consumer becomes over-dependent there is a risk of their strategy becoming controlled by the supplier instead of having them in a supporting role (Gilkey, 2011).

Mont (2002) mentions the potential risk of becoming highly dependent on a supplier which often is the case in a servitized solution. This result is according to the author two-fold, meaning that there are both positive and negative aspects of it. Mont (2002) highlights that once the supplier gains more knowledge about the customer and enhances the relationship between the two parties there is a great chance that they can experience a win-win situation. Despite this becoming a close relationship it may also pose a risk for the customer where the supplier can exploit the relationship to its advantage.

#### ***2.4.11 Bankruptcy Risk***

According to a study by Benedettini et.al (2013) that examines how servitization changes the risk structure in a company it is clear that servitized suppliers are exposed to a higher bankruptcy risk than their more traditional peers. However, the study suggests a number of ways to reduce the risk of insolvency or other issues that may result in bankruptcy. Mont (2002) states that when a company decides to change their business model from selling products to services they also change their revenue streams from shorter to longer periods. Oftentimes the change from short-time profit realization at the point-of-sale to medium and long-time amortization periods at the point-of-service is hard for a company and can risk for its financial situation. Furthermore Vezzilo et.al (2015) states that the biggest challenge for a company that implements a servitized business model is the development of the employees' competencies.

#### ***2.4.12 Pricing Model***

In a report by Barquet et.al (2013) the authors discuss the new revenue streams that needs to be created if a supplier changes to a servitized business model, since the former more traditional way of selling products generated one large initial payment and no guarantee of future cash flow. Once using a servitized business model there are according to Matthyssens & Vendenbempt (2010) more focus on the long-term relationship between the solution provider and the customer where the pricing model should be performance based. This new pricing

model can according to Mont (2002) be complicated once there are more than two actors in the value chain and that this likely can cause misunderstandings.

## 2.5 Summary of Theoretical Framework

The following table aims to summarize the different pains that have been discussed in the theoretical chapter. Further, it illustrates if the pain is found in the literature and in that case, which of the authors that are claiming that these aspects are perceived as pains for the customer.

*Table 1. Summary of the customer pains found in literature*

Ownership		<ul style="list-style-type: none"> <li>• Even though high expenses towards the asset for many years they will end up without ownership</li> </ul>	Found in Literature  <ul style="list-style-type: none"> <li>• Mont, 2001;2002;2004</li> <li>• Mathieu, 2001</li> <li>• Gebauer &amp; Friedli, 2005</li> <li>• Olivia &amp; Kallenberg, 2003</li> </ul>
Discrepancy of Theory & Practice		<ul style="list-style-type: none"> <li>• Difference between what the theory indicates and how the concept plays out in practice</li> </ul>	 <ul style="list-style-type: none"> <li>• Baines et al 2009</li> <li>• Maxwell &amp; Van Der Vorst, 2003</li> </ul>
Uncertainty of Value		<ul style="list-style-type: none"> <li>• Customers feel uncertainty of value of servitization</li> <li>• Complex to measure effectiveness</li> </ul>	 <ul style="list-style-type: none"> <li>• Baines, 2008</li> <li>• Neely, 2008</li> <li>• Min et al, 2015</li> <li>• Rexfelt &amp; Hiort af Ornäs, 2009</li> <li>• Ceschin, 2013</li> <li>• Catulli, 2012</li> <li>• Mont 2002;2004</li> </ul>
Complexity of Contracts		<ul style="list-style-type: none"> <li>• Complex contracts puts pressure on the manufacturer and the customer to develop an mutual understanding</li> </ul>	 <ul style="list-style-type: none"> <li>• Reim et al, 2014</li> <li>• Baines et al, 2011</li> </ul>
Control		<ul style="list-style-type: none"> <li>• Less Control of Product &amp; Service</li> <li>• Less Insight into Sustainability and Ethical Considerations</li> </ul>	 <ul style="list-style-type: none"> <li>• Maxwell &amp; Van Der Horst, 2003</li> <li>• Rexfelt &amp; Hiort af Ornäs, 2009</li> <li>• Vezzoli et al, 2015</li> <li>• Debruc et al, 2014</li> </ul>
Trust		<ul style="list-style-type: none"> <li>• Requires increased amount of Trust between stakeholders</li> <li>• Reliability &amp; Functionality</li> </ul>	 <ul style="list-style-type: none"> <li>• Baines et al, 2013</li> <li>• Rindebäck &amp; Gustavsson, 2005</li> <li>• Catulli, 2012</li> <li>• Rexfelt &amp; Hiort af Ornäs, 2009</li> <li>• Vezzoli et al, 2015</li> </ul>
Co-Creation		<ul style="list-style-type: none"> <li>• Servitization requires more integration and coordination of work between stakeholders</li> </ul>	 <ul style="list-style-type: none"> <li>• Schüritz et al, 2017</li> <li>• Mont, 2002</li> <li>• Prahalad et al, 2004</li> <li>• Zine et al, 2014</li> </ul>
Paradox of Choice		<ul style="list-style-type: none"> <li>• Increased range of options</li> <li>• Choice Overload can be overwhelming</li> </ul>	 <ul style="list-style-type: none"> <li>• Zimmerman et al, 2017</li> <li>• Komita &amp; Shimomura, 2009</li> <li>• Schwartz, 2004</li> <li>• Rexfelt &amp; Hiort af Ornäs, 2009</li> <li>• Mont, 2001</li> </ul>
Environment & Sustainability		<ul style="list-style-type: none"> <li>• Servitization may lead to less transparency in terms of being able to confirm sustainability</li> </ul>	 <ul style="list-style-type: none"> <li>• Maxwell &amp; Van Der Horst, 2003</li> <li>• Mont, 2002</li> <li>• Utting, 2005</li> </ul>
Dependency on Suppliers		<ul style="list-style-type: none"> <li>• Unbalanced/Skewed relationships</li> <li>• Potential Supply Chain Risk</li> </ul>	 <ul style="list-style-type: none"> <li>• Vandermerwe &amp; Rada, 1998</li> <li>• Correa et al, 2007</li> <li>• Gilkey, 2011</li> <li>• Mont, 2002</li> </ul>

### 3. METHODOLOGY

*The following section consists of the chosen research strategy, research design, choices made and general method of how this thesis was conducted. The aim of this section is to provide the reader with a thorough and transparent picture of the process behind conducting the thesis.*

#### 3.1 Research Strategy

To collect the empirical material and answer the stated research question the authors have used a qualitative research strategy with focus on semi-structured interviews. Generally, the two main research strategies are qualitative and quantitative, where the largest difference is that qualitative strategy focus on words, whilst quantitative focus on numbers in the analysis of the empirics (Bryman & Bell, 2013). Due to the nature of the research question and the case setting, which all deals with interpreting humans, a qualitative study fits the purpose best. Also, this thesis is an explorative one, where the interviews are used to clarify and create a holistic view of what general challenges and pains data-center customers have.

Motivated by the aforementioned discussion about the subject is relatively sparsely researched, together with an exploratory approach from the authors side, an abductive research approach has been used. This approach is further advantageous in a setting where the authors must iterate between theory and practice, which to a high extent is the way this research has been conducted. Essentially, an abductive approach is an alternative to the extremes of an inductive and deductive one, and in this case starts from a mix of the observations (empirics) and the theory and based on that iterate its way towards an analysis and a conclusion. Generally, an inductive approach starts from the observations and moves towards the theory whilst a deductive approach starts from theory and moves towards observations (Bryman & Bell, 2013). The abductive approach will allow the authors a certain degree of flexibility, for example, to change the questions in the interview guide during the process if new information is acquired or if the circumstances changes (Bryman & Bell, 2013).

In terms of the epistemological standpoint, this thesis has an interpretivism approach, due to the nature of the research question which is dealing with people, companies and their relationships and decisions. It is furthermore described that interpretivism allows the researchers to gain an understanding of human behavior instead of trying to explain the human behavior which is in line with the research question (Bryman & Bell, 2013).

By working with a research strategy that is based on qualitative research there are some clear advantages that deserve to be discussed further. As the collection of primary data will be based on semi-structured interviews there is the flexibility to depart from the interview guide that will be used. This allows the researchers to follow up previous replies from the interviewees and by doing so obtain deeper insights which in the end will lead to higher quality of the data. Therefore, one could claim that, in this case, one main advantage of qualitative research is the flexibility that characterizes it and the enablement of adjusting the direction of the interview which might change as the respondents provide their answers (Bryman & Bell, 2013). Additionally, what sets it apart from a quantitative research design is its ability to collect richer

and more detailed answers. Further, it also allows for the researchers with the opportunity to meet with the interviewee on more than one occasion. (Bryman & Bell, 2013)

### **3.2 Research Design**

This qualitative report is a single case study, which according to Yin (2014) allows the authors to gain an understanding of a problem through an organization, in this case, Swedish Modules. The reasoning behind claiming that this is a single case study, even though the authors conduct most of the interviews outside of the company, is that the respondents are a part of the case company's surrounding environment. Yin (2014) further states that a case study is advantageous if the authors aim to answer a research question that seeks to explain a present circumstance. In this case the thesis aims to explain the potential pains of the case company's customers and create a foundation for how they can be eliminated, which makes it an appropriate setting for a case study approach. As any other research method, single case study has its drawbacks, those are often connected to the fact that the researchers are only investigating one case, which leads to that the generalization has to suffer and the authors may be biased to a certain degree in the analysis. The generalization is further mentioned when discussing qualitative research, since the analysis can be highly subjective since it builds in the authors' interpretations (Bryman & Bell, 2013.; Yin, 2014). Bearing the discussion above in mind, these drawbacks have been taken into consideration during the thesis process.

The following flow chart illustrates the workflow process of the report, which is inspired by the process of an abductive workflow that relies on iterations. The first step of the process is a definition of the research problem which follows by a development of a research methodology and a theoretical framework. After the research proposal and the following data collection the methodology allows the authors to revise the research question depending on the collected data and the theoretical framework. This flexible looping process allows the authors to iterate their way through the report towards a conclusion.

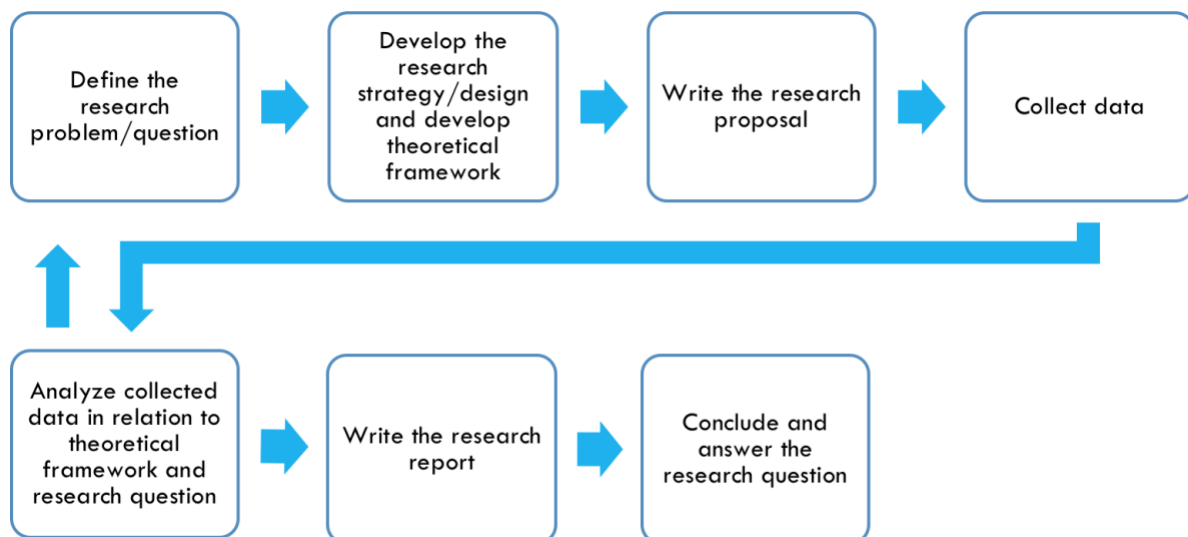


Figure 10. Illustration of how the process of writing a thesis has been carried out.

### 3.3 Case Selection

A challenging task for the authors of a single case study is to select an organization to study in-depth and then justify the selection. According to Seawright & Gerring (2008) it is common for researchers to select cases to study based on rather pragmatic considerations such as money, expertise, time and ease to access. These factors are legitimate, however, it does not provide any methodological justification of why one case is preferred over another. Despite the lack of methodological justification, we selected the case company Swedish Modules mainly based on time and ease of access (Seawright & Gerring, 2008). The case company has an expressed goal to change their business model towards a servitized and customer-centric one, and in the process of developing this business model they wanted get help from master students. Hence the selection of the case was based on the ease to find a research question and the fairly simple initial process from the first meeting to the decision to proceed the thesis.

### 3.4 Data collection



Figure 11. Illustration of how the data collection was carried out

To collect the empirical data the authors conducted semi-structured and unstructured interviews which thereby stood for the primary data collection. The field of qualitative interviews can mainly be divided into two categories, namely semi-structured and unstructured (Bryman &



Bell, 2013). For the sake of the research question and the initial setting of the problem stated by the case company the authors agreed that unstructured interviews would be suitable to gain an early understanding of the research. An unstructured interview can be related to an informal conversation which allows the interviewer to pick up spontaneous sidetracks whenever an interesting topic arises. Therefore, unstructured interviews are commonly conducted before the actual data collection starts in order to gain a broader understanding of the setting (Bryman & Bell, 2013). These unstructured interviews were mainly conducted during meetings particularly during the initial phase of the research and should mainly be regarded as a way for the authors to gain a better understanding of the case company and its industry. Apart from the initial unstructured interviews, semi-structured interviews were conducted as the main data collection method. A semi-structured interview is more structured than an unstructured one, oftentimes the interviewer follows an interview guide which consists of pre-stated question. It differs from a structured interview in the way that the interviewers can pick up side tracks and ask follow-up questions. The purpose of the interview guide is to be a guideline for the interviewer. Bryman & Bell (2013) states that it is favorable to follow somewhat a strict structure when conducting many semi-structured interviews in order to facilitate the analysis of them. Semi-structured interviews that follows a similar structure and consist of the same question makes it easier to compare and look for patterns across the respondents (Bryman & Bell, 2013). The result from the semi-structured interviews is present as empirical material, coded depending on what pain discussed, in the “empirical findings chapter” where the respondents are cited based on the recordings made during the interviews. The goal of the data collection has been to reach a theoretical saturation, meaning that the authors carry out interviews until no new relevant information emerges from the interviews (Bryman & Bell, 2013). This situation appeared during the last interviews, where authors already had a rather clear understanding of what the respondent would answer even before the interview.

## **3.5 Primary Data**

### ***3.5.1 Unstructured Interviews***

In the initial process of the research, several interviews were held with the case company in order to gain an understanding of the case setting and the problem. Before this process the authors had little knowledge about the case company and the industry it was competing in. Therefore, it was appropriate to conduct unstructured interviews with the case company, this due to the possibility to keep them rather informal and open. Apart from the initial unstructured interviews, a number of meetings were conducted with different employees from the case company. These meetings increased the basic knowledge about the company and its business, as well as helped to come up with questions to ask in the semi-structured interviews with potential customers. The respondents of these meetings include the CEO, CTO, and project managers of Swedish Modules. Many of these interviews were held in Swedish since it is the native language of many of the employees at the case company Swedish Modules, however when Swedish was not appropriate English was used.

There was also an intermediary company, First to Know, that helped to organize the contact

between Swedish Modules and master students. As more students than the authors of this report were involved in writing for Swedish Modules there was value in meeting with each other and exchanging information and relevant insights. Therefore, regular meetings were conducted to receive input and share information.

### ***3.5.2 Semi-structured Interviews***

After the unstructured interviews had been carried out enough knowledge had been obtained to initiate the process semi-structured interviews. Before the actual interviews an interview guide was created, which to a large extent was inspired by the literature review and the pains identified there. Hence, many of the questions were linked to the pains identified in the literature, which allowed the respondent to discuss and elaborate the subject. This discussion later allowed the authors to interpret and analyze whether the stipulated pain was confirmed or neglected by each respondent. The interviews were later transcribed and coded based on what type of pain they concerned. According to Bryman & Bell (2013) coding and a thorough categorization of the data is vital, due to this both authors were present during the interview in order to, apart from the recording, take notes and listen to the respondent. The majority of the interviews were carried out face-to-face, either in Amsterdam or Gothenburg, the rest of the interviews were carried out via Skype.

### ***3.5.3 Respondents***

In order to answer the research question and to gain a broader understanding of the field of study a vital component is to find relevant respondents. Generally, the respondents for this thesis can be divided into two different groups, namely, respondents from suppliers of servitized data centers and respondents that represent potential as well as existing customers of the case company. Amongst the two different groups more attention was given to getting in contact with customers. However, the aim has been to find respondents across the entire value chain to identify trends or themes that could be applied across multiple layers but also to obtain the most comprehensive collection of data possible.

To get in contact with the respondents the method called “snowball sampling” was used, this method is described as a non-probability sample where the interviewer makes contact with a one or a group of people that can be seen as relevant for the research and later uses them to get in contact with other relevant respondents (Bryman & Bell, 2013). The supervisor at the case company provided us with a number of contacts that he believed would be appropriate respondents for our research question. Due to that we got recommended by our supervisor we often got good response from the potential interviewees and manage to get further recommended by them to other interviewees.

Role	Position	Time	Code	Channel
Scalability Engineer	Customer	35 Minutes	AMS1	Face-to-face
Sales Director	Competitor	15 Minutes	AMS2	Face-to-face
Business Manager	Customer	55 Minutes	AMS3	Face-to-face
Innovation Consultant	Customer	15 Minutes	AMS4	Face-to-face
Solutions Architect	Competitor	58 Minutes	GOT1	Face-to-face
Business Developer	Customer	57 Minutes	GOT2	Face-to-face
Head of Open District Heating	Supplier	42 Minutes	STHLM1	Skype
Buyer	Customer	50 Minutes	GOT3	Face-to-face
CTO	Supplier	65 Minutes	STHLM2	Skype
Area Sales Director	Competitor	43 Minutes	GOT4	Skype

*Table 2. A table of the respondents and how they are coded.*

### 3.6 Quality of the study

#### 3.6.1 Generalization

Important elements of research are reliability, validity, and replicability. Bryman & Bell (2013) state that the nature of a single case study can cause problems to meet these requirements since it is hard to argue that one single case can be representative. This problem is often mentioned as external validity or generalizability and deals with how the findings in the case company can be generalizable for all other data center manufacturers or modular data center manufacturers? Bryman & Bell (2013) give a rather clear answer to this, and that is that a single case study cannot be generalizable for other similar companies. This is, of course, an issue with this research approach, however if this is known and presented by the authors it is still possible to reap important findings of the unique case and its complexity (Bryman & Bell, 2013). Another common critique towards qualitative research is that it is too subjective and is affected by the researchers own interpretations about what is important and significant together with the fact that it can be hard to replicate due to every cases uniqueness (Bryman & Bell, 2013).

Despite the potential drawbacks, we believe that the chosen method has more positive aspects than negative. It allows the researchers to dig deep and create a more thorough understanding of the case organization. This in contrary to quantitative analysis, which puts a much higher emphasis on detecting patterns in data at a macro level, the single case study puts much more focus into observing the data at the micro level which is regarded as a major advantage in the research method (Yin, 2014; Dubois & Gadde, 2002). Also, according to Dubois & Gadde (2002), case study is still a relevant research method that can generate valuable findings that can enhance the theoretical field. One reason to this is that there is evidence that findings are not just unstable between different companies but also over time, here a case study is regarded as something good that can provide deeper insights than other means of methods. Dubois &

Gadde (2002) further states that it is favorable that a case study is done with an abductive approach since it allows the researcher to investigate the relationship between “everyday language and concepts”. Regardless whether case study is seen as a problem or opportunity in academia one should be aware that the generalizability will lack, therefore this is something that the authors are taking into consideration.

### **3.6.2 Reliability**

The reliability of a study aims to explain to what degree the research can be repeated by another academic scholar/s and still result in the same outcomes and findings. Its main purpose is to be used as a tool of measuring and evaluating the quality of the research. There are some inherent characteristics of qualitative research that naturally lead to inferior reliability. One of these characteristics is the inability to construct exactly the same setting, social context and other circumstances during an interview (Bryman & Bell, 2013). However, certain actions have been taken by the authors to mitigate some of the negative effects discussed. All of the procedures and choices made have been explained thoroughly and motivated and by recording the interviews and following coding them, the reliability is increased. Additionally, the internal reliability has been increased as the authors have been actively validating each other with regards to the observations made during the interviews and its content. This has a positive impact on the inter-observer consistency (Bryman & Bell, 2013).

The roles of the authors have consciously remained the same during all the interviews to ensure that the differences in the procedure are minimized. As a final step towards heightening the quality of the study, the construction of the questionnaire has been made with special regards to being perceived as similar as possible regardless of which respondent that is being interviewed. (Bryman & Bell, 2013)

### **3.6.3 Validity**

The concept of validity refers to what degree an indicator that is constructed to measure a concept measures the targeted concept. In other words, it could be described as a way of investigating if the method measures what it is supposed to. It's an important indicator of the credibility of the study as it also affirms to which degree the findings can be generalized. A high level of generalization results in a possible application of the results to other cases. By successfully selecting suitable and relevant respondents the authors aim to generate data that will answer the research question that is being asked (Bryman & Bell, 2013). Also, in order to increase the validity of this report the respondents were guaranteed to remain anonymous as the possibility of experiencing any pressure from their employer which could affect the honesty of their answers could be avoided (Bryman & Bell, 2013).

### **3.6.4 Replicability**

It is not uncommon that researchers try to replicate the method of a previous study in order to further investigate the subject or to find out why that study differs from other studies. In order to be able to do this it is vital that the study has a high level of replicability, meaning that the author has described its method in detail, step by step. Despite the importance of replicability,

it is common that business research has a low level of replicability (Bryman & Bell, 2013). According to Leung (2015) consistency is the most important aspect when aiming to achieve replicability in qualitative research. Despite the obvious difficulties to achieve replicability in a single case study we have made sure to have a rigorous method that is strictly followed. As aforementioned, an abductive research method was used, this research method implied a high level of iteration, which further complicates the possibility of being consistent in the method. This since the iterative process to a large extent is circular and dynamic, meaning that the authors have gone back and forth between theory and analysis (Gummesson, 2003).

Oftentimes the concept of reliability, validity and replicability are common measurements in quantitative studies (Bryman & Bell, 2013). However, some researchers argue that the quality measurements can be applied on qualitative studies as well (Kirk & Miller, 1986). It is therefore adequate to consider that it exists other quality measurements than validity and reliability, such as trustworthiness, that is described by Lincoln & Guba (1985). The concept of trustworthiness consists of four different categories, namely *credibility*, *transferability*, *dependability* and *confirmability*. Bryman & Bell (2013) discusses whether validity and reliability are enough when ensuring the quality of a qualitative study and concludes that depending on what type of study it is different types of measurements are adequate. Leung (2015) goes even further and claims that validity, reliability and replication are “the three gold criteria” and can be used both in qualitative and quantitative research as long as the epistemological and ontological standpoint is taken into consideration. Therefore, we have considered the validity, reliability and replication in this study.

### **3.7 Ethical Implications**

When conducting research in social science there is always a risk that the researchers must deal with ethical questions, therefore it is vital that the researchers understand the risk and do not ignore the issue (Bryman & Bell, 2013). An apparent issue about ethics is that a lot of it lies in the eye of the beholder, meaning that what is ethical can be highly subjective. To mitigate this problem there are several associations such as American Academy of Management and Market Research Society that have formulated codes of ethics for its members and can therefore be a good guideline when writing a report. All semi-structured interviews in this report were recorded in order to transcribe and code the result. This procedure entailed ethical implication in the sense that it is not uncommon that respondents refuses to be recorded. This was not the case in this report, however all respondents were asked before if they accepted to be recorded.

Due to the choice of research method, which implies a number of interviews, the authors had to deal with ethical issues connected to the respondents of the interviews and disclosure of secrets of the case company. Also, it is common that the case company would like to review the thesis before it is handed in, this in order to make sure that no sensitive information is disclosed. Confidentiality was not a problem during thesis process, this due to the open innovation mindset that the case company had in the development of a new business model. Our case company was keen on sharing the insight that we gained during the process and encouraged us to share it outside the organization.

## 4. EMPIRICAL FINDINGS

In the following chapter the empirical findings will be presented in a similar manner as the theoretical framework with extensive focus on the identified pains derived from various actors in the industry. Before diving into the identified pains, the servitization of the respondent's organization will be discussed to clarify how servitization is being used for companies in the data center industry.

Role	Position	Time	Code	Channel
Scalability Engineer	Customer	35 Minutes	AMS1	Face-to-face
Sales Director	Competitor	15 Minutes	AMS2	Face-to-face
Business Manager	Customer	55 Minutes	AMS3	Face-to-face
Innovation Consultant	Customer	15 Minutes	AMS4	Face-to-face
Solutions Architect	Competitor	58 Minutes	GOT1	Face-to-face
Business Developer	Customer	57 Minutes	GOT2	Face-to-face
Head of Open District Heating	Supplier	42 Minutes	STHLM1	Skype
Buyer	Customer	50 Minutes	GOT3	Face-to-face
CTO	Supplier	65 Minutes	STHLM2	Skype
Area Sales Director	Competitor	43 Minutes	GOT4	Skype

Table 3. A table of the respondents and how they are coded

### 4.1 Servitization of Manufacturing Firms

After having conducted a number of interviews with various actors in the data center value chain it becomes rather obvious that servitization is an ongoing trend, but also that the different companies that we interviewed have different levels of engagement in servitization. One respondent explains that today's suppliers are either working with it or are in the process of implementing some kind of servitized business model. He further explains that they often start with offering services around the product and moves towards servitizing the whole value offering. Another respondent claims that as a potential customer of a servitized value offering they are considering to not just buy maintenances and other surrounding services as a service but to go over towards buying the whole data center as a service, which is often referred to "DCaaS" (data center as a service). The respondents' general thoughts about servitization is positive and all of them believe that it can be valuable both for the customer and supplier. What can be said is that all the suppliers interviewed for the thesis are either using a servitized solution or are working on installing one.

## 4.2 Pains in Servitization

### 4.2.1 Ownership

When discussing the ownership question with AMS1, the respondent claims that it is vital to be up to date with the latest technology in terms of software and hardware when dealing with data centers. AMS1 elaborates that one of the reasons to why his company is still owning their data centers is because they want to be able to deal with the updates of the software and hardware themselves and not let a supplier own that question. AMS1 points out that this is one of the most important question for his company and therefore one the reasons why they still own their data center.

GOT1, on the other hand claims that the ownership itself does not provide the owner with any real value. The sense of increased control that is associated with owning the hardware and infrastructure is artificial, meaning that the owner is often experiencing a false sense of security. Instead the perspective of how to deal with IT should be influenced by those other aspects of the business such as renting facilities. Further, GOT1 uses the concept of “lean and core competence” to support the argument.

*“If you do not have IT as your core business, there is no rationale behind owning the actual infrastructure itself” -GOT1*

One main underlying driver of refusing or resisting the transition of transforming ownership is due to the extensive history of having owned the infrastructure completely. According to GOT1 the mindset has for a very long time been influenced and dictated by owning infrastructure. The respondents claim that previously owning the infrastructure has to a large extent been viewed as the most optimal solution but as servitization is occurring across industries and verticals the experience from purchasing services is increasing. As more experience is obtained the process of purchasing services is becoming more accepted and easier.

During the interview with GOT2 the respondent claims that a possible servitization of a data center would require the supplier to fulfill a number of parameters in order for GOT2 to invest. Here, GOT2 highlights the sustainability aspect as an important one and it is important for the supplier to invest in these capabilities.

*“For us when we invest in a data center, sustainability and security are key parameters. Therefore, if we were to buy a data center as a service, we would demand a lot from the supplier” GOT2*

In the interview with STHLM1 the respondent points out the importance of the customer’s attitude which affects the willingness to purchase a data center as a service instead of owning it as a product. Here, the culture and tradition in the company play a vital part in the sense that a more static and less proactive company may be less prone to switch to a servitized business model.

*“The attitude amongst the customers is key in the ownership question” STHLMI*

#### **4.2.2 Discrepancy between theory and practice**

None of the respondents acknowledge the discrepancy between theory and practice.

#### **4.2.3 Uncertainty of Value**

GOT1 mentions that due to lack of knowledge together with an inherent tradition to buy products, customers are having a hard time to understand the true value of purchasing a servitized solution compared to the traditional way of purchasing products. GOT1 also points out that some customers have a hard time to compare a servitized offer with a more tangible offer even though the final offer is more or less the same in terms of what it can be used for.

*"If the customer compares a product offer with a service offer in terms of cost, it is common that they think it is cheaper to buy the product since they forget to calculate the cost of energy, maintenance, security and other things surrounding it" - GOT1*

Also, there is an inertia within companies if they have previously invested a lot of money in a technology that they really want to work, a sort of sunk-cost fallacy. This can according to GOT1 make companies less prone to move from buying products to buying services.

*"Previous business decisions, or things you have invested a lot of money in, make you less interested and willing to abandon it and invest in a service or do business in another way" - GOT1*

In an interview with GOT3, who is a purchaser at a large company, he claims that in all their cases they first decide whether to purchase the solution as a product or as a service before comparing the offers. Which means that they do not explicitly compare the value of a service with the value of a produce. On the other hand, GOT3 points out that they are a large company which to large extent base their business model on owning infrastructure, hence they claim that servitization is often something that they consider when it comes to smaller projects.

*"First you decide whether to buy the data center as a service or product, then you compare the offers. You can't compare apples to oranges" GOT3.*

#### **4.2.4 Complexity of Contracts**

According to GOT1 the development of technology is constantly occurring and an ongoing process which imposes challenges on the role and long-term impact of contracts of the servitized offer. The challenge derives from the fact that the outline of the contract is often static while the developments in technology are not, which becomes problematic over time. After the sales process which includes negotiation and terms of the contract between the



customer and supplier is done and the service is delivered the degree of satisfaction is often quite high in the eyes of the customer. However, as time goes on and the environment that the customer operates within changes so does the accessibility to more preferable and competitive services.

*“The customer doesn’t want a static service. Think of it like this: the customer subscribes for Netflix with an offering of 5 five movies and three years later they still have an offering that consists of 5 movies.” -GOT1*

Thereby, the customer is experiencing that they are not receiving a satisfactory service even though the supplier is delivering their end of the deal, which was mutually agreed upon and specified in the contract. A risk is therefore that the value of the service will decrease in the eyes of the customer even though all parts of the contract are met by the supplier. This might lead to a situation where the customer demands to renegotiate the terms which is time-consuming and aggravating for both the customer and the supplier.

Also, the lack of true modularity, which will be elaborated later, is highlighted as being an obstructing force as this decreases the ability to easily modify the deal made without substantially changing the terms agreed upon initially. GOT1 especially focuses on the challenge of being able to construct a service that smoothly combines innovation and integration of relevant developments done by the supplier without causing any hassle for the customer. Here, the contract plays an important role and dictates the future possibility to update the service solution in terms of technology.

GOT1 further describes that, as the purchaser at the customer-company commonly has the objective of ensuring that they are receiving the lowest price possible, certain important characteristics are sometimes overlooked. One of these is the decreased flexibility that is associated with not considering the long-term impact of only focusing on price when procuring services.

*“Sometimes there are underlying problems related to the knowledge level of the client who is not truly aware of what their needs are as of today but especially a little bit further down the road” -GOT1*

There is simultaneously risk management occurring from the supplier which might negatively impact the customer and become a pain. The supplier is constantly managing and evaluating their own risk-taking to ensure that they are reaching terms that are satisfactory. GOT1 mentioned that sometimes the customer does not realize the amount of resources and time that the supplier has invested in developing their proprietary technology and further the costs related to licenses and their own suppliers. The customer does not realize the risk that the supplier is taking.

Generally, the process of procuring services and thereby entering contracts is described as being rather easy and painless by GOT2. There are however important challenges related to

contracts that are more prominent in servitized business models, both for the customer and supplier.

*“It is usually very easy to enter agreements but can be very difficult to exit them. This is usually discovered too late, when it is time to do it” -GOT2*

Being aware of the terms and the way they are constructed is described as an aspect that is increasing in importance when moving from a traditional business model towards a servitized one. The impact of their configuration is more significant now than earlier as the general level of procurement of services is higher.

*“Especially problematic is the process of ending contracts earlier than planned initially. It is crucial to make sure that you are able to end the contract in advance if you are not satisfied with the service” GOT2*

Further, attempting to terminate contracts earlier than agreed upon can become very costly and complicated. GOT2 further explains that this is problematic because one of the reasons for choosing service instead of product is the stated flexibility of terminating the contract, hence one of the selling points of a service is gone missing.

In the interview with GOT3 it becomes clear that the contract is one of the most important parts of the servitization business model meaning that it sets the scene for the rest of the business. He claims that if the customer is afraid of experiencing any challenges or pains with the new business model the best solution is to stipulate it in the contract. By doing this the customer can always refer to the contract if they experience any problem with the service. He further states that the best solution to the above-mentioned pains is to make sure that the customer knows more than the supplier. Meaning that knowledge about how to order a servitized solution is key if the customer want to avoid trouble and setbacks.

#### **4.2.5 Control**

GOT1 explains that because the ownership of the products and services are moved from the customer to the supplier, control of the service and its components is considered to be an important aspect of a servitized business model. Due to this GOT1 explains that customers' demands a higher transparency in order to mitigate the change of control.

*“By being transparent in the relationship you earn trust from the customer and vice versa. This will also provide the customer with a feeling of control of the service which also enhances the trust” -GOT1*

Both GOT1 and GOT2 stresses the fact that the question of control creates an uncertainty among the customers, especially when the customer has gone from a previous ownership of a data center related product to now considering purchasing it as a service.

Being able to continuously stay updated in terms of having cutting-edge software and hardware is highlighted as a strength of using a service-based offering. However, there will always be a tradeoff between price and the level of control that the customer has. GOT4 points out that generally speaking more money available for capex (capital expenses) most often results in a higher level of control for the customer as the relationship with suppliers is skewed to their benefit.

*“There will always be a tradeoff between the price of using it is a service or not and the level of control that the customer will have. More money is equal to more control” -GOT4*

The perspective of dealing with the attitude towards control is according to GOT4 related to the business model of the company. Depending on the need of balancing capex vs opex of the customer's company.

*“At the end of the day it boils down to how much cash in hand you have. Want to keep control to yourself you invest in your own DCs. It makes more sense to adopt to a servitized one if you are heading towards more of an opex based business model.” -GOT4*

#### **4.2.6 Trust**

Trust is regarded as vital component for the customer in a servitized business model, the reason for this is according to AMS3 because the concepts are based on a relationship between two or more parties. In an interview with GOT1 the respondent claims that compared to a more traditional business model servitization requires more trust between the parties since it is more of a process than a single transaction.

*“To be able to work agile with your customer it is vital to have a good relationship with them. This relationship is based on that both parties trust each other, especially that the customer trusts the supplier. Also, servitization demands higher trust between the both parties since iteration and working agile is a vital.” - GOT1*

Important for building relationships that are heavily influenced by trust is the recognition of how time consuming the process can be as credibility needs to be established. The building blocks of trust according to one of our respondents, STHLM1, is characterized by softer values that creates a sense of trust among the customers.

*“When establishing trust, it's much more important with softer values than hard values or facts” -STHLM1*

As relationships where procurement of services are in the initial phase it can be difficult to establish trust which makes it more challenging and tenacious for the customer. Here, softer values are highlighted as key ingredients but facts such as standards and certifications can be helpful in a complementary role.

*“You can’t receive certain certifications if you do not own the product or infrastructure yourself” -STHLM1*

Thereby the lack of certifications could be a hurdle in the process of forming a relationship with the customer. STHLM1 indicates that there should be a healthy balance between the two different values but an emphasis on softer ones. Linked to this, AMS1 claims that trust is necessary if you want to create a win-win situation between the customer and supplier.

#### **4.2.7 Co-Creation**

According to AMS1, who works for a large company that owns the data center-infrastructure themselves, there are challenges connected to not owning the data center yourself. Mainly with regards to the possible difficulties if the relationship is not well established between the customer and supplier which could lead to problems connected to updates of hardware and software.

*“A possible challenge for a servitized business model is if the data center provider is updating the hardware, and you as the customer is not updating the software it can be compatibility problems” AMS1*

Both AMS1 and AMS3 adds that a good servitized business model allows the supplier to grow together with the customer and that the customer’s success is therefore the supplier’s success. This does however require trust between the actors, which becomes apparent when the services need to be updated. Here it is according to AMS1 important that the actors can iterate their way towards the best solution.

GOT1 claims that one threshold for the customer to move towards buying services instead of products is the heritage of making transaction-based business which implies distinct borders between the supplier and customer. Since many state of the art servitized solutions are built upon a relationship-based business this could be a threshold for customers to accept the business model.

*“Customers are due to their history a bit afraid to choose (a servitization alternative), but I believe that the customers should not be, because if they make the wrong decision, you can just choose again. That’s what nice with services” -GOT1*

GOT4 explains that going from consuming a product to a service does demand more in terms of exposing yourself and your way of conducting business. Even though that exposure could be uncomfortable they are still happy to do it. The reasons are that the required manpower to run the data center would be too extensive and thereby could be damaging or causing distractions for other operations within the company. The size of the company is further a vital part of this reasoning.

*"I think they are happy to do it. If you are not a big organization there would be a lot of people having to work and maintain the DC. Buying it as a service is beneficial, you can go from capex to opex instead." -GOT4*

#### **4.2.8 Paradox of Choice**

GOT1 explains that there are dynamics within the different sides of the market, namely the supply and demand that are complicating the construction of an optimal solution between them. GOT1 points out that as the demand-side sometimes wants to remain anonymous because of various reasons a challenge for the supply-side has evolved. These dynamics have led to a situation that complicates the conditions for the supply-side to provide a straightforward solution that is adapted to the requirements of the customer. Instead some providers have, as a consequence of insufficient information about their customer, developed too many configurations which make it more difficult for their customers to find the best offering for their business.

*"The customer experiences that there are too many choices when it comes to services and oftentimes the customer does not have enough knowledge about what to choose and what happens if to chooses the wrong services" -GOT1*

This challenge is further strengthened if the demand-side has low knowledge about what it actually needs and how to demand it from the supplier. In an interview with GOT3 who is a purchaser at a large company claims that one of the strengths of their purchasing team is that they often have higher knowledge about the products and services than their suppliers.

#### **4.2.9 Environment & Sustainability**

According to GOT1, questions regarding sustainability is something that both suppliers and customers care a lot about and therefore the customers can be keen to know how the sustainability question is handled by the supplier. This since, apart from when a customer is owning the data center they are owning the environmental question, the question of sustainability is in the hands of the supplier.

*"We are working a lot with sustainability and I know that our customers are caring a lot about is as well, that our services should be sustainable. Hence our customers are very keen that we as a supplier are meeting the customer requirements related to sustainability" GOT1*

The issue of not owning the matter of sustainability is further confirmed by STHLM1 who claims that it can be difficult to obtain the right knowledge when purchasing services. On the other hand, STHLM1 explains that the service provider might often be better equipped in dealing with these matters since the likelihood of them developing the proper know-how and scale to run the setup efficiently is higher.

#### **4.2.10 Becoming Over-dependent on Suppliers**

GOT1 discusses the fact that the relationships between the suppliers and customers are still very traditional in a sense that a lot of focus is on the price and that the actor's role in the value chain is very static. Therefore, both the supplier and customer might be unwilling to move towards selling products as a service since it often requires that the different actors become closer.

*"It is hard to do business the old way when you deliver services that allow flexibility and innovation without being close to the customer. It takes two to tango and it is not obvious that the customer understands that they have to be open with their challenges" -GOT1*

The size of the customer is highlighted as important in this question, meaning the if the customer is small they have to rely on their supplier to a higher extent than if the customer would be bigger. STHLM1 underlines that the customers' bargaining power is lower if they are smaller, together with the fact that their financial strength is low as well. A larger customer would have a greater possibility to deal with the situation if the supplier does not deliver accordingly, which is not the case for a smaller customer.

On the other hand, in the interview with GOT3 the respondent claims that becoming dependent on you supplier does not necessarily have to be negative. In a more relationship-based economy the goal is to create a win-win situation between the customer and supplier and this can imply a high dependency on the supplier. Both GOT3 and GOT1 explains that it is common to have incentives stipulated in the contracts that implies that the supplier and the customer share the savings generated by improvements in efficiency improvements.

#### **4.2.11 Bankruptcy Risk**

The fact that a supplier of a servitization solution is to a large extent relying on having ongoing revenue instead of a number of high nonrecurring revenue. STHLM2 claims that the risk that the supplier is going bankrupt is higher. He further claims that the risk increases if the supplier is smaller and does not have a stable cash flows, this since selling a data center as a service is still be a large investment for the supplier.

*"As a customer I would worry more for my supplier's finances if they choose to have a higher degree of volatility in their revenues" STHLM2*

#### **4.2.12 Pricing Model**

According to AMS2 there are challenges related to developing a pricing model that adequately meets the requirements and needs of the customers. What is discussed as one major challenge is that the customer wants to ensure that they are being charged according to their level of consumption. Many of the providers today offer pricing models in servitized models that are not coherent with the demands of the customer. It is common that the pricing is based on intervals of capacity or access that are too high which frustrates the customer.

*“It aggravates the customer if they are forced to pay for a bundle of access that exceeds their need. The customer is only interested in paying exactly for the amount that they want to use”*  
-AMS2

The result is that the customer is paying for access or capacity that they are not in the need of but still have to procure that amount to ensure the uptime of their own operations. This is further strengthened by STHLM2 who stresses the importance of having a clear and transparent pricing model, especially if the customer is new to a servitized business model. Also, the importance of having a pricing model that is ready for innovation and will be adequate and fair if the technology is developed is highlighted as important.

GOT4 explains that for a long time the industry used a pricing model that was based on a square meter or similar measurement basis for charging the customer. However, as advancements within technology have picked up in pace the amount of tech that can fit in the same amount of space has increased while the power consumption is increasing year-over-year they have moved to a power consumption-based pricing model.

According to GOT4 the utilization of new technology will result in a change of how the customer will be charged as the productivity or value will be higher. Those changes can be identified as possible pain points for the customer.

*“Every time we talk about transformation that we can do that will actually increase productivity or the value of the service would also change the pricing model for the customer. New technology coming in typically means that there will be a change to the pricing model sooner or later.”* -GOT4

#### **4.2.13 Security & Safety**

According to GOT2 the customer is very concerned about the safety aspects related to data centers and therefore making it an interesting aspect of services. The level of access physically is highlighted as an influential question and is only likely to increase going forward.

*“One aspect that I think could be a challenge for the customer is to be able to ensure their own safety & security when purchasing a service”* -GOT2

GOT2 stresses that the level of services procured is expected to increase generally speaking the matter of safety for the customer is going to be an important issue when delivering services as well as selling data-centers.

Despite the possible uncertainty about security and safety of the data centers and its content GOT3 claims that the simple solution to this is to state all your concerns in the contracts. He stresses the importance of knowing all your challenges and uncertainties and make sure that it

is stipulated in the contract together with a high fine if any of the parts in the contracts are not followed or complied with.

#### **4.2.14 Transparency & Visibility**

As servitization is on the rise there are trends that are not beneficial in terms of visibility between the customer and the supplier. As service-providers provide offerings as bundled packages it is more complicated to see what is actually procured when entering the agreement.

*"Generally speaking there is decreasing transparency with increasing servitization." - GOT3*

The fact that there is not a real industry standard developed related to purchasing IT-services also results in an undeveloped relationship in terms of openly collaborating from a long-term perspective. In other areas or sectors, it's more common to set goals together where both parties can benefit.

*"Implementing a win-win situation between the supplier and customer is key, it's still early days in the services and IT sector related to creating these agreements" -GOT3*

GOT1 claims that with a servitized solution it is much more important to establish trust between the parties in the contract. This trust is oftentimes crucial which becomes apparent when the supplier offers a bundle of services that for an untrained eye can be hard to disentangle. Meaning that when a supplier offers a complete service solution it can be hard for a customer to grasp what they are getting and what they are paying for due to the lower transparency and visibility the can be a result of a servitized solution compared to a solution where the customers own that solution.

#### **4.2.15 True Modularity**

When talking about services and their modularity GOT2 explains that it is easy to sell the offering as modular but without having an offering that is truly characterized as modular. Many times, the simplicity of switching services and adding or removing them is much more complex than the initial description of the process.

*"It is key to develop true modularity in the servitized offering making it easy for the customer to tailor the solution to their needs." -GOT2*

This observation is confirmed by GOT1 who stresses the importance of being able to offer a range of services without forcing the customer to pay for redundant services that are not providing value. GOT2 further highlights the significance of having inhouse processes already developed for quickly implementing or dismantling services, depending on the needs of the customer. In the interview with GOT3 the customer side is reflected, the respondent stresses the importance to create good contracts where the customer only pays for what they require. Hence that if the customer believes that the solution offers a low degree of modularity the solution is to come up with a better solution and state that in the contract.



*"There is a risk that the supplier is being dishonest and tries to sell you more than you actually want by providing a packaged solution, which results in that you pay for things you won't use - GOT3"*

GOT4 explains that this is related to which service that is being purchased. Sometimes the need of integration requires a lot of work and resources. Different networks can cause problems when adding services. Therefore, the purchase of bundled services might still be advantageous for the customer even though they purchase bundles where not every service is used.

*"I think it depends on the kind of service that you are looking for. You sometimes need a lot of integration. Different networks cause problems when trying to add on those services on your own. If you take it as a bundled it gives you as a customer more value in most cases." - GOT4*

#### **4.2.16 Lack of Customization**

When asking about the potential to customize a solution to a specific customer in a servitized business model STHLM2 explains that he sees a risk in that suppliers look beyond the contract period and therefore want to build a more standardized solution in order for the data center to have a value if the customer break the contract in advance.

*"An advantage of having standardized products is that if the customer goes under you can reuse the products and sell it to another customer, this is harder if the products are customized for a specific customer" STHLM2*

### 4.3 Summary of Empirical Findings

The following table illustrates what pains found in literature that the respondents confirmed or did not confirm. Along the process more pains were disclosure by the respondents which implies that there are more pains in this table than in the theoretical framework.

	AMS1	AMS2	AMS3	GOT1	GOT2	GOT3	GOT4	STHLM1	STHML2
OWNERSHIP	✓			✓	✓			✓	✓
DISCREPANCY BETWEEN THEORY & PRACTICE									
UNCERTAINTY OF VALUE					✓			✓	✓
COMPLEXITY OF CONTRACTS		✓		✓	✓	✓			✓
CONTROL				✓		✓	✓	✓	
TRUST	✓		✓	✓	✓	✓		✓	✓
CO-CREATION	✓		✓		✓		✓		
PARADOX OF CHOICE				✓	✓				
ENVIRONMENT & SUSTAINABILITY				✓				✓	✓
DEPENDENCY OF SUPPLIERS				✓				✓	
BANKRUPTCY RISK									✓
PRICING MODEL		✓		✓			✓		
CAPACITY BOTTLENECK		✓		✓					
VISIBILITY AND TRANSPARENCY			✓	✓		✓	✓		
LACK OF CUSTOMIZATION									✓
SECURITY & SAFETY					✓				✓
TRUE MODULARITY					✓				

Table 4. Summary of which pain each respondent confirmed or did not confirm.

## 4. ANALYSIS

*In this chapter we will analyze the empirical findings from the standpoint of the theoretical framework. We will look for similarities where the empirical findings correspond with the theoretical framework and cases where the empirical findings deviate from theory. The chapter starts with the pains identified in both literature and amongst the respondents and then moves towards the pains identified only in the companies. Further, pains that have been identified in the empirical data that are not present in the literature will be introduced and discussed.*

### 4.1 Pains in Servitization

#### 4.1.1 Ownership

When comparing the theory and the empirical findings several of the drivers of ownership related pains can be confirmed. As mentioned by Mont (2002), the customer's attitude towards ownerless consumption varies considerably in terms of acknowledging its benefits. The underlying drivers of the differences in attitudes also vary. AMS1 pointed out that the desire to be in control of updating software & hardware was an important process for customers and therefore the ownership question became important. One possible reason for this is the fear of ending up with an asymmetrical relationship with the supplier in terms of influence and by that losing the control, which is further elaborated by Vezzoli et.al (2015). Not being in a position to alter the equipment is an aspect that could be highly important, depending on the demands of the customer. However, other respondents, such as GOT1, claim that the feeling of increased control, when owning a product, is artificial as they are experiencing a false sense of security. What becomes clear is that the acceptance of the gains related to services still varies profoundly, in line with the opinions of Mont (2002). The false sense of security might, therefore, be a heritage from when almost everything was purchased as a product which is something that is described by both GOT1 and Rexfelt & Hiort af Ornäs (2009).

The theory states that one of the key pains of ownership is the need of developing new social and organizational structures that can reap the benefits of servitized solutions (Mont, 2000; Mont, 2001; Wong, 2004). Many of the respondents confirm the presence of this challenge. The history of ownership is strongly rooted in the culture of the corporations and further even associated with the success of the company (Rexfelt & Hiort af Ornäs, 2009). The empirical findings indicate that there are expectations of shifting data centers from operational expenses (opex) to capital expenses (capex) as the company becomes able to make those investments, even though the area of IT-infrastructure might be very far away from the core business of the corporation. The size of the company seems to be of importance when making those decisions and the opinion that services are primarily suitable for small corporations is still common. The fact that many of the respondents still have weak capabilities in new service development could be one of the hurdles that lead to them not accepting servitization to a large extent. The need of adapting the organizational structure and processes in a way that is more suitable to working

with services is a pain that has both been identified in the empirical findings and the theory (Mathieu 2001, Gebauer & Friedli 2005, Olivia & Kallenberg 2003).

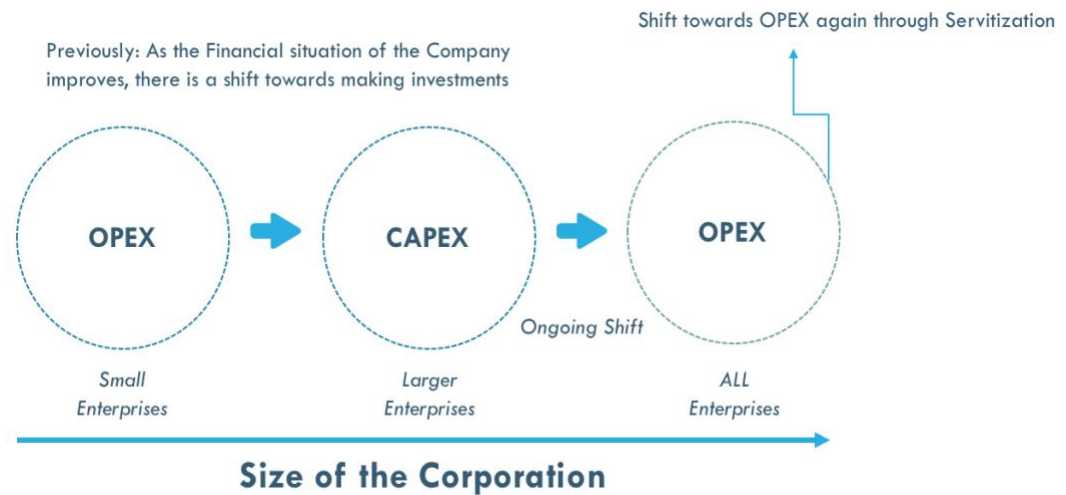


Figure 12. Illustration of the move from Opex to Capex, back to Opex

As the procurement of services is increasing across sectors and verticals, both in the corporate environment but also on a personal level, the acceptance and experience of purchasing them is likely to positively impact the acceptance of services. Therefore, the argument could be made that a shift towards opex is more likely to take place, even amongst larger corporations. By doing so even more time and resources could be dedicated towards the core competencies of the business. As mentioned above, the empirical findings indicate that there has previously been a strong tradition of moving towards capex when the corporation has reached a stage where it is able to proceed with those investments. However, some respondents indicate that there is an ongoing shift where corporations are moving away from those investments if there is no longer a clear connection between those activities and the core business of the corporation which can be illustrated with what GOT1 mentioned; *“If you do not have IT as your core business, there is no rationale behind owning the actual infrastructure itself”*.

One disadvantage of procuring servitization is the inability to take part of the possible appreciation of developing DC-technology and proprietary know-how as this is an asset that will always remain at the supplier. On the other hand, it could also be viewed as a way of hedging away the risk of ending up possessing outdated technology.

#### 4.1.2 Discrepancy Between Theory & Practice

Based on the interviews with the respondents the pain of discrepancy between theory & practice is not a challenge within the context of servitization of data center.

### ***4.1.3 Uncertainty of Value***

Generally, the literature agrees that moving from a traditional business model to a servitized business model has a positive impact on the profit for both the customer and the solution provider (Baines, 2008, Neely, 2008). Min et.al. (2015) and REXFELT & HIORT AF ORNÄS (2009) claims, however, that it is common that customer to servitized business model experience an uncertainty towards the potential profits and the expected win-win situation that should result from the business model. GOT1 explains that this is rather common, and it has to do with the inherent tradition of buying products which makes it hard for them to understand the value of a service. Furthermore, this problem is especially apparent for companies that previously have invested a lot of money in a technology that they really want to work and therefore they do not want to abandon it for the benefit of a service solution. REXFELT & HIORT AF ORNÄS (2009) discusses the problem of evaluating the long-term value of purchasing services instead of products which is something that the customers generally experience. Here GOT3 confirms this issue and claims that they seldom compare services and products per se, instead they first decide whether to purchase a service or a product and then compare either services with services and products with products. This statement underlines what REXFELT & HIORT AF ORNÄS (2009) claims, that it is rather complicated to compare services with products.

### ***4.1.4 Complexity of Contracts***

The pain caused by complexity in contracts has been identified as one of the key pains for the customer in a servitized business model. The complications further have a negative impact on the supplier as well making it a mutual problem if not dealt with properly, which is line with what the theoretical statements discussed by REIM et.al (2014). The respondents agree that the challenge that is present for both the supplier and the customer is to a large extent a result of the increasing complex contracts which matches the findings of BAINES et al (2011). As a result, there is a growing need for developing and improving internal capabilities and competencies that are able to design contracts and mechanisms for ensuring satisfactory outcomes for both parties (REXFELT & HIORT AF ORNÄS, 2009). Besides the theoretical statements of pains in servitized business models, several other pain points within contracts were identified in the empirical data.

A problem that was brought up by several respondents is related to the rapid developments of technology within the software and hardware context. The pain derives from the fact that the developments are taking place at a higher pace than the contracts are able to reflect, which can make the actors perceive the contracts to be static. Several respondents claim that it has a negative impact on the relationship between the supplier and the customer as the need for negotiation increases, which is both time consuming while it demands resources and attention that draws attention from focusing on their core business. Respondents from both the customer and supplier side are aligned with the view of the problem.

GOT1 specifically discusses the aspect of contracts being static as a key problem for the complexity of contracts. As the incorporation of innovation into the area of contracting is viewed as problematic it becomes a serious pain for the customer as the DCaaS context is

operating in an environment that can be characterized as fast-moving with regards to developments and advancements in technology. According to GOT1 and AMS1, an interesting way of mitigating those effects would be changing the output variables of the service meaning that the agreement would be more flexible in terms of allowing for progress to be integrated along the way as an ongoing progress. It could be achieved by developing a pricing model that has a moving component as the main variable for the contract, such as selling DCaaS by power measurements such as kW/mW instead of offerings based on space such as square meters within the DC.

When discussing innovative contracts and pricing models with AMS1 it became clear that changing the outline of the contract as discussed above would most likely lead to less negotiation for both the customer and the supplier which would allow for both parties to focus on their own enterprises with less distraction. This is discussed further down in the section about the pricing model. Additionally, it allows for new innovations to be continuously integrated into the offering to the customer enabling the supplier to always deliver the latest technology available.

The empirical findings claim that the entering and exiting of contracts between the supplier and customer vary substantially in difficulty dealing with. The process of exiting them can become a very painful process, for the customer especially, which highlights the importance of preparing for that event before it becomes reality but also make sure that the contract is beneficial for both parties (Reim et.al., 2014). The challenge of terminating the contract ahead of time is an area that can become especially tedious. It becomes evident that the need for developing a plan for how to exit them is necessary and even more so as respondents indicate that it is an area that is not prepared for enough. As mentioned by GOT1, one of the key advantages of procuring services is their supposed flexibility, one of the unique selling points is thereby lost if they are problematic to exit.

Two major components of contracting appear to be of great importance based on the empirical findings, these are flexibility and the perspective of time. The purchaser of the customer-side often has the objective of ensuring the lowest possible price for the service which results in a situation where more long-term objectives are overlooked. Simultaneously, the level of flexibility is given less attention in negotiation the terms which could become a hurdle for both parties but more so for the customer side as their demand of the service is more prone to change. The task of formulating contracts that deal with the complexities discussed above is tough but laying out an outline that is able to mitigate some of the effects is achievable. Incorporating set fines for goals that have to be met along the way is viewed as an efficient way of enforcing the terms. The use of penalties is a tool utilized by some of the respondents which illustrate its performance.

#### ***4.1.5 Control***

The move from the transaction-based economy towards the relationship-based economy with a servitized business model is having severe consequences on the distribution of ownership in

the value chain. Due to this REXFELT & HIORT AF ORNÄS (2009) describes how many customers of servitized solutions feel that they are lacking control of the products and services. This is in accordance with what GOT1 claims when discussing the issue, he confirms that this is an apparent problem and that it creates an uncertainty amongst the customers, especially if the customer comes from a previous traditional ownership of a data center. Even though literature shows the one of the largest obstacles for customers to move towards a servitized solution is the lack of control, this is also one of the positive aspects of servitization (VEZZOLI ET AL, 2015). The fact that customers do not have to spend time on maintenance and upgrading is freeing up time for the customer to focus on their core business (REXFELT & HIORT AF ORNÄS, 2009). When discussing this issue with the respondents the general thought is that the control is lowered with a servitized business model. More specifically GOT4 is claiming that if you want to have more control you have to invest in the data center yourself, hence it is hard to remain control and still moving towards operational expenses like a servitized business model. GOT4 further states that more money equals more control, meaning that if you value control you need the capital to invest in a data center, the alternative is operational expenses and a servitized business model. GOT1 explains that in order for customers to both use ownerless consumption and still maintain a feeling of control over the data center it is vital for the supplier to be transparent and open.

#### **4.1.5 Trust**

Another identified potential challenge and pain for customers in a servitized business model is the trust between the different actors in the value chain, mainly the relationship between the service solution supplier and the customer (CATULLI, 2012; BAINES ET AL, 2013). This statement is in accordance with what GOT1 points out in an interview. He stresses the importance of a good relationship between the supplier and customer and that this relationship is based on trust from both actors. Furthermore, GOT1 claims that trust is more important when using a servitized business model than a more traditional transaction-based business model, this is to large extent because the business is more relationship-based which implies that a lot of the value lies in the relation between the supplier and the customer (SCHÜRITZ ET AL, 2017). This is also mentioned by REXFELT & HIORT AF ORNÄS (2009) who are pinpointing the soft values of a move from a traditional business model towards a servitized one. In order for a supplier to persuade a customer that this could be a win-win solution, a high degree of trust is necessary.

Also, for a servitized business model to work properly information sharing between the actors in the value chain is important (VEZZILO ET AL, 2015). GOT1 explains that with this business model it is advantageous to work agile, meaning that the supplier and customer are constantly sharing their information with each other and iterate their way towards the best solution. Here, VEZZILO ET AL. (2015) points out the potential fear from the customer to share the information, where a fundamental trust between the customer and supplier is vital for this to work. In the interview with STHLM1 the respondent points out the that when establishing trust, softer values are as important as harder values such as certification and numbers. The importance of soft values is also enlightened by REXFELT & HIORT AF ORNÄS (2009) who claims that a lot of focus is drawn towards the hard values which draw the attention away from the softer ones,

which then could have a negative effect on the relationship and trust between the actors in the value chain. Generally, the literature is not giving a lot of attention to the softer values, Catulli (2012) points out a number of aspects that need to be in line in order to establish trust, however, none of them can be considered to be strictly soft values.

#### ***4.1.6 Co-Creation***

Schüritz et.al (2017) describes that value in a servitized business model is ideally created mutually between the supplier, customer, and other actors in the value chain. To facilitate this, it is crucial that the different actors in the value chain are open to co-creation. AMS1 explains that with a servitized business model for data centers one of the most important aspects in co-creation is the need of being up to date, both in terms of soft- and hardware. Here AMS1 claims that from his experience it is hard to align the updates of the software with the updates of the hardware, and this is a result of bad communication between the actors. Mont (2002) describes that the increased number of stakeholders may increase the complexity of communication and that this can be a barrier for customers to choose a servitized alternative.

This statement is reinforced by GOT4 who claims that when switching to buying a servitized solution the customer must be able to share more information with the supplier and that this can be a threshold for companies to take the leap. This is in line with what Prahalad et.al (2004) claims, who stresses the importance of dialogues and transparency between the suppliers and customers. GOT1 further explains the threshold of moving to a servitized solution as a result of business inertia and a fear of doing things differently. Because servitization is requiring a tighter relationship between the supplier and customer it is a rather big step for a company that traditionally have based their business on transactions instead of relationships.

#### ***4.1.7 Paradox of Choice***

As servitization enables suppliers of services to become more customized the number of choices for the customer increases (Zimmerman et al, 2017). GOT1 does however claim that the number of choices that customers can choose from can create an abundance of choices and therefore a concept called paradox of choice. This means that the possibility to become more customized can have its negative side connected to the fact that some customer does not know exactly what they want. Mont (2001) describes that once a customer decides to purchase services they have to develop new knowledge such as an understanding of how to purchase services. Connected to this, GOT3 explains that a good purchaser has more knowledge about the services and the industry than the seller at the supplier side. By having this knowledge, it is less risky that the customer will experience a paradox of choice since they actually have sufficient information about what they want. As mentioned by both Mont (2002) and REXfelt & Hiort af Ornäs (2009), once a company adapts to a servitized business model one of the biggest challenges is to acquire new capabilities in the organization, such as how to purchase the services. Hence both theory and practice states that the concept of servitization can create a lot of choices for the customers, and if the customer has not developed a knowledge of how to purchase the services there is a risk that they will experience paradox of choice.



#### ***4.1.8 Environment & Sustainability***

In theory servitization is generally presented as a business model that has potential to be beneficial for the environment, however, some authors highlight the risk that the customer may feel that they do not own the question of sustainability if purchasing services (Maxwell & Van Der Horst, 2003; Mont, 2002). The reason the customer might want to own the question about sustainability is according to GOT1 that they care about it and if they own the question they also have control of the outcome. Hence this potential pain is connected to the aforementioned pain *control*, where sustainability is an aspect that the customer wants to be able to have control of. Mont (2002) states that for the customer it may be a trade-off between control and sustainability when choosing a servitized solution, which is something that STHLM1 states, but also explains that there is a high chance that the supplier knows these things better than the customer.

#### ***4.1.9 Dependency of Suppliers***

As described earlier a servitized business model relies to a higher extent on a relationship-based economy than a transaction based one (Vandermerwe & Rada, 1988). Because of this, the balance in the relationship can become skewed, for example, that the supplier gets a lot of information about the customer and its business. GOT1 confirms this issue and claims the problem with this is that a customer might be less prone to buy services if it means that they have to become closer with their supplier and share sensitive information with them. STHLM1 adds that the size of the supplier and the customer plays a role in the dependency issue, meaning that the bargaining power of a smaller customer is lower if the supplier is a bigger one. This is, however, a rather common problem and is not unique for servitization, but since servitization is built on relationship to such a high extent the issue might be more apparent. Further, GOT3 highlights the importance of the relationship and claims that a high dependency on your supplier is not always a bad thing. He elaborates by claiming that this might be part of the creation of a win-win situation between the supplier and the customer which is also something that is highlighted by REXfelt & Hiort af Ornäs (2009).

#### ***4.1.10 Bankruptcy Risk***

In line with the findings of Benedettini et.al (2013) and Mont (2002), STHLM2 agrees with bankruptcy risk being a pain within the DCaaS context. The size of the supplier is especially highlighted as being of great importance when assessing the exposure. According to STHLM2 the unpredictability of the suppliers' cash-flows will increase the risk for the customer as offering DCaaS demands a lot of capex from the suppliers' perspective. The statement from STHLM2 goes hand in hand with the opinions of Mont (2002). Even though one of the respondents claims that it can be a pain for the customer, none of the others confirmed bankruptcy risk as a pain which implies that it is generally not a concern for customers in the context of servitized data centers. The belief amongst the respondents is that because few suppliers who offer DCaaS are small the concern for bankruptcy risk is limited. Furthermore, as this business model in this context is in its infancy, many of the companies who offer DCaaS have many other verticals within their company providing stability and maneuverability for proceeding with new ventures.

#### ***4.1.11 Pricing Model***

Barquet et.al (2013) states in a report that new revenue streams and pricing models will appear once servitization is adapted in a value chain. Mont (2002) further claims that this likely will cause misunderstandings and complexity since the value chain is not likely to be a straight line and will often consist of more than one actor that should take part in the revenue stream. When discussing the potential new pricing models of a servitized business model for a data center AMS2 claims that the challenge is to create a business model that meets the requirements of the customers. Here it is crucial to create a business model that is fair to the customer and by that only charges them for what they use. STHLM2 also confirms that this can be a problem and the solution can be to have a clear and transparent pricing model. STHLM2 also stresses the importance of having a pricing model that is ready for innovation of the technology. Referring to what Mont (2002) states of having a pricing model that is adapted to a more complex value chain could also be an aspect of development, where the value chain goes from being a straight line towards being both vertical and horizontal. By increasing co-creation between actors in the value chain there are more actors that should take part in the pricing model and hence more complexity is created. Apart from the complexity of the value chain the Mont (2002) describes the pricing model must be able to change rapidly and include parameters that is of importance for both the customer and the solution provider, which is also described and confirmed by GOT4.

***Besides the pains identified in the literature, the empirical findings have discovered additional pains relevant to discuss further.***

#### ***4.1.12 Visibility & Transparency***

GOT3 discusses the issues that may arise for servitization customer and stresses the importance of being transparent in the relationship with the customer. He claims that generally speaking the transparency of the service or product delivered is decreased with servitization, which to a large extent is because of the bundling of services and products. He further highlights the importance of transparency by claiming that in order to be successful with this business model trust is vital and here visibility and transparency is key. GOT3 states that visibility and transparency can be considered to be a threshold for customers in the sense that they have to share more information that might be sensitive. This statement is further reinforced by Vezzilo et.al (2015) who stresses the fear of information sharing. In the literature transparency is mentioned when discussing co-creation between the solution provider and customer, here Prahalad et.al (2004) claims that this is vital for co-creation to work. More specifically GOT1 states that the problem with visibility and transparency becomes apparent when developing new software and updating systems. He claims that dev-ops are important here, where the developers at the supplying company are transparent and work closely with the customers and the software users. This is in line with Prahalad et.al (2004) claims about co-creation and transparency.

#### ***4.1.13 Lack of Customization***

Customization is one of the features that often is highlighted to be improved when moving to a servitized solution (Vandermerwe & Rada, 1998). Komita & Shimomura (2009) developed this further by claiming that servitization results in mass customization which means that the supplier can produce a large variety of solution to a fairly low cost. In a servitized data center this can be to offer a large variety of computer power and speed depending what customer, but still being able to deliver it at a lower cost. However, when discussing this with STHLM2, the respondent stresses that there is a risk that the supplier looks beyond the contract period and therefore want to have a more standardized solution. This since it is usually rather easy to quit the contract and therefore the supplier might want to make sure that the data center has a value on the aftermarket.

#### ***4.1.14 Security & Safety***

The aspect of Security & Safety is an especially important pain today as so much of the regulatory landscape is being rewritten at the moment. The general position amongst the respondents is that it's a pain when moving from a traditional way of having data center towards a servitized one. Being able to ensure those aspects in-house is regarded as a more comfortable solution for many. When purchasing DCaaS there is a dubious attitude towards letting go of the influence over those matters amongst the respondents. It's clear that there is a strong connection between, a previously discussed pain, *Trust* and *Security & Safety*. For the respondents to feel comfortable it takes trust to establish a relationship that mitigates the feelings of uneasiness associated with handing over the physical management of the DC. Going forward, the need to emphasize the capabilities in this area will be an important part for suppliers. One interesting way of solving this situation was suggested by one respondent which is to connect contracting and security. By clearly stating which consequences await the supplier if those criteria are not met will ensure that they do their best to avoid those situations while the customer reaches less financial risk as they will be compensated.

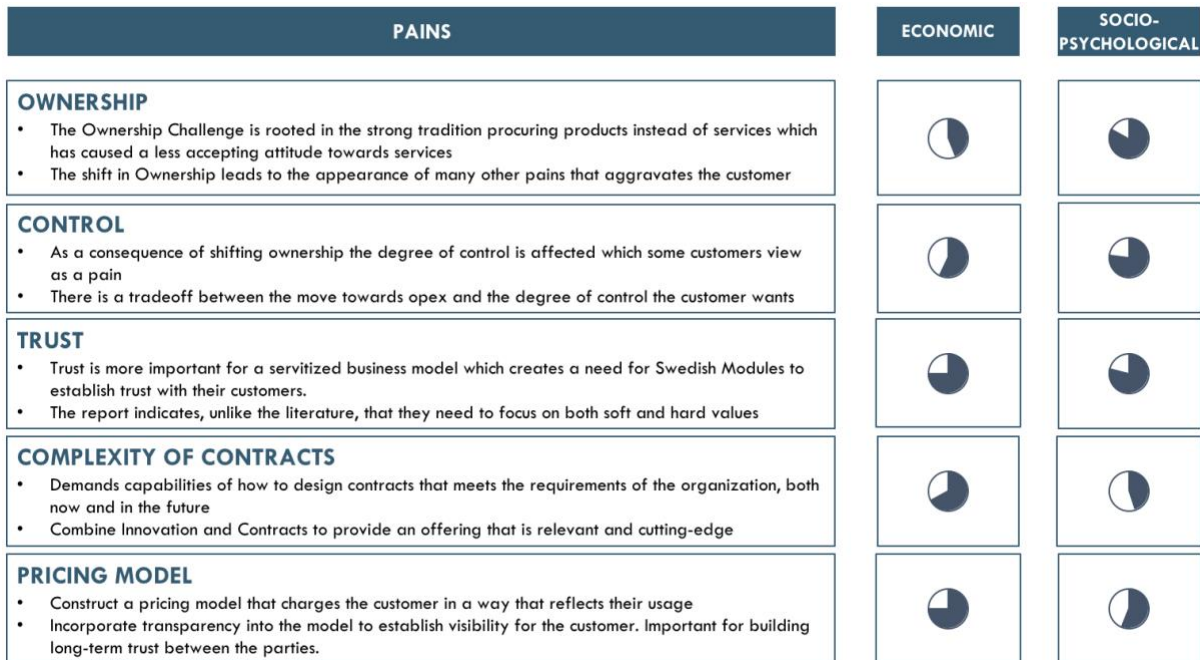
#### ***4.1.15 True Modularity***

As the aforementioned analysis about *visibility* and *transparency*, it was clear that both theory and practice underline its importance in order to get a win-win situation between the supplier and customer (Prahalad et.al, 2004). GOT2 states that it is common that supplier claims that their offering is modular, meaning that the customer can change between services without any bundling and thresholds to use them. GOT2 adds that many of these "claimed to be modular offers" are not modular and oftentimes customers have to buy one service to be able to access another, meaning that many of services they have paid for are not being used. Furthermore, GOT2 states that today's servitized offerings are not easy enough to tailor, which can be linked to the aforementioned discussion about lack of customization mentioned by STHLM2. Here GOT3 pinpoints the importance of creating good contracts that implies a high degree of modularity and low possibilities for the supplier to sell packaged solutions consisting of services that the customer does not need. On the other hand, GOT4 explains that sometimes it can be challenging for the supplier to offer a truly modular solution, which leads to that it sometimes is better for both the supplier and customer to have a lower modularity.

### 4.3 Analysis Summary

After a comparison of the what literature and practice say about pains in servitization it becomes clear that the two main themes presented by Ceschin (2013) and Mont (2004) fit well into the findings. Many of the pains discussed with the respondents can either be derived from *economic* or *socio-psychological* factors. Several the respondents claim that previous decision, organizational inertia or an insecurity about servitization affects the decision making process, which can be derived from socio-psychological factors. Here, the pains of *ownership*, *control* and *trust* are most prominent and can therefore be regarded as socio-psychological pains. The pain of *ownership* is regarded to be linked to the organizational inertia and hence not as much connected to the economic implications of an ownership change. The same can be found in *control*, where many of the respondents claim that lowered control as a result of servitization creates an uncertainty in the organization. Regarding trust it is evident that potential customers that are used to a transaction-based economy may have a hard time to move towards a relationship-based economy which can be connected to both economic and socio-psychological factors. To establish trust in a relationship the interviews indicates that soft values are important whilst the literature are stressing the hard values, hence these pains can be linked to both economic and socio-psychological factors.

On the other hand, it is common that economic aspects are affecting the decision. GOT1 claim that it is hard to compare a product with a service and GOT3 says that a large part of their business is to own a data center, hence servitization is not always an alternative. Regarding the economic factors it is plausible to say that pains such as *complexity of contracts* and *pricing model* are the most prominent ones since they to a high extent are linked to the monetary factor of the change to servitization and less connected to the socio-psychological factors. Regardless whether the aforementioned pains are claimed to be a result of either socio-psychological or economic factors it is clear that both these overarching themes are affect all pains but to different degrees.



*Figure 13. The authors' illustration of the most important pains*

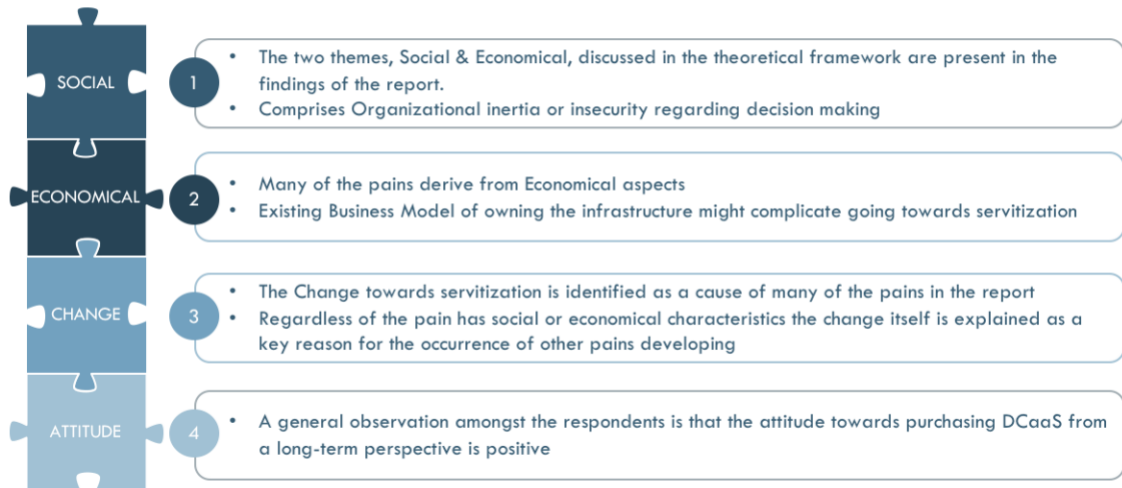
*with regard to the two overarching themes; economic and socio-psychological factors.*

Based on the previous discussion the figure above illustrates the authors' subjective interpretation of the most important pains with the regard to economic- and socio-psychological factors. These five pains can partly be derived from both the economic- and socio-psychological, however based on the empirical data and the previous literature the pie charts illustrate to what extent they are linked to each overarching theme.

Moving away from the analysis about economic and socio-psychological factors, another consistent theme is the fact that for many of the respondents the largest obstacle is the very change of how to purchase. Regardless if it is of economic or socio-psychological characteristics many of the respondents claim that the change process is a pain in itself. The fact that whenever a customer decides to purchase something, in this case a data center, as a service instead of a tangible product there will a number of changes that may imply pains. The common denominator in all identified pains is that it implies a change, which in many cases may be the largest pain for the customer.

Apart from the aforementioned consistent themes one could also notice a general positive attitude to purchasing data centers a service instead of product. Many of the customers were positive towards either start purchasing data centers as a service or increase the proportion products bought as a service. This may be contradictive to the previous discussion where change is seen as a pain. Despite that many customers do not like change they understand that servitization may have positive impact on their business and is therefore worth giving a try.

# ANALYSIS SUMMARY - KEY TAKEAWAYS



*Figure 14. Illustration of the key takeaways from the analysis.*

## 5. CONCLUSION

*In this chapter the conclusions derived from the thesis are presented and thereby answer the stated research question. Afterwards, some managerial implication of the study will be discussed followed by providing the reader with recommendations for future research.*

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*“What are the pains of a servitized business model for data center customers?”*

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The process of identifying a data center customer’s potential pains with a servitized business model consists of an overlook of what previous literature has stated and what respondents in the industry claim. The analysis and comparison of these two sources have given the authors a holistic view of the situation and the possibility to identify a number of pains that are more or less important. What can be concluded is that the customer feels an uncertainty towards changing the way they purchase products, in this case data centers. Today the majority of data centers are sold as products, where the customer pays upfront and by doing so claim the ownership and control of the data center. When changing the business model to a servitized one the customer is no longer paying all the money up front, they will not have the ownership of the data center and hence less control of it.

These new attributes of the business model can be regarded to create the largest change for the customer and hence be reasons for pains. One could link the identified pains to a number of changes that the move towards a servitized business model implies. First it is obvious that the *ownership* is transferred from the customer to the solution provider, which can be a pain for the customer if they previously are used to owning their data centers. It is plausible to believe that the *ownership* challenge is rooted in the strong tradition of procuring products instead of services which previously has resulted in a less accepting attitude of services. Further, the *ownership* change creates a situation where the customer is losing parts of the *control*, which is regarded as a pain for some customers. The analysis indicates that there is a tradeoff between the move towards opex and the degree of *control* that the customer wishes to maintain. Connected to this comes pains that are related to the *control* question, such as that the customer loses control of the *environment and sustainability* question and that in order for the customer to retain some control they have to create rigorous *contracts* which oftentimes are very complex.

As discussed in the analysis, servitization relies on a relationship-based economy which to many new adopters may be unfamiliar and create pains such as a higher need of *trust*, and *transparency* towards other actors in the value chain, more focus on *co-creation* with other actors and sometimes a higher *dependency on its suppliers*. Other pains that are connected to the changes is the *uncertainty of value* of the new service, this often as a result of the difficulties of comparing a product to a service. It is rather obvious that many of the mentioned pains are a result of little experience and low knowledge about how to purchase services. This means

that many of the mentioned pains in reality are based on an uncertainty towards the change they imply. Mentioned in both literature and by the respondents is that many of the pains are like a double-edged sword, meaning that at the first glimpse it can be regarded as a pain but in the long run it can be beneficial for the company. This is clear when discussing pains such as *trust*, *co-creation*, *dependency on suppliers*, and *control*, these are attributes of a servitized business model that implies a large change for the customer but in the long the change has the possibility to create high value for the customer. It becomes clear the underlying driver of the identified pains is the changing process, more specifically the fear and resistance of change.

If one would disregard the aforementioned discussion about that the fear of change would be the underlying pain for customers, the authors have identified five pains that are highlighted as being of especially high importance when implementing a servitized business model. These are *Ownership*, *Trust*, *Control*, *Complexity of Contracts*, and *Pricing model* and are also presented in the summary of the analysis with a figure (figure 13).

The *ownership* challenge is rooted in the strong tradition of procuring products instead of services which previously has resulted in a less accepting attitude of services. Through the empirical findings however, a change in the attitude has been observed. The opinion that services to a higher degree belong amongst smaller corporations is starting to vanish. Becoming more used to buying services both in the professional and personal context is viewed as drivers of this development. Furthermore, the view of focusing on the core business competencies solely is pushing the acceptance of services.

Related to the changes in ownership is the increased importance of establishing both *control* and *trust*. As customers of servitized solutions are more prone to feel that they have less control over the service the increased need of control is likely to appear. The report indicates that there is a tradeoff between the move towards opex and the degree of control that the customer wishes to maintain. Regarding trust there is a need for focusing on values with both soft and hard characteristics. Compared to the literature, the importance of working with softer values is introduced by the respondents.

The *complexity of contracts* is an increasingly important matter that demands capabilities of designing contracts that adequately meets the requirement of the organization, both now and in the future. Especially in the DCaaS environment where technology developments are taking place very rapidly, there is a challenge in combining innovation and contracts successfully. Introducing a dynamic pricing model that is based on different output variables is identified as a way of mitigating the effects of static contracting.

Furthermore, constructing a *pricing model* that appropriately charges the customer according to their needs is highlighted as being very important to customers. A model that charges the customer no more than the amount that they need is an important factor for building trust and a fruitful long-term relationship. Further, including visibility into the model and thereby creating transparency is key to establish trust.



To summarize, once the customer can overcome the fear and resistance to change, a number of new possibilities are disclosed that before has been perceived as pains, but now can be regarded as gains.

## **5.1 Managerial Implications**

Due to the twofold objective of this thesis, it is contributing both to the academia and the business field. In terms of managerial implications, the major contribution of this thesis is the development of the understanding of the customer when a traditional manufacturer moves from a traditional business model towards a servitized one. As described by Rexfelt & Hiort af Ornäs (2009) this field is sparsely studied, also Meijkamp (2000) stresses that it is hard to generalize from similar empirical studies conducted in different fields. Due to this, the thesis provides managers in this field of business with an industry-specific research that can allow the transition from traditional business models towards servitization to be smoother. This thesis has also confirmed many general pains and barriers found in other industries. Mont (2004) and Ceschin (2013) claim that most pains can be derived from either economic- or socio-psychological factors. Based on this sectioning a number of the pains identified in this thesis are considered to be either economic- or socio-psychological factors. Hence this thesis verifies the sectioning that Mont (2004) and Ceschin (2013) presents for the data center industry. Also, by understanding this and the fact that one of the largest barrier for the customer is the very change can help managers to create “pain relievers” that facilitates the customer to accept the new business model.

## **5.2 Future Research**

As the research of the thesis is specifically dedicated towards identifying and investigating the pains of a servitized solution within the DCaaS context it would be of interest to continue the research in other parts of the theoretical framework to obtain a more comprehensive understanding. The methodology applied in the research could be viewed as a source of inspiration when continuing investigating the framework in a DCaaS context further. To further reinforce and strengthen the understanding it would be beneficial to look in to all of the remaining sections of the framework.

After having obtained an understanding of the Pains section in the Value Proposition Canvas it would be quite natural to look further in to the following section which is Pain Relievers. The Pain Relievers section investigates what actions or initiatives that should be taken to mitigate the effects of the Pains that have been discovered through the research conducted.

The same process could be repeated on the Gain and Gain Creators side to get a thorough and comprehensive understanding of what the customer views as an advantage or benefit that is created by using the servitized solution. With those key elements being researched a mutually exclusive and completely exhaustive picture can be obtained as all perspectives are being taken into consideration.

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## 7. APPENDIX

### 7.1 Interview Guide

#### Background

During the spring of 2018, as part of our Master Thesis course, we will look further in the servitization of Modular Data Centers. We aim to conduct interviews with relevant stakeholders to identify and research the possible pains of this offering and thereafter look further into pain relievers that help to solve the problems.

#### Swedish Modules & Purpose of the study

Swedish Modules wishes to take a servitization approach by moving further down in the value chain and by that have the possibility to deliver a modular data center as a service. Hence, all the services and the product will be bundled together which creates a new business model that is much more suitable for competing in the globalized arena. In this process, it is important for Swedish Modules to obtain a good understanding of its buyers' customer journey and needs to identify and understand which contact points are vital and thereby understand the pains for the customers.

- What does servitization mean to your business?
- How is your business model affected by servitization?

#### *What is a Pain?*

The Customer Pains explain and describe any aspect or step that aggravates the customer before, during, or after trying to carry out the activity that is intended. A pain could also include the actual prevention of being able of performing a job. Lastly, pains include the possibility or risk of potential negative outcomes where the job might be done poorly or not at all.

- **Ownership**  
In what way could the matter of ownership of the products and services affect the customer?
- **Discrepancy**  
In what way could the matter of the discrepancy between theory and reality of the products and services affect the customer?
- **Uncertainty of Value**  
In what way could the matter of uncertainty of the value of products and services affect the customer?  
  
Is there an uncertainty towards whether it is valuable for a customer to purchase a data center through a servitization business model?
- **Complexity of Contracts**  
In what way could the matter of complex contracts of the servitized offer affect the customer?  
  
How does the possible complexity affect how companies perceives servitization?
- **Trust**  
In what way could the matter of trust of the products and services affect the customer?  
  
How does a servitization business model affect the trust relationship between the producer and customer?
- **Control**  
The concept implies ownerless consumption which decreases the control of the resource. In what way could the matter of decreased control of the products and services affect the customer?

- **Co-Creation**  
Going from transaction based to relationship based.
- **Becoming Over-dependent on Supplier**  
In what way could the matter of developing an dependency of the products and services affect the customer?
- **Environment & Sustainability**  
In what way could the matter of lack of insight of the sustainability related to the products and services affect the customer?
- **Paradox of Choice**  
In what way could the matter of an over extensive range of options of the products and services affect the customer?
- **Fear of Open Source (Low knowledge about OCP in this case)**

**Other (Industry Specific)**

Based on the potential pains mentioned, do you see any other pains for the customer that can be a result of a servitized business model?

Out of all the discussed pains, is there one or a several ones that you regard as being of higher importance compared the others? Why?