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Customers' Willingness to Buy Services

- A qualitative multiple case study

*Master's Thesis in the Master's Programme
Management and Economics of Innovation*

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Abstract

Problem

Previous studies on services have focused on the perspective of the manufacturer and are based on the assumption that customers want to buy services from the manufacturer of the product. However, customers also buy services related to a product from third-party service providers or provide the services in-house. Therefore, it is of interest to study services from a customer perspective and the factors that determine how services are handled. This area has been largely ignored in previous studies.

The study was conducted in collaboration with a case company that develops and sells heat pump systems. The company had identified the customer segments, construction operators, module rental firms and property owners, beforehand, but wanted to gain additional insights into how to approach the customers and how to develop a profitable value proposition, i.e. how to package their offering in accordance with the customer demand.

Purpose

The purpose of this study is to analyze the factors that determine and influence customers' ways of handling their services.

Literature Review

A concept that captures the essence of the study of services is servitization. Although lacking a unanimous definition, there are common factors in the different definitions of servitization. The main difference is whether it describes a static or dynamic process. There are also other concepts related to servitization, but they all center around the idea of offering customers both products and services. Literature also describes various frameworks for classifying different services and degrees of servitization. In an attempt to reach consensus, a new product-service continuum is proposed. Moreover, different drivers for servitization, for both manufacturers (e.g. financial, strategic and innovation factors) and customers (e.g. focus on core business), are described. Here, the concepts outsourcing and backsourcing become relevant and insightful. Maintenance is a common form of service, and three types of maintenance management can be employed: run-to-failure management, preventive maintenance and predictive maintenance.

Methodology

Primary data was collected through semi-structured interviews and questionnaires, and secondary data was collected through browsing websites and databases. Ten interviews were conducted and 30 questionnaires were answered by customers and service providers. The customer segments examined consisted of construction operators, module rental firms and property owners, and their service providers consisted of machine rental firms, district heating suppliers and third party service providers. These actors were interviewed in a qualitative, multiple case study. The collected data was thematically analyzed based on the research questions.

Results

The results of this study show that customers within the same customer segment and customers across different customer segments handle their services differently. The way of handling services mainly depends on four factors: structural inertia, level of competence, cost/value-relation and risk aversion and control. It can also be concluded that the customers put limited emphasis into their choices of service provision, which can be due to the relatively low competition in the industry. Although services related to the product are not part of most customers' core business, it is still vital that the product functions properly. Therefore, it can be argued that the customers should reassess the services related to their heating systems. Proposals for future studies include examining under which circumstances in a firm's environment it is appropriate to buy more or less services, and validating the results of this study in other industries.

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1. Introduction

This chapter aims to present servitization and its development in literature. Then, a problematization of the purpose of the study is described, where a gap in current literature is presented. This gap has helped to form the purpose and research questions of the study.

1.1 Background

Traditionally, manufacturing firms develop and produce tangible products (Lay, 2014). In some cases, firms provided their customers with services such as maintenance and repair (ibid). These kinds of services have not played an important role in the strategies of the manufacturers (ibid). Limited focus on service development could be one reason for why most large manufacturers struggled during the 1990s despite long economic expansion and an extreme focus on improving productivity and quality (Wise and Baumgartner, 1999).

However, the customer focus has shifted from demanding pure products to the lowest price to demanding service (Vandermerwe and Rada, 1988). Customers now demand solutions in order for them to focus on their core competences (Sharma and Loh, 2009). Wise and Baumgartner (1999) noted that the traditional way of doing business by solely producing and selling products is not enough. Manufacturers must go downstream – towards the customers (ibid). Likewise, the goods that traditional manufacturers have been producing for decades are being replaced by bundles of products and services (Vandermerwe and Rada, 1988). Kastalli and Van Looy (2013) describe how manufacturing firms operate in an increasingly competitive, global world where products are easily commoditized, and that adding services to their core product offering has become a common strategy.

This shift of manufacturers becoming service providers has been described as “servitization” (Vandermerwe and Rada, 1988). Vandermerwe and Rada (ibid) first described servitization as a synonym for offering packages of combinations of goods, services, self-service and knowledge, with the largest emphasis on services. They regarded servitization as a powerful new feature of total market strategy that was being adopted by the most successful companies (Lay, 2014). However, Vandermerwe and Rada (1998) also described new challenges for top management, namely how to fit services into the overall strategies of the company.

Furthermore, since new competitors in emerging countries are catching up technologically to manufacturers in developed countries, the development of services can be used by manufacturers to gain a competitive advantage (Lay, 2014).

Initially, product-related services were mainly regarded as a way of reacting to changing customer needs and gathering important information from the customers (Lele and Karmarkar, 1983; DeBruicker and Summe, 1985). Consequently, many studies on servitization have focused on the transformational process of going from product-provider to solution-provider (Turunen, 2013). For example, Wise and Baumgartner (1999) describe the process of manufacturers moving downstream, Martin and Horne (1992) explain the move towards a service orientation, and Oliva and Kallenberg (2003) state the transition from offering products to offering services.

The benefits for the manufacturer to offer services to its customers are described excessively in literature. Baines and Lightfoot (2013) note that this strategy can improve customer relationships, create new and robust revenue streams and set high barriers for competitors. Other authors, such as Oliva and Kallenberg (2003), and Gebauer and Friedli (2005), state that the main drivers are financial, strategic and marketing. Lay (2014) states that offering more services can increase both product and service sales, and increase margins for the manufacturer.

Another main area in literature in regards to servitization is different levels of servitization (Baines et al., 2009a). Various authors have attempted to depict different levels of services along a product-service continuum (Frambach et al., 1997; Boyt and Harvey, 1997; Tukker, 2004; Baines and Lightfoot, 2013; Oliva and Kallenberg, 2003). For example, Boyt and Harvey (1997) divide services into elementary, intermediate and intricate services, and the level of service impacts the customer attention. Tukker (2004), on the other hand, categorizes services into product-oriented, use-oriented and result-oriented services with different degrees of customer interaction. Although the components in these frameworks differ, they all focus on the manufacturer's perspective. That is, what kinds of services can be *offered* from the *manufacturer*, not what kinds of services are *demand*ed by the *customer*.

1.2 Problematization

Despite extensive literature on servitization, this focus on the manufacturer is a general theme, and there is a lack of literature in studying servitization from a customer perspective (Rexfelt and Hiort af Ornäs, 2009). When it comes to the customer, previous studies assume that customers demand services from the manufacturer and have conducted their research based on that assumption. However, it is likely that customers do not demand services from the manufacturing firm. Instead, the customer may provide services related to a product in-house or buy services from a third party service firm. This aspect has yet to be taken into account in previous studies on servitization.

Therefore, it is important to understand what factors that determine a customer's willingness to provide services in-house or to buy services from a manufacturing firm or from a third party service provider. As noted, previous studies assume only one of the three possibilities - the customer wants to buy services from the manufacturer of the product. As a result, further studies on the customer's perspective and their demands related to services may help managers, in both third party service firms and in manufacturing firms, to provide the right service offerings and value propositions for their customers. From an academic perspective, this study aims to provide an insight in an area which previously has been largely ignored.

1.3 Empirical setting

The sales on the Swedish heat pump market has been slowly decreasing during recent years (Auderis, 2017), and can thus be argued to be positioned in late maturity or decline phase (Tukker and Tischner, 2006). According to literature regarding industry life-cycles, declining markets are not subjected to many product or process innovations (Tukker and Tischner, 2006). This makes it difficult for companies to compete on differentiation by selling a premium product with improved performance or functionality. Hence, being competitive on a market such as this requires other measures, one being strategic innovation. Strategic innovation is about finding a new approach to doing business where new business models are included, and can be a key source of competitive advantage (Grant, 2010). It typically involves the creation of value for customers from new products, experiences or ways of delivering the product (ibid).

Traditionally, heat pumps are sold through authorized resellers who also help with installation of the equipment. The growth company (noted Company X) develops and sells water/air-heat pump systems. It was founded in 2009 and is present in Sweden and abroad. It employs 15 people in Sweden, Norway, Poland and Holland. Company X has now taken a strategic decision to enter a new market with a newly developed product where it seeks to sell it B2B instead of B2C. Its aim is to start an expansion in Sweden and thereafter focus on foreign markets. Company X now wants to examine the possibilities of offering a new business model where they will sell or rent out their heat pumps in a new, innovative modular configuration. Its three target segments are customers in need for temporary heat provision, semi-permanent heat provision and permanent heat provision.

The aim with the market entry is to gain additional revenue and increase its profitability in these new segments. At this moment, Company X is not certain about how the product should be packaged, if it is most appropriate and profitable to sell or rent out the product, and what level of service the customers demand. An additional and interesting option for its strategic innovation is to enhance the service offering for the offered product. Adding services to the product offering might increase the profitability if seen as value-adding by the customer (Vargo and Lusch, 2004). To understand the feasibility of this option the authors have decided to examine what factors that affect customers' willingness to accept services.

1.4 Purpose and Research Questions

The purpose of this study is to analyze the factors that determine and influence customers' ways of handling their services. This will be conducted by answering the following research questions:

1. What factors influence the customer's willingness to buy services?

Previous studies on services, and more specifically servitization, have focused on the manufacturer's perspective and have assumed that there is a customer demand for services. This has led to ignored or incomplete research on the customer's perspective on services. It is therefore of interest to analyze which internal and external factors that influence the customer's willingness to buy services or not.

2. How do these factors impact the level of servitization?

In the product-service continuum, customers may demand solely the product, an integrated solution or anything in between. The factors can impact the customer demand of services, which moves the activity towards the product or towards the integrated solution in the continuum. It is consequently interesting to see how the identified factors impact the level of servitization. In this report, the term “level of servitization” will be used to describe a customer’s demand for buying more or less services.

3. How and why does the level of servitization differ between customers and customer segments?

The results could show that there are disparities in demand of services between different customer segments and between different customers within the same customer segment. These differences could be due to both to external and internal factors. In order to more thoroughly understand customer’s view of services, and more specifically various levels of servitization, it is interesting to examine the reasons and motivations that determine what services customers want to perform themselves and what services they want another party to do for them, and the differences between customers.

1.5 Limitations

The in-person interviews were only conducted in the Gothenburg area due to time restrictions. Furthermore, not all parties that were asked for an interview were able to participate, which limited the number of interviews. A higher number of interviews would have been preferred in order to validate the findings.

2. Literature review

The literature review aims to highlight the area of servitization. It starts by describing various definitions of the concept “servitization” in an attempt to reach consensus of a definition that is to be used in this study. Since servitization is often confused with other similar concepts, it is compared with related concepts in order to arrive at a concept that is to be used in the rest of the study.

Since servitization includes products and services, the differences between the two are described. This is important when describing various frameworks classifying the degrees of servitization. Finally, because many studies about servitization take the manufacturer’s perspective, where it is often assumed that there is a demand for services from the customers, the drivers of servitization will be described from the perspective of both the manufacturer and the customer. Therefore, literature on outsourcing and backsourcing will be provided to gain valuable insights from a customer perspective. This approach may help in identifying the factors influencing a customer’s willingness to buy services. Maintenance is a common form of service and is consequently described.

2.1 Defining Servitization

Despite excessive literature on servitization, Kowalkowski et al. (2017) report that little progress has been made toward agreeing on the core paradigm. Essentially, service concepts refer to processes, offerings and practices (ibid). Different definitions of servitization are presented in Table 1 below.

Kowalkowski et al. (2017) define servitization as “the transformational process of shifting from a product-centric business model and logic to a service-centric approach” (p. 7). As such, a redeployment and reconfiguration of a company’s resources and organizational capabilities and structures is involved in servitization to varying degrees (Baines et al., 2009a). With a service business model, the supplier gets greater responsibility in creating value compared to the product-focused, transaction-based business model (Kowalkowski et al., 2017).

Vandermerwe and Rada (1988) define servitization as “fuller market packages or “bundles” of customer-focussed combinations of goods, services, support, self-service, and knowledge” (p. 314). The authors describe three development phases of servitization. First, companies offered goods or services. Second, companies offered goods and services. Third, companies now offer goods, services, support, knowledge and self service. Further, they describe servitization as a customer-driven process where the emphasis is on establishing and maintaining a relationship between firm and customer through broader offerings. This means that firms move further down the distribution chain giving more attention to the end-users by understanding their problems and provide services to create demand. (Vandermerwe and Rada, 1988)

Verstrepen and van Den Berg (1999) define servitization as “adding extra service components to core products” (p. 539). The authors mean that servitization can be used to overcome the threats of saturated markets, global competition and technological advancements which have resulted in declining profit margins and growing customer disloyalty. Turunen (2013) defines the concept in a related way – “the transition process of adding services into a goods-based offering” (p. 6) – and highlights the importance of the firm-customer relationship. A similar definition is provided by Lindberg and Nordin (2008) - “firms move from manufacturing goods to providing services or integrating products and services into solutions or functions” (p. 292) – as they analyze the buying process of complex services. Pawar et al. (2009) also highlight the transition from offering products to offering services, and define servitization as “a transition from an emphasis on the manufacture of products to the provision of service” (p. 469).

Robinson et al. (2002) describe servitization as “an integrated bundle consisting of both the goods and the services” (p. 150). They conclude that managers should not separate products from services, but instead regard them together as a total offering. Along the same line, Brax (2005) defines the term “services can be bundled with the tangible product to add value to the (often tangible) core offering” (p.145) as the author describes the challenges of becoming a service provider. Åhlström and Nordin (2008) analyzed servitization from a different perspective by identifying potential problem areas that may arise when establishing service supply relationships. Here, servitization is defined as “establish service supply relationships to deliver product services to augment their physical products” (ibid, p. 77).

Slack (2005), on the other hand, defines servitization somewhat differently: “the generic (if somewhat unattractive) term that has come to mean any strategy that seeks to change the way in which product functionality is delivered to its markets” (p. 326). The boundary between products and services is blurred due to companies’ willingness to grow or protect their profitability, and moving to offering services can help firms to stay competitive (ibid). However, Slack (ibid) also highlights the importance of integrating individual processes, such as manufacturing systems, maintenance systems and logistics systems, in order to make the transition successful.

Author(s)	Definition of Servitization
Vandermerwe and Rada (1988)	“fuller market packages or “bundles” of customer-focussed combinations of goods, services, support, self-service, and knowledge”
Verstrepen and van Den Berg (1999)	“adding extra service components to core products”
Robinson et al. (2002)	“an integrated bundle consisting of both the goods and the services”
Brax (2005)	“services can be bundled with the tangible product to add value to the (often tangible) core offering”
Slack (2005)	“the generic (if somewhat unattractive) term that has come to mean any strategy that seeks to change the way in which product functionality is delivered to its markets”
Lindberg and Nordin (2008)	“firms move from manufacturing goods to providing services or integrating products and services into solutions or functions”
Åhlström and Nordin (2008)	“establish service supply relationships to deliver product services to augment their physical products”
Pawar et al. (2009)	“a transition from an emphasis on the manufacture of products to the provision of service”
Turunen (2013)	“the transition process of adding services into a goods-based offering”
Kowalkowski et al. (2017)	“the transformational process of shifting from a product-centric business model and logic to a service-centric approach”

Table 1. Definitions of Servitization.

Conclusion

From the definitions above, two different views on the meaning of servitization can be seen. The first view describes a fairly static firm that offers products and related services, such as

“an integrated bundle consisting of both the goods and the services” (Robinson, 2002, p. 150). The other view describes servitization as a transformational process from offering products to offering products and related services.

However, neither of these views is optimal for this study. This study aims at describing a customer’s perspective on services, while the aforementioned definitions focus on the manufacturer. This means that a new definition of servitization has to be formed in order to capture the customer perspective: *Servitization is a customer’s willingness to accept services from a product supplier*. A product supplier ensures that the product is delivered to the customer and is the actor closest to the customer in the value chain. This means that a product supplier could be, for example, a manufacturer or a reseller. However, since previous research has focused on the manufacturer perspective, the following literature review undertakes this focus.

2.2 The Differences between Servitization and Related Concepts

Kowalkowski et al. (2017) conclude that the terms “servitization”, “service infusion” and “service transition” are similar. Brax (2005) uses the term “service infusion” as she describes the challenges of becoming a service provider. These challenges include marketing, production, product-design, communication and relationship challenges (ibid). Moreover, service infusion often includes taking larger steps moving from offering transactional, commoditized products to service and solution provision (Kowalkowski et al, 2012). However, in order to become a successful service provider, continuous modifications and adaptability, and being able to manage different goals are needed (ibid).

Fang et al., (2008) argue that firms must undertake a service transition strategy by shifting from a “goods-centered paradigm to a service-centered view” (p. 1) in order to compete in the future. The authors conclude that a firm, which initiates such a strategy, often starts with low levels of services, but gradually move to offering higher levels of services. Undertaking a service transition strategy, thereby offering more services, results in benefits such as increased customer loyalty, enhanced pricing power and improved resistance to outsourcing (ibid). This strategy can make a company’s total offering more unique, which makes it more

difficult to imitate and valuable to customers (Vargo and Lusch, 2004). This initiative should therefore result in higher and more stable profits (ibid).

Another overlap in literature is between the concepts of servitization and product-service system (PSS) concepts (Baines et al., 2009a). Both concepts can add potential value to manufacturers since they make companies move up the value chain and exploit more valuable business activities (Baines et al., 2007). Also, many of the principles of servitization and PSS are identical (ibid). Baines et al. (2007) state that one reason for the concepts' differences is that they come from different countries of different research communities and with different motivations. As a result, one of the differences between the concepts is their different focus on sustainability, which is emphasized in PSS literature but not in servitization literature (ibid). However, both concepts conclude that manufacturers should focus on selling integrated solutions or PSS (ibid).

Baines et al. (2009b) make another effort to separate servitization from PSS. PSS is a market proposition that adds additional services to a product (ibid). However, PSS emphasizes product *use* instead of product *sale*. In other words, with PSS, the customer does not necessarily own the product. PSS is a form of servitization, which adds value through utilization rather than ownership (Baines et al., 2007). It differentiates by integrating products and services that provide value in use to the customer (ibid). Consequently, Baines et al. (2009a) provide a perspective of the relationship between servitization and PSS, and define servitization as “the innovation of an organization’s capabilities and processes to better create mutual value through a shift from selling product to selling PSS” (p. 555).

Another concept similar to servitization is hybrid offering, which is defined as “one or more goods and one or more services, creating more customer benefits than if the good and service were available separately” (Ulaga and Reinartz, 2011). Ulaga and Reinartz (ibid) describe that traditional manufacturer have moved from offering products to hybrid offerings due to increased competition and the potential to grow their revenues. This has also shifted the firm’s focus from a goods-dominant to a service-dominant logic (ibid). As such, hybrid offering is similar to some of the static definitions of servitization described above, e.g. “an integrated bundle consisting of both the goods and the services” (Robinson et al., 2002, p. 150).

Conclusion

The terms “service infusion”, “service transition”, “PSS” and “hybrid offering” are similar to “servitization”. Service infusion, service transition and servitization all refer to describing adding services to a business’ processes (Kowalkowski et al., 2017). Kryvinska et al. (2014) note that servitization and PSS handle “exactly the same topic” (p. 254). The meaning of hybrid offering can be considered as one of the static definitions of servitization. Many studies use these concepts interchangeably, but for the purpose of simplicity, only the term “servitization” will be used in this paper.

2.3 Degrees of Servitization

Baines et al. (2009a) state that there are different forms of servitization and that the features are different for each. There is a “product-service continuum” (ibid, p. 556), which ranges from a traditional manufacturer offering services as add-on to their products to service providers offering services as the main part for creating value (ibid). In this study, five of these frameworks are provided. They describe different types of services, and consequently various product-service continuums.

Before discussing various frameworks of product-service continuums, however, a distinction between a product and a service needs to be made. Grönroos (2001) states that services are about processes, not things. While product providers offer tangible products, service firms rely on a governing system that puts resources, such as employees, technology and customers, to use when the customer requests a service (ibid). Another main difference between goods and services is that the results of the services cannot be fully evaluated in advance (Thomas, 1978), which means that the customer must trust the reputation of the service provider (Edvardsson et al., 2000).

The most widely accepted characteristics of services, which also describes the differences between a product and a service, are intangibility, inseparability, variability and perishability (Kotler, 2003). *Intangibility* means that services are activities and not physical objects, which means that they cannot be seen, felt, tasted or touched before they are purchased (ibid). One cannot set a uniform quality specification on services because they are performances rather than objects (Zeithaml, 1981). Likewise, it is impossible to count, measure, test or verify the quality of the service before the purchase (ibid). Therefore, firms may find it difficult to

understand how consumers perceive and evaluate services (ibid). *Inseparability* denotes that services are typically produced and consumed at the same time (Kotler, 2003). Therefore, they differ from products, which are manufactured and consumed at different stages (ibid). Edvardsson et al. (2005) argue that this inseparability of production and consumption brings uncertainty since it poses challenges in, for example, quality assurance and quality control. *Variability* describes that services are variable because they depend on how they are provided (Kotler, 2003). Quality control, which can be achieved through recruiting the right personnel, standardizing the service and monitoring the customer satisfaction, then becomes crucial for service firms (ibid). *Perishability* denotes that services cannot be stored, which can cause problems for the service firm when the demand fluctuates (ibid).

Pre-sale Product – Sale Product – Post-sale Product

Frambach et al. (1997) separate between services offered before, during and after the sale of the related product. “Pre-sale product services” aim to support the buyer in the purchase decision and to stimulate the adoption of the product. These services include demonstrating the product and offering trials. “Sale product services” are designed to help the customer use the product, which includes installation and training. “Post-sale product services” ensure that the customer is satisfied with the purchase, and includes failure handling and regular maintenance inspections. (ibid)

Elementary – Intermediate – Intricate

Boyt and Harvey (1997) state that services can be classified in accordance with six characteristics: “replacement rate”, “essentiality”, “risk level”, “complexity”, “personal delivery” and “credence properties”. Replacement rate refers to the frequency of need for the service to the customer. Essentiality is the necessity of the service relative to the product, which means that there is a high essentiality if a product cannot properly function without regular service. The risk level is associated with the failure of the service provided and the resulting impact on the customer’s operations. Complexity refers to the level of training and difficulty related to providing the service to the customer. Personal delivery is whether the service has to be delivered in-person by the service provider. Credence properties refer to the difficulty of understanding or evaluating the product or service. This means that if the credence properties of the service are high, the customer is less likely to understand the quality of the service. (ibid)

These characteristics are indicators that determine the classification of services into “elementary service”, “intermediate service” or “intricate service” (Boyt and Harvey, 1997) as shown in Table 2. Elementary services are those related to the frequently purchased products that are not essential to the customer’s primary functions, have low complexity and do not require formalized service providers. Intermediate services require more services, which means that the provider must be more directly involved in supplying the service. Intricate services require close customer attention, they are highly complex and have low replacement rate. They are high risk because it is of great importance to select the appropriate service provider and the impact that can result from service failure. (ibid)

Service Characteristics	Elementary Service	Intermediate Service	Intricate Service
Replacement rate	High	Medium	Low
Essentiality	Low	Medium	High
Complexity	Low	Medium	High
Personal delivery	Low	Medium	High
Credence properties	Low	Medium	High

Table 2. Classification of industrial services according to Boyt and Harvey (1997).

Product-oriented – Use-oriented – Result-oriented

Tukker (2004) makes a third distinction between three main categories of product-service systems, ranging from pure product to pure service. The first category is “product-oriented services”, and, here, the provider sells the product and offers services that are needed during the utilization of the product. This type of service includes maintenance contract, consulting and take-back agreement at the end of the product lifecycle. The second category is “use-oriented services”. Here, the provider has the ownership, and is often responsible for maintenance, repair and control. The firm pays a regular fee to the provider for the use of the product. In the third category, “result-oriented services”, is the most advanced service type. Here, a part of an activity is outsourced to a third party. The user does not buy the product, only the output of the product according to the usage. (ibid)

Base – Intermediate - Advanced

Baines and Lightfoot (2013) distinguish between services by dividing customers in three categories: (1) “customers who want to do it themselves” (p. 4), (2) “customers who want us to do it with them” (p. 4), and (3) “customers who want us to do it for them” (p. 4). The

customers “who want to do it themselves” (p. 4) are offered “base services”. They own and repair products themselves in their own facilities, and only rely on the manufacturer to deliver the product and spare parts. This means that the customer gains access to the equipment. The customers “who want us to do it with them” (p. 4) are offered “intermediate services”. These customers do some of the maintenance themselves, but let the manufacturer do more important repair. This means that the outcome of intermediate services is a reassurance that the equipment is maintained properly. (ibid)

The third level, “advanced services” (“customers who want us to do it for them”) is more complex (Baines and Lightfoot, 2013). Here, the focus is on the consequences of the equipment’s performance. The customers will contract the use of the product, and let the manufacturer take care of everything else. The different types of services are described in Table 3.

Type	Definition
Base services	“An outcome focused on product provision” (p. 5)
Intermediate services	“An outcome focused on maintenance of product condition” (p. 5)
Advanced services	“An outcome focused on capability delivered through performance of the product” (p. 5)

Table 3. Classification of product-services offered by a manufacturer according to Baines and Lightfoot (2013).

Basic – Maintenance – Professional – Operational

Oliva and Kallenberg (2003) argue that the expansion of the service offering occurs through two transformations (see Figure 1). The first transition is from transaction- to relationship-based customer interactions. This could mean that companies move from paying for a service every time it is provided to instead paying a fixed price covering all services over an agreed time-period. Service providers are advised to base the pricing of their services on equipment availability, and not on their cost of monitoring the equipment and performing scheduled maintenance, which requires the service provider to assume the equipment’s operating risk. (ibid)

The second transition focuses on the product’s efficiency and effectiveness within the end-user’s process, and moves from product-oriented services to end-user’ process-oriented services. The transition means that product becomes a part of the offering instead of being the center of the value proposition. This results in shifting the focus from being a machine

manufacturer to being a solution provider and developing services to support and continuously improve the utilization of the installed base. Here, firms provide services over its complete life-cycle instead of only services required for the installation and commissioning of the product. (Oliva and Kallenberg, 2003)

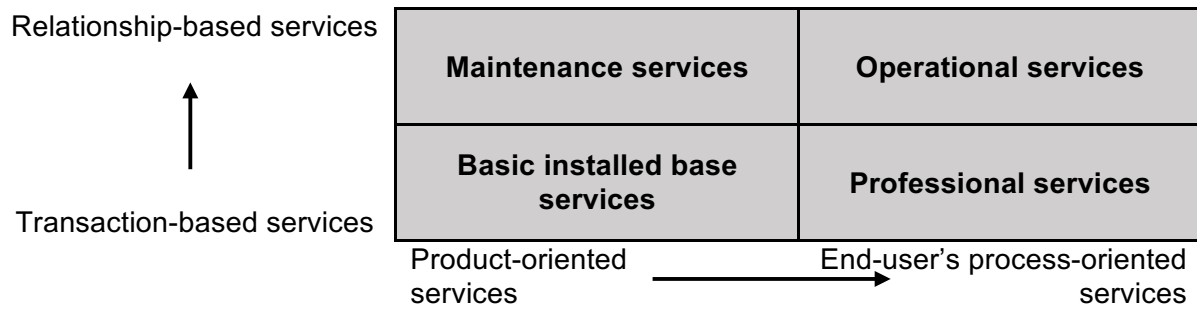


Figure 1. Classification of services. Adapted from Oliva and Kallenberg (2003).

Conclusion

The product-service continuum used in this study (see Figure 2) is based on some of the frameworks described above. As shown in the empirical findings, some customers only required the product itself from the product supplier, which makes the lowest level of services described in every framework above irrelevant since they all include some kind of service and not solely the product. Therefore, the model used in this study, the customer only pays for the product and is therefore responsible for all services associated with the product at the most basic level. At the other side of the continuum, the service provider takes over the customer's operations. This means that this level will be related to the most advanced levels of services from some of the frameworks described above. Oliva and Kallenberg (2003) call it "operational services", Baines and Lightfoot (2013) call it "advanced services", Tukker (2004) calls it "result-oriented services" and Boyt and Harvey (1997) call it "intricate services". This highest level of service could mean that the customer does not even own the product, but only pays for its output, and will be denoted "integrated solution". Between these two end-points are all kinds of services offered to the customers.

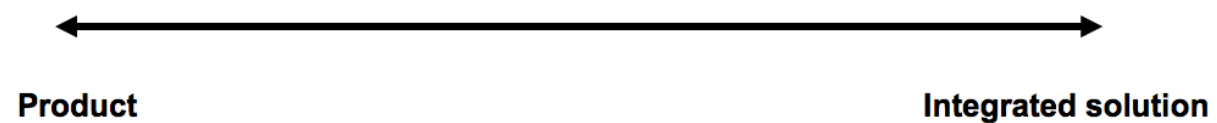


Figure 2. The product-service continuum used in this study.

2.4 Drivers of servitization

The drivers of servitization can be divided into the benefits for the manufacturer and the customer respectively. Literature on the drivers from a manufacturer's perspective is extended while the benefits from a customer's perspective is limited. The motivations for a manufacturer to move into more servitized offerings are described using two different perspectives of main arguments. The first perspective is divided into financial, strategic and marketing drivers while the second perspective consists of growth, profit and innovation rationales. When looking into the drivers from a customer perspective, outsourcing and back sourcing become important aspects since they are related to servitization (Viitamo et al., 2016). From a customer's point of view, research on the benefits of outsourcing is more extended than it is on servitization, which often emphasizes the manufacturer's perspective.

2.4.1 Drivers of Servitization for Manufacturers

Mathe and Shapiro (1993), Mathieu (2001), Oliva and Kallenberg (2003), Gebauer and Friedli (2005), Gebauer et al. (2006), Gebauer and Flesich (2007) and Baines et al. (2009a) state that the main drivers of servitization for manufacturers are financial, strategic and marketing. Lay (2014), on the other hand, identifies three other, yet similar, main drivers from extensive literature research: growth, profit and innovation.

Financial, Strategic and Marketing

Often mentioned financial drivers are higher profit margin and stability of income (Wise and Baumgartner, 1999; Gebauer and Friedli, 2005). Slack (2005), and Wise and Baumgartner (1999) agree that higher revenue potential exist from adding services in some sectors of high-installed product bases. There are identified companies that have been successful by this approach, which managed to achieve stable revenues from services despite sales declines (Sawhney et al., 2004). The increased life-cycles of many modern, complex products (e.g. aircrafts) push significant revenues downstream in the value-chain towards in-service support (Ward and Graves, 2007). Malleret (2006) argues that these product-service combinations usually are less price sensitive, and therefore tends to be more profitable than selling the physical product alone (Frambach et al, 1997). Furthermore, product-service sales tend to be more resistant to economic cycles (Oliva and Kallenberg, 2003; Gebauer and Fleisch, 2007).

This helps to secure a more regular income on mature markets despite unfavorable economic cycles (Brax, 2005; Malleret, 2006).

The strategic drivers referred to in the literature mainly concern gaining competitive advantage. Service elements are used to differentiate the offerings and thereby competitive opportunities (Frambach et al., 1997; Mathieu, 2001; Gebauer and Fleisch, 2007). The sustainability of competitive advantages obtained through services are often better since they are less visible and labor-intensive, which make them difficult to imitate (Oliva and Kallenberg, 2003; Gebauer and Friedli, 2005; Gebauer et al., 2006). Many authors also reflect on the difficulties of pursuing a differentiation strategy based on product innovations, technological superiority or low prices in commoditized markets (Coyne, 1989; Frambach et al., 1997; Mathieu, 2001; Gebauer and Fleisch, 2007). Services can enhance the customer value (Frambach et al., 1997).

Using services as a way of selling more products is seen as the marketing driver (Mathe and Shapiro, 1993; Gebauer et al., 2006; Gebauer and Fleisch, 2007). It is well known that adding services influences the purchasing decision (Mathieu, 2001; Gebauer and Fleisch, 2007), especially in industrial markets where customers demand more services (Vandermerwe and Rada, 1988; Oliva and Kallenberg, 2003; Auramo and Ala-risku, 2005; Slack, 2005). This demand of outsourcing services comes from pressures to create more flexible firms with narrower core competences and higher technological complexity (Lewis et al., 2004; Auramo and Ala-risku, 2005; Slack, 2005). Services create customer loyalty, which can make the customer dependent on the supplier (Vandermerwe and Rada, 1988; Corrêa et al., 2007). Mathieu (2001) and Malleret (2006) further state that using services might lead to repeat-sale and puts the supplier in a favorable position to offer other products and services by the intensified contact opportunities.

Growth, Profit and Innovation

Growth can be achieved by stimulating product sales and by selling additional services, which can be fostered by gaining competitive advantages with services and by differentiation in mature markets (Lay, 2014). Vandermerwe and Rada (1988) describe that this can be fostered for companies by developing services to create and keep customers, and consequently sustain a competitive advantage. Furthermore, Frambach et al. (1997) argue that

because most products are physically comparable, the only way to achieve differentiation is through adding services to the tangible product as they enhance the value of the product to its users. Oliva and Kallenberg (2003) agree with the aforementioned authors and state that services are less visible and more labor dependent than products and therefore are more difficult to imitate, which can make them a sustainable source of competitive advantage. In conclusion, firms can gain a competitive advantage and differentiate through services by setting barriers for competitors' entry, protecting against imitation and helping to diffuse innovative products (Lay, 2014).

Profits from services can be achieved by increasing margins (Frambach et al., 1997). Lay (2014) argues that services can help to “(1) increase capacity utilization and therefore increase overall margins, (2) open up service markets with traditionally superior margins compared with product markets and (3) avoid price competition in markets for mature products” (p. 5). Furthermore, profits can also be stabilized by services (ibid). Mathieu (2001) states that offering services can be a way to smooth capacity utilizations when product sales are decreasing, and thereby lowering the company's vulnerability.

Studies on the innovation aspect is limited (Lay, 2014). Frambach et al. (1997) conclude that services can help to create sustainable customer relations. The solution provider can satisfy the customer by offering different services during different stages of the relationship (ibid). This can result in a closer relationship between the provider and the customer, which allows for additional transactions and the ability to customize the products (ibid). Learning more about the customer's demand can be used to foster technology innovation (Lay, 2014). In this respect, services can be used as a source of information and form a feedback loop for product development (Brax and Jonsson, 2009). These drivers are illustrated in Figure 3 below.

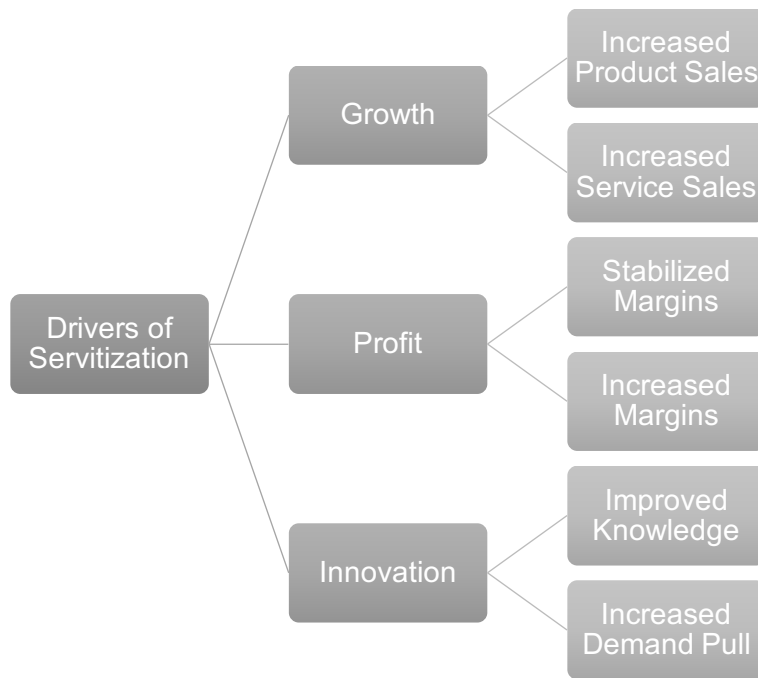


Figure 3. The drivers of servitization. Adapted from Lay (2014).

2.4.2 Drivers of Servitization for Customers

Mont (2002) states that customers can benefit from servitization due to greater diversity of choices in the market, such as different services, various payment schemes and different ways of using the product that suits the customer in terms of ownership. It is through more customized offers of a higher quality that customers receive added value, both in terms of the product/service itself and the delivery of the service (ibid). Tukker and Tischner (2006) emphasize that customization is part of the value proposition since servitization enables the combination of product and service elements. The service component, which is flexible by nature, can easily create new combinations of services and products, and therefore better respond to changing needs and conditions (Mont, 2002).

An important characteristic of servitization is its strong customer focus. The customer should be offered a solution to a specific problem and not merely a product (Baines et al., 2007). Marketing literature brings forward the common understanding that customers are looking for a function or simply getting a job done, rather than buying a product (ibid). Mont (2002) states that one of the benefits with servitization for customers is the relief of responsibility from avoiding the ownership of a product. Isaksson, Larsson and Rönnbäck (2009) also argue that lower responsibility for product lifecycle can be valued and a guarantee of functionality. However, some consumers are not willing to consume without owning the product (Baines et

al., 2007; Mont, 2002). The common perception that customers are more interested in a function rather than the ownership and the product itself is not represented in reality (Mont, 2002).

Rexfelt and Hiort af Ornäs (2009) state that customers may experience uncertainty in the decision-making process of purchasing services. There are uncertainties in understanding the offering and predicting the potential consequences and risks, which may lead to the customer not buying the services (ibid). Another reason for wanting to own the service in-house could be a sense of freedom connected to ownership (Littig, 2000). Conversely, ownerless consumption may also result in a sense of freedom for the customer who is then able to experiment with the product before deciding on whether to keep the product or not (Armstrong et al., 2015). However, this increased sense of freedom does not seem to outweigh the perceived loss of freedom for the customer (Rexfelt and Hiort af Ornäs, 2009).

Outsourcing

Outsourcing is defined as “the operation of shifting a transaction previously governed internally to an external supplier through a long-term contract, and involving the transfer of staff to the vendor” (Quélin and Duhamel, 2003, p. 648). There are many drivers and benefits for a firm to outsource. From an operational perspective, outsourcing can improve the return on capital employed (ROCE) through specialization and utilization (Viitamo et al., 2016). This results in reduced customer assets such as inventories and equipment (ibid). Furthermore, outsourcing can help the customers to focus on their core activities, and more quickly and efficiently respond to demand variations (ibid). Quélin and Duhamel (2003) state that increased specialization can be achieved through factors such as increased learning and shared experiences.

Other drivers of outsourcing include cost reduction, greater focus on core activities and accessing foreign markets (Sharma and Loh, 2009). Narasimhan, Narayanan and Srinivasan (2010) also highlight that due to intense competition between firms and increasing customer demands, companies must turn to outsourcing as a strategy to acquire the needed capabilities. Outsourcing can achieve faster time to market by acquiring technical capabilities and increase internal capabilities by allocating resources to more value-added activities (ibid). Moreover, Quinn (2000) states that firms can gain innovation capabilities through outsourcing due to

increases in customer demand and improved communication capabilities. In order to make the outsourcing process successful, the implemented practices need to fit with the environment in which they are implemented (Narasimhan, Narayanan and Srinivasan; 2010). Therefore, the relationship between the two parties are important (ibid).

Brandes, Lilliecreutz and Brege (1997) agree with aforementioned authors and state that a clearer focus on core competence and cost reductions are driving forces of outsourcing, but they also identify financial problems as a potential factor. Companies with financial problems need to find ways to slim down their business and consequently must release some resources to external parties (ibid). Furthermore, risks can be mitigated by sharing or shifting them between the firm and the provider (Brax and Jonsson, 2009). Many of the firms interviewed in Brax's and Jonsson's (2009) study valued risk reduction over cutting costs.

Jenster (2005) highlights that outsourcing can help firms to reduce hassles and free up management time to focus on strategic issues. Outsourcing can be used to solve skills shortages for both vacancies and for areas in which there is constant pressure because of technological development and great demand for external parties with the necessary skills and expertise (ibid). Furthermore, outsourcing can help to free up the firm's resources for relocation to other business areas (ibid).

Backsourcing

Backsourcing is "the reversal of existing outsourcing strategy and returning to the previously abandoned internal service provisioning strategy" (Wong, 2008, p. 103). Backsourcing can be motivated by changed circumstances or that the outsourcing agreement did not turn out as expected (Veltri et al., 2008). Another common reason for backsourcing is that the costs of outsourcing are often higher than expected (ibid). Other factors that foster backsourcing include poor service quality, know-how mismatch, changes in executive management and external business changes, such as mergers and acquisitions (ibid). Veltri et al. (ibid) also state that loss of control is a reason to backsource. In order to prevent loss of control, firms should not outsource critical success factors that are necessary for the success of the company, because of the difficulties to capitalizing on and adapting to new business opportunities (ibid).

Bhagwatwar et al. (2011) and Wong (2008) state that back-sourcing requires significant efforts by the firm to bring back previously outsourced activities. Back-sourcing requires knowledge transfer (Argote and Ingram, 2000) and re-integration of expertise, skills and knowledge into the firm that may have been lost during outsourcing (Ejodame and Oshri, 2017). Ejodame and Oshri (ibid) mean that re-acquiring the necessary skills and competencies is challenging since previous outsourcing agreements resulted in that physical and human assets left the firm with limited or no capabilities in the specific area. This means that recruiting new personnel to ensure a high level of service can be problematic (ibid). Furthermore, employees often have negative perceptions towards management during and after outsourcing, and that could lead to additional challenges to back-sourcing, including improving employee morale after potential job losses (ibid).

2.5 Maintenance

Mobley (2002) states that maintenance is generally managed ineffectively because of lack of data that can help to determine the actual demand of a service. There are three types of maintenance management that can be employed by a company: (1) run-to-failure management, (2) preventive maintenance, and (3) predictive maintenance. Run-to-failure management implies that something is fixed only after it breaks down, which means that a firm adopting this strategy only spends money on maintenance when a machine or system fails to operate. This form of maintenance management is associated with costs related to high spare parts inventory cost, high overtime labor cost and high machine downtime. In order to minimize the impact of machine failures, maintenance personnel must be able to react immediately to the failures. (Mobley, 2002)

Preventive maintenance, on the other hand, is time-driven, which means that maintenance activities are based on elapsed time or hours of operation. A risk with this form of maintenance is that service activities are performed even though the system does not necessarily need it, which can result in high costs. However, preventive maintenance is a third of the cost of run-to-failure management. Predictive maintenance means regular monitoring of the system. It includes that it can be predicted when a system is in need of maintenance. Predictive maintenance uses direct monitoring to determine the actual mean-time-to-failure, which lowers the cost of maintenance. (Mobley, 2002)

3. Methodology

The structure and phases of research depends on the methodology chosen (Jacobsen, Sandin and Hellström, 2002). According to Jacobsen et al. (ibid), a qualitative approach enables more flexibility in the study and can better respond to unexpected impulses, which is useful in an explorative research such as this. Furthermore, a qualitative approach is more suitable for examining perceptions and phenomenon that cannot easily be measured (Wallén, 1996). Based on the nature of this study, a qualitative approach was chosen as the methodology for collecting data to gain new insights and bring a more nuanced picture of the topic.

A case study is preferable to examine a certain phenomenon with the purpose of understanding a context (Collis and Hussey, 2009). This study aimed at analyzing customers' perspective on services, and therefore, a large number of companies was studied. These companies were compared in order to gain additional knowledge and to draw conclusions. A combination of a qualitative approach and comparative design is described as a multiple case study (Bryman, 2013). Each company or individual had either a connection to Company X or one of the identified customer segments. This study was based on a combination of deductive and inductive reasoning, which is appropriate in multiple case studies (Patel and Davidsson, 2003; Bryman, 2013). The research investigation of the study (see Figure 4) was based on the following, overlapping phases:

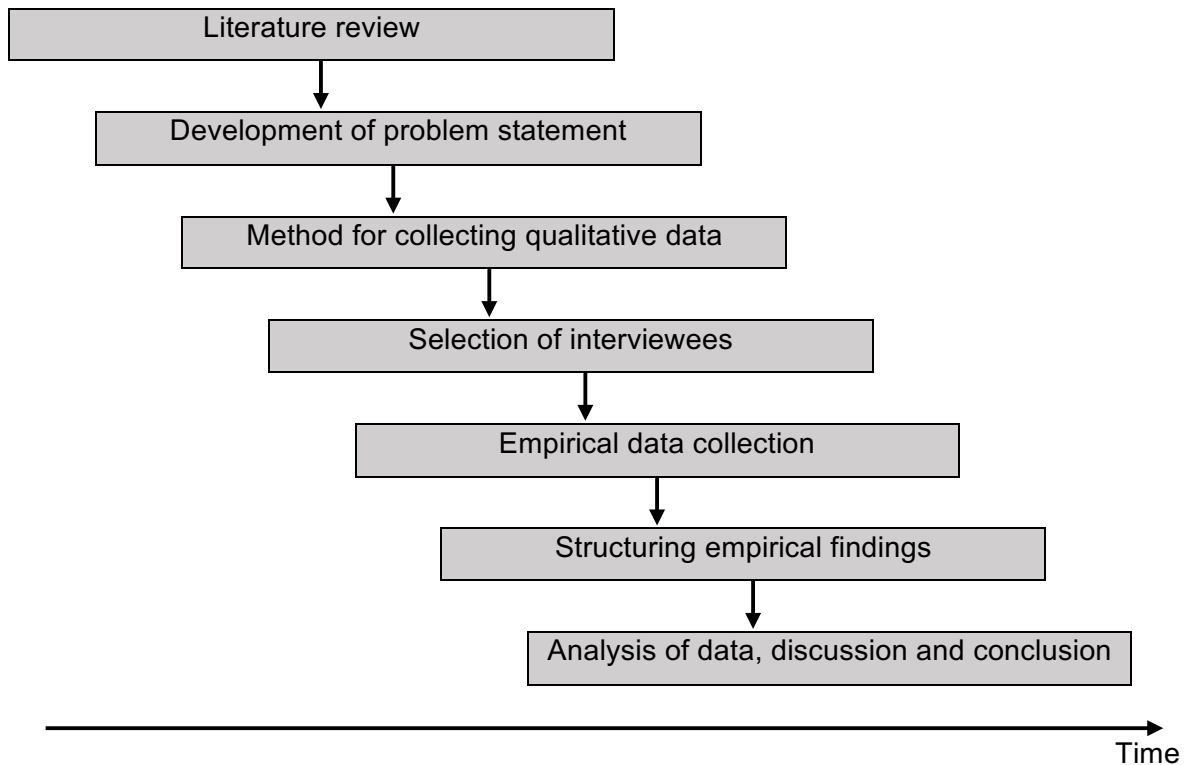


Figure X. The phases conducted in this study.

3.1 Literature Review

A literature review was conducted to gain an overall understanding of the concepts of servitization and related bodies of literature. Relevant concepts, theories and methods from previous service-related studies were found and worked as cornerstones for further research. This also included problems and contrasts within the research area to gain additional depth and understanding of the complexity. The majority of the articles used were found in the Chalmers Library database, and included key words such as “servitization”, “outsourcing”, “product-service continuum” and “service marketing”. The literature review also helped to form the interview template (Appendix) and to identify the gap in previous service-related studies, which was essential when the purpose and the research questions of the study were formulated.

3.2 Development of the Problem Statement

The literature review revealed that the customer’s perspective on services had been largely ignored. Previous studies focused on the manufacturer’s perspective and were based on the assumption that customers demand services from the manufacturer. As a result, the problem

statement was based on the lack of literature related to the customer's perspective on services. By studying the factors that determine whether or not a customer demand services from the manufacturer or a third party services provider, the learnings from this study were aimed at guiding managers in their strategic decision-making.

3.3 Method for Collecting Qualitative Data

The qualitative data was collected through in-depth, semi-structured interviews or through questionnaires. There are mainly two types of interviews to be used during qualitative interviews: unstructured and semi-structured interviews (Bryman, 2013). The semi-structured interview was chosen because this study was aimed at exploring many different cases, that were compared with each other. The interview template was formed based on learnings from the literature review and aimed at discovering the different actors' demand for services and their rationales behind how they are performed. The answers from the in-depth interviews helped to gain an understanding of the industry's perspective on services and helped to form more precise questions for the questionnaire (Appendix). The two main benefits of questionnaires are the simplicity of reaching a large number of respondents and the answers are already in written format, which make them easier to compare (Ejvegård, 2003).

3.4 Selection of Interviewees

The customer segments were identified by Company X, but narrowed down by the authors based on the relevance of this study. As a result, the customer segments construction operators, module rental firms and property owners, and their respective service providers machine rental firms, district heating suppliers and third party services providers, were identified. The companies within each customer segment were chosen based on size and responses from interview requests. A wide range of sizes of the property owners were interviewed in order to capture a more complete picture of the industry. The answers from the actors in the customer segments were confirmed by industry experts and specialists on heating processes, who were interviewed to ensure validity and reliability, and to gain additional knowledge within the subject area. The interviewed persons were chosen based on his or her competence within service related to heating processes. The interview template was sent to the respondent prior to the actual interview in order to ensure his or her knowledge. In

some cases, two persons from the same company were interviewed due to lack of knowledge of the initial interviewee.

The number of interviews varied between the customer segments due to the variability in answers. Consequently, three experts, eight district heating suppliers, seven third party service providers, two module rental firms, two machine rental firms and three construction operators were inquired. Since the answers from these actors were similar, theoretical saturation was considered to have been reached. This was, however, not the case for the property owners who handled their services related to their heating methods differently. As a result, in-depth interviews were conducted with three property owners, and thereafter, questionnaires were sent to 41 property owners in order to reach theoretical saturation.

3.5 Empirical Data Collection

The empirical data consisted of both primary data and secondary data. The primary data was collected through in person-, video call- or telephone interviews or through questionnaires (see Table 4). The secondary data was collected by browsing websites and electronic documents.

Actor	Number of interviewed actors	Format
Machine rental firm	2	In person and telephone
District heating supplier	8	Questionnaire
Third party service provider	7	Questionnaire
Construction operator	2	Video call and telephone
Module rental firm	2	Telephone
Property owner	18	Telephone and questionnaire

Table 4. The number of interviewed actors and the format for which they were interviewed.

3.5.1 Interviews

The interviews were prepared by creating different interview templates for the different types of companies to be interviewed. The templates were based on the different roles each company plays in the value chain of each segment and focused on identifying factors that impacted the decision of service provision on heating systems. The interviews also aimed at understanding the choice of heating method and collecting additional knowledge of the

companies and the industry in which they were present to better set the context. The questions for each interview template can be found in Appendix.

The interview templates were then sent out to the chosen interviewees. Meetings were booked continuously throughout the project with companies accepting the requests of being interviewed. The total number of interviews conducted was ten and was decided based on finding a balance between the time restriction of the project and obtaining enough data to reach theoretical saturation for the study. The interviews were conducted in three different formats: in person, via telephone or through video calls. All interviews were recorded with the consent of the interviewees, and throughout the interviews both authors were present and had different roles. The recordings helped to reduce the risk of misinterpretations by allowing the authors to listen to the interviews more carefully afterwards. Regarding the different roles, one focused on listening and was responsible for follow-up questions, whereas the other one took notes and ensured that the interviews followed the prepared interview template. This was done to handle the interviews in a more beneficial and efficient way attempting to obtain as much valuable information as possible. The interviewed companies are summarized in Table 5 below.

Company	Segment	Size (BSEK)	Role(s)	Duration (min)	Interview method	No. of interviews
1	Machine rental firm	1.90	Technical Electricity Specialist	37	Telephone	1
2	Machine rental firm	0.82	Assistant Project Manager	51	Face-to-face	1
3	Property Owner/Construction operator	14	Construction Manager & Production Manager	31 & 13	Video call & Telephone	2
4	Construction operator	46	Moisture Expert & Energy Development Engineer	27 & 33	Telephone & Telephone	2
5	Module rental firm	0.20	CEO & Partner	34	Telephone	1
6	Module rental firm	0.33	Technical Manager	33	Telephone	1
7	Property owner	9.4	Business Developer	49	Telephone	1
8	Property owner	4.5	Sustainability Manager	35	Telephone	1

Table 5. Information about the interviews.

After the interviews were conducted, they were transcribed by listening to the recordings and sent back to the interviewees to ensure that the interpretation was correct. By doing so, validity of the empirical findings was ensured by correcting any misinterpretations. If any uncertainties were acknowledged after the interviews, the authors asked for clarification through email.

3.5.2 Questionnaires

The questionnaires were prepared with the purpose of reaching a larger set of companies to reach theoretical saturation and reflecting a more accurate view of reality, in accordance with Ejvegård (2003). The questionnaires consisted of a smaller set of questions focused towards collecting key data for answering the research questions. The questions for each questionnaire can be found in Appendix.

The questionnaires were then sent out to the chosen examination objects. The questionnaires were sent to 41 property owners, nine district heating suppliers and 37 third party service providers. The number of companies chosen for each segment was decided based on the results from already performed interviews, where property owners were perceived to vary more in their opinions regarding how to handle services related to their heating methods. Thus, the authors opined that this segment needed a larger sample to better represent all the contrasts and to describe a more accurate picture. This was to ensure that enough information was collected to reach theoretical saturation. From all of the sent out questionnaires 18 property owners, eight district heating suppliers and seven third party service providers answered. As the companies replied, their answers were continually transcribed and if any uncertainties were encountered clarifying questions were sent back to the respondent to ensure correct interpretations.

3.5.3 Secondary Data

While conducting interviews and sending out questionnaires, secondary data was also collected to complement the primary data. The secondary data was collected from websites of the different companies for the interviewees to add general information to better put the empirical findings from the examination objects into context. Some data was also collected since it added valuable insights for the analysis and gave a better understanding of the topic as such.

3.6 Structuring Empirical Findings

After the empirical data had been transcribed it was screened and structured in a clearer and more understandable way. The most important parts providing information relevant to the research questions from each interview was extracted and represented in the empirical findings section of the report. This thematic analysis is common when processing qualitative data (Bryman, 2013). A summarized overview of key data from each interview was then created in the form of a table to give the reader a better overview of the identified factors. The results from the interviews, presented in the empirical findings chapter, follow the same structure in order to ensure readability and comparability:

1. General information about the company and the role of the interviewee
2. The company's heating method and its rationale
3. The services related to the heating method and their rationales

3.7 Analysis of Data, Discussion and Conclusion

The analysis was then structured based on the four identified factors (structural inertia, level of competence, cost/value-relation and risk aversion) in the empirical findings to provide a clear view of the identified factors. In this section, the empirical findings were analyzed by drawing parallels and finding dissimilarities with existing literature. This was performed to answer the first and second research questions by identifying and explaining why certain factors, internal and external, either empower or inhibit the acceptance of servitization in each customer segment. The findings in the analysis then served as a basis for the structure and topics brought up in the discussion.

The discussion was structured into three topics; *How the factors were interconnected*, *How and why the willingness to buy services differed between customers* and *How the factors affect the customer's willingness to buy services from a third-party service provider as compared to from the supplier or manufacturer*. The discussion mainly aimed at answering the third research question by reasoning about how companies perceived the different factors and their rationales. Further interesting findings were also discussed to give additional insights into customers' view on service provision. Lastly, conclusions were drawn from the analysis and discussion, are were aimed at answering the research questions.

4. Empirical Findings

The customers can be divided into three main segments: construction operators, property owners and module rental firms. Their respective demands of heating differ between the segments. The construction operators, who only require heating during the building process, demand heating temporarily. The property owners, who are responsible for finished buildings, demand heating permanently for their customers. The module rental firms, who are responsible for the modules, demand heating semi-permanently since a module has a shorter lifecycle than a regular building. Heat is necessary during the construction process to keep away moisture and for the comfort of the construction operators. In the buildings where tenants of property owners live and in the modules where the customers of the module rental firms perform their daily activities it is also needed to achieve a comfortable environment.

The property owners and module rental firms have the same type of service providers, but the service provider for the construction operators differs. The district heating supplier and third party service providers provide services to the property owners and module rental firms, while machine rental firms provide services to the construction operators. This relationship is illustrated in Figure 5 below.

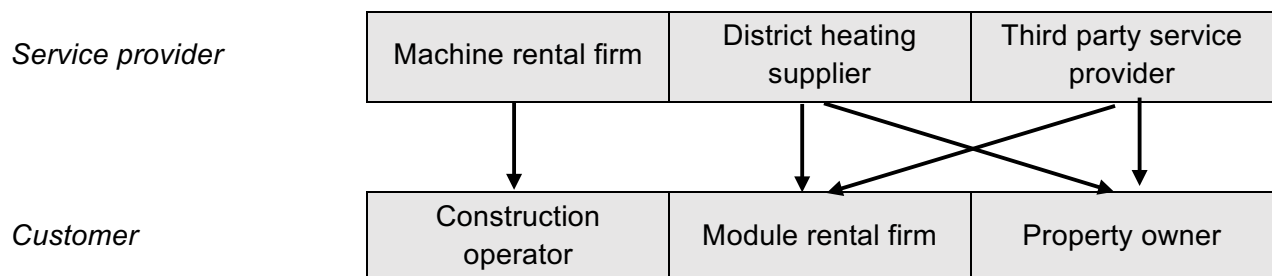


Figure 5. The relationship between different service providers and customers.

The services associated with the different heating methods can be divided into five main categories: installation, monitoring, maintenance, failure handling and operational optimization. Installation includes mounting and setting up the equipment. Monitoring is considered as simple task and is often performed by the customer itself. Maintenance includes activities such as changing filters and adjusting the heat exchangers, and is regarded a more difficult activity than monitoring, although the level of difficulty may vary between different maintenance tasks. Failure handling is regarded as an advanced form of service, and

only occurs under extraordinary circumstances. Operation optimization means improving the energy efficiency of a building and is also considered an advanced service.

4.1 Service Providers

The service providers are divided into three main categories: Machine rental firms, District heating suppliers and Third party service providers.

4.1.1 Machine Rental Firms

The machine rental firms are specialized firms who rent out machines and equipment used at construction sites and possess the needed expertise for handling the equipment. Part of their offer is renting out heating equipment along with necessary service to construction operators.

Company 1

The company provides equipment rental solutions and serves customers from a variety of sectors, including construction and industry. The company's product portfolio includes access equipment, heavy machinery, electrical systems and heating systems. The service offering includes planning, on-site services, logistics services and training. The role of the interviewed person is Technical Specialist of Electricity.

During the production of a building at the construction site, heat is needed to ensure drying and heat processes. Here, district heating, electric heating fans, boilers and heat pumps are used, where district heating and electric heating fans are most frequently used. District heating is mostly used in larger construction sites, if available, while direct electric heating system is used in smaller ones. The choice of heating method also depends on type of building, location, heating time and outside temperature. The company recommends the most appropriate heating system to the customer, but the customer makes the final decision. This decision is generally based on price, efficiency, environment and access to the specific heating method.

The company offers solutions in the heating process to ensure that their customers can focus on the building process. The customer controls the temperature because of the simplicity of the task. More advanced services, such as planning, installation, continuous maintenance,

training and support, are performed by the company. In general, however, the company “does anything that is demanded by the customer and that the customer is willing to pay for”. This collaboration makes the company and its customers come closer. The interviewed person also highlights the negative aspect of not having anyone at the construction site with an overall perspective of the building process.

Company 2

The company provides equipment rental solutions and serves customers in the construction sector. The product portfolio includes building sheds, heating systems, heavy machinery, electrical systems and elevators for construction sites. The service offering includes planning, installation, assembly, maintenance, dismantling and training. The role of the interviewed person is Assistant Project Manager.

During the construction process, the company offers products and services that facilitate district heating, electric heating fans, boilers and heat pumps, where electric heating systems is the most commonly used method at smaller construction sites. In general, however, district heating is the most frequently used heating method. Direct electric heating system is often used for building sheds because of their smaller sizes.

The level of service demanded by the customer depends on the complexity of the task. For example, hot water heating systems, which are difficult to install, are installed by the company while electric fans, which are easy to install, are installed by the customer itself. Before the heating system is installed, the company and the customer agree on which services to be performed by whom. These services could include checking the water pressure and changing filters. Mostly, the customer wants the company to perform these services due to lack of internal competence. The company then goes to the construction site at predefined time periods to ensure that the system works properly.

4.1.2 District Heating Supplier

District heating is a large-scale method for producing and distributing heat. A central production facility produces the heat which is then distributed with water through a pipe system to its consumers; apartment buildings, facilities and houses, where it is used for heating and domestic hot water. In Sweden, there are several district heating production facilities

placed in different regional centers around the country. Each of these production facilities has its own pricing and service offerings.

Therefore, the offered services agreements differ somewhat between the production facilities, but in general they are quite similar. Generally, services such as a yearly monitoring and control of functionality of equipment are offered by most as a part of their service agreement, and is used for a preventive purpose. Repairs and spare parts are usually offered to a lower price if a service agreement has been signed and a 24-hours access to on-call service is also usually offered. Some service that are available at some locations but not that common are services such as operating optimization, energy consumption mapping. The most common arguments to why they offer service agreements is as stated by one of the suppliers “The service execution should be smooth and we want to provide a well-functioning and reliable heating system with long durability.”

4.1.3 Third Party Service Provider

The third party service providers provide services to the property owners and the module rental firms. The extent of services provided depends on the demand of the customer. The third party service providers are, in this report, divided into two main categories: authorized service providers and miscellaneous service providers. The authorized service providers collaborate with the manufacturers to ensure that the manufacturers’ customers are provided the services they demand and are satisfied. The miscellaneous service providers, however, have no similar collaboration and are often requested at irregular times when the customer encounter sudden problems associated with its heating method.

Many service agreements include installation, monitoring, maintenance, failure handling and operational optimization, and are based on the customer’s demand. Most third party service providers claim that most of their customers sign service agreements due to “they do not have the competence themselves” and signing an agreement is the most “cost-efficient” way of making sure that the customers’ heating systems are working properly.

4.2 Customers

The customers exist of construction operators, module rental firms and property owners. In this section key findings from the empirical data are presented.

4.2.1 Construction Operators

Company 3

The company is one of the largest construction operators in Sweden with a business focus on new production in larger cities. It builds condominiums in apartment blocks and office buildings. The roles of the interviewed persons are Construction Manager and Production Manager.

The main source of heating during the construction process comes from district heating. The interviewee claims that the company “tries to be as energy-efficient and environmentally friendly as possible”, which is one reason for the wide usage of district heating. Another reason is that the company mainly builds in larger cities where district heating is available. Furthermore, the company tries to use the same heating method during the construction process as when the building is built and the tenants have moved in due to cost savings.

Before, the company had its own machine warehouse, but due to high costs of capital it now outsources the equipment and its related services to other parties. The equipment necessary to facilitate the district heating is rented from different machine rental firms. This also means that the machine rental firm is responsible for all services associated with the equipment. The company rents other equipment, not associated with the heating process, from machine rental firms and, therefore, it makes sense to let them provide the services for the heating equipment as well. The interviewee claims that the company does not have the “front edge competence” related to these services, which is why it lets the machine rental firms provide the services necessary. The interviewee also states that due to increased specialization “a firm should do what it is good at doing”, which is another reason for letting the machine rental firms provide services to ensure that the company can focus on its core business. The most important factors when selecting a machine rental firms are price, delivery dependability and environmental aspects.

Company 4

The company is one of the Nordic countries largest construction operators focusing on construction work and -services with roughly 14 000 employees and a turnover exceeding 46 Billion SEK. Their main products consist of residential buildings, industrial buildings, commercial properties, and public properties such as schools and hospitals.

Two people were interviewed, the first interviewee works as an Energy Development Engineer and is responsible for business development and routines regarding energy consumption in production and transportation. The other interviewee works as a Moisture Expert who works with routines regarding controlling the moisture levels at construction sites and making sure they are held at desirable levels to ensure that the construction does not get damaged.

During construction work, there is a temporary need for heat for the building itself to keep away moist and to dry out concrete, but also heat for the comfort of the workers. According to the interviewees, which method is used for the constructions varies a lot from each project. Sometimes installed heating systems can be used and other times temporary fans/heaters are installed. Most commonly, the temporary fans/heaters run on gas or oil but electricity or hot water from district heating is also used.

Which method that is chosen depends on “the specific situation such as size and duration of the project, and the availability of district heating or electricity.” For smaller and shorter projects electricity is usually chosen since it is often more convenient. However, for larger projects district heating is almost always chosen, if available. It is the cheapest and most environmental friendly option.

Planning, dimensioning, installation and handling all the heating equipment are done by a specialised external partner firm included in the business group. This is, according to the interviewees, due to strategic and financial reasons by focusing on core business and freeing restricted equity. “This has been the way we do it for years. It’s a question of strategy, possessing the required competence and equipment costs a lot of money”. Also, letting the machine rental firm handle all the equipment is seen as better in terms of avoiding mistakes and thereby better assuring quality.

4.2.2 Module Rental Firms

Company 5

The company is a module rental firm who rents out modules used as temporary buildings. It handles between 4000-4500 modules for various purposes where the company's customer segments consist of the both public sector and the private sector. Its main customer segment is the public sector which occupies 70% of their rented modules where they are used as temporary buildings at pre-schools and schools. For the private sector the modules are mainly used for temporary project offices or staff areas. The company has two offices and workshop locations, one in Stenungsund and one just outside Stockholm. The interviewee is one of the owners and the CEO of the company.

The most modules the company is using today are built in the 90s or early 2000 and are heated with direct electricity, whereas all the new modules are heated with water. The most common heat source is an air/water-heat pump, but there are locations where district heating is used instead. The interviewee states that "the reason to why it looks this way is because the company must comply with the requirements" decided by industry authorities. These requirements are continuously tightened and therefore new building permits require more energy efficient heating methods, hence the use of heat pumps. Regarding the heat pumps, the company has chosen to use one single brand with a rigid service organisation behind it, which makes it easier regarding service and maintenance.

When it comes to performing service on the heating equipment the owner says that "the older modules using electricity heating we know almost everything about and can therefore perform the service ourselves on modules that are located near our offices." Otherwise, if they are too far away, the service is contracted out to local service technicians. For the company's newer modules that use heat pumps most of them still have warranty and therefore it is the authorized service technicians/resellers that have the responsibility of performing service and making sure everything works as it should. The owner further states that for those heat pumps that does not have any warranty left "we contract out the service to either the authorized service technicians we bought it from or from another local third party service provider." This is mainly because of the long distance to many of its rented modules and because of lacking competence on how to perform service and maintenance on heat pumps.

Although the company lacks the knowledge today the owner still sees it as important and something he thinks the company should know better in the future to be able to offer better service towards its customers. The interviewee describes that the company has its “own service technicians who attend training sessions for the heat pumps, so that we can learn more for the future.” He further states that there is also a new dimension to service in the future where equipment is connected through the Internet of Things and can be monitored and controlled via a web portal. This is something that he wants the company to be able to perform itself. The owner also states that even if an external part would offer a complete solution where they would handle everything regarding the heating equipment, the company would still want to keep the control itself. “There is so much more that needs to be maintained and managed than just the provision of heat”.

Company 6

The company rents out modules for offices, school and preschools. It is responsible for the establishment, services and dismantling of the modules, which enables its customers to know the exact price for the rent during its lifecycle and offers them a total solution. The company rents out around 1,000 modules per year, which makes it one of the largest module rental firms in Sweden. The role of the interviewed person is Technical manager.

Due to the relatively short leasing, the installation cost of the heating methods needs to be low. Therefore, direct electric heating systems are mostly used. However, new environmental laws, which impose higher costs on direct electric heating systems, will force the company to “use other heating methods, such as heat pumps and district heating, more frequently”.

The modules are spread out all over Sweden, which makes it financially impossible for the company to have its own personnel providing the services. Therefore, the company collaborates with third party service providers in cities close to the modules. This means that the services related to the heating methods are performed by third party service providers. Since the modules are mostly placed outside of major cities, where district heating is not available, the company does not let the district heating supplier provide the services since “the costs would be too high”.

4.2.3 Property Owners

Company 7

The company is one of Sweden's largest property owners with focus on building, developing and managing properties for universities and Science Research. It is the leading company in Sweden in terms of renting out facilities to universities. The company is owned by the state and therefore has a "great responsibility of being at the forefront in terms of sustainability". As a goal, it wants to reduce its energy consumption by half by the year of 2025. In time, it also aims at being carbon dioxide neutral and is therefore demanding towards its heat suppliers environmental thinking. The interviewed person of this company has had an earlier career as an Energy Strategist but nowadays work as a Business Developer at a central support function to the company.

Since the company does not build its properties themselves and only manages facilities after completion, it has a need for permanent heating solutions. The interviewee states that "in 90% of our residences the heating comes from district heating, which will also remain a large supplier of heat in the future". The reason to why it uses district heating is mainly due to historical reasons and because their properties are adjacent to the deployed district heating networks. It has shown to be financially beneficial and he thinks that it is due to the company's large scale it has achieved to obtain beneficial agreements with the suppliers.

Although 90% of the company's properties are heated from district heating, some years ago it started to store heat in the ground and make use of local energy flows by using geothermal heat pumps for some properties. This, in contrast to district heating, lets the property generate its own heat and is therefore "even more environmental friendly than district heating." This has been done at locations where it has shown to be the most economically feasible option, usually in properties with no availability to connect to the district heating network.

Installations of geothermal heat pumps are performed by the supplier but the substations used for district heating are installed by the company itself. Once installed, the company then manages operation and maintenance of associated installations and products by itself, regardless of heating method. This has been decided to be this way because the company values its own competence highly and wants to be in control. This is desired to "ensure

customer satisfaction and goal completion regarding energy consumption from operational optimization”.

Company 8

The company is a large Swedish property owner focusing on commercial properties in attractive growth markets and has today around 6000 leasing agreements. The person interviewed at the company works as Sustainability Manager for the Northern parts of Stockholm.

The heat demand for the company is permanent building heat since it manages properties. The most common method for heating is through district heating, which serves as the heating method for around 85-90% of all the company’s properties. The remaining properties are mainly heated with geothermal heat pumps.

District heating was always chosen before in conjunction with termination of using oil and gas, but if something is built today it is not certain that district heating is chosen. If possible, it is more common that the company drills holes for geothermal heating and thereby provides the property itself with energy for heating. The interviewee states that “the variable cost of district heating is quite high and the company aims at owning the properties for 50-100 years” and therefore examines the total life cycle cost when choosing heating method. It is most often preferred to invest more to reduce variable costs, both in terms of environmental and economic costs.

Installations of district heating systems and geothermal heating systems in new properties are not performed by the company, but by the hired construction operators and third party service providers. The district heating supplier is only responsible for installing the primary side of the district heating system as is the standard procedure. After this is done the company fully owns the equipment itself.

The company has chosen this way of operating since it perceives it to be the cheapest and most optimal solution. The interviewee states that the company wants to “possess the know-how to maintain and operate the systems and the belonging equipment” itself. Since the company has had enough financial power to make the investment and care for its own

operation and maintenance this has been the desirable decision. Although the interviewee agrees on heating not being the company’s core business it is still seen as something critical and important for its “tenants’ satisfaction and for the company’s control over energy consumption”. To be able to do this, personnel with the right knowledge and experience is required, which sometimes can be problematic. There have been occasions where the company has chosen to use district heating because “the knowledge needed to handle a geothermal heating system has not been available”.

Summary of Questionnaire Findings

A summary of the answers from the property owners related to district heating are presented in Table 6. The size of each company is based on its revenue, where “Small” denotes companies with revenues between 0 and 100 MSEK, “Medium” denotes companies with revenues between 100 MSEK and 3 BSEK and “Large” denotes companies with revenues from 3 BSEK and above.

Company	Size	Service provided by company	Service provided by third party	Services provided by district heating supplier	Factor
7	Large	Monitoring, Maintenance	Maintenance, Failure handling	None	Competence, Control, Customer service
8	Large	Monitoring, Maintenance	Failure handling	None	Financial, Competence
9	Large	Monitoring, Maintenance, Failure handling	None	None	Financial, Competence
10	Large	Monitoring, Maintenance, Failure handling	None	None	Strategy
11	Medium	Monitoring	Monitoring, Maintenance, Failure handling	None	Strategy, Competence

12	Medium	Monitoring, Maintenance, Failure handling	None	None	N/A
13	Medium	Monitoring, Maintenance	Maintenance, Failure handling	None	Financial, Competence, Time management
14	Medium	Monitoring, Maintenance, Failure handling	None	None	Control, Competence
15	Medium	Monitoring	Monitoring, Maintenance, Failure handling	None	Finance, Competence, Risk
16	Small	Monitoring, Maintenance	None	Monitoring, Maintenance, Failure handling	Strategic
17	Small	None	None	Monitoring, Maintenance, Failure handling	Competence, Risk
18	Small	Monitoring, Maintenance	Maintenance, Failure handling	None	Financial, Competence
19	Small	Monitoring, Maintenance	Maintenance, Failure handling	None	Financial
20	Small	None	Monitoring, Maintenance, Failure handling	None	Time management
21	Small	Monitoring, Maintenance	None	Monitoring, Maintenance, Failure handling	Competence, Time management
22	Small	Monitoring	Maintenance, Failure handling	None	Risk, Control, Customer service

23	Small	None	Monitoring, Maintenance, Failure Handling	None	No purpose, Not aware
24	Small	Monitoring, Maintenance	Failure handling	None	Financial, Competence, Customer service

Table 6. Overview over the property owners' services performed by different actors.

The factors on the right-hand side in Table 6 above describe the rationales for handling services in a certain way for the property owners. As seen, the rationales vary between the actors. The factors are explained in Table 7 below.

Factor	Explanation of factor	Example
Financial	Companies that regarded financial reasons as a factor affecting how they wanted to provide services.	Companies that find it cheaper to perform services in-house instead of contracting out.
Competence	Companies that regarded Competence as a factor affecting how they wanted to provide services.	Companies valuing competence as important and those who see it as unnecessary.
Risk	Companies that regarded Risk as a factor affecting how they wanted to provide services.	Companies reducing risk by performing services in-house or reducing it by letting an external part perform it.
Control	Companies that regarded Control as a factor affecting how they wanted to provide services.	Companies that felt they had better control by performing services in-house.
Customer service	Companies that regarded Customer Service as a factor affecting how they wanted to provide services.	Companies that wanted to be able to perform services in-house as a way of having good customers service and assuring customer satisfaction.
Strategic	Companies that regarded Strategy as a factor did not explain in detail what made them chose one way or the other, but simply stated that is was due to strategic or competitive reasons.	"It is perceived to be more beneficial for us to operate in this manner"

Time management	Companies that regarded Time management as a factor affecting how they wanted to provide services.	Companies who contract out since they feel they do not have time to perform services themselves, or those who thought it was more time efficient to have own personnel.
Inertia	Companies that provided their services in a certain way due to historical decisions and not due to certain factors.	Companies who had taken a decision to perform services in-house at an earlier point in time and kept the <i>status quo</i> .

Table 7. Explanations of the factors.

5. Analysis

From the results, four main factors that impact the customers' willingness to buy services have been identified: Structural inertia, Level of competence, Cost/value-perception and Risk aversion and control. Below, these factors are analyzed based on research question 1 and 2.

5.1 Structural Inertia

The structural inertia impacts the customer's demand of services. It results in an unwillingness to change from its current state of business. This unwillingness works both ways, meaning that if the customer today demands only the product and provides the services in-house, there is an unwillingness to change to demanding services from another party. Likewise, if the customer today demands the product and buys services from another party, there is an unwillingness to change to demanding only the product and forming a service department in-house.

Oliva and Kallenberg (2003) state that transitioning from product manufacturer into service provider results in managerial challenges. However, it is also likely that the same applies for customers transitioning from outsourcing services to performing the services with in-house personnel. As for the manufacturer transitioning (ibid), the customer's organizational principles, structures and processes need to change. There will also be a different level of interaction between the customer and the manufacturer, moving from a relationship-based business model to a more transaction-based business model, as opposed to the transition described by Oliva and Kallenberg (ibid).

This shift to only buying the product may also result in the need of creating a separate department for handling services, which can be seen in the results for the firms already handling their services in-house. In general, these companies were larger and had taken the decision of providing their own services a long time ago, which means that they already have a working organization. For other firms, however, there may be a resistance to change due to the structural and organizational problems that may arise. In contrast with the perspective of the service provider (Oliva and Kallenberg, 2003), the customer needs to hire its own service technicians and implement an information system to monitor the business operations. As a

result, problems may arise in sharing knowledge across the network and managing the service personnel (ibid).

Both types of customers, the ones demanding the product and the ones demanding the product and related services, are satisfied with the way of working. As a result, there may be a resistance to change something that is working regardless of the firm's current state, i.e. firms demanding the product and services from service providers are reluctant to change to instead demanding solely the product and performing service activities in-house due to the need of changing organizational structures. Likewise, a firm that is currently demanding solely the product and is performing services in-house are reluctant to change their way of working with services due to lack of relative advantage. This can be seen in the results where it is shown that companies cannot see the benefit of changing their current way of dealing with services. Furthermore, if the transition requires many changes for the customer, this may in itself become a barrier to change (Rexfelt and Hiort af Ornäs, 2009).

A transition from demanding just the product to demanding services may also affect how the customer pays and what activities the customer engages in (Rexfelt and Hiort af Ornäs, 2009). The customers, who are used to producers trying to maximize their profits, may find it difficult to see the win-win situations (ibid) by letting the product supplier perform the related services. This uncertainty may increase further due to the monopoly position of the energy provider of district heating.

This resistance to change may, however, be understandable for the companies in this study because their current ways of handling services work for them. The firms that perform the services themselves state that they already have the competence and skills to perform the relevant services. In contrast, the firms that do not perform the services themselves argue that new competence and skills are required and it does not make financial sense to perform the services as that activity is not part of their core business. This attitude may, however, imply an inflexibility to change, and suggests an organizational culture that will hardly foster continuous improvement and innovation (Lay, 2014). This lack of innovativeness is also depicted for the smaller property owners where no owners had thought of using the heating system without owning its associated equipment, which relates to Mont (2002) who states that there is no clear willingness to ownerless consumption in reality.

This type of resistance to change may be related to change management literature. Tamilarasu (2012) argues that people resist change when they believe that change is unnecessary, which is related to the companies' perspectives of relative advantage of changing something that is currently working. People may also be reluctant to change due to personal loss (ibid), which in this case would mean job loss since the in-house service department would be outsourced to another party.

The existing industry structure, consisting of machine rental firms, construction operators and property owners, is beneficial for all parties. The property owners use the skills they already have in-house, and if they do not have the necessary competence, they will acquire it from a third party. The construction operators let the machine rental firms, who are vital to their temporary construction processes, provide the services related to their heating system. By doing so, the construction operators are allowed to focus on their core business. Additionally, the machine rental firms can increase their revenue streams by providing services to the construction operators while focusing on their core business. In this relatively mature industry, there is no incentive for any actor in the value chain to change their current way of handling the heating methods. Therefore, one potential explanation may be the property owners' inability to see other solutions and their benefits, different from their current ways of working. None of the actors see the relative advantage of changing something that is currently working. This logic impacts the customer's willingness to buy more or less services.

5.2 Level of Competence

The customers' current level of competence impacts their willingness to handle a service in-house or to let another party perform the service. The level of competence usually depends on historical strategic decisions, where some companies have chosen to specialize only in certain areas close to their core business. The companies with low levels of competence let another party perform all types of services, while the companies with high level of competence handle the service in-house. Moreover, the firms with some competence perform the services associated with that competence themselves, while more advanced services are handled by a third party. For example, one company states that "we monitor the system while a third party is responsible for the actual maintenance" since the company itself does not have that competence.

Other companies, mostly property owners, have, based on historic decisions and investments, chosen to acquire high levels of competence to perform services associated with their heating methods. This approach aims to foster knowledge growth and knowledge transfer by keeping these activities in-house. However, all companies (apart from one which puts a lot of emphasis on energy consumption), regardless of type of business, state that “services related to our heating methods are not part of our core business”. From one perspective, it may therefore seem surprising that some companies perform these services themselves because they are not part of their core business. From another perspective, however, it makes sense that they perform the services since they have already acquired the related competence. Nevertheless, narrow core competences are advised in increasingly competitive industries (Lewis et al., 2004).

Viitamo et al. (2016) show that outsourcing can help customers to focus on their core activities, and although all but one firms state that services associated with their heating method are not part of their core business, some still perform the service. In this competitive industry, however, these firms may find it difficult to stay competitive as other firms slim down their business and release some resources to external parties, as suggested by Brandes, Lilliecreutz and Brege (1997). Company 9, 10, 12 and 14 perform all services with their own personnel and state that “we perform the service ourselves since we already have the competence”. This implies that these firms are influenced by path dependence where previous decisions are impacting their current ways to handling services related to district heating, even though their competitiveness may suffer.

However, most of the property owners that handle their services in-house and have a high level of competence also want to keep it that way. They consider the knowledge and the capabilities this enables as important and something they want to continue to be able to offer to their tenants. Consequently, these firms may consider these services as critical success factors and therefore choose to keep them in-house in order to secure the control, as suggested by Veltri et al. (2008).

5.3 Cost/Value - Relation

The cost of a service agreement with a product supplier or a third-party service provider compared to the perceived value received from the service is one of the most common factors to why many companies want to perform as many of these activities as possible themselves and even some of them not at all, since they are perceived as unnecessary. Among most of the property owners, easier and more general activities such as monitoring, troubleshooting and smaller reparations are performed by in-house personnel. This is perceived to be more cost-efficient since they already have employees taking care of the facilities that can perform these activities equally well especially since they do not require any expert knowledge. More complex services, such as larger repairs and part replacements, are usually performed by local third party service providers due to lack of knowledge.

Oliva and Kallenberg (2003) argue that monitoring the condition of a product does not add any value to the customers *per se*, the value only comes apparent when this monitoring can be translated into actual improvements in terms of increased product availability or capability. Accordingly, many of the property owners do not see the actual benefit from the services provided in the service agreements from the suppliers. According to Mont (2002), the value-added for the customer lies in the customization of the offers, but for most of the property owners their needs and preferences are not met. One of the property owners stated that “we have previously tried service agreements with suppliers but felt that many of the services provided did not meet our expectations and some of the features were too advanced and perceived as unnecessary”. This led the company to not realize sufficient value from the services in relation to the costs of the service. This can be related to back sourcing literature which states that a common reason for back sourcing is that the outsourcing agreement did not turn out as expected, which can result in higher costs than anticipated (Veltri et al., 2008). There were also larger property owners that handled all services themselves, even the more advanced ones such as repairs and part replacements, with their own personnel claiming one important reason being cost-efficiencies.

However, the quite opposite view is also apparent in the results where two smaller property owners consider having their own personnel taking care of service activities. These companies instead have service agreements where the district heating supplier is responsible for managing the condition of the system by performing tasks such as monitoring, examining,

and necessary part replacements once or twice a year to keep it in good condition. These two companies therefore, in accordance with Vargo and Lusch (2004), perceive an added value of letting the supplier handle the heating system's associated services instead. This also coincides with marketing literature, which states that a customer does not want to buy a product but to fulfil a need or to get a job done (Christensen, Cook and Hall, 2005). Moreover, it also concurs with Davies (2004) who states that smaller companies with limited in-house capabilities more often rely on suppliers for complete solutions to their needs. One of the larger property owners also said it was a question of financial capabilities. Since it had the possibility to invest in own personnel and training they did, but for smaller firms this might not be a feasible option and must therefore buy the service.

Similar to the two smaller property owners, the view among construction operators regarding temporary heating needs is that it is not cost-efficient for them to focus on non-core business activities, such as having their own storage of heating machines and the necessary knowledge on how to use them in an optimal way. This non-core part of the business is therefore, in accordance with Viitamo et al., (2016) outsourced to machine rental firms among all the interviewed construction operators. The construction operators also claim that by renting the temporary heat as a complete solution they make sure the performance quality is better since it requires expertise regarding dimensioning and positioning of the heaters. This attitude clearly coincides with outsourcing philosophies that companies should be more specialized and focus on core competencies (Viitamo et al., 2016). It also corresponds to servitization literature stating that manufacturers or suppliers have better knowledge about their products and therefore can better optimize its usage (Brandes, Lilliecreutz and Brege, 1997).

The module rental companies renting out modules as semi-permanent premises pre-install the heating systems themselves before the modules are assembled in place. Once the modules are in use the rental firms mostly let local third party service providers perform service and maintenance on the heating system. This is mainly due to the module buildings' widespread locations. The cost for having its own personnel at every location or travelling from location to location would be too high. This means that module rental companies are accustomed with, and perceive the value to be greater from, getting all service done on their products from external companies. Hence, they might not be reluctant towards getting this service provided from a manufacturer of heating equipment aiming at servitizing instead.

5.4. Risk Aversion and Control

As is shown in the empirical findings, many property owners wanted to keep performing maintenance and other basic services themselves instead of letting an external part, such as the heat supplier or machine manufacturer, do it for them. One apparent reason to this was risk reduction and a greater sense of being in control by not relying on an external part. This is in accordance with what Veltri et al. (2008) state about back-sourcing and why outsourcing is not always wanted. Ultimately it comes down to uncertainty of what actually is offered and trust or lack thereof towards the external part providing the services. In order for a customer to buy services from an outside provider, it needs to trust the reputation of the service provider (Edvardsson et al., 2000) since services cannot be fully assessed in advance (Thomas, 1978). Rexfelt and Hiort af Ornäs (2009) state that customers may experience uncertainty in the decision-making process of purchasing services. There are uncertainties in understanding the offering and predicting the potential consequences and risks, which may lead to the customer not buy the service (ibid). Moreover, according to Grönroos (2011), value has a perceptual dimension where trust plays a part of that perception, hence affecting the value a customer can create out of the support provided by a supplier.

Servitization literature generally highlights that servitization transfers risk from the customer to the manufacturer since the manufacturer, in some cases, takes on the responsibility of the functionality of the product (Grubic, 2014). However, according to some of the property owners, even if the risk for being responsible of the functionality of the product would be transferred to the supplier it would still be the customers of the property owners that would be displeased if the heating would stop. Even though only one of the property owners considers heating as being part of their core business, it is still something seen as one of them put it “critical and of high importance for our customer’s satisfaction”. The property owners are therefore concerned of being able to solve a problem with the heating system as soon as possible to minimize their tenants’ dissatisfaction. Many of the property owners therefore argue that this is best controlled and performed the fastest by having their own service technicians instead of relying on their supplier.

On the other hand, Grubic (2014) states that risk can be mitigated by letting the manufacturer remotely monitor the product in the field by providing real-time data on, for example, health, performance and usage. This data can then be analysed and enable manufacturers to act more

proactively in terms of maintenance and service to prevent failures, disruptions and other hazards that could ensue (Grubic, 2014). Monitoring is one of the basic activities offered from many of the district heating suppliers. However, as previously mentioned a service activity such as monitoring does not add any value to the customers *per se*. The value only comes apparent when this monitoring can be translated into actual improvements in terms of increased product availability and/or capability. From the results, it is seen that many property owners do not see the need for service agreements offered by the suppliers and manufacturers, where remote monitoring is one of the included services. They have the belief that the company can perform this monitoring themselves just as well or better, without an increased risk of operational failures.

The module rental firm company 5 stated that “new and upcoming technology will enable the use of remote controlling for some preventive maintenance in the future”. This can reduce the costs that the long distances today bring and thereby enable the module rental firm to provide these services itself. Based on this answer, it is clear that this is something the company wants to perform itself, stating that it values control and customer closeness to ensure customer satisfaction instead of contracting out preventive services, if shown feasible. Mobley (2002) states that one disadvantage of preventive maintenance is the costs of maintaining the system even though the system is not really in need of maintenance. Company 5, however, may be able to overcome this problem with the technology that may ensure that services are performed only when the heating system needs to be fixed.

Although not many, it is seen in the results that two smaller property owners state that they rely on their suppliers for service provision, one of the reasons being reduced risk of machine failure from pro-active service activities such as monitoring. Apart from the many other property owners, this view is in accordance to what Grubic (2014) states about risk aversion from letting the manufacturer remotely monitor the product.

As previously mentioned, in the construction sector, where temporary heat provision is needed for drying and building heat, the construction operators instead find it better to let others perform the installation, handling and maintenance since it is not seen as being part of the core business, but still is a critical process that requires specialized knowledge. This is associated with outsourcing literature, which states that outsourcing certain activities can help the firm to focus on its core business (Viitamo et al., 2016; Sharma and Loh, 2009). Another

reason for this is that risk is involved with handling the heat-water installations in a correct and careful manner since it can be dangerous and cause damage to the workers and also negatively affect the quality of the construction. Therefore, sufficient knowledge on how to do this correctly is needed, which also indicates that companies with the right competence should perform these activities, as suggested by Jenster (2005).

6. Discussion

This chapter discusses how the identified factors impact each other and are connected. It also aims to answer the third research question: How and why does the level of servitization differ between customers and customer segments?

6.1 Interdependencies between the Factors

Although a few different factors affect the choice of whether a company prefers to perform services in-house or to outsource them, separating the factors can be troublesome. In some cases, the factors are intertwined to such an extent that it becomes difficult to describe them separately.

As earlier stated in the analysis, most companies want to continue working as they have previously done due to internal structural inertia. It was found that companies with high levels of competence wanted to perform services in-house and keep doing so. The same companies also had the cost philosophy that keeping the competence in-house and performing as much of the services as possible themselves would be more cost-efficient. The exact opposite was found among the companies with a low-level of competence who outsourced their services to other parties. These companies considered it to be more expensive to acquire their own employees possessing this competence.

This clearly states the interdependence between the factors of cost and competence. All companies want to pursue the more cost-efficient way of managing these services, and rationally so. However, which cost philosophy they perceive as more cost-efficient correlates with their current level of knowledge. The companies' sizes were also seen to affect this. The larger companies are more likely to perform their services in-house and the opposite applies for the smaller ones. Viitamo et al. (2016) argue that outsourcing can be applied to increase utilization, which can be a reason to why larger firms, with many properties and projects, are less willing to outsource since they already have higher utilization than smaller firms.

The same applies for the companies' perception of how to avoid risk as it can be seen that this also correlates to the level of competence. The companies with high level of competence who also performs most of their services in-house consider this as more risk averse since they

keep the control over the heating system and can offer their tenants swift service and be perceived as knowledgeable and reliable. The opposite applies for firms with lower levels of competence. These companies prefer an external part with higher competence to monitor, maintain and perform service on the heating equipment to avoid risk. Boyt and Harvey (1997) state that the risk level depends on the impact on a firm's operation if the service fails. Firms with higher level of competence may consider their skill levels higher than the skill levels of service providers, which makes them less willing to buy services from other parties for services on operations with high risk levels.

6.2 Differences within and across Customer Segments

There are similarities and dissimilarities between how the different customers handle their services within each customer segment and across the customer segments. First, the customers within each segment are compared separately. Then, the companies are compared across segments.

6.2.1 Within Segments

The customers within each customer segment, property owners, construction operators and module rental firms, demand services from another party to varying degrees. While there are major differences within the segment of property owners, the differences within construction operators and module rental firms respectively are not significant. This means that the service demand for the customers within the segments of construction operators and within the segments of module rental firms are similar for the construction operators and module rental firms respectively. The service demand for property owners, however, varies within that segment.

Property Owners

As shown in the empirical findings, the property owners' level of competence varies between the firms. Consequently, firms with relatively high level of competence are more willing to perform services themselves while firms with relatively low level of competence are more likely to buy services from a third party. This can be related to "customers who want to do it themselves" (Baines and Lightfoot, 2013, p. 4), where the property owners only rely on the district heating supplier to deliver the product. This has resulted in that the property owners'

views on risk vary. The firms with high internal competence believe that it is less risky to perform the services themselves since they keep the control and can satisfy their customers by offering an overall solution. This approach is, however, in contrast with Brax and Jonsson (2009) who argue that risks can be mitigated by sharing them between the firm and the provider. The firms with lower internal competence, on the other hand, believe that it is less risky to let a third party perform the services so that they can focus on their core business, as suggested by Brax and Jonsson (2009).

Another difference between the property owners is their respective financial situation. Firms with strong financial situation have focused on acquiring personnel with the skills and competence to perform more advanced services while firms with weaker finances have to let a third party service provider perform these services. This strategy aligns with Brandes, Lilliecreutz and Brege (1997) who state that outsourcing may be an appropriate approach for firms with weaker financial situation that aim to slim down their business and release some of its resources to external parties. This becomes evident when analyzing the size of the property owners, where large companies, in general, are more capable of providing their own services compared to smaller firms. However, the similarity between the property owners lies in the internal inertia. The relatively low competition in the industry makes the property owners reluctant to change their current ways of handling services. For example, changing from letting a third party provide the services to handling the services in-house would mean new expertise, skills and knowledge, as suggested by Ejodame and Oshri (2017).

Construction Operators

The level of competence within the construction operator firms is similar. By specializing on building buildings, they choose to let the machine rental firms take over their different heating methods. This leads to a, in general, low level of competence in regards to services associated with the heating process, but also results in a strong focus on its core business. This focus may be attributed to a fiercer competition between the construction operators as compared to the lower competition between the property owners. This means that there is a risk for the construction operators to perform these services themselves as they may become less competitive. The direct risk of handling various heating methods is also a reason for mitigating risks between the firm and the service provider (Brax and Jonsson, 2009). Consequently, the firms' strong focus on cutting costs leads them to slim down their

businesses and they must therefore release some resources to external parties, as suggested by Brandes, Lilliecreutz and Brege (1997).

The internal inertia within construction operator firms may be less prevalent than that within property owners, and requires construction operators to be flexible in their choice of heating method due to the different locations of the construction sites. This need of flexibility may be a reason for the firms' general openness to letting the machine rental firms perform services, which is supported by Lewis et al. (2004), Auramo and Ala-risku (2005) and Slack (2005).

Module Rental Firms

The module rental firms rent out their modules to locations all over Sweden. This means that it is not profitable for them to perform services related to their heating methods to all locations. However, they still want to offer their customers a total solution and since they already perform other services, not related to the modules' heating system, they can monitor and maintain the heating system while providing other services. If the module is located far from their offices, they instead let a third party service provider maintain the heating system in order to save costs. This means that the level of competence, and the perspective on cost and risk are similar for all module rental firms, which results in a similar demand for services from other parties. It is, nevertheless, possible that various legislative laws associated with the modules' heating systems will impact the similarities between the firms since they might approach these laws differently, which could impact the demand of services. This may impact the executive management within the firms, which can impact their ways of handling services (Veltri et al., 2008).

6.2.2 Across Segments

Three factors, that explain the differences between different customer segments, have been identified: Varying competition, Customer closeness and Varying heating methods.

Varying Competition

It can be seen in the empirical findings that there is a difference between how services regarding heating are performed in the segment of property owners while it does not differ within the segments of module rental firms and construction operators. The reason to this is

complex and likely depends on a large set of factors, but one factor that has been identified that can explain why this is the case is varying level of competition.

In an industry or market with low level of competition the importance of being competitive in order to be profitable is not as high as in more competitive markets (Grant, 2010). Therefore, companies in low competitive markets do not have as high incentives to improve their operations and ways of doing business. This might be the case for the property market, where the profitability is high (Företagarna, 2017). Hence, the companies in this market have not been sufficiently incentivized to improve their ways of doing business and no “best practice” has superseded and led to a dominant design of how to operate.

Contrary, in the industry of construction operators the level of competition might be higher which have led to higher incentives of being competitive to be profitable. Since heating a construction site does not belong to the core business of the construction operators, this is outsourced to be able to focus more on core operations and thus be more specialized and in turn competitive. This approach coincides with what is suggested by Lewis et al. (2004) who state that narrow core competencies are advised in competitive markets.

The choice of strategy might therefore not be that crucial for the survival of property owners or as clear as in the construction industry. It can also be argued that heating belongs more to the core business of property owners than it does for construction operators since the requirements and regulations on energy efficiency are strict for properties (Boverket, 2017). Therefore, it may seem as a rational decision not to let other parties provide these services, as suggested by Viitamo et al. (2016) who state that non-core activities should be outsourced.

Customer Closeness

Performing services in-house is more common among property owners than it is for construction operators and module rental firms. One reason could be that most property owners desire to have close relationships with their end customers, which is in accordance with Frambach et al. (1997) who conclude that services can help to create sustainable customer relations. Property owners have a high preference to keep in control and reduce the risk of dissatisfaction among their tenants by keeping competence and capabilities for service provision in-house. They emphasize being able to offer quick service to their customers to

avoid dissatisfaction among their tenants. They want their tenants to be able to contact them directly if something happens to make it easy and smooth for their tenants. Similarly, the module rental firms care much about the convenience for their customers but they do not have the possibility, in most cases, to have their own personnel in place due to their scattered locations of their rental modules. For the construction operators the situation is different since the demand for heat is simply for their operations and does not affect their customers directly.

It is likely to believe that heat for the tenants is considered a hygiene factor, which refers to those aspects of a product that has to be provided just to be considered a credible option (Bowman and Faulkner, 1997). This means that it is important that the heating systems are working properly to ensure the tenants are not dissatisfied. Even though it is not part of the core-business but is such a critical factor to avoid dissatisfaction, some property owners may want to perform the services related to the heating method themselves in order to retain their control over the system. This can be related to Veltri et al. (2008) who state that factors that are critical for the success of the company should not be outsourced.

Varying Heating Methods

Another explanation to why property owners are keener on keeping the competence and capabilities of performing service on their heating systems in-house could be because the use of district heating is dominant in properties. In comparison to construction sites where the heating method varies much more because it depends on many factors such as location, size and time of the year. For construction operators to be able to dimension, install and perform service correctly on their heating equipment they would need a wider scope of knowledge than property owners since the methods could vary from cooking pellets to using district heating or other various heating sources. Property owners on the other hand basically just need to have knowledge about performing service on one method, which in most cases are district heating systems. Obtaining knowledge and competence on many different heating methods requires many resources and might not be perceived as beneficial if it is not part of the core-business. Hence, outsourcing this service might be cheaper according to Sharma and Loh (2009), and more competitive as stated by Viitamo et al. (2016).

6.3 Selecting Service Provider

From the empirical findings, it has been found that property owners and module rental firms tend to have a somewhat proactive philosophy regarding service management also known by Mobley (2002) as preventive maintenance. Most companies in these segments prefer to possess the competence themselves and keep monitoring and maintenance services in-house. The reason to this is probably due to the reliability of most heating equipment today. Heat pumps and district heating equipment are reliable and malfunctions rarely happens, meaning that the preventive maintenance is not that demanding. This implies that the customers consider it unnecessary and costly to have a service agreement with preventive maintenance. More complicated services are, however, performed by a third party service provider.

If the customers act rationally, they would choose the service option that best fits with their management philosophy, which in most cases aligns with what third party service providers offer. Their service offerings are perceived as more flexible and can be customized, which fit their management better than a service agreement from a district heating supplier. The service agreements offered by the district heating companies are standardized without the possibility to customize the services included. This makes the service agreements to be perceived as unnecessary and overlapping with what most customers can and want to perform by themselves. This absence of customizability might therefore neglect the value-added from the services offered, in accordance to what Mont (2002) states. As a result, few customers have entered service agreements with district heating suppliers.

Consequently, it is not about who offers the service, but what services and how they are being offered that determines which provider a customer chooses. Ultimately, it comes down to the perceived value of the service offered and what best fits the customers' needs. However, among those customers that use heat pumps, few have a service agreement with their product supplier either even though these third party service suppliers are more flexible with what they can offer. This might in turn depend on the already mentioned fact that most of the property owners value having their own competence for simpler service tasks and, if needed, those can be performed quickly and easily by their own personnel. The kinds of services they do not perform themselves are more advanced tasks such as repairs and change of spare parts, which are almost by all customers contracted out to third party service providers. These one-time service interventions are among all property owners and module rental firms performed

by third party service providers. Some of the companies do not know that district heating suppliers also offer these services. However, those firms that are aware of this often have enough knowledge to identify the errors themselves, which enables them to contact the correct third party service provider directly. One argument stated was that “the district heating supplier in turn will have to contact third party service providers since they do not possess this competence themselves” and that this would be more expensive and time-consuming.

7. Concluding Remarks

The purpose of this study was to analyze what factors influence the level of servitization from a customer perspective. From the study it can be concluded that the factors impacting the customers' willingness to buy services are structural inertia, level of competence, cost/value-relation, and risk aversion and control.

The structural inertia makes the customers unwilling to change their current way of handling services. It is not rational for any customer to change since the service provision is beneficial, but it may reflect lack of innovativeness among the firms in the industry. Moreover, firms with relatively high competence are less willing to buy service from other parties compared to customers with lower levels of competence. The level of competence is often based on strategic decisions. The perception of value from the services to be performed were by all customers compared and evaluated against the costs of obtaining them. Simpler services are perceived to be more cost-efficient to perform in-house among property owners and module rental firms. Among construction operators, the value-to-cost relation from outsourcing was seen as more favorable. Risk aversion also affects the choice of service provision where customers have different philosophies on how risk is avoided. Among property owners and module rental firms most of the customers want to keep control of services to reduce risk. For construction operators, risk is related to handling dangerous equipment and installing the equipment correctly to ensure high quality on the construction. Therefore, construction operators prefer to outsource to firms with expert knowledge.

The level of servitization differs between some customers within the same segment. While the firms within the segments of construction operators and module rental firms are similar in terms of structural inertia, level of competence, financial situation and risk, the property owners differ in level of competence, financial situation and their perspective on risk. This implies in that the willingness to buy services is different for property owners, but is the same for construction operators and module rental firms.

It can also be concluded that the level of servitization differs between different customer segments due to three identified factors: varying competition between the segments, customer closeness and varying heating methods that require different expertise. Since the level of competition is lower for property owners than for construction operators and module rental

firms, which results in that property owners have lower incentives to improve their operations. The property owners' high emphasis on offering their end-customers a total solution requires them to be closer to their customers than construction operators and module rental firms. This means that they are more inclined to handle the services themselves. Moreover, since the property owners almost always use district heating, which is relatively easy to provide services to, they only need to acquire competence in this area. This is different for construction operators and module rental firms, however, which use many different heating methods, and therefore need competence in many areas.

7.1 Proposals for Future Studies

Since most studies on services, and servitization specifically, focus on the manufacturer's perspective, more studies on the relationship between service and customer are proposed. Studies like these would help to question the previous assumption that customers always want to buy services from the manufacturer specifically, which most studies on servitization are based upon. These studies could include:

- The relationship between a customer's willingness to buy services and the product itself. Factors that could be proved relevant are the product's relation with the customer's core business, the product's criticality for the customer's business and how often services are needed for the product.
- How do services impact the profitability of a company and how does that relate to the customer's willingness to buy services?
- As compared to Oliva and Kallenberg (2003), what steps must a customer take to go from buying a product to buying a service or from buying a service to buying a product?
- Under which circumstances in a firm's environment is it appropriate to buy more or less services?
- Validation of the findings of this study by conducting a large-scale study analyzing customers in other industries.

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Appendix

Interview Template - Property Owners, Module Rental Firms and Construction Operators

1. What is the company doing? What is your core business?
2. When do you need heating?
3. What heating methods do you use? Why?
4. Describe the relationship between your company and the heating provider.
5. Why did you choose that heating provider? What factors determined the choice of heating provider?
6. What kind of services are needed for the equipment associated with the heating method?
7. How often are these services performed?
8. What kind of services are performed by the company? Why?
9. What kind of services are performed by another party? Why?
10. If the manufacturer were to offer a total solution where you only paid for the heating you used, would that be beneficial? Why/why not?

Interview Template - Machine Rental Firms

1. What is the company doing? What is your core business?
2. What heating methods do you provide services to? Why?
3. Describe the relationship between your company and the customer.
4. Why do your customers pick this company?
5. What kind of services are needed for the equipment associated with the heating method?
6. How often are these services performed?
7. What kind of services are performed by the customer? Why?
8. What kind of services are performed by this company? Why?
9. Does this company offer a total solution where the customer only pays for the heating it uses? Why/why not?

Questionnaire - Property Owners

1. What heating method/methods do you use for your properties? Why?
2. Are you in a service agreement with the energy provider or heat equipment supplier?
Why/why not?
3. What is included in the service agreement?
4. What kind of service is performed by another external partner? Why have you chosen that solution?
5. What kind of service do you perform with in-house personnel?
6. Why are some services performed with in-house personnel while other services are performed by external parties?
7. Do you consider services related to your heating methods as your core business?

Questionnaire - District heating suppliers and Third party service providers

1. Do you provide a service agreement for your company customers (e.g. property owners)? What is included?
2. What kind of services do you usually perform?
3. What is the most common reason why your company customers sign the service agreement?
4. Why do you offer the company customers a service agreement?