SERVITIZATION IN FINNISH MANUFACTURING INDUSTRY

A Framework for Transforming Businesses

Lappeenranta–Lahti University of Technology LUT

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Examiner: Professor Pasi Luukka

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ABSTRACT

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This research studies the journey of manufacturing companies that are making a transition from being product-centric to offering a blend of product and services. Research in this domain is important because a practical framework is needed in the industry that can be utilized to define a central strategy for the company's service offerings and to determine clear standards for the implementation and measurement of servitization. The study followed an inductive qualitative approach with embedded case study. For the part of data analysis, grounded theory was used as the framework for qualitative research. As a result, a data structure was developed that represented three dimensions namely i) structure and change-oriented internal factors, ii) consumer-oriented external factors, and iii) strategic factors, and how these dimensions facilitate or hinder the transition from manufacturing to service business.

The results highlighted the key elements, phases, and challenges faced in the transition from product-centred business to service-centred business (servitization) in the context of chemical manufacturing industry and focused on how the development of servitization transition can be measured and what are the key performance indicators (KPIs) to use. For measurement, the understanding of the existing service offering of the firm, the strategic aim for future service offerings, and service orientation were considered as crucial elements of the servitization plan. Finally, to reflect the economic implications of the servitization strategy, revenue growth was considered to be the key component for evaluating servitization. As a practical implication, a framework was developed that can be utilized by senior or middle-level management to define an overarching strategy for the organization's product/service offerings and to establish explicit standards for the implementation of servitization. The main limitation of this research is that it only covered the chemical manufacturing sector of Finland and hinders the generalization of findings of the study.

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1 Introduction

In quest of sustainable revenue streams and viable growth opportunities, manufacturing companies have transitioned from offering only a product to offering services and solutions with a deep emphasis on the needs and demands of the customer (Matthyssens and Vandenbempt, 2008; Rabetino et al., 2015). This thesis attempts to find out the key elements and factors involved in the journey of a manufacturing company moving towards service provision and how the development of this transition can be measured and what are the key performance indicators to use, by collecting data from the companies that have successfully made this transition or are in the process of doing so. The goal is to establish the basis for future manufacturing companies who wish to servitize so that they can benefit from it.

1.1 Background and Motivation

In 1988, Vandermerwe and Rada were the first ones to interpret this shift as ‘Servitization’, after they observed Volvo moving from manufacturing cars to finance, insurance to gas stations, roadside assistance, towaway and emergency systems. Baines et al. (2020) stated that the notion of transition implies a change from one state to another, such as ‘Goods to Services’, whereas transformation implies a supplement, in which the second state includes ‘Goods and Services’. Servitization is generally understood as a shift or transformation defined by a linear and progressive progression across a product line from low to highly complex services (Oliva and Kallenberg, 2003; Lütjen et al., 2017). Based on previous literature, Brax (2005) concised the definition of servitization as to add services into the existing product-centric model to increase revenue, strengthen customer relationships, build new opportunities and to keep updated with consumer demand.

Services have a vague definition (Slack, 2005). Goedkoop et al. (1999) classified the difference between product and service as a product being a tangible object produced to be sold and satisfy consumer's need and a service being an incorporeal doing, having certain economic desirability, and is executed on a profitable basis. Baines et al. (2009), in context of operations, services, and

business, defined servitization as the alteration of company's operations and potential to improve the co-creation of value by making a transition from product-centered approach to product-service-centered approach. According to Chesbrough and Spohrer (2006), the science of service emphasizes services as a system of interconnected segments that include people, technology, and business. However, Peillon et al. (2015) proposed that rather than transitioning from products to services, servitization is the incorporation of product and service operations. Lytle and Timmerman (2006) described service orientation as the proclivity of the organization towards its prowess in services. According to Raddats et al. (2019), Service infusion occurs when a company's service offering becomes relatively more important than its product offerings. Olivia and Kallenberg (2003) broke the stereotypes about how services were being defined by stating that services are not restricted to only revolve around products and it is not necessary that the service provision is only done by the manufacturer, independent parties are also present for competition and in this relation, partners can be industrial as well as end users.

Managers, today, do not have any other choice than to focus on the blending of products and services rather than treating them as separate entities. Perhaps giving services the main role. This inclination is demonstrated in both the internal corporate culture and service activities of the organization (Gebauer et al., 2010) and its HR practices (Schuler, 1996). Specifically, the manufacturing companies shifting into service business incline their focus more towards customer's processes to take hold of the business opportunity (Wise and Baumgartner 1999; Davies, 2004). Huikkola et al. (2016) considered servitization as *'a potential goldmine for manufacturers'*. Partnering up with the customer to solve the problems faced by the customer is risky but proves to be beneficial in the long run (Baines et al., 2009). The approach of prioritizing asset application over ownership of the asset helps provide value to the customer via integration of product and services (Baines et al., 2007). Furthermore, service addition to product offers uniqueness which can provide a competitive advantage to the company (Gebauer and Fleisch, 2007). According to Lee and Tsai (2014), to strengthen customer relationships and have a competitive edge in the market, the manufacturers need to focus on the integration of the service part of the business with the product and develop a new business model that enables this change as servitization leads to a shift towards the value chain of the consumer from operational perfection to customer commitment and loyalty (Slack, 2005; Baines et al., 2009).

1.2 Current Trends of Servitization

As described by Vandermerwe and Rada (1988), the trend of servitization started as companies began to move down the distribution chain with more focus on the self-derived customer demand by offering a variety of services to get competitive advantage. At that time, servitization was considered an unpaid and expensive activity. Parida et al. (2014) stated that more than 50% of the companies offer the product-oriented services almost 20% offer functional and operational services. However, the literature provides mixed evidence on which manufacturers a service strategy would be most beneficial for (Raddats et al., 2019).

Specifically in the construction sector, there is a lack of standardization, capability, and the need for more inventive behaviour for deployment of servitization (Brady et al., 2005). However, recently a trend has been observed among design and construction firms collaborating in the operating stages of developed assets (O'Shea and Murphy, 2020). On the other hand, the construction industry's development of servitization strategies is still lagging and there is a scarcity of literature on servitization in this industry; in particular, an in-depth investigation of industrial construction from the standpoint of service incorporation has yet to be done (ibid.). As a result, off-site procedures must be assessed as a possible chance to improve servitization in the construction industry (Galera-Zarco and Campos, 2021). Clearly, there is an opportunity to add services from conception to demolition if constructors and developers could modify their conventional thinking and include consumers in value co-creation from the very beginning (O'Shea and Murphy, 2020).

1.3 Research Objectives

The first objective of this research is to find out the key elements, phases, and challenges that a company in chemical manufacturing business encounters when it sets the path to move from a pure manufacturing business model to solution-provision business model. The second objective is focused on how the development of this transition (servitization) can be measured and what are the possible key performance indicators (KPIs) to use. The goal is to develop a practical framework that can be utilized by senior or middle-level management to define an overarching

strategy for the organization's product/service offerings and to establish explicit standards for the implementation of servitization.

1.4 Research Questions

This study is aimed to address the following research questions:

1. What are the key elements and phases in the transition from production-oriented to service-oriented (servitization) business model?
2. How can the development of servitization transition be measured and what are the key performance indicators (KPIs) to use?

1.5 Data and Methodology

The data was collected through interviews of credible individuals with substantial expertise of the area. Participants were picked from firms that either already provide services and solutions to their clients or aim to do soon. Data was gathered through semi-structured interviews. The interviews effectively addressed the study questions, which attempted to advance the discourse toward a characterisation of servitization initiatives through time, concentrating on both the process and the contextual aspects influencing transformation development. The interviewed firms were from the manufacturing sector of Finland consisting of five large enterprises from chemical manufacturing industry and one from equipment manufacturing industry. Agreement over confidentiality was made in all cases, and as a result, the identities of the manufacturing companies were coded. Table 1 gives an overview of the cases that were chosen.

Table 1. Overview of the selected case companies

Case Company	Industry Focus	Size (Turnover in EUR / No. of Employees)	Designation of Interviewee
Case 1	Label materials for branding and promotion, information and functional labeling	~1,5 billion / ~1,001-5,000	Vice President, Global Business and Segment development
Case 2	Industrial coatings	~400 million / ~1800	Group Commercial Director
Case 3	Sustainable and innovative fiber-based solutions	~3 billion / ~8000	Product Manager Disruptor
Case 4	Forest machine manufacturer	~650 million / ~1,001-5,000	Team Lead, Digital Experience
Case 5	Insulation and building envelope solutions	~4,5 billion / ~1,001-5,000	Technical Service Manager
Case 6	Industrial construction and maintenance tools and supplies	~400 million / ~500	Head of Key Accounts

The research methodology used in this study is grounded theory, and throughout the process of data collection, data analysis was also carried concurrently for the generation of codes and these codes were compared to one another. The methodology employed follows an inductive approach that is appropriate for the grounded theory method. It emphasises respondents' interpretations with the purpose of discovering new concepts rather than validating only the past ones. However, researchers use the notion that users can detect patterns in data to generate ideas, create interrelationships between them, and utilise them to create explanations.

1.6 Thesis Structure

The thesis comprises of six chapters in total. In the first chapter, there are six sections. In the first and second section, related background on the topic in general industrial context and current trends in servitization are described. In the third and fourth section, the research objectives and research questions of this thesis are defined. In the fifth section, a brief overview of data collection and research methodology is provided.

The second chapter contains systematic literature review and consists of eight sections. The purpose of these sections is to describe the objectives of servitization, key elements and factors affecting the transition, stages that a firm goes through, practical challenges in the journey, how the transition affects financial performance and recommendations for implementing service-

based business models in sufficient detail. The last section of this chapter lays out a practical framework for measuring servitization journey based on already present industrial practices.

The third chapter discusses the study methodology in depth, with distinct sections explaining the research setting and design, sample and data collection, and data analysis. In chapter four, the first two sections address the research questions, while the third section includes an analysis of the study's findings. The fifth chapter provides conclusion and discussion that summarises the study's important findings, compares them to the literature, and suggests future research directions. And finally, the sixth chapter consists of appendix with two tables, one comprising of the key elements and factors affecting servitization from previous literature and the other illustrating the data supporting interpretations.

2 Literature Review

In this chapter, systematic literature review is comprised. The purpose of this section is to describe the objectives, challenges, and phases of servitization in sufficient detail and to lay out the key elements and factors that affect this transition. The goal is to create a practical framework for measuring servitization journey based on already present industrial practices.

2.1 Objectives of Servitization

The notion behind the transition into services varies from company to company. According to Vandermerwe and Rada (1988), for some companies, it is a natural step to take. However, for others, it is only done when a clear need to servitize can be observed to create new opportunities and for some businesses, it is merely because of their need to survive in the competitive market as it gives a company a competitive advantage in the market by creating a stronger connection with the customer base. Martinez et al. (2017) stated that the process of servitization is neither rational nor organized, but rather spontaneous and natural. Sawhney et al. (2003) explained how companies with pure manufacturing background explored new opportunities by going downstream in the value chain by focusing on doing the tasks that were under the responsibility of the customer in the past. Vargo and Lusch (2004) tossed the concept of value addition by the customer being a co-creator of value and the value is not only relying on the product, rather more on the ‘value in use’ derived by the customer and this gives a competitive edge to the company.

The objective of servitization among the firms has been to create consumer demand rather than control it and, in this process, the competition can be the firm’s own customers, suppliers, other industries (integrated competition) or a group of companies (Vandermerwe and Rada, 1988). Schmenner (2009) pointed out that servitization was piloted by companies with new products but limited production capacity and companies with abundant production capacity were more focused on their product rather than services. In case of manufacturing businesses, Olivia and Kallenberg (2003) stated that they have some clear advantages when transitioning towards

services as there is 1) an already present customer base for targeting of newly released services, 2) first-hand knowledge about the product and its lifecycle, and 3) lower investment capital needed for expansion because of already present infrastructure.

Apart from the manufacturer's perspective, servitization also offer a lot of benefits for the consumer which the manufacturer keeps in mind while making this transition such as better value addition, flexibility and personalization of services, higher level of quality, and fulfilment of expectations (Tan, 2010).

Annarelli et al. (2019) has shed a light on the environmental aspect of servitization. He suggested that firms should cooperate with authorities to accomplish legislative improvements, encourage the use of environmentally friendly solutions, and decrease environmental costs through the use of waste recycling technologies. The implementation of servitization allows businesses to detach environmental challenges from financial prosperity while maintaining a continual focus on customer's requirements, which has long been recognized as a clear and important strategic potential.

2.2 Key Elements and Factors Affecting Servitization

For a successful execution of servitization, it is important to keep in mind the key elements and stages that a company goes through. According to Olivia and Kallenberg (2003), knowing the importance of services and valuing them accordingly is crucial. It is important to contemplate that there will be a shift of relationship with customers from ‘transaction-based’ to ‘relationship-based’ (ibid). Similarly, making new service units by merging the services related to the product, conducting a customer-centered market analysis, focusing on building stronger relationships with customers (Annarelli et al., 2019). Furthermore, taking the responsibility of consumer operations also plays a key role. Olivia and Kallenberg (2003) emphasized that the order (transaction-based to relationship-based approach and involvement in the end user's process) does not matter. However, they should be implemented one after the other. Companies need to assess the activity of the consumer to know the current value gaps and strategically use these as an opportunity to add more value (Vandermerwe, 2000).

Deep understanding of the processes of customers is very important to create value from service offering. To know what type of services the customer wants, values and would be prepared to pay for, keen interest and involvement in the customer's process is necessary (Olivia and Kallenberg, 2003). But entering the user's process should only be done after successful establishment of the already offered services, failure otherwise (ibid). And customers become more afflicted by service delivery failure rather than a failure in some core product offering of the customer (Tsai et al., 2014). Servitization necessitates an in-depth technical understanding of product-service portfolios as well as customer-focused soft skills (Rabetino et al., 2017). Lee and Tsai (2014) suggested identifying the need of the customers to differentiate their offerings. The authors also suggested integrating product and services in line with customer's core need and demand for internal and external integration.

A vital driver of service infusion is the customer's point of view. When the service prominence is clearly communicated to the customers, they get more interested in the services which then assists the exposure of the service positioning within the firm (Homburg et al., 2003). Involving customers on a higher level of engagement builds stronger relations (Vandermerwe and Rada, 1988; Galbraith, 2002). Better client understanding is also required for a tailored value proposition. The perspective of the customer plays a vital role in designing the services for it to be beneficial (Raddats, 2011). The beginning and end of the entire servitization process is the study of consumers' expectations. Companies cannot overlook the importance of end consumers, who are frequently engaged in the delivery of a servitized product (Annarelli et al., 2019). It is very important for the personnel dealing with services to consider themselves as 'customer’s problem solver' (Kohtamäki et al., 2015). Gebauer et al. (2008) termed the collaboration with customers as "development partners". Company’s responsiveness is increased, and value is formed for the customer when the customer has a positive image of the employees of the company (Theoharakis et al., 2009). Furthermore, to avoid any type of waste because of ineffective strategy, be it time, labor or substance, collaboration with the customer should be done at the starting phase to have a steady product capability at bearable cost (Markeset and Kumar, 2005).

As a result, organizations must utilize customer data while developing new goods and gather necessary information at the same time in order to discover consumer demands and establish

how customers use the supplied items and build service-related technology to collect client process data for service offerings (Porter and Heppelmann, 2015). Firm's service configuration can be done by gathering and converting customer information into tailored and cost-effective solutions and services by aligning internal and external operations to accomplish intra- and inter-organizational fusion (Rabetino et al., 2017). Along with enhancing customer relationship management and relations with the supplier (Saccani et al., 2014, Annarelli et al., 2019), Information and Communications Technology (ICT) systems help manufacturers enhance the design, development, and execution of PSSs while also lowering costs by improving organizational effectiveness (Kowalkowski et al., 2013). Customer Relationship Management (CRM) also proves to be helpful in assisting mass service customization and project management by businesses (Rabetino et al, 2017). Frank et al. (2019) proposed that services do provide value to customers while also serving as a data and information gathering mechanism, with the goal of encouraging organizational feedback that leads to internal changes and improvements. Galera-Zarco and Campos (2021) also found a strong correlation between service offerings geared toward growing end-users and dimensions like the complexity of services and technological-soundness of the service.

To make this transition successful, another necessity is transformation at the corporate level and priority should be given to service development rather than the conventional methods (Coyne, 1989; Olivia and Kellenberg, 2003; Slack, 2005) as making the right atmosphere within the company is the key to making the transition successful (Baines et al., 2009). Organizational changes quite often face a lot of backlashes from inside the company because of either misunderstanding of the concept of servitization or because of unease it may cause as it requires abandonment of conventional methods. The biggest change that is required for this transition is the change in concept from product being the focus to customer being the focus. Managing the service portfolio with a single approach might be unproductive (Raddats et al., 2019). Different researchers have suggested different approaches in organizational change mainly categorized into the following two: (i) Continuous change: This change is not random, but rather inherent to the way businesses work, with the potential to participate in swift and ongoing change (Langley et al., 2013), and (ii) Punctuated equilibrium: In this change, lengthy stretches of relative stability are interlaced with minor, gradual changes, which are disrupted by short

surges of intermittent and drastic transformations (Tushman and Anderson, 1986). Context, process, and content all play a role in determining organizational change (Pye and Pettigrew, 2005). Context is concerned with the conditions of change (both within and outside of organization), whereas process is concerned with how change occurs, and content inclined more towards the practical decisions taken (Gebauer et al., 2010).

According to Baines et al. (2020), internal factors that function throughout all stages are referred to as organizational commitment, and it focuses on the essential qualities that permit or restrict advancement and the current organizational commitment has a substantial impact on the progress. These factors include management commitment, availability of funds, and awareness of competitors, etc. The external factors that work against these internal forces are customer demand, technological competence, and value network positioning. These five factors interact and define progress of transformation as a whole. Gebauer et al. (2010) emphasized that more of a revolutionary transformation is needed rather than an evolutionary one. Because in the latter, the core manufacturing values remain rigid which hinder the process of the transition. According to Kaplan and Norton (2006), the rationale with which businesses execute their plans, rather than the plans themselves, will develop as a critical success factor, as a result of strategic convergence. The commitment of the top management towards a certain plan of action for servitization plays the core role in its successful implementation (Lay et al., 2010).

A controversial discussion exists among the researchers regarding a critical factor in transition which is whether to create a separate department for services or keep it integrated into the department handling the product directly. As products and services are inextricably linked, manufacturers transitioning to servitization should think about how products and service businesses may be structured in the future to complement one another (Huikkola et al., 2016). Olivia and Kallenberg (2003) inclined towards creation of a separate organization to handle services (separate dedicated sales team, technicians, IT monitoring, accounting transparency, profit-loss accountability) and service employees should be given equal importance and incentives (Gebauer et al., 2005). Windahl and Lakemond (2006) also suggested that the core production facility and service department should be kept separate for a successful transition. However, Auguste et al. (2006) found that for manufacturers whose services are not completely developed or are fully linked with existing products, separation may not be the best

organizational model. A manufacturer may establish a service department separate from the one of product's if its goal is to offer complex services on top of simple services (Oliva et al., 2012). Although a distinct services department is not always the best organizational layout, it can effectively 'kickstart' a service culture in the firm. While separation is critical for developing a service culture and in many circumstances, deeper integration between product and service strategic business units is necessary for providing solutions. Furthermore, separation enables the establishment of services which are not dependent on products, resulting in more transparency for their performance and a company culture that is more service-oriented (Raddats et al., 2019). Summarily, creating a network structure that allows product and service personnel to collaborate with each other could allow a company to provide sophisticated, dynamic services like turnkey and integrated solutions (Huikkola et al., 2016).

In effort to promote a service-oriented culture, skill-based training and consistent outcome-oriented incentive systems are effective tools (Bowen et al.,1989; Gebauer and Fleisch, 2007; Reinartz and Ulaga, 2008; Antioco et al., 2008). Many manufacturing firms lack experience in service design and delivery, while service organizations lack technological know-how, both of which necessitate the hiring of skilled individuals (Cavalieri and Pezzotta, 2012). Olivia and Kallenberg (2003) stated in their research that '*Training, compensation, and recruitment policies geared to support a service-oriented culture are central when developing and benefiting from service-dominant business logic*.' Tuli et al. (2007) and Huikkola et al. (2016) had similar views that using service-oriented human resource strategies aids in the hiring, training, and retention of service-minded employees. It is important to train salespeople to concentrate on selling solutions alongside products (Ulaga and Reinartz, 2011). A case study organized by Rabetino et al. (2017) concluded that for service-oriented organizational inclination, the companies strongly focused on the processes of management of: i) company culture, ii) internal relationships, and iii) human resources.

New Business Models have been one of the topics that has received notable attention in making transition from manufacturing to service business (Lindahl et al., 2009). Understanding and finding the most appropriate business model to make this transition is very important (Parida et al., 2014). Rabetino et al. (2015) emphasized that the business model and strategy of a servitizing company depends on the specific requirements of the customer base. A company

should focus on fostering mergers and collaborations that bring in the needed resources (Kindström et al., 2013). Kastalli and Looy 2013 suggested to integrate product-service business models and focus on activities that bring the customer closer and invest the needful amount in building integrated service portfolios for better profits in the long run. Specifically, manufacturers must develop new capabilities while balancing the existing ones in order to effectively execute service-led business models (Huikkola et al., 2016).

According to Huikkola et al. (2016), developing a service business requires promoting service-related skills, which may include the production of new resources, the restructuring of existing resources (Annarelli et al., 2019), and getting rid of the irrelevant resources. To incorporate new resources, machine manufacturing companies continued to enhance their current competencies in order to support their new service orientation and there should be dissemination of service-related information company-wide (Olivia and Kallenberg, 2003). Following a case study of nine Finnish manufacturers, Huikkola et al. (2016) concluded that it is beneficial to release resources ahead of time to allow the company to produce new resources and dominate through the current ones in innovative ways. A firm should only eliminate an old resource if it intends to generate more value with the new ones (ibid). Finding the Unique Selling Point (USP) is also considered crucial in driving the company towards servitization (Annarelli et al., 2019).

Lee and Tsai (2014) studied four firms in the marine-lubricant industry and linked resource-based, transaction-based, and relationship-based perspectives as three main points in the journey to servitization. Their study emphasizes on these three points as how intangible resources, the customization of transactional activities and strong trust-based relationship with the customer can provide a huge competitive edge to the company. As shown in Table 2, Baines et al. (2020) constructed a list of key factors that affect the transformation from manufacturing to service business.

Table 2. Factors affecting the transformation by Baines et al. (2020)

Internal Factors	**External Factors**
Organizational structure	External political characteristics
Corporate culture	Social aspects
Leadership	Technological aspects
Internal politics	Environmental aspects
Strategic Intent	Industrial aspects
Top Management's Support	Legal regulations.

2.3 Stages of Transformation

According to the study of Baines et al. (2020) and Figure 1, only when top management became convinced there actually is a real economic opportunity, did companies convert from Exploration to Engagement step. And only after the capability of advanced services was acknowledged within the organization did the firms move from Engagement to Expansion step. Only until considerable value was being shown inside the organization did the companies move from Expansion to final Exploitation step. The transformation process looks to be organised and generally unidirectional, but there are other sub-processes that are notably organic, unorganised, and recursive, therefore the entire process can be regarded as a corporate growth model with multiple systemic concerns. Only when there is adequate organizational preparedness, can change begin effectively. The management should also keep in mind that progressing through these four phases can take a long time, and a corporation commencing on a servitization journey may take decades to attain the characteristics of those mature in the industry.

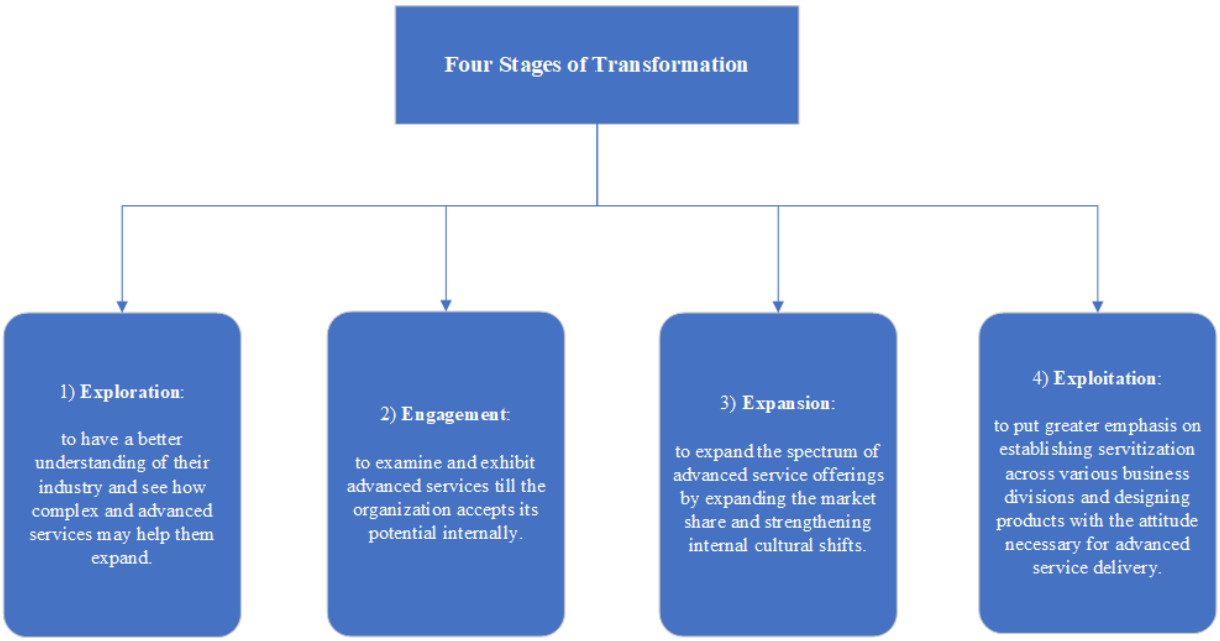

Figure 1 Stages of Transformations from Manufacturing to Service Business (Baines et al., 2020)

According to Baines et al. (2007), the main driving forces behind servitization are finance (revenue, profit), strategy (competitive edge) and market (customer commitment, stand-out feature). The growth plan comprises two parts that attempt to boost a) mid-term and b) long-term revenues. First, manufacturers may boost mid-term growth by acquiring new consumers, moving into new market sectors, and increasing the share of revenue from current consumers through stronger customer engagements. Second, long-term advantages can be gained by realigning offers to enable sales of simple to complex product-related services at various points of the product life cycle (Rabetino et al., 2017). Kohtamäki et al. (2015) considered breadth of services an important dimension as it delegates the people of the company to get to know the shift that the company is making towards being service focused and changes their conventional manufacturing perspective. Extending the range of service offerings exposes the manufacturer to new risks and developing sophisticated services without sufficient alignment of internal business variables (corporate strategy and service operations) with external business aspects (client and other players in the network infrastructure) is a major issue (Alghisi and Saccani, 2015).

2.4 Classifying Servitization Types

Different authors have had categorized services into different types such as:

Table 3. Service Categorization

Mathieu, 2001	**Kotler, 2003**	**Baines et al., 2007**
Services that support the product with which they are being offered	Product only	Product as main and service as a side
Services that are more focused towards the processes of the customer	Product with service as add on	Service as main and product as a side
	50/50 mixture of product and service (Hybrid)	
	Service with product as add on	
	Service only	

In the industrial context, Homburg et al. (2003) defined the types of services as i) customer services and consultation, ii) training services, iii) business services, iv) optimization services and v) Services supporting customer operations. Similarly, Kohtamäki et al. (2015) further detailed types of the services as i) optimization services which includes installation, repair, and product upgradation, ii) research and development (R&D) which includes designing and developing prototype, checking feasibility, and analyses of manufacturability of the product, iii) customer support including trainings, seminars, and product demonstrations, and iv) procurement services. Baines and Lighfoot (2014) categorized the product-related services as shown in Figure 2.

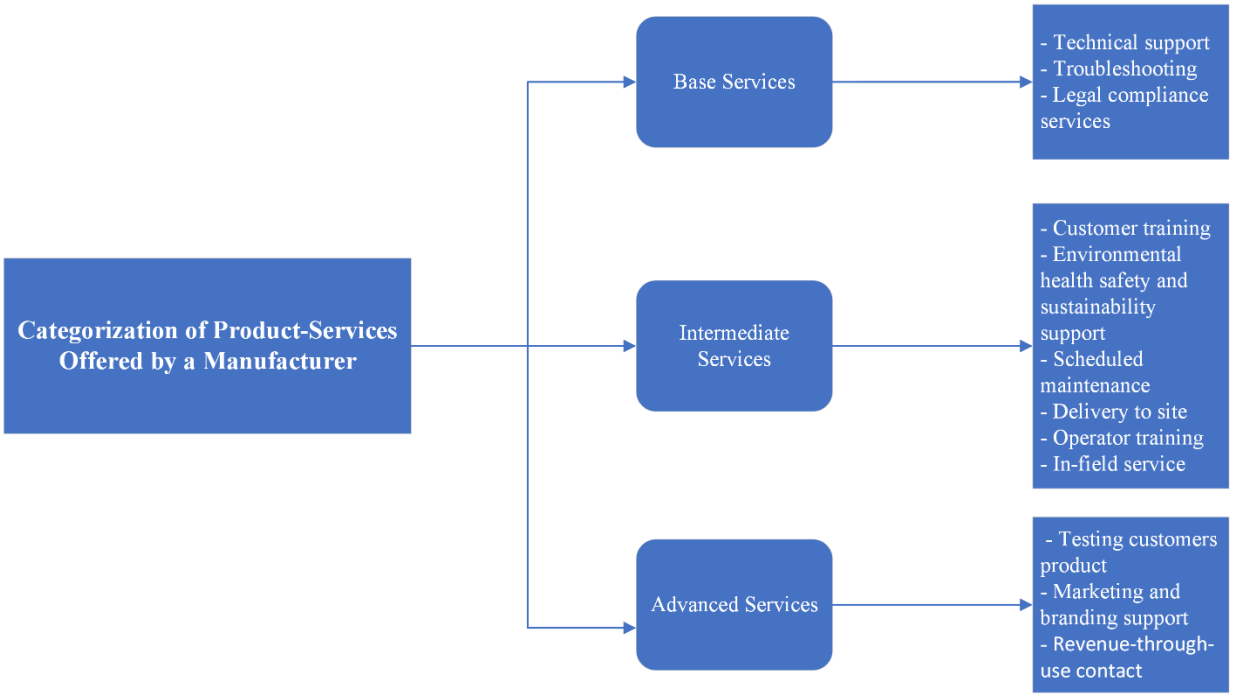

Figure 2 Categories of Product-Services Offered by a Manufacturer (Baines and Lightfoot, 2014)

Frank et al. (2019) grouped services into three categories: i) Smoothing services: these enable businesses to sell or use a product without compromising its performance. They are not intricately tied to the product such as maintenance, financing, etc., ii) Adapting services: these are incorporated into the product and increase the product's functionality or allow it to be used in new ways. They necessitate a greater interchange of information between the manufacturer and its consumers. Examples can be customizations and consultation, and iii) Substituting services: these services replace buying, with users paying mostly for consumption; this type of services is related to Tukker (2004)'s use-oriented and results-oriented services as well as Baines and Lightfoot's (2013) advanced services.

When it comes to business model categorization, Parida et al. (2014) further divided Tukker's (2004) Product-Service System (PSS) into the following four business models which can be seen in Figure 3.

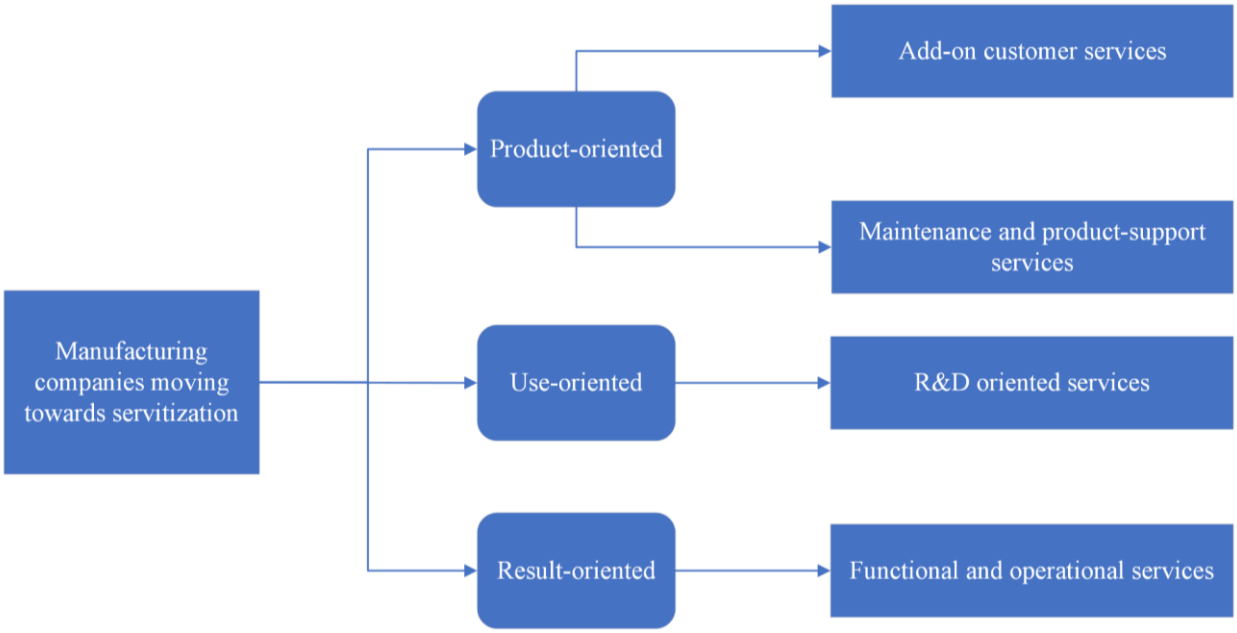

Figure 3 Classification of Service Business Models

Business management mostly focuses on goods / service bundles from a marketing standpoint, whereas Engineering & Design focuses on designing, producing, and providing service to the end customer (Annarelli et al., 2019). The authors defined the key characteristics of service as shown in Figure 4.

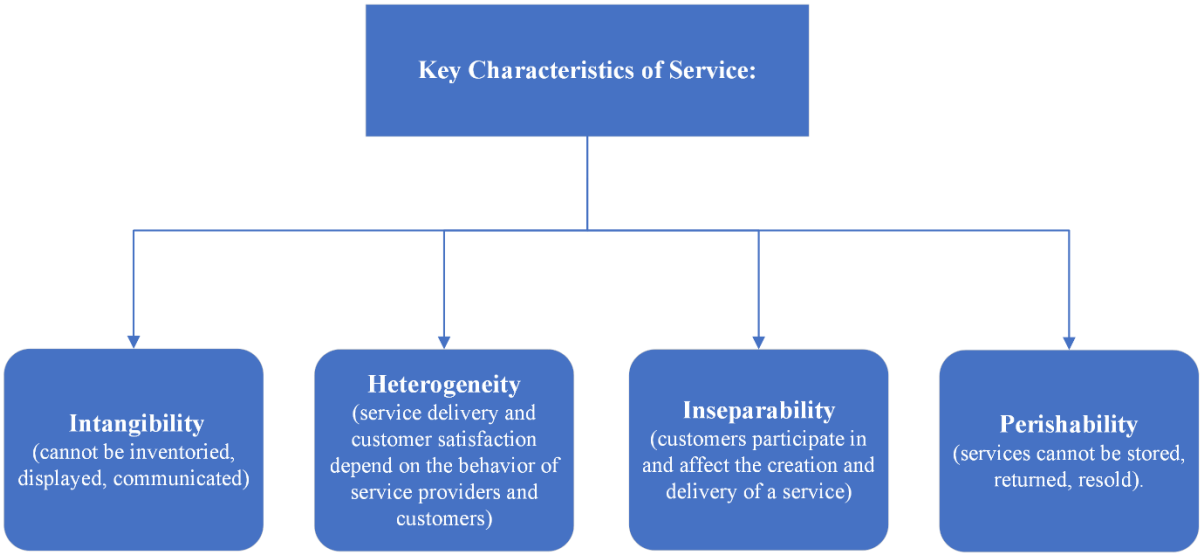

Figure 4 Key Characteristics of a Service (Annarelli et al., 2019)

2.5 Practical Challenges in Servitization

According to Ulaga and Reinartz (2011), 80% of companies who attempt to servitize fail. Understanding and managing this transition, to compete in the market through services rather than only selling products, is considered the main challenge in research and practice (Baines et al., 2017). Being unaware of the economic potential of services, thinking of service provision as beyond the company's scope, and unsuccessful service strategy are few hurdles in the process (Olivia and Kallenberg, 2003).

Although both markets, manufacturing, and service provision, are highly interlinked, the marketing of the services require a completely different type of communication with the client organization. It is a challenge to develop a global service infrastructure which is competent enough to cater the needs of local products-service related matters. Throughout the implementation of a strategy, businesses must deal with organizational pushback, internal disputes, and political consequences. (Salonen et al., 2007; Antioco et al.,2008)

Brax (2005) conducted a qualitative case study for an industrial equipment manufacturer adding more services to their portfolio. After conducting interviews within the company and outside the company and in-depth review of the previous literature, the challenges that the author found which were faced by the company were:

- The company struggled in servitization because of their conventional transaction-based approach.
- Lack of awareness within the company.
- Lack of skills to cope with the new methods and approach.
- Lack of feedback effectiveness awareness.
- Lack of management support.
- Short-sightedness of local managers.
- Communication gap between managers and subordinates (Josephson et al., 2016).
- Weak customer relationships.

After servitization, not getting the expected results (Revenue/profits) can cause conundrums within the company and the reasons behind this are mainly related to intra-organizational barriers (Gebauer and Friedli, 2005) as the conventional activities performed in the company such as capital investments, manufacturing infrastructure development, and R&D operations constitute towards the maintenance of product-centeredness of the company (Kohtamäki et al., 2015). Changing inter-organizational culture from product oriented to service centered is considered a huge challenge (Olivia and Kallenberg, 2003). Parida et al. (2014) after conducting a study with companies like Volvo, ABB, Metso Outotec, Ericsson, and found the following challenges that were most common faced by these firms:

- Bundling of the product with services.
- Understanding customer's challenges
- Generating value through a combination of both product and services. (Integrated R&D)
- Pricing model (over or under-pricing)
- Targeting the need of customer will help make a good pricing model (premiums, etc.)
- Maintaining good relationships with partners and customers (separate relationship managing units)
- Quality of service delivery partners globally (solution: evaluation of distributor's ability and target customer)
- Lack of competency (solution: hiring of experts in that field)
- Lack of development of an effective, deliverable, and profitable service package. (Jacob and Ulaga, 2008).

2.6 How Servitization affects Financial Performance

Servitization generates sustainable revenue streams (Mathieu, 2001). During global economic descents, big companies like GE, IBM and Siemens have been able to maintain a steady revenue by having customers commissioned through long term contracts (Kohtamäki et al., 2013) and income generated by services offers not just more appealing margins, but also a more reliable

source of revenue (Malleret, 2006). Customer satisfaction is also positively linked with service orientation which brings with it; customer loyalty and trust, and this creates a positive effect on the revenue of the company (Theoharakis et al., 2009, Heskett et al., 2008). Companies well known for a successful servitization include ABB, Caterpillar, General Electric, IBM, and Rolls-Royce Aerospace.

Olivia and Kallenberg (2003) highlighted that the revenues will not start straight away, and the firm should be willing to provide services for less profit in early stages to develop trust. In early stages of transition, small companies misinterpret services as intangible and of lesser value and start offering them for free which brings harm to the financial performance in the long term. This can be avoided by first infusing an inter-organizational service orientation in early stages to make the personnel better acknowledge the prospective financial value of the services (Gebauer et al., 2010) as services enables the firm to charge a premium on services which lead to higher profits (Theoharakis et al., 2009).

As far as simple additional services are concerned, it has been observed that their addition does not necessarily end in better financial performance of the company, rather, it impacts negatively. Except add-on services, all the others have strong positive relationships with the economic performance of the company but for a successful transition, these low-level offerings are essential to go through (Parida et al., 2014). For a firm to generate notable financial gain, transformational change within the organization is needed (Parida et al., 2014). Fang et al. (2008) also argued that until the business achieves critical mass, the effect of servitization on firm value is unvarying or in some cases, to some degree, negative. However, after that, the service ratio has a favorable accelerating effect. Kohtamäki et al. (2015) performed statistical analysis and concluded that additional services do not have any considerable effect on financial performance of the firm, moreover, they do not create a prominent competitive advantage to be considered as a KPI. When compared to pure manufacturing businesses, servitized firms earn higher sales but lower profits, and this is true for bigger enterprises; however, this result is totally flipped for companies with fewer than 3000 employees. The author called this the ‘Paradox of servitization’. He also emphasized that it mainly depends on the industry and the type of the service profile if the performance will enhance or not. In their analysis, Hong et al. (2013) have positively linked service orientation with several characteristics such as attitude of employees,

job satisfaction level of the employees, service performance, delivery and financial KPIs. Gebauer et al. (2010) found that service orientation has a positive effect on the average profitability of the firm.

Kastalli and Looy (2013) studied the servitization of a global producer of industrial equipment, named Atlas Copco Compressor Technique, over a period of three years and exhibited the essence of creation and appropriation of value in a firm. The author concluded that low scale servitizing brings a sudden positive effect in profits while large scale servitizing causes a temporary decrease in profits before increasing. Similar view by (Quinn and Gagnon, 1986). Kastalli and Looy (2013) attempted to see the value creation and appropriation process through the eyes of the customer, then applied what they learned to the manufacturer's perspective. The first hypothesis that the authors gave was suggesting that sale of product and sale of services has a positive reciprocal relationship between them. And the more the firm becomes customer-focused, the more growth there is in the sale of products. The second hypothesis suggested a curvilinear relationship between service activities and profit margin. The profit margin increases with ample economies of scale. Like the increase in product sales and efficiency of the firm through economies of scale, it enhances the service delivery of the firm. The author then concluded that 1) by outsourcing the services to the product-service supplier, the customer is believed to have more economic advantage, 2) the propinquity (closeness) of the customer increases the sales of the products, 3) The focus should be to build an integrated product-service business model in which services should be considered as a tactical supplement to the product and the services should remain related to the product to keep economies of scales a source of value creation, and 4) scaling up the level of services over time also causes an increase in profit margins.

Baines and Lightfoot (2013) concluded that sustaining profitability of the company requires combining optimal pricing with efficacious cost and threat management. Service provision typically leads to a rise in fixed costs, which, along with the *'poor scalability'* of servitization, can adversely affect the majority of profits, making this business model unsustainable (Annarelli et al., 2019). Bonnemeier et al. (2010) recommended three revenue models for the companies to adapt which are: i) Usage-based pricing, ii) Performance-based pricing, and iii) Value-based

pricing. Parida et al., 2014 suggested that a good investment plan for servitization should be considered for long term economic benefit.

2.7 Recommendations for Implementing Service-Based Business Models

Olivia and Kallenberg (2003) recommended that before offering services, elementary changes in the culture are needed. A representation of service structure by creation of a service-oriented communication channel between firm and the customers is also required. (Service oriented culture, HR practices). First step for service development in studied firms was to integrate product and services the firm is currently offering and improve the service delivery of the services already being offered (Annarelli et al., 2019). Internally, some kind of monitoring system should be developed to track the effectiveness and efficiency of the service delivery. Externally, quality enhancement should be focused on, to establish trust and a good repute among the clients. Olivia and Kallenberg (2003) also recommended manufacturers to shift towards improving the product's involvement in the end user's process and build metrics to measure customer and employee satisfaction and the success of the company.

Davies et al. (2007) emphasized that firms should focus on i) 'Front end' (direct engagement with customer), ii) 'Back end' (a strong service base), and iii) 'Strategic center' (for coordination between the two). Companies should make it clear about what they are expert in and what are the possible opportunities for further development (Davies et al., 2006) and should be aware of the diversifying changes in servitization (Baines et al., 2009). Services should be added to core product offering to orient product-based services with the operational activities of the consumer throughout the life of the product (Raddats, 2011) and they companies should not abandon the low-level services when they are moving towards high level services, rather they should build on the previous ones in a structural manner (Parida et al., 2014).

New service offers, according to Raddats et al. (2019), should address risk from both the provider's and the customer's perspectives and customers' requirements for different types of services (SSPs, SSCs) must be considered while developing service implementation pathways. Also, while developing servitization capabilities, all parties, not just the manufacturer, must be considered.

2.8 Practical Framework

Firms that want to compete through a servitization approach must continually assess their existing offering and plan future offerings. To that purpose, the suggested scale of measuring servitization by Maheepala et al. (2018) can serve as a monitoring tool for identifying and improving certain areas. To compare itself to key rivals, the businesses might utilize an external scale at the industry level. Senior management may utilize this basis to define an overarching approach for the organization's product/service offerings. The framework may be used by middle-level managers to establish explicit standards for the implementation of servitization. The following framework shown in Table 4 adapted from Maheepala et al. (2018) takes into account the changes in management and organizational behaviour, as well as recruitment, training, development, and reward systems.

Table 4. Framework for Servitization Measurement (edited from Maheepala et al., 2018)

Key Performance Indicators	**What to look at? / The right questions to ask.**
Number of services offered	How many services are currently offered?
Nature of Services	Refer to Figure 6. (Depends on position in the value chain)
Depth of services delivered	Offering to how many customers? Aligned with customer expectations? How well do you know the customer? Does it need more resources for more efficient delivery?
Strategic intent to develop a service breadth	How many services to introduce each new year? Digital services? Sustainability-related services? More services in the customer's value chain?
Strategic intent to develop a service depth	How intense is the offering? Does it need more attention?
Service orientation of corporate values	Position of service-provision in the corporate value structure. Does the company culture support mergers and collaborations? Is there a start-up spirit?
Service orientation of management behavior	Does senior management understand and support this shift? Are they committed to the cause?
Service orientation of employees' behavior	Is there any mechanism to measure service orientation among employees? Are service employees integrated with other departments? How deep do they go into customer relationships? Create more awareness.
Service orientation of employee recruitment	Is service-mindedness considered an important criterion when recruiting/training/educating?
Service orientation of employee training	Are current trainings more focused on manufacturing?
Direct revenue from service offerings	What is the % of revenue directly from services? (Price charged separately for services)
Indirect revenue from service offerings	How much are the services contributing to the sale of the product?

3 Research Methodology

This chapter goes into detail about research methodology, including parts discussing the research setting and design, sample and data collecting, and data analysis.

3.1 Research Context and Design

The purpose of this study was to elucidate on the process of transformation that a product-centric firm goes through as it servitizes to compete through services. The study aims to answer the research questions "What are the key elements and phases in the transition from production-oriented to service-oriented (servitization) business model?" and "How can the development of servitization transition be measured and what are the key performance indicators (KPIs) to use?". To answer these questions, the study follows an inductive qualitative approach with embedded case study. The choice of case study methodology as the research strategy is due to the fact that it allows the researcher to provide descriptions, theory testing and theory generation that corroborate or disprove theoretical concepts as they emerge (Eisenhardt, 1989). Moreover, the embedded case study approach provides the grounds for intensive analysis (Yin, 1994). Therefore, the study aimed at involving individuals from various companies from similar industrial contexts to give their expert opinions. This section discusses case selection, gathering of data, and analysis methodologies.

The research design of the study is based upon the model provided by Yin (1994), which comprises three components. First, the stressed component is the explanatory research question demanding operational links by investigating thoroughly. Second, is the unit of analysis to define the case more specifically targeted towards the research question through the means of individuals who are experts in this field. Third, the emphasis is laid upon the data collection and analysis methods. There are predefined tools for collection of data such as interviews, podcasts, and authentic documents. For the part of data analysis, grounded theory is used as the framework for qualitative research (Graue, 2015). According to Strauss and Corbin (1994), grounded theory

is a qualitative means of formulating theory inductively from grounded data that is deduced from systematic procedures.

The methodological steps for this study's data analysis part are adapted from Corley and Gioia (2004) and Gioia et al. (2013). This methodology follows an inductive approach which is suitable for a grounded theory method. In addition, it emphasizes informants' interpretations without being focused on existing theories for the goal of finding new concepts instead of validating prior concepts. However, there lies an assumption for researchers that users are able to find patterns in data in order to produce concepts, interrelationships between them and use these to define theories.

3.2 Sampling and Data Collection

For this study, purposive sampling was chosen to select the appropriate population who possess the right qualities, knowledge and experience related to the context that is being studied (Etikan et al., 2016). The primary source of data collection was interviews that were gathered from authentic sources who possessed extensive knowledge of the field. The participants were chosen either from companies that were already providing services and solutions to their clients or are planning to do so in the near future.

Data was collected between February and April 2022 and was aided by a data collecting procedure centered on the research topic. As a result, data was gathered through semi-structured interviews. The research questions were effectively addressed in the interviews, which geared to lead the discussion towards a characterization of servitization initiatives over time, concentrating on the process as well as the contextual factors influencing the progress of transition. In total, detailed interviews from seven Finnish companies were conducted and accordingly transcribed to provide the information for data analysis. Responses were captured by video recording. Each interview lasted 50 minutes on average approximately, providing more than 400 minutes of recorded information in total.

3.3 Data Analysis

The analysis of data for this study is performed by keeping in mind the grounded theory approach. The methodology initiates from defining specific research questions and using a step-by-step breakdown approach to the right set of information to find in the interviews. As interviews are conducted, the analysis is started to make sure that the comparative analysis between data can begin as early as possible (Corbin and Strauss, 1990). The underlying goal of grounded theory is to make sure that the interpretations and voices of subjects being studied are correctly interpreted (Strauss and Corbin, 1994; Eisenhardt and Graebner, 2007). Furthermore, this part of the study covers back-to-back comparative analysis, systematic coding guidelines and conceptualization of theory development (Strauss and Corbin, 1994).

This research adopts grounded theory as the research methodology, defining themes and codes of the central element for data analysis (Bryman, 2011). Throughout the process of data collection, data analysis was also carried simultaneously for the generation of codes and these codes/findings were compared to one another. The comparative element that is stressed in the grounded theory approach helps build a basis for new concepts and theories (Bell, 2022; Bryant, 2017). To ensure the integrity of the data analysis, this study follows six steps of thematic analysis adopted by Nowell et al. (2017). According to Clarke and Braun (2017), thematic analysis is the most popular method used in qualitative research to identify, analyze, and interpret patterns of codes or themes from data such as in the form of interview transcripts. Table 5 gives descriptions about each phase of the thematic analysis.

Table 5. Illustrations and description of Thematic analysis process

Phase	**Description**
1. Familiarization of Data	Interview transcription, highlighting of quotes, preparing ideas, repeating the process, and redefining ideas (Braun and Clarke, 2006)
2. Initial code generation	Formulating framework for coding, compiling data relevant to each code, assembling data that corresponds to one type of code, reflexive journaling (Corley and Gioia, 2004; Braun and Clarke, 2006; Gioia et al., 2013)
3. Theme Search	Preparing codes to make potential themes, mapping codes and themes for relationships, documenting the formation and pattern of concepts and themes (Bryman, 2011; Gioia et al., 2013).
4. Theme Review	Formulating a thematic map for analysis of themes (Gioia et al., 2013; Bell, 2022)
5. Defining names of Themes	Conducting analysis to specify the names of the themes (Braun and Clarke, 2006).
6. Report Generation	Compiling final analysis in form of report by referring to research questions and literature

4 Findings

In this chapter, findings obtained based on methodology defined in chapter 3 are presented. Each research question has been addressed in separate sections. And in the final section, an analysis of findings is concisely presented.

4.1 Key Elements and Factors (Research Question # 1)

From the thematic analysis based on the approach of grounded theory, there emerged three aggregate dimensions sufficient to answer the first research question i.e. "What are the key elements and factors in the transition from production-oriented to service-oriented (servitization) business model?" In these dimensions, there was an overlap of the first order concepts between the general industrial literature (manufacturing) and the contextual case study which validates the fact that those elements are common to all manufacturing industries. According to the systematic literature review, ten key elements and factors were shortlisted from the literature in general manufacturing industrial context with customer's needs, wants, requirements, expectation, and involvement in end user's process being crucial external factors and internal standardization, top management commitment, service-oriented HR, and internal coordination between departments being the key internal factors. They are shown in the Appendix Table A1.

The derivation of aggregate dimensions is done by consultative identification and grouping of relevant quotes, 1st order concepts and 2nd order themes. The coding of 1st order concepts from the assigned quotes was administered using constructed codes. The demonstration of linking the assigned quotes to the 1st order concepts, 2nd order themes and aggregate dimensions is shown in Table A2. From the collected data (interviews), the main themes and concepts were chosen to formulate a grounded theory related to servitization of manufacturing business. A *Data Structure* is developed to answer the first research question in a detailed manner. The data structure shows the three dimensions namely structure and change-oriented internal factors, consumer-oriented external factors, and strategic factors and how these dimensions facilitate the

transition from manufacturing to service business. Figure 5 shows the summarized data structure for this study.

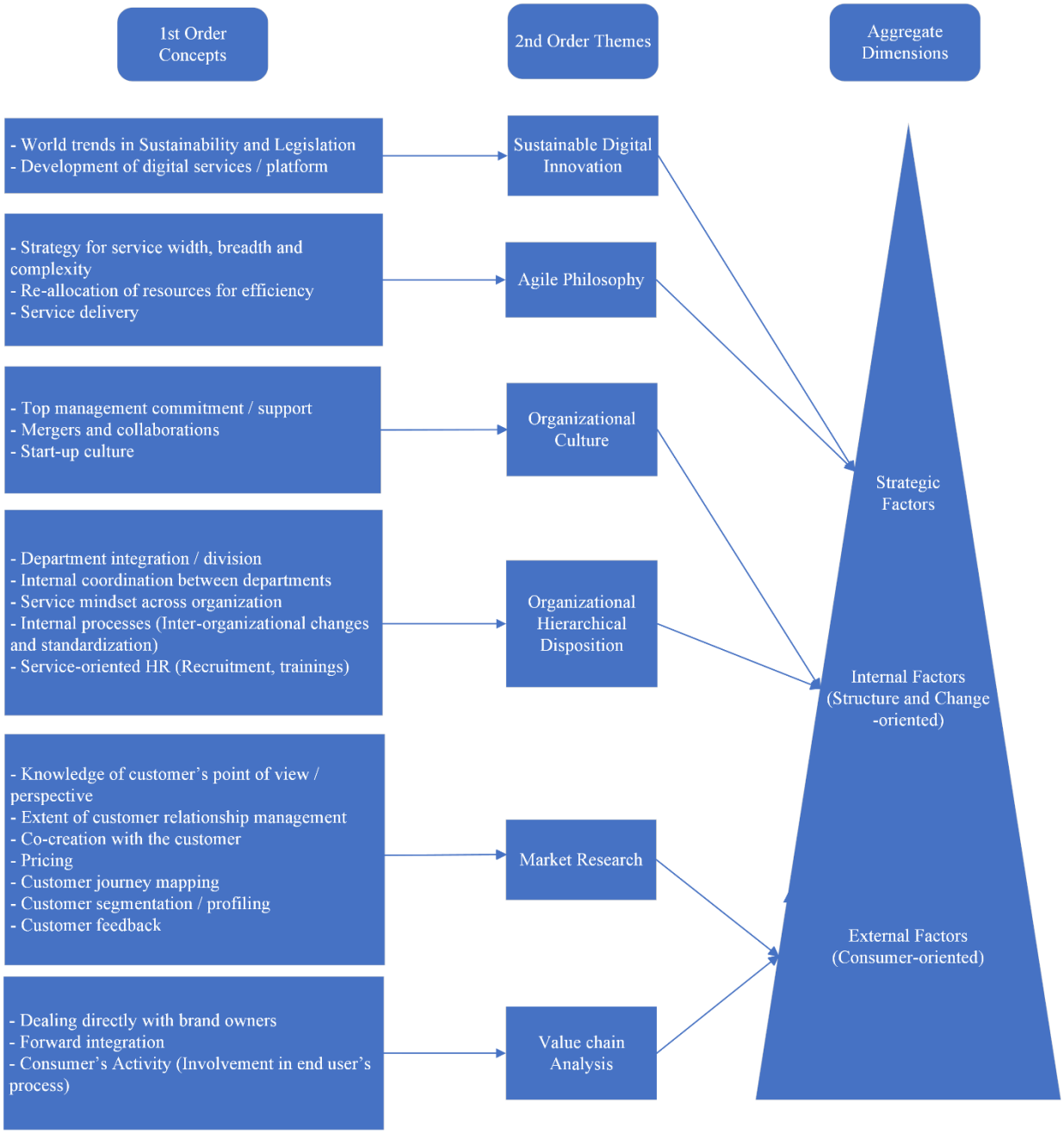

Figure 5 Data Structure of Key Elements and Factors Affecting the Transition

The 2nd order themes act as an umbrella for certain 1st order concepts. Each theme will now be explained briefly. Sustainable and digital development includes the development of digital

services that a firm can deploy and make the whole interaction process and journey easier for the customer. Similarly, the firm should keep a keen eye on the world trends regarding sustainability and climate change legislations to be ahead of their competitors. Agile philosophy includes efficient service delivery, re-allocation of resources for better performance of services, and strategy of the firm regarding service width, breadth, and complexity. The next is the organizational culture, which includes the internal culture of the company from top to bottom. The position of service-provision in the corporate value structure is crucial for service development. The company culture should be supporting any progress related to mergers and collaborations. And there should be a start-up spirit among smaller service departments as it promotes faster decision making. Organizational hierarchical disposition is an important theme as it includes several crucial elements such as integration and internal coordination between product and service department, inter-organizational changes, and standardizations of information across the firm, service orientation of human resources in matters like recruitment, training and educating employees and service-related incentive system to promote the service mindset across the firm. Similarly, market research and value chain analysis are of equal importance as they cover the consumer-based external factors which include knowledge of the customer’s perspective and processes for the co-creation of services and solutions with the customers with more depth in the value chain of the customer.

4.2 Measurement (Research Question # 2)

One of the most important considerations that an organization's top management must make is how the strategy's effectiveness will be measured. Measured strategies are more likely to succeed than unmeasured ones. To facilitate corporate adaptability, an organization's plans must be effectively assessed using key performance indicators (KPIs). Identifying the components of the strategy that can be measured allows a company to dedicate resources to properly execute it and review its progress on a regular basis. It is also simple to acquire approval from the necessary stakeholders provided the metrics for measuring the strategy's effectiveness are defined.

It is critical to comprehend how businesses assess the level of servitization and assess it with the level of other firms. It is not feasible to continue or improve upon a proposition unless it's been measured. Even though variables such as profitability may be assessed directly, intangible variables relevant to the organizational setting must be quantified using properly constructed measuring scales.

The number of services provided by manufacturing firms has frequently been used as a benchmark for industrial service offerings. According to Maheepala et al. (2018), proportion of service revenues in manufacturing firms has been used to calculate servitization. In addition, direct as well as indirect service revenues were often used to evaluate servitization, and a manufacturing firm's service orientation is commonly used to illustrate the level of a firm's overall service strategy (ibid). When considering a strategy that incorporates service offerings into core business strategy, it is essential that such a plan be measured against the following four dimensions:

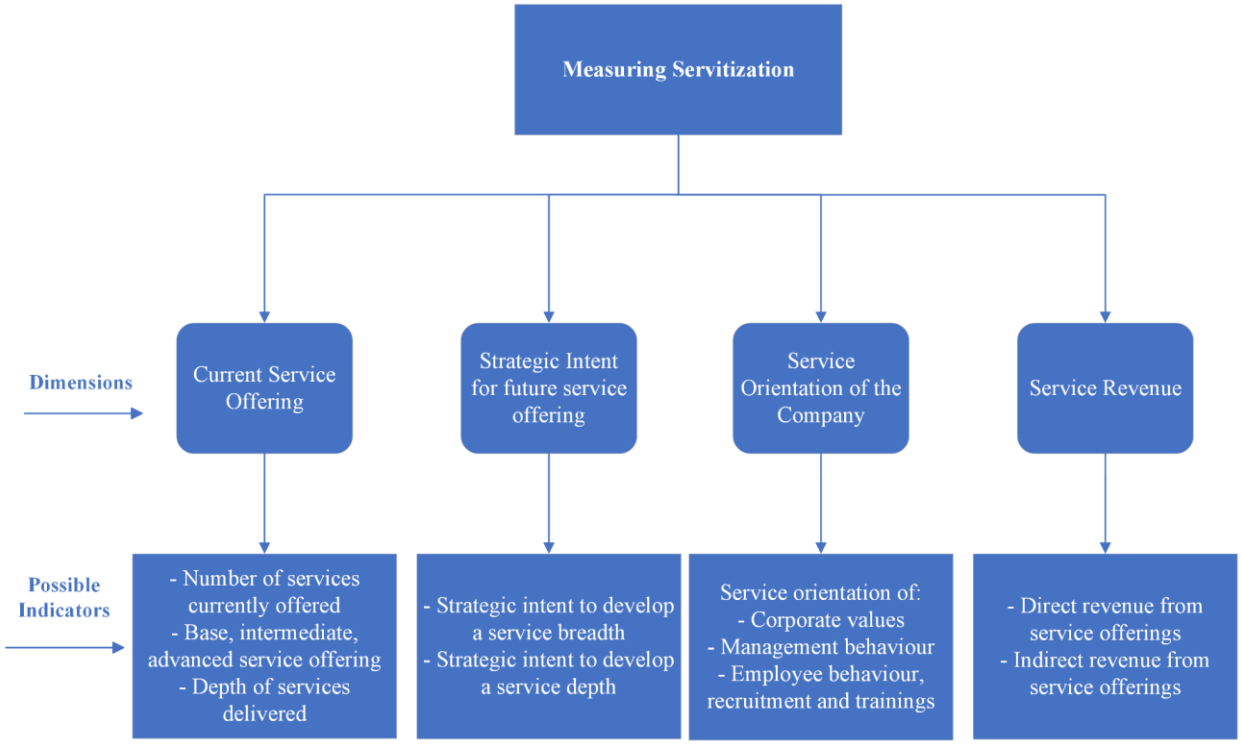

Figure 6 Dimensions and Indicators for Measuring Servitization in a Firm (Maheepala et al., 2018)

The existing service offering of the firm must be comprehended first. After that, understanding the strategic aim for future service offerings is crucial in determining if the company is delivering services in a tactical way. Third, because the implementation of the service plan is inextricably tied to the firm's service orientation, hence, that makes it a crucial element of the servitization plan. Finally, revenue growth will reflect the economic effects of the servitization plan and is the fourth key component to consider while evaluating servitization.

KPIs for the service program depend upon what the company wants, how they want to make sure that this is going to contribute towards the strategic positioning of the company, and goals of the company, but for each service, there needs to be a separate set of KPIs. For example, if the company can reduce its CO_2 footprint, or the customer's CO_2 footprint, these are considered more strategic KPIs than financial and are considered crucial in most of the cases. It really depends whether the KPI is financial or strategic (sustainability-related or innovation-related) as it can be crucial for the companies to decide what to prefer, as it is dependent on the financial and strategic goals and targets of the company and also depends on their commitment to the notions such as sustainability and climate change. From a financial point of view, the KPI that is considered the most important is input versus outcome, i.e., the profitability of the service. And there is a consensus among the interviewed firms that there should be a system in place to track how much does it actually cost to provide the service and what does the company get out of it. It should be kept in mind that it is not meaningful to have KPIs which are totally unrealistic, and they should not be written in stone as well.

It has been observed in the interviewed companies that the priority is to measure the value delivered to the customer and to visualize the value and then charge for it, for example, training services regarding the use of product. Companies consider it important to visualize the value of the service even though it's for free as it is about finding the balance and knowing what the extra service is. Hence, they must continually assess their existing offering. In early stages, it was more that the companies felt the need to expand into services as a futuristic strategy and they had started creating financial KPIs for services but those used to be much smaller than the costs. There always have been targets of contribution to certain sales levels from the services part but that number used to be much smaller than the actual operation cost. The reason behind this is that most of the services were in the pilot phase and the company did not want to risk losing the

customer by starting with high prices. The priority has always been to lock and customer and commit to a long-term relationship. After the service matured, the companies started to have more commercial target thinking and built a financial commercial matrix to follow and measure the growth. The case companies that started offering services a few years back observed that the numbers didn't always prove to be on their side, but they just decided to continue as it was a part of their strategic vision, and they were fully committed to the cause. There used to be a steady growth but not as expected**,** but when the service became niche and a must-have as the time passed by, their growth performance exploded, and growth graph took the shape of a hockey stick.

4.3 Analysis of Findings

Based on the results, the take-away message for the companies that want to make this transition from being product-centred to service-centred is to focus on three dimensions which are: i) structure and change-oriented internal factors, ii) consumer-oriented external factors, and iii) strategic factors. As according to the empirical results from the interviews, these are the dimensions that facilitate the transition from manufacturing to service business in the context of chemical manufacturing industry. To measure the success of the servitization journey, the framework given in the Table 5 can be used as it helps in defining a predominant strategy for the organization's service offerings and to establish precise guidelines for the implementation and measurement of servitization.

As the previously described four dimensions reflect distinct elements of servitization, several key performance indicators of servitization would be useful for creating and implementing a service-based company strategy. Managers can identify outlying regions by measuring servitization along these four dimensions. As a result, the structure in Figure 7 would be useful in developing an action plan by linking the first order concepts with KPIs to better measure servitization.

Figure 7 Direct Effect of Key Elements on KPIs

To further dig into the correlation between KPIs and first order concepts, we need to keep in mind that when merging products and services, it's critical to consider the service portfolio's breadth in terms of number of offerings. Businesses have the opportunity of actively offering a certain number of services to clients or just delivering them when customers specifically request them. Service delivery plays an important role in this aspect. In order to effectively depict the current scope of service strategy in the business, the number of services the company offers, as well as the layers of complexity with which it provides those services to its clients, are critical considerations. Knowing the customer's perspective and reallocating resources properly can also help in regard to reaching customer expectations. The strategic vision of service provision demonstrates if the company is selling services as a key differentiator or as a tactical response to customers' demands. The company will not be able to invest and enhance its current service offering if it does not have a clear roadmap for its future service offers. As a result, keeping an eye on global trends such as climate change, sustainability, and digital innovation is essential for service breadth, while involvement in end-user processes and direct dealings with brand owners are essential for service depth.

Service-oriented businesses devise, implement, and reward the systems, processes, and protocols which reflect the notion that it is a strategic objective of the business to provide quality service to its clients and that services have a substantial impact on the development of superior value. Therefore, it is critical to have top management commitment and a service mindset across the firm, as well as standardization of internal processes related to services and collaboration between product and service teams. Finally, the revenue from service offerings is determined by the price plan used by the organization. As a result, when calculating service revenue, it is customary to incorporate both the directly and indirectly invoiced service components of organizations.

In the past, practical framework for measurement had been suggested but this study also finds out the links of those KPIs with the key elements and factors. Hence, the visualised correlations of first order concepts in Figure 7 can be used to measure the degree of servitization using the possible key performance indicators.

5 Conclusions and Discussion

The findings of this study highlighted the key elements, phases, and challenges encountered in the transition from product-centred to service-centred business (servitization) in the context of the chemical manufacturing industry. From the collected data (interviews), the main themes and concepts were chosen to formulate a grounded theory related to servitization of manufacturing business. As a result, a data structure was presented based on empirical data collected from chemical manufacturing industry and the findings of this research are consistent with the findings of prior studies done in different industrial contexts like machine and equipment manufacturing industry, metal and mining industry, industrial construction, aircraft parts, aerospace and defence equipment, material handling equipment power generation and transmission equipment, technology manufacturer and exporter (Olivia and Kallenberg 2003; Gebauer et al., 2008; Kohtamäki et al., 2015; Huikkola et al., 2016; Rabetino et al., 2017; Annarelli et al., 2019; Baines et al., 2020; Galeria-Zarco and Campos 2021).

The developed data structure represented three dimensions namely i) structure and change-oriented internal factors, ii) consumer-oriented external factors, and iii) strategic factors, and explains how these dimensions facilitate or hinder the transition from manufacturing to service business. The findings also included framework and explanation on how to track the progress of the servitization shift and which key performance indicators (KPIs) to utilise. Understanding the firm's existing service offering, the strategic goal for future service offers, and service orientation were all deemed critical parts of the servitization strategy for measurement (Maheepala et al., 2018). Finally, to reflect the economic implications of the servitization strategy, revenue growth was considered to be the key component for evaluating servitization. As a practical result, a framework was created that can be used by senior or middle-level management to define an overarching strategy for the organization's product/service offerings and to establish explicit standards for servitization implementation.

The research question *"What are the key elements and phases in the transition from production-oriented to service-oriented (servitization) business model?"* was answered in detail, as according to the empirical results from the interviews, three dimensions were further explained

to facilitate the transition from manufacturing to service business in the context of chemical manufacturing industry. In the dimension of strategic factors, sustainable and digital development was critical as it included the development of digital services that a firm can deploy and make the whole interaction process and journey easier for the customer. Similarly, it was suggested that the firm keep a close eye on global trends regarding sustainability and climate change legislation in order to stay ahead of their competitors. Agile philosophy comprised effective service delivery, resource reallocation for enhanced service performance, and company strategy for service width, breadth, and complexity. The internal components of the organisation, which encompassed organisational culture from top to bottom, was the next dimension. The firm´s culture was discovered to support any development related to mergers and collaborations, as well as a start-up mentality among smaller service units, which fosters faster decision making. Integration and internal coordination between product and service departments, inter-organizational changes, and standardizations of information across the firm, service orientation of human resources in matters such as recruitment, training, and educating employees, and service-related incentive system to promote the service mindset across the firm were all considered important themes in this dimension. Market research and value chain analysis were also deemed equivalent in importance because they included consumer-based external factors such as knowledge of the customer's perspective and methods for co-creating services and solutions with consumers with greater depth in the customer's value chain.

Moving forward to the next question of *"How can the development of servitization transition be measured and what are the key performance indicators (KPIs) to use?"*, a framework had been developed to measure the success of the servitization journey. Table 5 shows the framework, which can be utilised to define a dominant strategy for the organization's service offerings as well as instructions for servitization implementation and measurement. In Figure 6, four dimensions were visualised which reflected distinct elements of servitization. Additionally, several key performance indicators of servitization were described for creating and implementing a service-based company strategy. The understanding of the firm's existing service offering, the strategic aim for future service offerings, and service orientation were identified as critical elements of the servitization plan for measuring progress. And, in order to reflect the economic implications of the servitization strategy, revenue growth was regarded as

the key component for evaluation. Furthermore, the findings of this study contained practical implications that can assist servitizing manufacturers in measuring the progress of the transition with sufficient explanation of realistic key performance indicators.

The limitation of this research is that it only covered the manufacturing sector of Finland, limited to six companies from chemical manufacturing industry and one from equipment manufacturing industry, and contained some firms that were in the early phases of the shift to services, possibly due to the specific industry focus. To analyse the experience and challenges of organisations further along in the change process, more extensive study is required. Therefore, it is suggested that in future, researchers must consider a larger data set from a global perspective and look beyond the bounds of manufacturers to compare results from different types of organisations in order to make a generalized finding. The further development of the framework and key concepts described in this research could be especially beneficial to companies experiencing product transformation and seeking to services to differentiate their offering, satisfy customers, and improve financial performance.

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Appendix

Table A1. Key Elements and Factors Affecting Servitization from Previous Literature

Key Elements and Factors	**Author(s)**
Customer's Point of View / Perspective (Needs, wants, requirements and expectation)	● Dotson and Patton (1992) ● Kaplan and Norton (1996) ● Homburg et al. (2003) ● Olivia and Kallenburg (2003) ● Raddats (2011) ● Annarelli et al. (2019)
Consumer's Activity (Involvement in end user's process)	● Vandermerwe (2003) ● Olivia and Kallenburg (2003) ● Rabetino et al. (2017)
Internal Processes (Inter-organizational changes)	● Kaplan and Norton (1996) ● Mathieu (2001)
Top Management Commitment (Corporate culture/mindset)	● Baines et al. (2007) ● Lay et al. (2010) ● Baines et al. (2020)
Extent of Customer Relationship Management	● Olivia and Kallenburg (2003) ● Baines and Lightfoot (2014) ● Saccani et al. (2014)
Service-Oriented HR (Recruitment, Trainings, Incentive system)	● Bowen et al. (1989) ● Gebauer and Fleisch (2007) ● Tuli et al. (2007) ● Antioco et al. (2008) ● Huikkola et al. (2016) ● Rabetino et al. (2017)
Internal Coordination between departments (Internal culture of the company)	● Davies et al. (2007) ● Lee and Tsai (2014) ● Baines et al. (2020)
Mergers and Collaborations	● Gebauer et al. (2008) ● Kindström et al. (2013)
Business Model Transformation	● Edvardsson et al. (2008) ● Lindahl et al. (2009)
Service Breadth and Complexity	● Kohtamäki et al. (2015) ● Galeria-Zarco and Campos (2021)

Table A2. Illustration of Data Supporting Interpretations. (Colour legend: **green** = **Case 1; blue = Case 2; purple = Case 3**; **yellow = Case 4; magenta = Case 5; red = Case 6)**

Second Order Themes	**First Order Concepts**	**Quotes**
	Aggregate Dimension: Strategic Factors	
Sustainable and Digital Innovation	World trends in Sustainability and Legislation	*"**Sustainability** has been in our DNA, and we have introduced so many different services already, maybe five, or even 10 years before the customers started to ask. After the first five years, we had only 50 customers, but now we are getting 50 new customers every year. We try to be the best when it comes to sustainability, and we've been investing a lot of time during the last 20 years.* *There was no other choice as to where the world was heading regarding sustainability. The numbers didn't always prove that in the beginning, but we just decided to continue and there was always more **steady growth** but now this **hockey stick** has now really exploded in the last maybe two or three years."* *"We have a **big team** following all the **legislation** which might change in two- or three-years' time. So, let's now be prepared and when the questions start coming, we already have the answer for customers. So, we've been just believing and looking forward to seeing what's happening in the society, in the value chain and in the legislation, and just invest in time."* *"We are moving towards **offering sustainable solutions** and innovative solutions to our customers, instead of just simple boards. We are actively seeking sustainability and **innovative** building **solutions**. So we already have that as our main focus and the goal. And I think that that's the only way that it comes from the higher level, and we'll tell it to the other people that our mission is not to sell boards, but to offer a **better future** for them and towards their clients."* *"We have to follow the **world trends** to be a little bit ahead of our competitors."* *"We're taking care of the customer pull and also keeping in mind the world and modern tech trends and being ahead of the game to gain the competitive advantage because if we don't get better and more modern every day, we will be out of the train real soon."*

	Development of digital services / platform	*"We have now **developed a new app** that our customers can use to order online 24/7. We have put quite a lot of time and effort so that customers can place the order online and they can see not only the order, but they can see their own portfolio, what they're buying from Raflatac including of course the price, order history, the quality details of the product and all the information about our production, they have our own low-key **portfolio**. We are really strongly **integrating our ERP system** where we have all the customer information regarding quality, orders pricing, product safety, sustainability, etc.* *In the same platform, now we really want to give **360 overviews** for the customer so that they can see if they want to have more information regarding product safety and sustainability. From this app/portal, they get the information already which then you don't need to verbally discuss."* *"By moving towards strong digitalization now, and to really try and have a higher share of the data, the **growth** has been really like a hockey stick during the last six to nine, or 12 months. We have spent quite a lot of time making it as smooth and as easy to use, our portal or app and the feedback has been very positive, that it is the easiest thing to use in our industry. And of course, that's best what we can hear: that it's easy and intuitive to use by our customers."* *"In the **future**, expanding the production line will not help us in the proportional increase. So, the **new strategy** is really to sever ties, and also focus on the **digital services** in the service."* *"There are plenty of **opportunities in the digital environment.** Whatever comes to business basics, like ordering and stock management and follow up, etc., can be replaced by digital ordering, and reordering channels like web shops. Also the inspections and maintenance plans can be built in a digital environment where you actually formulate a maintenance plan by doing an inspection and then just send that info further."* *"We started Webshop over two years ago, and it still contributes to a couple of percent of our sales. And actually, customers didn't even expect it from us, because we have a lot of field workers and shops. We're still talking about it to the customers. Couple of customers have said that it's wonderful that we have that."* *"We have a service included in the webshop which is 'click and collect'. In the old days, customer had to call to the shop that I need this product, can you pick it up and I will be there in hour, but with 'click and collect', you can do it in the webshop and select these products and press OK and the order will go to the shop right away, and they will pick it up without phone calls."*

Agile Philosophy	Service delivery	*"We have the Customer Sales Service to ensure the quality and delivery and in case there are any issues, we have a **dedicated team** that serves those customers.* *There's a huge amount of increasing questions regarding sustainability and product safety, it takes quite a lot of time to answer those questions, but we have a **dedicated team** and also the systems that we will then be able to give answers if and when the same question comes from other customers that we can reuse the work what we have done already before, so that's how we try to **differentiate ourselves**. That is how we are serving the customers."* *"We train the field sales guys a lot about the services in our portfolio. So it goes like this, when the field sales guy or the key account manager finds out that the customers might be interested in a particular service. They report it back to us and we send a **dedicated team** to the meeting and then they will talk about the real details on that. But for the smaller services, we have trained the field guys to handle it by themselves."*
	Re-allocation of resources for efficiency	*"We realized quite soon that the more we can **automate the process,** we can allocate our people's time for other more valuable things such as to serve our customers better and we can **allocate those resources** doing something different when it comes to serving customers."*
	Strategy for service width, breadth, and complexity	*"Selecting the right pain points, and many opportunities in the value chain underneath, you already have solutions there. So just go deeper. But certain areas, we need to maybe just **widen our services**, maybe there might be most probably there will be maybe a couple of new services. Sustainability is the topic where we will go deeper, but maybe we might even add, maybe, some new services also going forward."* *"We have selected a few **pilot services** that we really want to do well and learn about the process of that. But then again, if we go a little bit towards these must-have things, when we don't have a price tag on it, it gives us a little **bit more freedom** to design it and even speed up that introduction. So I think that we can do a **hybrid approach**. So for the ones where we want to introduce a bit more niche type of negotiation type of services, those we need to study well, and make sure that we really know what we are doing before we introduce them. But for some of the **must haves**, we can drive a bit faster."* *"We are definitely going to expand into both, deeper and wider, service portfolios. There is already a strong standard of what we know already so we can already package plenty of services out of that knowledge and then we just need to **cascade that and multiply and copy** that. And there is a lot to **standardize and streamline** for offering new services**.** And I think it's a good approach to have a balance and **combination of these two approaches**."*

		*"From a digital point of view, as I mentioned, that data actually is produced **throughout the value chain**. So, in the future, we would like to expand as wide as possible when we have a solid foundation in our core business, we should also expand into the **whole value chain** of the forestry business."* *"We decided that because our rivals in Finland are actually going away from the fieldwork and they're bringing everything to the web and all that, so we decided that we are doing exactly the opposite. We are doing more guys in the field and more services and more of these things around the product. So, the customers will find out that we are not going anywhere, that they don't need to have a computer or even WhatsApp if they want to deal with us. We will come to you; you don't have to come to us. So, we are going deeper and actually wider too."*
	Aggregate Dimension: External Factors	
Market Research	Knowledge of customer's point of view / perspective	*"When introducing a new product, we have to have the **client's opinion** and views, so it's easy to develop from there. "* *"If we want to take bigger steps in future, then we need to be on the pulse of our end customers, what do they want to achieve? What do they have in their strategic roadmap? Where do they want to be in five years' time? And study those and understand that this is the direction where they want to go? So should we now focus on this as well."* *"We need to see from the **customer point of view**, what are their needs, instead of what do we have. We need to design solutions for the customer. Because it's not only a service, it also involves our physical offerings, it involves our channels, it involves our physical and digital services. Everything that we can offer, we need to center around the customer. We need to start from understanding the customer"* *"One big thing we figured out that if the guy needed two products and if he comes to the shop, he will buy four because he didn't actually himself realize that I Oh, I need that one too. So, it's important that we know **what's in his mind** when he's coming to buy that product. "*
	Extent of customer relationship management (Customer Closeness)	*"We need to have an understanding of what the **customer needs**, what their business is and what their targets are. The better we understand that the better we can serve them and it's not always that easy. As we are not the only supplier and they buy from our competitors as well, but we do have more loyal or more long-term customers and based on our customer segmentation, we spend more*

		time on those customers who are more important for us now and then try to understand them a bit better." *"For customers, data and digital services are now becoming top priority. To continue with this starting point, we want to also be* ***more close to the customer*** *and listen to them, what kind of services can be digitized and what kind of services they don't want to digitize, for example, that there would be some features that our business or our internal people want to impose but when we really talk to the customer, they might not want that feature. For example, taking notes, while operating and making observations, this is making our service easy. So first of all, we need to make the customer see the value of the features. On the other hand, we also need to understand the customer's real problem, are we solving the real problem."* *"We focus on developing deep relationships with the customer so that when the customers get to know our field sales guy, they are not buying from the company anymore, they are buying from Kai or Pasi or whatever."* *"Locking the customer is more important than getting the most money out of it. Because if you have a long-term customer, and that customer is satisfied with your products and services, they will be willing to pay extra for it because they don't want the hassle of changing all the processes and moving to something different. So I think it makes sense that if you're aiming for the long-term relationship, the profit and the revenues will follow."*
	Co-creation with the customer	*"Most of our salespeople have a technical background. Basically, they have technical information built in them when they meet the customer. So, they spend a lot of time themselves at the customer line. And then of course, they also pull other people in that question setting like R&D people from product development or somebody else so that way, the* ***competence can be a co-creational process*** *in a way, as well."* *"We need to* ***ask deeper questions,*** *instead of just taking notes of what the customer wants. Because sometimes our customer might not be such an* ***expert*** *in digital services like us, because they're experts in the forestry business, but maybe not IT, maybe not software, so we need to also guide our customer and give the best solution.* ***Communication*** *is important to elucidate the goal of the customer, not just you know, taking notes of the requirement assets."* *"We always try to get the right people at the same desk. We are trying to ask where the pain is, in your daily work? We try to find out where we can help the customer in their normal life. We are not actually talking that much about the products and that is good. If we can help the customer do their job better and faster or more effectively, in that case wherever we are, we're going to win the race"*

	Customer journey mapping	*"The **journey** started by **mapping** what else we do then only support the customer with the product, and we were able to identify 60 different additional things that the customer gets more value from than the product itself."* *"We need to map out the personas and customer journeys of our customers to really understand their priorities and their pain points, in order to offer the best configuration of the machine or the best parts that we could offer, but also understand what is needed in between and what kind of services we can provide hand in hand with a physical offering. So from a holistic point of view, from the start of the journey, until the customer is satisfied with their goals."* *"We will have a systematic methodology to interview our customers to understand the key personas to prioritize these key personas and map out the customer journey end to end from the start point to the endpoint from the journey point of view. And also vertically from the front stage to backstage from the customer experience towards business processes to support those experiences and then towards different systems, both physical and digital, that can support these business processes. We are just starting that work and hoping that this will bring our customer understanding to the next level to more actionable features, solutions, and whatever we can offer to our customer."*
	Customer segmentation / profiling	*"At the beginning, some of the services were **free of charge** but if you looked at the cost of that service, and external costs, those were really expensive. So now we are deciding that maybe for certain customers, if they are the best of the **segmentation**, they are really, really loyal, and our share of the wallet is quite high, they get it as a free of charge service. But then if you have a transactional customer, maybe with them, we have to either ask for some money for the service, or they need to start buying more from us."* *"One way to segregate is through **customer profile**, whether that's a big multinational key account or a local important customer or a small customer. Then there are also these positions where what is **must have** for key accounts might be a niche for a very small customer. So this is also something to think about.* *We are doing some **spot services** for which we are charging as well, like some certain training, for example, and it might be that there is some certain training that is very typical, that we are **charging that in some countries** at least."* *"For a product with service element in it, we charge a subscription, there's a fixed price and then monthly subscription. But if the customer is big enough and they are buying a lot of the products from our product range, we don't charge them the subscription fee. But it depends on the customer segmentation. For small customers, if they want to have a specific service, they have to pay. And for the bigger ones, they're already paying us enough to give that to them for free."*

		*"**Drawback:** from a sales point of view, more customer segmentation will be needed as we have observed that the sales are going down in the case that if the order goes automatically, the salesman goes there to only put the products in the right place. But if the guy goes there two times, he will see the customers and he will talk with them and can sell an extra couple of products to the customer. But if it goes automatically, he only goes there once and then the sales cycle gets a little bit down."*
	Pricing	*"We need to **visualize the value** and then also **charge** for the value. We have been **saying yes too many times**. It's really about finding the **balance** and knowing what the extra service is. This is now something that we will do, it's an investment for us."* *"**Pricing is certainly a challenge.** We also would like to tackle this with a service positioning thinking that the must-have services would be included in the product price, but still visualizing the value. I think it's important to **visualize the value** of the service even though it's for free."* *"For now, we are providing the basic information, the technical details about our product **for free** for the designers to use. And we are not taking any responsibility for it. But if we ought to provide the solution that includes the design service, which they usually now buy from a third party, then from that we need to have the **invoice** also to be **built** up."* *"Now we are having more **commercial target thinking**, but it wasn't the case 10 years ago, so it was more that we felt that that's what we need to do, it will maybe become like a new normal or tick the box which every supplier needs to have in as a service. But in the beginning that wasn't the case. But now we have a more **financial commercial matrix** which we want to follow."* *"Almost every service is included in the price of the product. So it's not very common that we are charging those. There's our revenue you can see how it goes in the different product groups. We're basically following indirect revenues from the services."*
	Customer feedback	*"The **feedback** from the customer has been that our system is the easiest way to use. We ask customers how they see us in terms of quality service, and different elements of the service. "* *"We are really interested in the end user, because only then we know what the real requirements are. If you know the end customer business, you also understand what kind of **improvement possibilities** there are, what is their strategy, going forward to what kind of sustainability paths they want to look at and all that. So, we can also **find opportunities** from there. So, it's a very important source for us."* *"We are also pushing more in a way that we will be involved more directly with the customer and **understand the requirements***

		together *with the business.* ***Customer closeness*** *is one of our key values of the company. We really like to listen to the customer and develop our products and services together with our customer. And the business, sales, marketing and services, and the products, they are having day to day conversations with customers to understand their needs. And they are constantly* ***collecting feedback*** *from the customer as well."*
Value Chain Analysis	Consumer's Activity (Involvement in end user's process)	*"It has been very strongly in our DNA that we* ***know the customer production line*** *really well. And over the years, over the decades, we have been* ***carefully listening*** *to what their* ***requirements*** *are within that and learned a lot also outside that about how they do the stacking, and how the service has been and will be evaluated by the end user."* *"We are using bottom-up customer relationship growth. If we consider a pyramid, the CEO is on the top of the tip. And all the magic happens in the bottom. And our job is to use that magic to get the customer to work with us more because our company believes in long term customers who are counting on us, and we are counting on them."* *"We need to then be* ***more involved*** *in the whole value chain. So that requires us to understand the data that comes from prior to operation and the data that is produced during operation and how our customers can utilize this data and* ***solve their business problems.****"*
	Entering value chain / Forward integration	*"We are now trying to understand not only what are the customer's target demands, but also, we want to understand what the* ***customers' customers' needs and targets*** *are so that we can even better develop our value proposition solutions. And so, meaning that we can support our customers and they can be more successful with their customers and so on. We try to understand the whole value chain and spend quite a lot of time with that."* *"I think that from a* ***service design point of view****, I can see a whole way in* ***the value chain*** *which could work really well because it would prevent* ***a cost*** *as when you just maintain something, you don't need to stop your operations."* *"A basic solution for the right use of our products is available on our website. And also, we try to train the designers to use our product. But if we are growing in taking the responsibility of the whole structure and solution, that's, of course, another level of the services, and then we have to have larger warranty times and guarantees for the customers."* *"I think we're going towards* ***exploring the unknown*** *and trying to challenge the status quo. And the ones who are the braver ones are generating new experiences, in whatever business. It's still a big question, you know, forward or no forward integration in selected*

		*markets. There's pros and cons to everything. If anything, we just want to continue this **organic growth.**"*
	Dealing directly with brand owners	*"A business where we **deal directly with the brand** is kind of an opportunity and a challenge at the same time, because lots of different types of efforts are needed to convince them (very big companies)."* *"If we are just listening to our direct customers, we are not necessarily working on the right projects. If we **talk to the customers' customers**, we then understand where we are really going and where we should be headed. So, it's a **better compass**."* *"If we would start to expand in a certain segment, we would step right on the toes of some of our key customers, and that could have a bad effect on the business. But then if you look at another product segment, it's more **like a jungle** and a chessboard of sorts. I mean, the servicing exists in our business, but it **does not necessarily make sense** for us to do it as of now. But it might be an area to be revisited now."* *"Many of our customers have realized that we can help them to look better in front of their customer, especially with sustainability, because quite often they don't have a resource or know-how on these very challenging, very demanding needs and questions coming from the value chain. And I think that we've quite often been able to **help the customers** with sustainability. And now as I said that now the brand owners, they are even contacting us directly. Because they know that they get much better answers to questions now having direct contact with us than the smaller, smaller suppliers."* *"When we have a deal with a big OEM manufacturer, which we would call a key account, they determine that these are the **subcontractors** for them and only then we **contact them** directly."* *"If the customer is dealing our products to b2c or whatever, we are not talking with the customer. It's really 99 times from 100 where we have a couple of really specific customers what we are doing like that. We're not doing this because if the customer is selling our products, it's not our job to interfere."*
	Aggregate Dimension: Internal Factors	
Organizational Hierarchical Disposition	Internal processes (Inter-organizational changes and standardization)	*"Talking to the customer and having individual understanding with the knowledge remaining in the same business salesperson is not enough, we need to have that **knowledge** actually **shared** and documented for the whole company to understand **and constantly update** that knowledge."* *"Currently the technical service department is responsible for products in the application. But moving towards offering a solution,*

		we have to strengthen the organization of the technical service department." *"There's a continuous effort to make sure that our **internal colleagues are kept updated**. There's so much content and how to put it into the format that can be then given to the customer or explained to the customer is really a continuous **challenge**. For that, **continuous training** is needed. We are organizing quite a lot of webinars or training sessions for our customers and customers' customers."* *"From a digital point of view, we would like to release our digital services often to **customers all over the world**, and gather the data, the real usage data of our customer in order to find the gaps and the improvement points to have the input for the next release of our digital platform."*
	Department integration / division	*"We have both product development for production and centralized R&D for longer term projects but it's always like a **combination** of both."* *"We have a lot of communications between product and service departments, but they are **separate departments**. For **future development** of the services, developing another department for only the solution provision could be a possibility."* *"We have decided that we will keep this process an **iterative** one. So that we will learn as we walk. But my current thinking is that the services are very **cross functional**. We need people for marketing, R&D, finance operations everywhere. Sales might be the channel to discuss the value to the customers. But I could see **integration** being done rather than separate."* *"Product and R&D are integrated **under the same roof.** Digital service and IT are a separate department, but we have very close **collaboration** with business and R&D."*
	Service mindset across organization	*"We have learned a lot and that has led to a situation where we have also started **fine tuning our products** to better match these needs. There have already been a lot of service elements in our offering as well, but we haven't formulated that as a business offering, we have been focusing on the product itself. We are just about to start a **competence journey** related to the services, which is the **service mindset**. So we will work on these competencies and will **develop** a training program for our employees. And when we are done with the certain pilots, we will move towards more practical service-related training. And we started this **journey** to move a little bit more towards a **complete solution supplier**, which would include not only the products but also some services.* *Mindset change is a big journey. So it will take a couple of years to get that turnaround in people's heads."*

	Service-oriented HR (Recruitment, trainings)	*"Now even the salespeople have spent a lot of time **educating, training** again and again and they are comfortable explaining the value to the customer.* *We have this HR tool i.e. Our Workday which is now the current HR system, and we are also using it for **training and educating** our salespeople with all kinds of e-learning and. So now we are trying to put more and more content into the tool."* *"We also have **digital services** for our **employees, and partners**. So we have a lot of dealers and also our own subsidiaries all over the world. So we have certain tools that we develop, to empower their day-to-day work so that they can provide better service for our customers."*
	Internal coordination between departments	*"Our **salespeople** who are dealing with them are also **trained**, and they know the basics of that service and they can take it to the point where they can introduce it and so but then after the service is implemented, we have our own dedicated team who is then dealing with the customer directly. They are very **strongly working together** with the business and the sales. So, it's like a **joint effort.**"* *"The company should be **innovation-driven.** People sitting on the best information should go hand in hand with the ones who have the authority. Otherwise, you won't be making the right decisions."* *"In organizational restructuring, **internal challenges** are always the bigger challenge. Internally, it's called **corporate parenting**.* *When nobody was paying too much **attention** to us, we actually generated this direct contact with the customers which allowed us to really come up with solutions, which nobody else has. But if we have somebody else within our organization telling us what we should be doing, then it can very often be a long **frustration**."*
Organizational Culture	Top management commitment / support (Corporate culture)	*"We have a very **flat organization**. So all good initiatives can be directly discussed with the owner and management board. And there has been a lot of interest in this area."* *"If there would be kind of a structural challenge to get a certain number of management teams and boards and country teams to kind of accept different ways of doing, I think it might become very stressful, because you would need to run **two types of changes** at the same time. So, I think it would be a **burden**."* *"Every leader in our company knows that this is the way we can even further improve our value proposition and our competitive advantage."* *"Our top management came from an IT background. So he's very aware of the future trend. And the reason why we have a new department is because of reorganization of the company. And previously, there was no separate digital service, and the IT department was part of the support team together with finances and so on, but now it's a separate department and the company has*

		decided to invest and expand the capability here. So from the very beginning of this department, I think there is ***top management support****, for sure."*
	Start-up culture	*"In start-up culture, instead of going through the hassle, they just pick what is really super interesting and fits the strategy. Maybe you then end up paying more for it, but you are really carving out exactly what you want. So this kind of* ***small organizations within big ones*** *support faster decision making and changes the dynamics totally. Having a smaller team, I can do almost anything I want. So, it's like, there's* ***no monkey behind the back****. I have a boss who understands what's going on, we can agree, we can disagree and so forth but there's a mutual trust in between. It's almost like a* ***startup in a big company,*** *and we have been generating good results as an output."*
	Mergers and collaborations	*"By* ***joining*** *the different companies and building our portfolio* ***together****, we will move towards the solutions. So when we have two companies coming together, one is making the membrane for the roof and other is making the insulations, we have the best knowledge on both of those products. So together we can get the best advantage for the client when we* ***combine our forces.****"*