

Servitization:
Analyzing its Dilemma in B2B
Manufacturing Industry

Xiaoming Xu

Master's thesis
February 2021
School of Business
Master Degree Programme in Entrepreneurship & Business Competence

Author(s) Xu, Xiaoming	Type of publication Master's thesis	Date February 2021 Language of publication: English
	Number of pages 82	Permission for web publication: x
Title of publication Servitization: Analyzing its Dilemma in B2B Manufacturing Industry		
Degree programme Master Degree Programme in Entrepreneurship & Business Competence		
Supervisor(s) Akpinar, Murat		
Assigned by JAMK Centre for Competitiveness		
Abstract <p>In recent years, due to the development of globalization, the rise of emerging markets, and the manufacturing industry's proficiency in existing technologies, the competitive situation among manufacturing companies has become increasingly severe. So, it is imperative to find a breakthrough for the survival and development of companies, and to find new directions for increasing profits and profitability. In view of the rapid development of the service industry, the servitization of the manufacturing industry defined as a service-oriented package for customer, has become a new development requirement and a stable profit growth point for the industry.</p> <p>Exploring the challenges faced by the servitization of manufacturing industry and how to overcome these challenges has become an indispensable part. Through the research of the existing literature, the corresponding theoretical framework was established. Combined with the blueprint designed by the theoretical framework, a typical case company and its customer in the industry was selected for empirical research. The challenges of manufacturing servitization and the corresponding solutions, were discovered based on the analysis of the empirical data from the case company and its customer.</p> <p>The challenges that exist in the servitization of the manufacturing industry are concentrated in the internal strategic management of the companies and external customer relationship. This study suggests that companies should adopt a suitable business model and coordinate the key performance indicators among various functions to solve the internal challenges. In addition, the method of evaluating performance should be shared with customers to improve customer satisfaction. The study ends with suggestions for future research to further develop servitization.</p>		
Keywords/tags (subjects) Servitization, business model, operations management, B2B		
Miscellaneous (Confidential information)		

Contents

1	Introduction.....	4
1.1	Background.....	4
1.2	Motivation for the Research	6
1.3	Research Questions	8
1.4	Structure of the Thesis.....	10
2	Literature Review	11
2.1	Key Concepts	12
2.2	Servitization.....	14
2.3	Business Model.....	25
2.4	Operations Management	28
2.5	Theoretical Framework.....	30
3	Methodology	36
3.1	Research Approach / Strategy.....	36
3.2	Research Context.....	38
3.3	Data Collection	39
3.4	Data Analysis	42
3.5	Results Verification.....	45
4	Results	46
4.1	Findings	46
4.2	Analysis.....	49
4.2.1	Company View	50
4.2.2	Customer View.....	59
4.3	Results Synthesis.....	62

5	Discussion	65
5.1	Answers to the Research Questions	65
5.2	Managerial Implications.....	68
5.3	Contribution to Existing Literature	69
5.4	Research Limitations.....	70
5.5	Recommendations for Future Research	71
	References.....	73
	Appendices.....	80
	Appendix 1. Interview questions	80
	Appendix 2. Interviewee List.....	82

Figures

Figure 1. The Servitization Route	16
Figure 2. A shift in competition	18
Figure 3. Service theory classification.....	20
Figure 4. Five factors of industry competitiveness.....	22
Figure 5. Servitization Driven Flow	23
Figure 6. Business Model Elements	27
Figure 7. The transformation of input and output between operational function departments	29
Figure 8. Strategic operation and its four factors.....	30
Figure 9. Interaction between business units	32
Figure 10. Service development map	32
Figure 11. Business Challenge Dimensions	33
Figure 12. Data Analysis Process.....	44
Figure 13. Challenges and Barriers Status.....	47
Figure 14. Solutions and Findings Status.....	48
Figure 15. Challenges and Barriers Status.....	63
Figure 16. Observed Challenges and Barriers with Solutions from Theoretical Framework and Empirical Study	64

Tables

Table 1. Structure of the Thesis	10
Table 2. Service Category Table.....	17
Table 3. Rules, Norms and Metrics of Business Model.....	28
Table 4. Barriers of Servitization.....	34
Table 5. Theoretical Framework of the Thesis	35

1 Introduction

With the economy's continuous development and the further combination of the global cooperative supply system, enterprises, especially the manufacturing industry, face more new challenges and new opportunities. In order to adapt to this change and improve their own capabilities and competitiveness, companies need to develop and self-improve on a strategic level. Eloranta and Turunen (2015, 409) pointed out that the shifting from specific product business to services business is a good direction to obtain competitive advantage. Many publications suggest that servitization as a concept which has been defined as a combination of offering with product and service in manufacturing industry (Baines, Lightfoot, Benedettini & Kay 2009c; Vandermerwe & Rada 1988; Wise & Baumgartner 1999). This chapter is presenting the background of servitization to the reader as well as the research motivation, research questions and the structure of this thesis, so that it guides well for the reading of this thesis.

1.1 Background

The key question is how a company can survive in the current fierce competitive environment in business. It was explained that a company needs to have a favorable position and status through a unique strategy to improve the competition which as a core to run their business whether success or not (Porter & Advantage C. 1985, 1). Therefore, companies that want to survive, have to find a way or approach to be more competitive than their rivals, so that the continuing and expanding of their business can be ensured. Referring to this thesis, the phenomena it studied was within business to business (B2B) of manufacturing industry about the challenges of implementing servitization. Under this specific context, the question of how a manufacturer should shape the company in order to be more competitive in the market was focused and studied. As reported by Filed Service News (2018), conventional manufactures are seeking a way to improve their competitiveness and the commonly recognized way to this is called servitization which is a services-led competitive strategy with its specific processes. Thus, the importance of servitization

to the manufacturing industry is explicit and commonly known by the industry's executive teams. The related strategic activities are taken in implementing in enterprises with various situations and servitizations as recognized as a blue ocean strategy (Kim and Mauborgne 2004, 71) which helps the companies' businesses with continuity and expansion.

As a strategy, servitization is a way to increase value to a product by adding services (Vandermerwe & Rada 1988) and it is a higher vision for value generating instead of being a category of market offerings (Edvardsson, Gustafsson & Roos 2005, 118). Hence, for the manufacturing industry, it emphasizes the combination of the service and product as one package for the customer in order to improve the value supplying, as well as to attract customers and gain more orders. Hso (2018)-a leading Microsoft partner points out that servitization as full-service manufacturing and growing phenomena with no doubt, drives the potential growth in the manufacturing industry by bringing companies closer to their customers and leveraging wider skill areas. Through such approaches, the manufacturer is able to build up their own competitive strategy and obtain the advantage in running business comparing to conventional manufacturers.

Even though the servitization concept was introduced in late 1960's and it has been developed and implemented into practices in a very long time, its actual role and connotation still need to be continuously researched and updated in line with different requirements and purpose. The recognitions of servitization is still not on the same level as other elements such as manufacturing, assembly, production and R&D in most manufacturers' thoughts, and it is treated as a way of effecting on customer relationship rather than revenue creator (ibid.). This fact is easier for understanding because the attributes of servitization, which are more invisible and difficult to measure, bring barriers for its implementation. On the other hand, these characters of servitization, are also the essential factors of why it brings strategic advantage to manufacturers, and explain why this approach should be adopted in the manufacturing industry.

Overall, when manufacturers moving towards servitization, it helps to obtain strategic competitiveness for enterprises. This fact is partly recognized by manufacturers. But, the implementing situations and the clearly understandings does

not show optimistically in reality. It is still ambiguous how to make the combination of product with service, and what the effect from internal and external factors of enterprises is on what kind of expectations from customers' perspectives. Based on the understanding of the essence of servitization and the familiarity with the basics of current servitization implementation in the manufacturing industry, the author believes that the study of the factual difficulties and dilemma of implementing servitization in the manufacturing industry helps the whole industry to understand this strategic choice, and to provide a better reference for business development. This thesis presents the challenges from both the case company and its customers' perspectives and attempts to provide solutions and suggestions for them with a structured and systematic approach.

1.2 Motivation for the Research

Motivation from Manufacturing Industry

With the industrialization of information technology, the globalization of product supply chains, and the development of artificial intelligence technologies, especially after the financial crisis in year 2008, business competition has become increasingly fierce. This is undoubtedly worse for the traditional processing and manufacturing industry. In addition, due to the transfer of industries, the gradual application of new technologies, and the changes of consumption power globally, they have deeply affected and restricted the competitive advantages of traditional manufacturing. Therefore, taking obvious strategic measures such as transferring factories to low-cost regions, adopting localized supply, investing in emerging economies, as well as acquiring mergers and using outsourcing, has become the first choice for manufacturing owners to enhance their competitive advantage. These initiatives often appear in the media reports and news. There are more than 20 000 multinationals that are running business in developing economies and a 70% future growth is expected from there for western multinationals (Matthew, Mark & Hari 2011).

The Above mentioned activities are all related to cost, efficiency and operation optimizing of manufacturers, and they lead the business competition into a situation

where the boundaries are clearly defined and understood, and where the rivals try to outperform each other (Kim & Mauborgne 2004, 71-72). So, the needs of seeking a new strategy to improve the competitiveness and business advantage, is at the top of the executive teams' list in the manufacturing companies. From the innovation of adding service with product to upgrade the business type, changed from product oriented to product-service oriented, that it brings the new way to maintain and rebuild the strategy for manufacturers. It brings new concepts to the strategic activities and makes the company's strategic decisions in line with the strategic principle and theory.

Since servitization as a way out for manufacturing industry in improving its competitiveness, the necessary research and study concerning to its implementation has become inevitable. The author hoped to explore the difficulties of implementing service through this thesis, and then reveal the problems that have not been demonstrated by another research. It was also hoped that this would help and support the servitization process for the whole industry.

The Case Company's Motivation

The case company is running business all over the world as a frontier to delivery machines and service. The company is headquartered in Europe, with service centers around the world closer to its customers and manufacturing facilities in Asia and Europe. Among them, the company has also set up a research and development unit in Europe. And the largest manufacturing plant of the company is located in China. The company's main business is the sale of machines, and the rebuilding and upgrading of machines for the customers as a service sale. The case company's sales are mainly composed of traditional product sales as capital business and service sales, but the service sales continue to rise and grow steadily, especially in the advanced economics. Thus, the executive team of the case company is seeing the service business as an important portion and potential pillar business in this organization. Moreover, the service business is also treated as a supplement to capital business when it is up and down.

As explained by the case company's vice president of the service business, the service level and situation in the case company has changed since the year 2000 and

is still on the way to be perfect. To identify the problems and trying to find the actions to it, will help the case company to maintain its competitive advantage as well as generate more revenue and keep its leading position in the related industry. Therefore, it is obviously a necessity for the case company to study its servitization situation and find the improving solutions. The aim of this thesis was to review the case company as an empirical research objective and bring the results back to the case company for further development.

The author's motivation

The motivation from the author towards servitization is come from real work experiences during one project in the case company. This project brought lots of questions concerning project arrangement, customer information sharing, technology consulting and resource utilizations. The deep question in the author's heart was why this project was arranged under such circumstances even though the company attached great importance to the service business. This case inspires the author's curiosity and wanted to carefully understand the company's servitization situation and the factors that affected it and restricted its implementation in the company. Furthermore, the author also wanted to know what the solutions to the difficulties of implementing servitization would be for the manufacturing industry from the perspectives of the organization itself, the outside environment and the customers.

Through such learning and research, the author hoped to promote the understanding of the essence of service, enhance the perception of the service strategy, and better serve the future work tasks related to business management, problem analysis and solving. Moreover, the author wanted to take the opportunity to find the barriers and challenges in the case company's business operation cycle in improving the servitization level, so that it would help the case company to upgrade its service situation and improve its competitiveness.

1.3 Research Questions

Since servitization as a result to answer to the request of improving the strategic competitiveness for manufacturing industry, its implementation is directly affecting

to the company's competitiveness. Through the company's inside elements as business model and operations management with the outside business environment and customer requirements, servitization specifically presents various requirements and corresponding responses. Therefore, by analyzing different elements and requirements from various aspects of different stakeholders, it can maximumly presents the problems existing in each link of servitization implementation, and then for developing better countermeasures to increase the current level of servitization and improve its status.

Based on the above, the phenomenon studied in this thesis is servitization in the manufacturing industry. It involves an analysis of the existing situation of manufacturing, an analysis of the existing state of manufacturing servitization, a discussion of the manufacturing operations management and business model, and an analysis of the needs of the customers and the external environment. So, the research questions are stated below:

Q1: What are the challenges/barriers to implementing servitization from the company and customer points of view?

Q2: How to overcome the challenges and improve the level of servitization in the B2B manufacturing industry?

In order to answer the above questions, firstly, the author systematically read and studied extensively relevant literatures about servitization, summarized the existing research results of related concepts, and established the conceptual system and research scope for this thesis. Through literature review, it helps to gain a better understanding of how specific disciplines presented and discussed research results and helps to create relevant knowledge, and to master more useful concepts, techniques and expand research methods and experience (Western Sydney University 2017, 1-2). The literature review of this thesis presents a complete status quo about servitization. This provided the author with a solid foundation for creating a theoretical framework and to use it to guide the direction in solving the research problem.

Then, by conducting interviews with the relevant personnel of the case company and with the company's customers, empirical research data was obtained as a blueprint


for data analysis plus the internal material of the case company. The interviewees were selected carefully in line with the principle of closely worked with research phenomena. After collected the empirical data, an analysis was processed, and the research results presented as the next step.

1.4 Structure of the Thesis

This thesis consists of five chapters, each of which focuses a central topic. The chapters are connected and supported to each other coherently. The chapters' division is clearly for its purposes.

Table 1 below illustrated the structure of the thesis more explicitly (Kananen 2013, 11).

Table 1. Structure of the Thesis

Thesis Sections	Process Direction	Sections in Brief
Title (subject)		The title chosen according to the study field. In this thesis it named as Servitization: Analyzing its Dilemma in B2B Manufacturing Industry
Abstract		Abstract presents the research background, objectives, theoretical framework, and a summary of what kind of works has been done for the thesis, and a discussion of implications plus future research recommendations.
Introduction		Introduction chapter presents the research background, motivations of the research, and research questions which describes the problem that researcher attempts to solve. By presenting the research problem with research question(s), the researcher works for answers seeking through literature review, empirical data collecting and analysis. The measure of how the objective be reached, should be proceeded if the objective is to solve and remove the problem.
Literature Review		Literature review chapter shows the theories and earlier research results in related research problem. And a theoretical framework is presented for research.
Methodology		Methodology chapter is to present the chosen method with a justified analysis for data collection, analysis and interpretation. The main categories are either qualitative or quantitative research based on different research problems.
Results		The empirical data is tested by different analysis methods for providing answers to research problems and questions in this chapter.
Discussions		Discussions presents based on the research results, and recommendation would be made based on discussion.
References		Sources reference to this thesis are listed in this section.
Appendices		Appendices is at the end of the thesis with related numbers and informations of the thesis.

Literature review chapter 2 is connecting with introduction chapter. It starts with key concepts of servitization and briefly introduced all concepts. The main concept as servitization, business model, operations management are presented in detail and summarized. A theoretical framework is illustrated in the end of this chapter to show a way how the author is going to solve the problems. Chapter 3 is methodology for empirical data collecting and deeply introduced how the data obtained and analyzed. Research results are provided and verified in Chapter 4. The Chapter 5 is a discussion of the results of the research, which is used to illustrate the relationship between research results and research questions, literature review, and theoretical frameworks. According to the real situation, the limitations of the research are discussed and future research directions suggested.

2 Literature Review

Though literature review, it is able to show a panoramic phenomena and understandings about the existing similar researchs related to the research questions of this thesis. It also provides a chance to study and debate current researchs for new ideas and thoughts provoking (Western Sydney University 2017, 1). By this way, it helps to build up a theoretical framework for the author so that it will be a tool to answer the research questions. In literature review chapter, there are totally 5 sections presented to reader. The first section introduced the key concepts concisely and to the point. These key concepts are carefully selected around the thesis topic, so that it ensures the validation of the thesis topic. The detailed introduction and analysis about servitization, business model, operations management are presented separately in second, third and fourth sections. The theoretical framework in the fifth section, shows the solutions/models from existing researchs related to the thesis topic. And an adopted conceptual framework for the thesis is built up in the end of this section after study and analysis.

2.1 Key Concepts

This section introduces related key concepts which are selected carefully for the study. The inappropriate concepts leads to misunderstandings in communication of research results and also bring questions to reader about its reliability and validity (Morse, Hupcey, Mitcham & Lenz 1996). All the selected key concepts are related to research questions to be able to establish a logical and reasonable context for the thesis study, and in addition to create a most fittest approach of theoretical framework to answer the research questions which are introduced in chapter 1 and listed here as well:

Q1: What are the challenges/barriers to implementing servitization from the company and customer points of view?

Q2: How to overcome the challenges and improve the level of servitization in the B2B manufacturing industry?

Concerning to above research questions and related phenomena, there are three key concepts which are more valuable for study and reasearch. They are servitization, business model, operations management as mentioned above. The theoretical framework is briefly intruded in the last paragraph of this section.

Servitization

For this thesis topic, it is about the servitization in B2B manufacturing industry. Obviously that servitization is the center concept of this research. Vandermerwe and Rada has defined the servitization as a phenomena that manufacturers to selling their products with customer focussed combinations as a package, which helps them to obtain more competitive advantages in business world (1988, 314-324). The detailed informatively introduction and explanation of servitization is presented in literature review chapter second section. The purpose of this section is to clarify the defination of servitization, and to explore the current implementation situation of servitization in enterprises through literature review. Furthermore, it presents the reasons of why companies implementing the servitization in their organization and

why not do that. The benefits and challenges of applying servitization approach are also introduced in line with other concepts for the thesis.

When speaking of servitization in manufacturing industry context, in a conventional way, it usually means the maintenance and service that supplier can provide to customer with their product. But under concept of servitization, the meanings of service that supplier provided and customer required, is extended widely and deeply to affect the business operation in both side. And it is difficult to understand why any manufacturing organization would drop off the attempt of exploring servitization (Baines & Lightfoot 2013, 50). The study of servitization in manufacturing industry, especially for the company's business expansion, is indispensable based on the facts of its implementation level. Servitization as a company's approach from the different aspects, is demanded to fulfill different needs. It complied with the customer's request and organization's interests. It also need to in accordance with company's business model and operations management and interacted in both sides.

The main target of this thesis is to dig out the facts and find out the effective factors of implementation of servitization, so that through a adopted theoretical framework, to answer the research questions and bring a clear understanding to reader.

Business Model

The third section is about business model which related to company's functions mainly based on the relationship between supply and demand. The business model describes the logical relationship of the company's operations in the form of a conceptual tool by including relevant elements and relationships between them (Osterwalder 2004, 15). It reflects that for the purpose of obtaining sustainable revenues, company offers its customers the value created through its internal organization structure and network of partners (ibid.). This section will provide reader that the business model concept, and how the business model interacts with servitization and servitization implementing in organization, what is the meaning of business model acting on servitization, what is the key factors for different business models related to servitization. In this sense, the business model structure and linkage among stakeholders is studied in detail to be able to analyse the essential effects for organization to implement servitization. Moreover, the expectations for all

partners, to affect the business model to adapt to servitization, is one important aspects for understanding and answering the research questions. Business model, from strategy's point of view, is a tool to achieve and fit with organization's value propositions. The business model need to be developed after the company determined and validated their value proposition (MaRS 2012, 2). Servitization as a company's strategy, needs a suitable business model that mutual coordinated.

Operations Management

Operations management is presented in literature review fourth section. The purpose is to discover the definitions and connotation of operations management, and what is the interacting way between operations management, operations strategy and servitization. Operation management describes how a organization producing and delivering its goods and services through all its functions (Porter 2009; Slack, Chambers & Johnston 2010). A company's operations management is a method to achieve its strategy and reflecting on its strategy to operational level. It should be able to fulfill the needs of the organization. Servitization, in another words, as a company strategy, should have its suitable soil to grow and develop. A clear operation and management model is an important link between strategy and daily operations, and plays a role in guiding their collaboration, provides the context and enables the behaviours, so that the strategy and vision of the organization will be realized (EY 2016, 3). Therefore, to bring reader a clear image of operations management in business will help to understand better of the research questions and will provide a concrete based for linking the operations management and servitization. The operations management is one factor from company's inside to reach to research questions.

2.2 Servitization

As a key concept of this thesis topic, the author attempts to present a panoramic view of servitization and its development in business area. In this section, it presents the related definitions of servitization and define what is servitization in

manufacturing industry, and in which way the servitization be developed with what kind of competitive advantage of servitization. Also the challenges in implementing servitization is introduced as well.

Defination and Development of Servitization

Servitization as a concept was brought up to the business world already in earlier 1988 by Vandemerwe and Rada, which can be traced back to Theodore's essentially description of service as to meet the customer's needs (1969). And it gradually attracted the attention of the academic community, industry and commerce, and the government. Vandemerwe and Rada believes that service is to provide options to market more than just product, or to selling products, services and knowledges bundles in accordance with customer-centric strategy, adding value to the base product, where the service can not be produced and imitated because the invisibility of its essence (Vandemerwe, Rada 1988, 314-324). Neely and his colleagues defined servitization is a new measure in the process of business management, which changes the traditional single product sales into a service package for the purpose of serving customers to increase corporate profits and value. (2013). Tellus Institute pointed out that servitization is the service based on product, and servitization creates boundaries ambiguity between manufacturing activities and traditional service activities (1999). These definiations illustrate the servitization in a base of changing from selling product to selling product tied with services. It is the way of traditionally to increase profit and attract customers.

Ren and Gregory consider that servitization is a procedure of altering in which a manufacturing-oriented enterprise takes the method of service-oriented and develops better services, to fufill the needs of its customer, gaining better competitive advantage to improve performance and revenue of corporate (2007). Athyantha Nalina described the servitization as a situation, which in recent years, more and more manufactrers are compting through the high concentration of products and services (2017). This situations is a clear and purposeful strategy for manufacturers to have differentiating factor in business and market by providing the provision of product-centric services (ibid.). From these kind of point of view, the

servitization is recognized as a strategic approach for manufacturers. Servitization implementing in enterprise is providing a differentiation and a unique value chain to prevent the imitation from rivals.

Baines and Lightfoot explained the servitization as a move to competing through advanced services and provide a servitization map show in below Figure 1 (2013, 6). It explained the servitization from its particular aspects of advanced services which can provide manufacturers a high value by providing customer with the capabilities and functions from their product than just using (ibid., 219). Through the road to advanced service, it is clear that company's servitization approach helps to improve its' capability, in addition to achieve the ultimate value goal of customers through a network between its partners and customers as well. The essence of servitization is to meet customer needs, and the company provides professional solutions through its unique technology, and combines the products and services it sells to meet market requirements (Neely 2013).

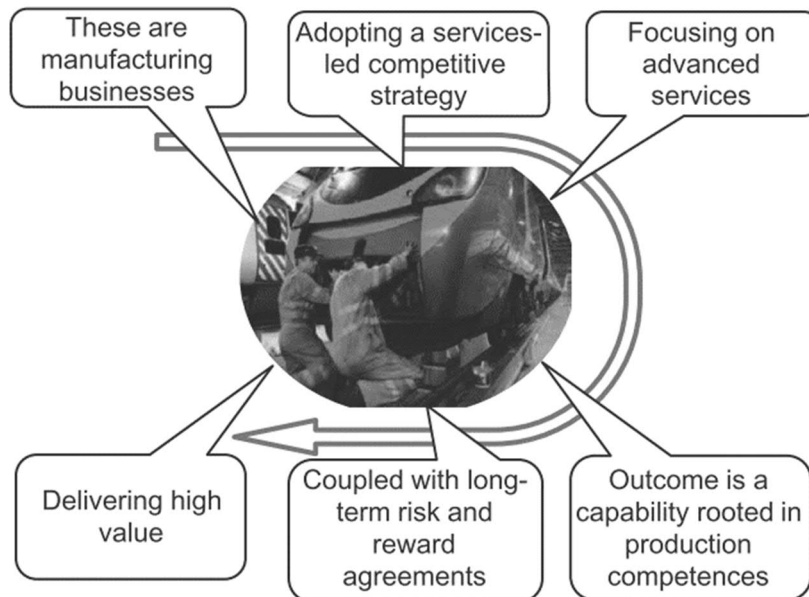


Figure 1. The Servitization Route (Baines and Lightfoot 2013, 6)

The detailed category of servitization from Baines, Lightfoot, Smart and Fletcher, is to define manufacturing services into primary services, middle-level services and advanced services which are presented on below Table 2 (2012, 638). Based on this

classification, it can be clearly seen that in each corresponding service level category, the enterprise uses what kind of principles and what characteristics it has, so that it can better guide the daily production and operation activities of the enterprise. Meanwhile it is convenient for the enterprise to further improve its service level to another level. Companies which adopt the servitization approach, is capable of providing the advance services for their customers and to maintain their business scale, even better for gaining more customers and obtaining competitive advantages. Therefore, to clarify the meaning of servitization to certain circumstance is very valuable to enterprises and vital to their development.

Table 2. Service Category Table (Baines et al. 2012, 638)

	Principle on which cluster is defined	Relative characteristics of cluster			Examples of services offerings within cluster
		Range of service activities	Extent of risk	Revenue payment	
Base services	Focus on product provision	Narrow: activities centred on and around production competences	Low: easily delivered for an enterprise with manufacturing competences	Point: largely on completion of contract	Product/equipment provision, spare part provision
Intermediate services	Focus on condition maintenance	Broadening: based on the exploitation of production competences to assure state and condition of equipment	Medium: increased expose to the consequences of equipment faults	Periodic: some upfront and/or on completion. Maybe with interim payments	Scheduled maintenance, technical help-desk, repair, overhaul, delivery to site, operator training, condition monitoring, in-field service
Advanced services	Focus on outcome assurance	Extended: stretching the manufacturing enterprise to take on activities that are usually internal to the customer	High: financial penalties incurred almost immediately if equipment fails to perform as specified	Linear: pay-through-use with period adjustments in rate	Customer support agreement, risk and revenue sharing contract, revenue-through-use contract, rental agreement

After decades of developing for the servitization, the core concept is becoming more and more clear to business world. From the initial single product-oriented maintenance, maintenance service phase, after the service adding to product for packaging selling phase, it has now been upgraded to a corporate strategy to

improve the competitiveness of enterprises. Nowadays, that manufacturing companies are very difficult to reach its expected profit by just selling real product due to the fierces competition with massive pressures, which encourage them to avoid direct fierce competition in product cost by continuously strengthening the corporate value chain, upgrading their product service packages to satisfy customers and increasing strategic advantages. (Ahamed, Inohara and Kamoshida, 2013).

Servicization is a new model and way for enterprises to satisfy customers. It creates the competitiveness and maintains the company's dominant position in competition. It is the objective choice for the survival and development of an enterprise, which is in line with the needs of customers and the market, and reflects the basic fact that customer are part of the supply chain of the enterprise. The adoption of service-based strategies is obviously generated by the higher pressure that company faced especially for European companies under globalization environment (Orio, Matei, Scholze, Stokic, Barata and Cenedese, 2016). Below Figure 2 shows the the competition shifting maps.

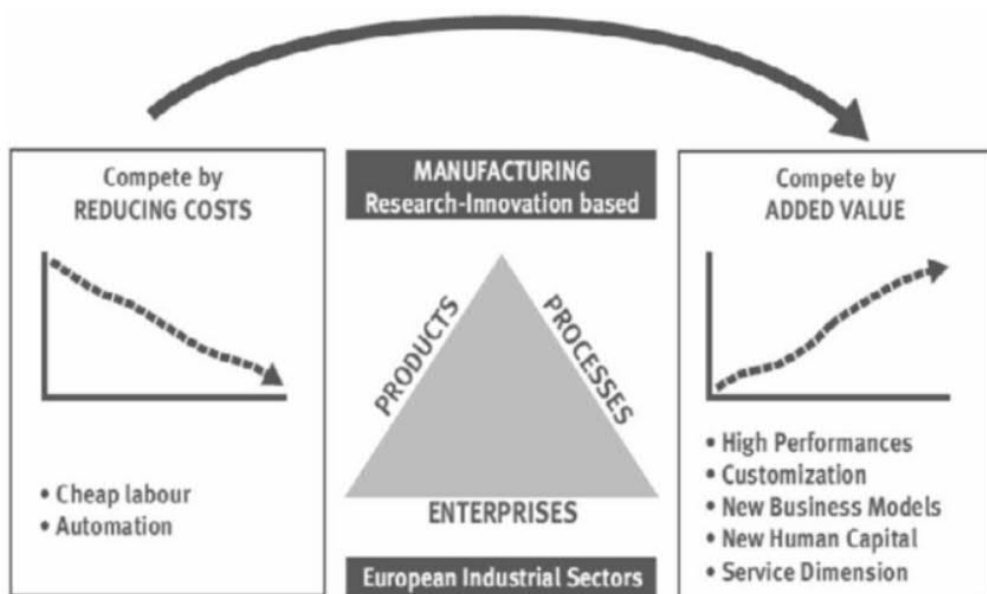


Figure 2. A shift in competition (Jovane, Westkämper and Williams 2008, 2)

The core of these definitions is centered around product-based services and how to make service-oriented to be came a business strategy. Regardless of how the content of servitization is developed, it ultimately serves the enterprise and its

customers. This thesis starts from the dilemma of servitization in manufacturing industry, and focuses on how to integrate and develop from different aspects of suppliers and customers based on the cognition of servitization strategy.

Status of Servitization

Servitizations in reality, is adopted by different manufacturing industries in different levels with certain approaches. Lay introduced servitization strategies from three aspects of motivations which are growth, profit and innovation (2014, 4). The detailed structure of the theory is illustrated in below Figure 3. Through the structures, servitizations is implemented in different way in manufacturing industries to fulfill the needs of organizations and customers. But the improving space of servitization is evaluated and presented as a fact in different manufacturing industry (ibid., 23-176).

Overall situation of servitization in manufacturing industry, it is that implementing servitization need to be evaluated so that it is in cope with companies' strategy and operational models. There are multiple needs from all kinds of aspects which are expected to be realized. The level of servitization will focus on varied directions because of different industries. But as a commonality, the transformation of servitization for manufacturing industry is unchanged. According to the existing market operation model, the manufacturing industry is integrating products with corresponding services to improve customer satisfaction and industry profitability. (Vandermerwe and Rada 1988). As suggested by management literatures, that servitization should not be ingnored and is always recommended unanimously to manufacturers that it is good value proposition to combined their phasical product with invisible service approaches (Oliva 2003, 169).

So the common understanding of servitization for manufacturing industry is shared and the attemptations also is ongoing in practices. The improving spaces is still existing for whole industry of manufacturing.

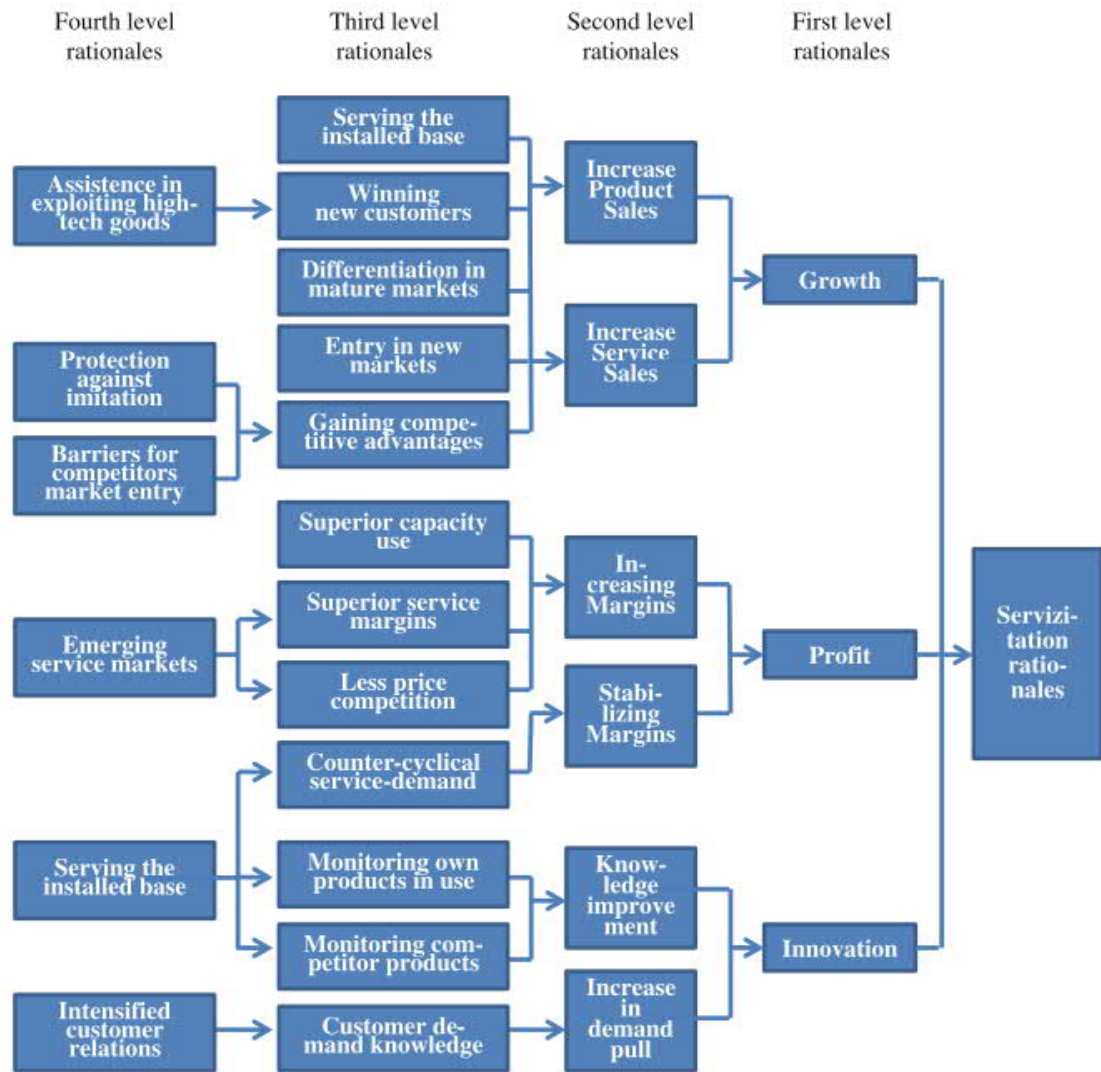


Figure 3. Service theory classification (Lay 2014, 5)

Since the servitization can be categorized as basic service, intermediate services and advanced services according to Meta- clustering model (Baines et al. 2012, 638), so that the advanced services are more interested to different manufacturing industries. Supplemented to advance services, in certain manufacturing industry such as printing industry, the modular and flexible solutions maximize the cost advantages and be able to attract various customers with different needs (Visintin 2012). Basically, it means that for different manufacturing industries, the servitization level is varying from each other. The direction of servitization is the same which towards to advanced and higher level of services. This thesis focuses on the phenomena research from the perspective of advance services for the B2B manufacturing industry.

Advantage of Servitization

To clarify the necessity of servitization implementing in manufacturing industry and find out the reason of it, it is must to be studied thouroughly about the inner and external driving forces of servitization. This will give a clear base for understanding of why to adopt servitization approach as a strategy for companies. As many of researches shown that manufacturers can gain their strategy for enterprise operations under service guidance of such approach known commonly as servitization (Oliva & Kallenberg 2003; Schmenner 2009; Slack 2005; Wise & Baumgartner 1999). Thourgh this kind of strategy, manufacturers can protect their product-service merged systems to be copied. Moreover, it helps the manufacturers build tighter relationship with their customers for further cooperations and higher revenue. The benefits brought to company is obviously and drive management teams to attemp to implement into the orgainzations. The main focus for the servitization advantage of this thesis, is made from inner and external aspects in accordance with both sides of supplier and customer.

Supplier Aspect

In the current society, manufacturing operations and profitability pressures are unprecedented. There are many reasons for this, such as the huge competition brought about by globalization, the impact of emerging economies, the increase in labor welfare costs, environmental and social responsibility. Therefore, taking a strategy which can improve efficiency and profit is a matter of lif and death for the company. As a result, servitization as a concept and model has been continuously researched and mentioned, and eventually rose to a strategy adopted by many units. It has been believed that the adoption of a service-oriented strategy can increase the company's ability to fight risks and to resist competition, and can continue to develop in depth and create more self-value. (Baines, Lightfoot, Peppard, Johnson, Tiwari, Shehab & Swink 2009a). From this point of view, the servitization is bring a special enterprise value chain and different value systems which is difficult to be imitated. The distinctive value proposition answers the needs of customers from demanding side, and the different from the value chain of competitors, it is difficult

to imitate the relationship between delivery methods and production and operation activities. (Magertta 2012).

If a company wants to survive, it must improve its competitiveness and strive to adapting the changes and requirements in the market. How to increase its competitiveness, as Porter suggested, it is to take a strategy which brings the operational effectiveness with three key principles underline strategic positioning, which are a unique and valuable position, tailored value chain, trade-offs in competing, fit among a company's activities and continuity forstering improvements (1996). Furthermore, he also introduced that there are five forces which are within a certain range, having a corresponding influence on the daily business activities of the enterprise (1989, 133-143). After understanding the essence of a company's competitive advantage, its profit model and competitive advantage can be reflected (ibid). Below Figure 4 is presented the five forces framework of Porter.

Servitization as described before, as a strategy which is in accordance with attributes of Porter's theory. As the fierces of competition currently on market, the five forces are shaping the strategy for companies to gain the competitiveness (ibid). It is identified that servitization literature points out the advantages of various industries in implementing service strategies, and it is a summary of various viewpoints. Its effectiveness is highly unified with the corporate strategy. (Eloranta and Turunen 2015, 405-406). Thus, the servitization as a strategy, from aspect of product and service combination as package selling to customers, is accepted by suppliers with inner driven forces.



Figure 4. Five factors of industry competitiveness (Porter 2008, 80)

Customer Aspect

Customer on the other hand, is presenting a external forces to push companies to take appropriate approaches to attract their customers and maintain the continuity of their business. Through servitization, company answers well about what is the customer wants and what should company provide. Manufacturers are often to motivated by economic aspects, which leads the corporates focus changing from products to services as considering it to be effective process of economic success (Reinartz & Ulaga 2008). The motivations of servitization are discussed quite often and it can be defined that it for manufacuturers are categorized with unique, requirement and economic three levels (Raddats, Baines, Burton, Story & Zolkiewski 2016). From these aspects, the author is presenting the driven forces of servitization through customer's effecton as in below Figure 5.

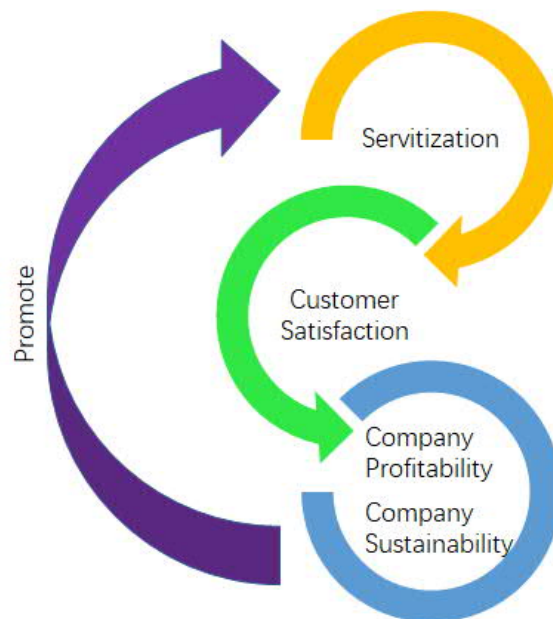


Figure 5. Servitization Driven Flow

Although there are more factors which are effecting the customer satisfaction, this thesis picks up the servitization to study, so the effective of servitization on customer satisfaction is put on table for observation. Customer's satisfaction is leading the customer loyal when customers perceive higher relatedness between the product and the services (Fang, Palmatier & Steenkamp 2008). The effectives of servitization are mainly focused on aspects of fulfilling customer's needs, helping to achive customer's business targets, building up tigher relationship and trustness with

customers. Through all of the achievements, companies obtain more profit and long term cooperation with customers. These results turn inner forces to push management team of company to improve a better servitized approaches in running business.

Challenge of Servitization

Changing, always means breaking the rules and making innovations. While bringing benefits to the company, it will inevitably increase some uncertain factors, which will cause certain risks and challenges. When a company decides to implement servitization in their organization, some of the challenges as literature pointed out, should be observed and realized before hand. Below are some facts about servitization challenges during implementation.

Internal Challenge

The servitization as a change should be communicated widely within enterprise and get the supports from different level of company. People intend to stay in the comfortable zone to resist the changes. White pointed out that people's performance will alter either upwards or downwards when there is a change (2009). So this would be the first challenge from people. Through the factor of people, the organization structure is another aspect which need to put more focus on. The organization structure need to be designed to support servitization in the organization. As well as to build up a product-service culture, this is effects on people from their mind sets to support the servitization (Martinez, Bastl, Kingston & Evans 2010).

Besides of these subjective, personnel plus organizational challenges, there are also many adaptive challenges in the transformation from product-oriented business to service-oriented. In connected with this, are the operational risks, which are generated when enterprise start to create and expand their service-centric model to delivery more value for customers (Durugbo & Erkoyuncu 2016; Li, Lin, Chen & Ma 2015; Nordin, Kindström, Kowalkowski and Rehme 2011; Reim, Parida and Örtqvist.

2015). Due to the uncertainties in different parts of servitization, confirmed obstacles become the inevitable threshold for the implementation of servitization (Hypko, Tilebein & Gleich 2010).

External Challenge

Servitization, also incorporates customers as an important link into the value supply chain. The customer's recognition of the service provided by the supplier, is essentially the success of business operations. In addition, the good supports from the supply chain for value delivery also provides the basis for service realization. Therefore, these two factors, from outside the organization, affect the implementation and role of service. External risks have caused a certain range of impacts on the business (Sharma & Mahajan 1980; Sheth & Sisodia 2005), which are mainly focused on the local laws and regulations, technology, marketing, finance and globalization (Benedettini, Neely & Swink 2015). All the factors increase the success of servitization.

What described in above about the challenges in doing servitization, combined together caused huge uncertainties, which could lead to fail of organization servitizing process. This is also summarized as servitization paradox, which is called 'service paradox' as a phenomenon in literature (Kastalli, Van Looy, & Neely 2013, 101). A poorly implementation of servitization may lead in a decline of company's performance and even worse as of exposing company into bankruptcy risk (Benedettini et al. 2015, 946). So this is requiring a carefully study and analysis when organization towards to servitization approach for company as a strategy. This is not an anti-force for manufacturers to stop their servitizing attemption, but on contrary it is a warning sign and lighthouse to guarantee a success implementing of servitization in manufacturing industry.

2.3 Business Model

Business models as explained in literature, it is a method for enterprise managers to analyze and select strategies, which can create valuable production activities within the enterprise and help the enterprise make profits. (Shafer, Smith & Linder 2005).

Therefore, it is very critical for enterprise to select the correct business model for its operation. So it is necessary to clarify and understand what is business model, how it effects on business running and which is appropriate for servitization. In below, the author is presenting all answers and more in detail for reader to realized how important this conceptual terminology for servitization implementing in manufacturing industry.

The business model is a tool to describe the internal operation and management of an enterprise, and it defines the business relationship between various departments and types of work within the enterprise, as well as their corresponding job descriptions and ways and channels to obtain benefits fairly. (Timmers 1998). Similarly, Weill and Vitale define business model as a collection of the relationship between the company's employees and customers, suppliers, as well as allies and competitors, and describes the interests of all relevant aspects in the product sales process (2001). This two definations, from the aspects of overall business operations, identify the relationship with all stakeholders, and summarize the benefits and incomes of all participants. It is good way to explain the business model with all materials, and include all key factors for business operations. Nevertheless, the core purpose of business model is not presented explicitly in these definations.

The business model is very critical for every enterprises, because it fundamentally embodies the company's operating mode and core logic, and the way to satisfy customers (Shafer et al. 2005). Likely, Petrovic, Kittl and Teksten (2001) point out that business model is the core relationship of creating value for business same as defination given by Linder and Cantrell (2000). Hawkins (2001) explains that business model is the company operations to be able to sustain itself based on generating incomes, which the business model is the behavioral way in the production and manufacturing process of an enterprise, and it is a complex of various resources, costs and incomes to realize business profit. (2001). Definitely that business model from funcitonal point of view, it presents the core logic of business operations in a strategic way of enterprise. These definations of business model concept illustrate the recognition from functional perspective.

The business model is defined to serve company's value propostion. It is the best way company recognized to efficiently deliver values to customer. The company's

strategy guides the formation of the value statement, as the core strategy is reflected in the business model, so that the business model occupies a higher strategic position in the enterprise (MaRS 2012, 2). So the business model is a way of how company implementing its strategy for delivering value to customer and obtaining profits and incomes for all stakeholders during business activities.

From the business model definition, it is clearly that there is not only one business model to suit for all business activities for it is decided by business value proposition. Different business model is suitable for different business and contains different aspects of values. No matter what kind of business model enterprise select, the key factors of a successful business model are supporting the same goal as customer value proposition as illustrated in Figure 6.

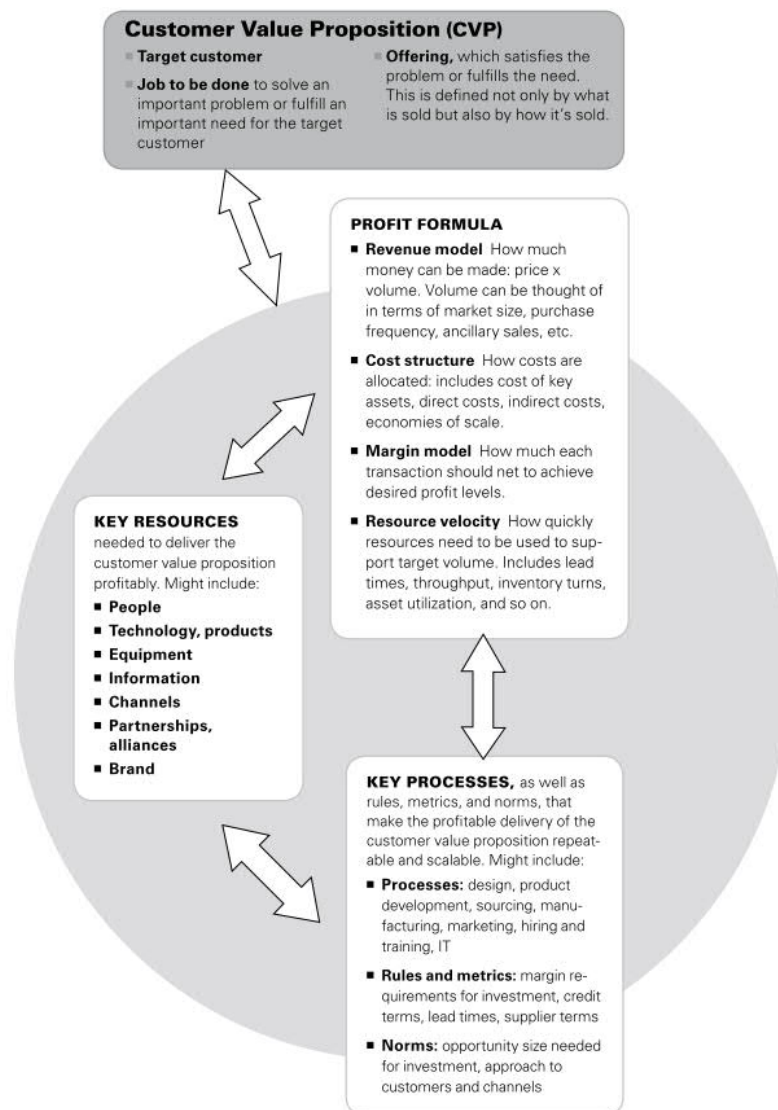


Figure 6. Business Model Elements (Johnson 2006, 62)

Also through below Table 3 about the rules, norms and metrics, it helps to understand the core model more easier. In each category, there are different key concepts concerning to the themes where the business model could be pay more focused on in accordance with the business model.

Table 3. Rules, Norms and Metrics of Business Model (ibid., 67)

Financial	Operational	Other
<ul style="list-style-type: none"> • Gross margins • Opportunity size • Unit pricing • Unit margin • Time to breakeven • Net present value calculations • Fixed cost investment • Credit items 	<ul style="list-style-type: none"> • End-product quality • Supplier quality • Owned versus outsourced manufacturing • Customer service • Channels • Lead times • Throughput 	<ul style="list-style-type: none"> • Pricing • Performance demands • Product-development life cycles • Basis for individuals' rewards and incentives • Brand parameters

In manufacturing industry, from the perspective of implementing servitization, as literature shows that service business model was born out of a service-oriented strategy, which is the key to the adjustment of the manufacturing company's industrial strategy, and it has expanded the business from products to product services and formed a new business structure with comprehensive services. (Cusumano, Kahl & Suarez 2014). This changing from product to service package business model has brought new opportunities for development. Servitization as a strategy, which achieves the enterprise's value proposition which decides the business model as product-service integration. It needs to be built up in accordance with the key elements as shown in above Figure 6.

2.4 Operations Management

Operations Management, as a core concept of business operations, it is about how a enterprise produce or deliver their products and services into market, through the way of organizing its inner functions and resources which devote to the productions and delivering goods and services (Porter 2009). It is defined as activities of managing company's resources which to conduct production and activities (Slack, Chambers & Johnston 2010). Therefore, operation management is company through a

package of activities in managing its resources to delivery products and services to customers. Thus it must fit with company's strategy by including the contents of input, process and output. Operations management is a transformation process by using resource to transform input into output (Horváthová & Davidová 2011). The transformation process is illustrated in below Figure 7. The operations management is so important, as all oranzations devlivers some mixture of services and products despite of the size of oranzitions and the business types, nor profitable or not and public or private (Slack, Chambers & Johnston 2010).

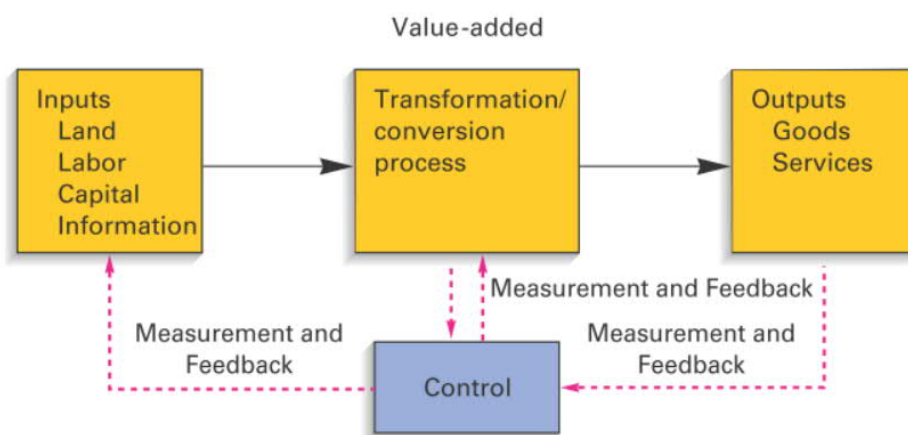


Figure 7. The transformation of input and output between operational function departments (Stevenson 2018, 6)

From strategy point of view, operation management, through harmonization of market requirements with operations resources, is the whole decisions package which build up the long-term capabilities to overall strategy for all types of operations and their contributions (Slack & Lewis 2011). Therefore, it is a concrete manifestation of the company's strategy at the implementation level and a way to achieve corporate strategy. Conversely, good operations management can complete, perfect and improve the company's strategy. Therefore, another concept as a extension of operations management in strategy level called operations strategy, was analyzed by Slack who mentioned that operation management and operation strategy are basically similar comparing to the differences in other fields. (2005). The operations strategy is formed from four perspectives for business operations, which are top dow, bottom up, operations led and market led as illustrated in Figure 8 (Slack & Lewis 2002).



Figure 8. Strategic operation and its four factors (Slack et al. 2002, 31)

Operations management is a key concept influencing servitization implementation in company. As an extension of strategy which is servitization, its fitness and effectiveness, directly link to whether servitization can be successfully implemented in organization or not. Through the organization structure, resource utilization, process development, customer management and risk management, operations management masters the right to speak in strategy implementation with cost, time, quality and flexibility in operations measures of capabilities which gives competitive priorities (Porter 2009). For operations management, this thesis focuses on the aspects of its strategic perspective and its key contents.

2.5 Theoretical Framework

The typical theoretical frameworks from previous literatures are presented in this section for deeper analysis to find a suitable solution roadmap for this thesis research questions. Through theoretical frameworks studying and analyzing, it is guiding the author to explore a way towards the answers of research questions, and discover own theoretical framework which also allows the author to clarify the differences, analogies and literal similarity descriptions, abstractions and other types of comparisons (Gentner 1983). After literature review, as a result, the theoretical framework brings the guideline and direction for studying research questions, and

provides reader a clear clue of how the research questions would be answered in following chapters.

Through the literature review and key concepts identification, it is clearly showing that servitization as a strategic option of manufacturers, is a correct way out from heavy competitions in current market. It creates unique value proposition and higher barriers to prevent the rivals' imitating. To realize this strategy for companies in manufacturing industry, which need to create the suitable environment from both sides of internal and external. Otherwise, the servitization paradox could lead this strategic choice to failure even worse as bankruptcy. Opportunities and challenges coexist, advantages and risks are at the same time. Therefore, how to ensure that opportunities are seized and advantages are realized becomes the ultimate goal of all decision makers. How to convert product-oriented enterprises into products-service-oriented, and even to advanced service-oriented companies, are reflecting the adaptability and management wisdom of enterprises on the road of service.

Through below presentations of typical theoretical frameworks, it introduces current way of how servitization implemented and what are the may factors and concerns. In certain level, it provides a whole picture to reader about this phenomena and its results of related researches. After all, the author introduces the own theoretical framework for the research questions of this thesis. It as explained before, leads reader towards to this research's results shown in after chapters.

The first theoretical framework is from Lay (2014), it is presenting the servitization from the aspect of "achieving a strategic fit", which enlarges the servitization from two hands. One is that when the company conducts business activities, it should coordinate management with the service model (ibid., 342), and another is the supplementation of consecutive sequence of servitization from "environment determines strategy" to "strategy determines organisational design" (ibid., 343). Below Figure 9 illustrates the theory of this pattern for servitization of manufacturing industries.

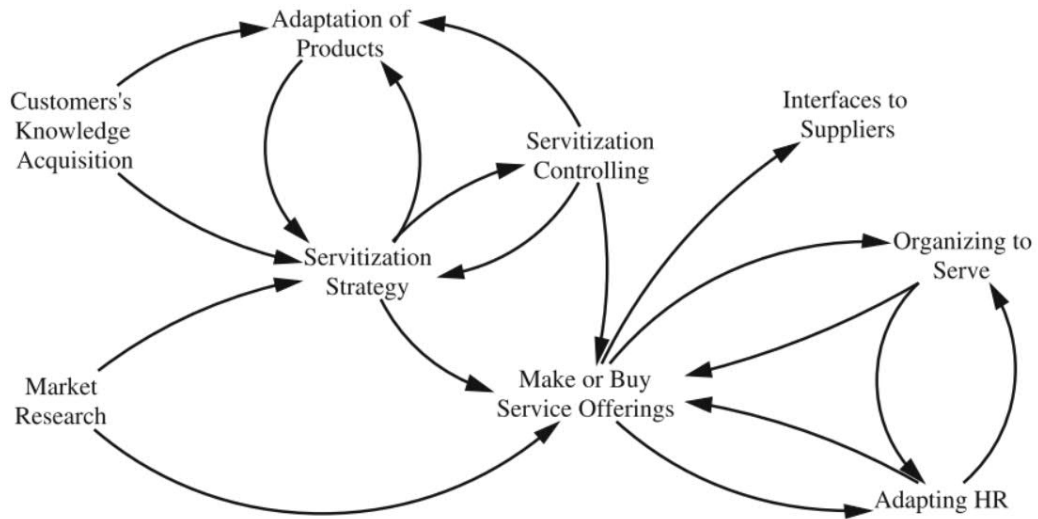


Figure 9. Interaction between business units (ibid., 343)

From the strategy point of view, this model introduced how servitization is driven by different factors, and how organization functions adapting to implement servitization, and adopting what kind of strategy to provide service to different customers.

To be defined as a transformation of operations from company, servitization is introduced by Baines and Lightfoot (2013) for competing through advanced services which helps manufacturers to improve and increase higher value for their customers. Thus the second theoretical framework from Baines and Lightfoot is presented here as well in below Figure 10. Although the visualization of servitization is not easy for general public understandings (ibid., 218), the principle is still remain reality.

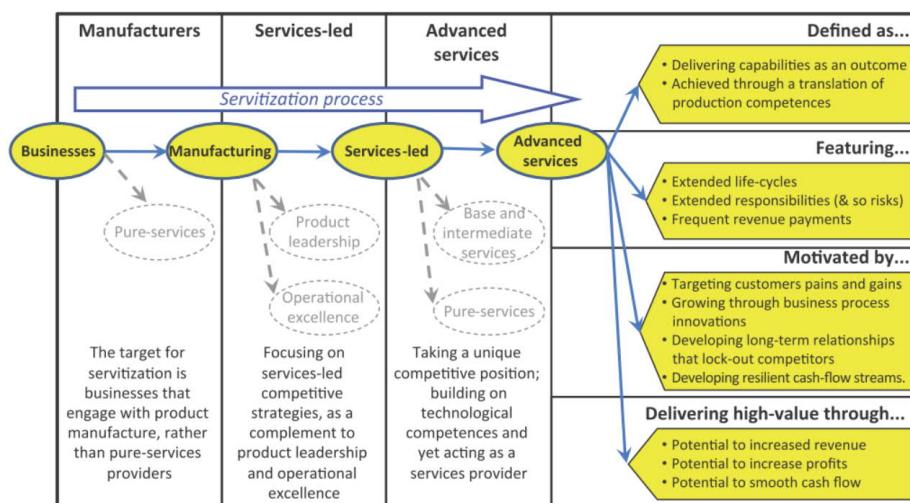


Figure 10. Service development map (ibid., 218)

This roadmap of servitization illustrated how a manufacturer transform its business focusing from traditional business orientation towards to advance services, and also shown the definitions, features, delivery scopes with motivations of advanced services. From the changings of operational points, it provides a step by step on forward to servitization for manufacturing companies with the attributes of each steps as well.

Above two models of servitization shows the key factors for its implementation. It brings the ideas helping to find the solutions for this thesis research questions of what are the barriers and challenges of implementing servitization and how to overcome these challenges. Below two theoretical frameworks are from challenge point of view to show what is the aspects of challenges and barriers during implementing servitization in manufacturing industry. The third one is illustrated in below Figure 11 which included eight challenges of product based organizations during their transformation of servitization (Nudurupati, Lascelles, Yip & Chan 2013). This model shows a holistic approach in finding the challenges of servitization implementation in product based companies.

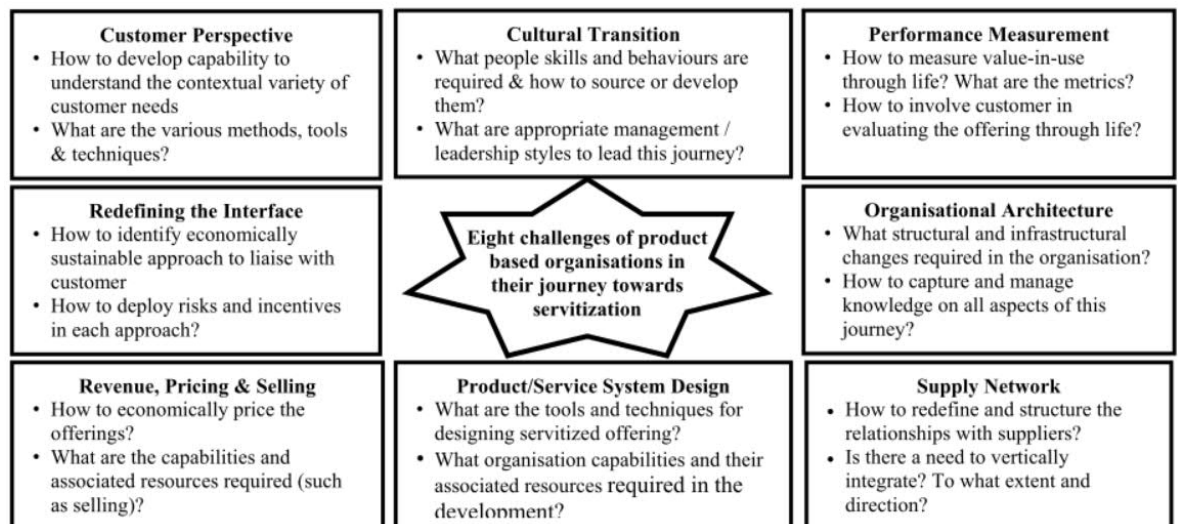


Figure 11. Business Challenge Dimensions (ibid., 11)

The fourth theoretical framework points out seven causes of servitization barriers which existing in servitization process (Hou & neely 2013). It is presented in below

Table 4. These mentioned barriers and challenges provide a research pool and direction for the author to find the previous researching areas and problems, which presents also a theoretical base from the whole picture of servitization level in manufacturing industry for the thesis. Moreover, it helps to identify some false alarms which could lead to wrong way and generating uncertainties during the research.

Table 4. Barriers of Servitization (ibid., 191-192)

Aspects	Existing barriers before servitization	Barriers during servitization
Competitors Suppliers & Partners	•A more complex competitive environment involving different actors (Vandermerwe and Rada, 1988)	•Difficult to get coordination and cooperation from different actors (Mont, 2002)
Society & Environment	•Lack of policy and infrastructure support (DiPeso, 2000) •Lack of incentives to pursue environmental benefits (White et al., 1999)	•Difficult to achieve environmental benefits, which largely depend on circumstances (Mont, 2002)
Customers	•Heterogeneous demands (Vandermerwe, 1994) •Lack of trust from customers (White et al., 1999)	•Difficult to get cooperation & acceptance from customers (Vandermerwe and Rada, 1988) •Lack of control over customers' behaviors (Heiskanen and Jalas, 2003)
Finance	•Lack of financial competence for early investment (DiPeso, 2000)	•Service paradox (Neely, 2009) •High risks (Stremersch et al., 2001) •Unexpected costs (Ottman, 1999) •Difficult to price services (Steinberger et al., 2009)
Knowledge & Information	•Lack of expertise (Brax, 2005) •Lack of understanding of customer demands and product properties (Mont, 2002) •Lack of innovation ability (Macdonald et al., 2011)	•Difficulties in knowledge & information management (Vandermerwe, 1994)
Products & Activities	•Lack of cheap labour (Cook et al., 2006) •Lack of infrastructure (Maxwell et al., 2006)	•Difficult to design service packages or scenarios •Difficult to measure services (White et al., 1999)
Organizational Structure & Culture	•Lack of service based organizational structures (White et al., 1999) •Lack of service oriented culture (Mont, 2002) •Preconceived thoughts and resistance to change (Vandermerwe, 1994)	•Conflicts between different sectors and different hierarchies in organizations (White et al., 1999) •Internal resistance to servitization (Vandermerwe and Rada, 1988) •Difficult to build service oriented organizational structures and culture (Vandermerwe, 1990)

Through above four different models, they present reader of all activities during servitization processes and also the challenges and barriers for implementing servitization. These conclusive research results help author to find research methods and roadmaps that are appropriate for this paper. By determining the strategic orientation of servitization, combining the characteristics of the manufacturing industry and the organizational structure to achieve the improvement of corporate

competitiveness, behind this series of initiatives, it mainly depends on the promotion of external customer requirements, and the development vision for corporate from its investors and management teams.

Based on such commonly understanding of servitization, the theoretical framework of this thesis is presented in below as a matrix and comparing types of table. It is expected to answer the main concerns of challenges during implementing servitization in B2B manufacturing industry. As a fact, this model would not cover all specific cases due to the particularity of individual customers with particular demands and unique expectations, operations and cultures (Latonen 2017). Thus, the theoretical framework for this thesis is illustrated in below Table 5 to show the key challenges and its possible answers from previous literature.

Table 5. Theoretical Framework of the Thesis

Parties	Challenges and Barriers	Solutions
Perspective from Company	Difficult to get support from current organization for servitization approach	Particular and peculiar language used in service to have better understanding (Baines et al. 2009b).
	Build up servitization culture within company	Time and Training (Dubruc et al. 2014).
	Smoothly cooperating between functions	A corporate-wide strategy (Johnstone et al. 2009).
	Alter business model for adapting to servitized organization	Service development process and training (Barquet et al. 2013).
	Appropriate resources allocation	Make or Buy (Lay 2014).
	Solution and service package creation	Targeting customers pains and gains (Baines et al. 2013).
	Key performance initiatives of servitization	
	Supply chain development to fit with servitization	Vertical integration (Baines et al. 2011).
	Recognition of customer for service value	
	Maintain relationship with customer	Delivery high-value (ibid).
	Finance Risk	Smooth cash flow and frequent revenue payments (Baines and Lightfoot 2013).
Perspective from Customer	Evaluation of solution and service package	
	Solution performance measurement	

Above theoretical framework is based on the analysis of existing literatures and researches, summarized the results from all these literatures and listed the typical representatives in table 3. Some of the challenges and barriers are lack of solid solutions which are mainly focused from this thesis. However, this thesis is not limited by this, instead, will be proceeded with some of other challenges and barriers in the same time during empirical study according to the empirical data. By this way, a more holistic view of challenges and barriers are presented to reader as well as with possible solutions and suggestions which supplement to previous researches.

3 Methodology

3.1 Research Approach / Strategy

In doing research, researchers have to select certain ways to achieve their research targets. Therefore, research methods are one kind of resource and equipment for helping researchers to accomplish their tasks (Nicholas 2011, 1). For reasearch methodology, there are two basic approach and methods normally to be used by reasearchers quite offten, which are quantitative reasearch and qualitative research. In general, quantitative research is a basic research normally used in natural sciences (Seppelin 2018). It studies the scientific realism with different ontology (ibid). On the other hand, the qualitative research is an applied research commonly used for the rest of the area and it is mainly for social sciences (ibid). It studies the social constructionism with epistemology (ibid). In quantitative research, analyzing quantitative data to prove the theory or hypothesis that needs to be verified , so that they can evaluate wether or not their tested contents come true (Johnson & Christensen 2014). The qualitative researcher on the other hand, focuses on the explorations, depicts, or generalization of theories through qualitative data (ibid). Nevertheless, there are also mixed research approach has been used as well among action researchers. In order to find solutions and improvement actions, the data and information is collected during the reserch steps from any resources and methodologies as long as can be reached fairly (ibid). So the mixed research can be

seen as a hybrid research methodology from quantitative and qualitative, and have both perspective.

What this research studied is about the servitization level in B2B manufacturing industry . More precisely it evaluates the current situation and level of servitization in manufacturing industry, and finds out what is challenges for improving the servitization in B2B manufacturing industry. And in the end, this research will try to provide some suggestions and ideas, which research think that could help industry to solve the existing challenges. Throught these research questions and problems, it will reveal the potential essence which is how to increase the competitiveness for suppliers in B2B manufacturing industry. Afte answering the research questions, The author believes that these suggestions and ideas will also light the direction for business owners in related areas. As a firm channels to maintain the customer relationship in a good level, the servitization, is proven as a continous profitable business element for manufactures. (Susheelendra, Sundarajulu, Samiksha, Ajay 2016).

World economy situations are always changing and it is turning to be more difficult for manufacturers nowadays. Due to the prosperity and development of emerging markets, and the shift of the industrial chain, the competition is becoming increasingly fierce in business operation and production and sales environments. How to maintain a company's competitiveness is one essential task for corporation owners, management team, and its employees. And it is especially important for companies in B2B manufacturing industry. Porter pointed that a good strategy for a company is to have a distinctive value proposition. And appropriate approach of servitization in the manufacturing industry which the author believes is differentiation for corporations. To build up entities' unique competing capabilities, companies should offer their customer-specific product and value (Magretta 2012). Servitization has been pointed out as a strategic factor acting in the manufacturing industry (Foresight 2013). Since servitization is a new way for equipment suppliers to increase their revenue and growth their business so that it becomes very critical to know the difficulties of how to implement it into this industry and try to approach solutions for it. Therefore, the research questions and phenomenons are quite interesting and valuable for manufacturing companies competitiveness to improve.

In addition, the author is working in the same kind of company and experiencing every day of similar needs of answering the research questions. So it proved in certain level that there are the needs from business as well. A qualitative research is normally focused on qualitative phenomenon which involves social appearances, experiences of people, and related kinds (Kothari 2004). As the research problems are related to business operating ways and phenomena of competitiveness increasing which both are belonged to social science scope, so the research is qualitative as it will fulfill the purpose of this research context.

The goal of the research is through findings of existing problems, to provide suggestions and answers to the manufacturing industry. The data collection will be conducted with interviews in case company which author works for, and in customer side of the case company. This is the way for empirical data collecting since the interview is one main method for qualitative research. The interviewee will be selected from the service function of the case company and they are working closely in servitization area. Also interviewee from the customer side is working closely with case company service functions. So, all collected data are relevant with research questions in a high corresponding level.

3.2 Research Context

The case company is running a business in a B2B manufacture industry, and it is the technology leader in its industry globally. The business of this case company is all over the world. As agreed with the case company, the specific name of the case company will not be shown in this research, same as their customers and interviewee related to empirical data collection. The researched company will be simply appointed as the case company in this thesis, and its customer will be referred to as the customer. The interviewee will be addressed as interviewee(s) in a related statement.

The case company in this thesis runs a service business session in addition with other three major business sessions which are pulp and energy, automation and paper. This case company is running the business in a global base. Its business sessions are

working independently but not means that they were not supporting each other's. In fact, these sessions can collaborate and connect with each other to complement each other and promote business development. The case company operates the business in more than 30 countries and areas around the world and employs more than 10,000 people worldwide. And the net sales annually are around billion levels. It is a tech giant in its industry.

Customers of the case company are all over the world including developed countries and developing countries. In different areas and countries, the case company can provide close services to all its local customers. The case company has built up the local service centers, on site services units and local manufacturing centers to fulfill the different needs of its customers. And the requirements of customers are various and changing over one project. It needs more professional skills and solutions for service business runners in the case company.

As known in service business, there are lots of different difficulties for B2B manufacturing rather than B2C business area. Marketing and sales strategy of course are different, and they need specific ways to reach the goal and maintain the customers. The case company shares the similarities as well. Also, the competition in B2B manufacturing industry is very fierce. One way to obtain more order and increase business is to continuously improve the servitization level. As one article cited from Dr. Howard Lightfoot, that the manufacturers need to change their organizations' s capabilities and processes for getting better common values via the realization of product service integration. (Nalina 2017).

3.3 Data Collection

There are multiple ways for data collection. The data can be collected through interview or observation. As in many books shown, that the interview covers the continuous process from structured, semi-structured to unstructured interviews (Edwards & Holland 2013, 2). Qualitative interview is how to collect qualitative data. It serves as a research tool in the field of academic research and provides empirical materials for research problems (Eriksson & Kovalainen 2008, 84).

To collect the primary data, the author has conducted semi-structured interviews with the case company and the customer for empirical study. There are some material about servitization which are picked up from case company, which will be studied as empirical data during the research. All collected empirical data by researchers are called primary data (ibid., 82). The experience data of the researcher's research project can be displayed from multiple channels, such as interviews, sketches, telling stories or opening forums or in other ways as acting the fact. (ibid., 77).

To use semi-structured interview for empirical data collecting, the interview questions was designed and selected carefully according to previous framework. Normally when the interview questions were not good at fitting with reality and research questions, or not designed according to the interviewees, then the results or the conversation will not be carried smoothly and very well enough for such purpose. As mentioned by Eriksson and Kovalainen, that the questions you asked should serve the purpose which is capable to present the research questions detailed answers from the interviewee with carefully analysis. (ibid., 79). And as semi-structured interview type means, that the interview has been pre-defined and studied quite well. But also there are flexibilities during the interview and which provide the space for the interviewer and interviewee to have deeper discussions about the phenomena. It has shown evidence that by this kind of interview, It allows the researcher to freely explore the interviewee to elaborate or follow the interviewee's new way of asking (KnowHow 2018).

The research questions are about servitization level improvement in B2B manufacturing industry. Thus the interview questions are designed to try to answer this questions step by step. Each step has its own purposes and tasks. It starts from drawing a clear vision of the current situation. Then it continues with the comparison between theory and relality, and ends with the suggestions and visions of servitization by analyzing the collected data. Mainly the questions of interviewing are focused on below areas:

Current situation investigation

Challenge identification

Framework auditing

Suggestion collection

Prospect of Vision in Servitization

The case company material selecting is based on the fact and mutual proof point of view. It also will help the interview process and support in both ways.

As the author is working in the case company and playing a role in cooperating and supporting to service business, so the data collection is directly achieved with the case company and the customer through semi-structured interviews. And the service business related material are also obtained directly from the case company. The interviewee are selected based on the research questions and servitization phenomena. The principle for this research interviewee selection is to find the people who directly working with servitization or who directly involved into this business area meaning be affected as well. Therefore the interviewee which the author selected are working in service business with different responsibilities from both case company side and the customer side. Thus, there are three persons who has been interviewed for this research based on the research material and research problems. The reliability of the empirical data is more accountable and reliable by using this kind of principle to select the interviewee.

Two of the interviewees were invited in the first place after seeking in service team of the case company. The invitation letter was sent to them and also a pre-introduction message was sent to them in the same time. As a kind confirmed responding received from them, this two interviews have been scheduled in a nice meeting room within one and half hours. These two interviewees are both male and have background in business management and technology management. They both are working for the case company more than 5 years and more than 2 years working in service business. On the other hand, the interviewee from the customer side, was recommended by the case company service team. So the interviewee from the customer is also in a counterpart side as the case company interviewee. But the interview with customer has been postponed for almost one year due to schedule issues. And since COVID-19 affected, the interview with the customer was conducted

via phone call meeting. The related background of this interview was also sent to the customer in advance.

All these three interviews were recorded via audio method. By this way, the author is easier for upcoming data analysis and transcription. The interviewees' names are remained as anonymous. The interview questions are attached in appendix 1. The data size in this thesis is in a reasonable level to do the research. The content and context significantly affect the understanding of the messages' meaning (Drisko & Maschi 2016, 4), and it should be paid attention to it. In following chapters, interviewees from the case company were referred to as the case company interviewee A and interviewee B, the customer interviewee was referred to as the customer interviewee C.

The materials of the case company serving this research phenomena can not be presented in this thesis due to confidentiality reasons. The material is in power point format with 51 pages about the servitization situations of the case company. It shows the actions that the case company took in doing better service business and maintaining good relationships with customers. It also guides people who work around the service business to remain a good mind set in doing business in principle.

3.4 Data Analysis

Qualitative research takes the data analysis in the center position (Flick 2013, 3). As mentioned by Eriksson & Kovalainen (2008, 148), that the data analysis is processing and organizing the empirical data, to make it into a certain order and format as a fundamental description element. Dr. Uwe Flick defined the Qualitative data analysis which is to sort the collected materials and data, so that can be stated in the direct and extended dimensions and the material structure and presentation of the content (Flick 2013, 5). Data analysis is an indispensable step in qualitative research. Without data analysis, researcher is not easy or impossible to obtain the facts or criteria and basis from the original empirical data, to summarize the objective facts and phenomena.

Empirical data of this thesis was obtained via different channels, such as the internal materials of the case company, the interviews of the case company and the customer. With the recording devices of a cell phone, the conversations between interviewer and interviewees have been recorded with English language. There are three interviews which has been carried out. Two of them were done with the case company employee and one was done with the customer. The transcripts and data analysis have been processed one by one. It means that once an interview finished, the author started the transcription and analysis after it. When the data analysis accomplished for first interview, then the second interview was arranged afterwards. The good thing for this kind of arrangement is that it will make the transcription and analysis easier as the memories were so fresh for the author. Another benefit is that the author can finetune the interview questions so that they will support the research question in a better way. Data coding should be started as soon as possible after first interview, observation or video was completed. Because the data collected for the first time can provide support for the next data collection (Corbin & Strauss 2008, 69).

When doing the transcription and data analysis, the category way of data that the author used is by using different codes and colors to mark the different types of questions and answers. And the expression and tone of the interviewees were also moderately marked in the transcription. It will give a hint to author when summarize the data to conclusions. So that this research can be more and more accurate and closer to the facts and objectives. But as a fact that answers from interviewee are not always fit with the truth, but realistic is that to assume that interviewees tell the things just as it really is or happened (Seppelin 2018). And we need to believe what we got from the phrases of interviewees.

The data analysis is complying with below process shown in Figure 12. And this process is picked up from the theory of the qualitative content analysis process (Elo & Kyngäs 2007).

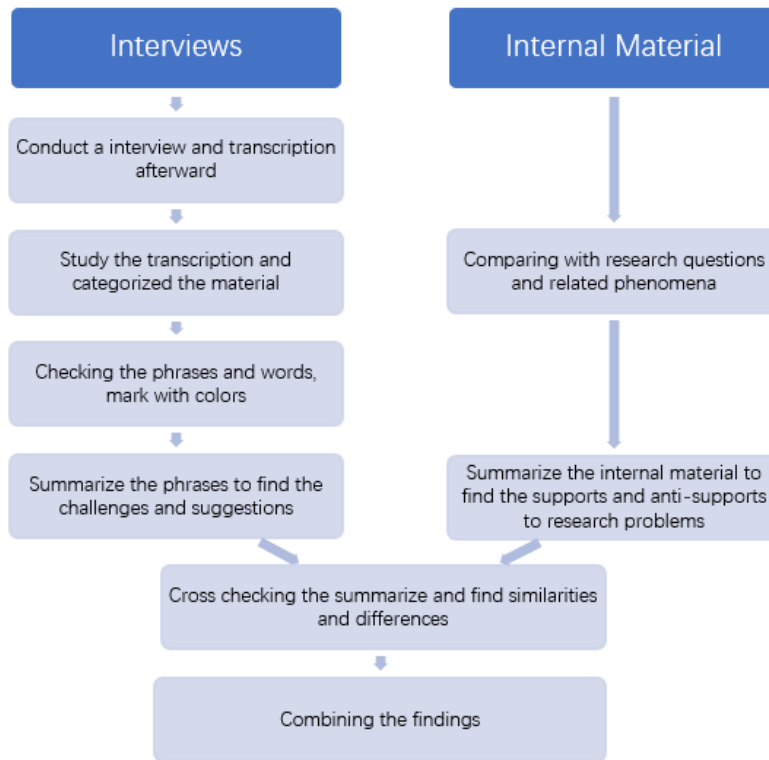


Figure 12. Data Analysis Process

Through the cross checking of the results from interview data analysis and internal material checking, it is easier for author to observe the similarities and differences. It helps to get the combination from different resources after analysis. The interview records have been transcribed to a excel document, which was categorized and coded afterwards. The marks have been made after checked the phrases. The analysis of empirical data from interview contents was made one by one. And the interview questions were fine turned in between for the last interviewee from the case company accordingly. The interview questions for the customer, was tailor made. The reason is that the customer was describe the research questions in another dimension and level comparing to the case company interviewee. This is one benefit to reveal the whole story of the research.

The summary and analysis of the transcriptions are finished afterwards. The internal material of the case company was compared with the research problems. The content of the material was checked and analyzed in accordance with the research problems as well. After the summarization, the combination was made from two resources ways. The combinations of findings are the phenomena towards research problems and questions.

3.5 Results Verification

How to verify the research results is related to whether or not the reader will accept it and believe the meanings of the phenomena that it studied. In the research process, these issues are affected by various factors. Those attributes most likely are related if the research is doing scientifically, and the good quality of it and its trustworthiness (Eriksson & Kovalainen 2008, 290). So, it is a critical step for research project. Validating qualitative research can be done by through internal and external combinations and groups (Sousa 2014, 213). External or called extrinsic mainly is depending on the standards introduced from quantitative research, and suitable for qualitative research (ibid). Internal or named intrinsic on the other hand, is only based on the research context (ibid). For qualitative research evaluation, emphasis should be placed on the consistency of the results, the reliability of the method, and the portability and application of the outcomes (Lincoln & Guba 1985, 300; Hill et al. 1997, 556).

To make the research process more explicit will help to increase the trustworthiness of the method by describing the orientation or disclosure of the researcher as a tool, as well as the interpretation of the social and cultural context (Stiles 1993, 593; Morrow 2005, 259). The methodology steps which be designed should ensure credible research process, strict experimental methods and internal consistency (Sousa 2014, 214). The central goal of result consistency is to verify the results through the fusion of opinions (Hill et al, 1997, 558). It means that another researcher can have similar results by redoing your research, or your research results is interpreted with other previous research. This explains the universality and application ability of the experimental results, and is reflected in the consistency and rationality.

The research procedure of this thesis were conducted by means of maintaining the reliability and validity which are both effects the research quality. To select the direct working-with the interviewees, and data selection from servitization area of the case company, it provides the information which are more close to the phenomena area. All these steps, as well as explicitly presented the methodology and framework the thesis adopted, can ensure the reliability of resources and information. The

coherence of results, can be validated by another researcher replicating this research. And the author believes that this research revealed the essence of research questions and phenomena, which means that the research questions are answered certainly and can be reproduced in other similar research.

4 Results

4.1 Findings

As mentioned in earlier chapter, the research questions of this thesis are reviewed in below to refresh the memory for the reader. So that can provide the more clearly clue how the findings and suggestions of this chapter linked to providing answers to the research questions. In this chapter, the author reveals the findings from the empirical study of interviews and case company material. It answers below research question on a relatively reliable basis. In some dimensions, the findings are very useful for industry to considering the way of entering to servitization and actions needs to be taken then.

Research questions:

Q1: What are the challenges/barriers to implementing servitization from the company and customer points of view?

Q2: How to overcome the challenges and improve the level of servitization in the B2B manufacturing industry?

Through analysis of the findings from the interviews and the case company material, as well as comparing with the theoretical frame work of the thesis, it shows that some challenges in current servitization level is irrelative, and some are true challenges the industry. Similarly, the suggestions from respondents are relatively in

accordance with the theoretical frame work, but some of the emphasis are slightly different as well. The Figure 13 in below, is presenting a holistic picture for the reader to understand the situation of the challenges and barriers easily. From different dimensions, the status are illustrated correspondingly.

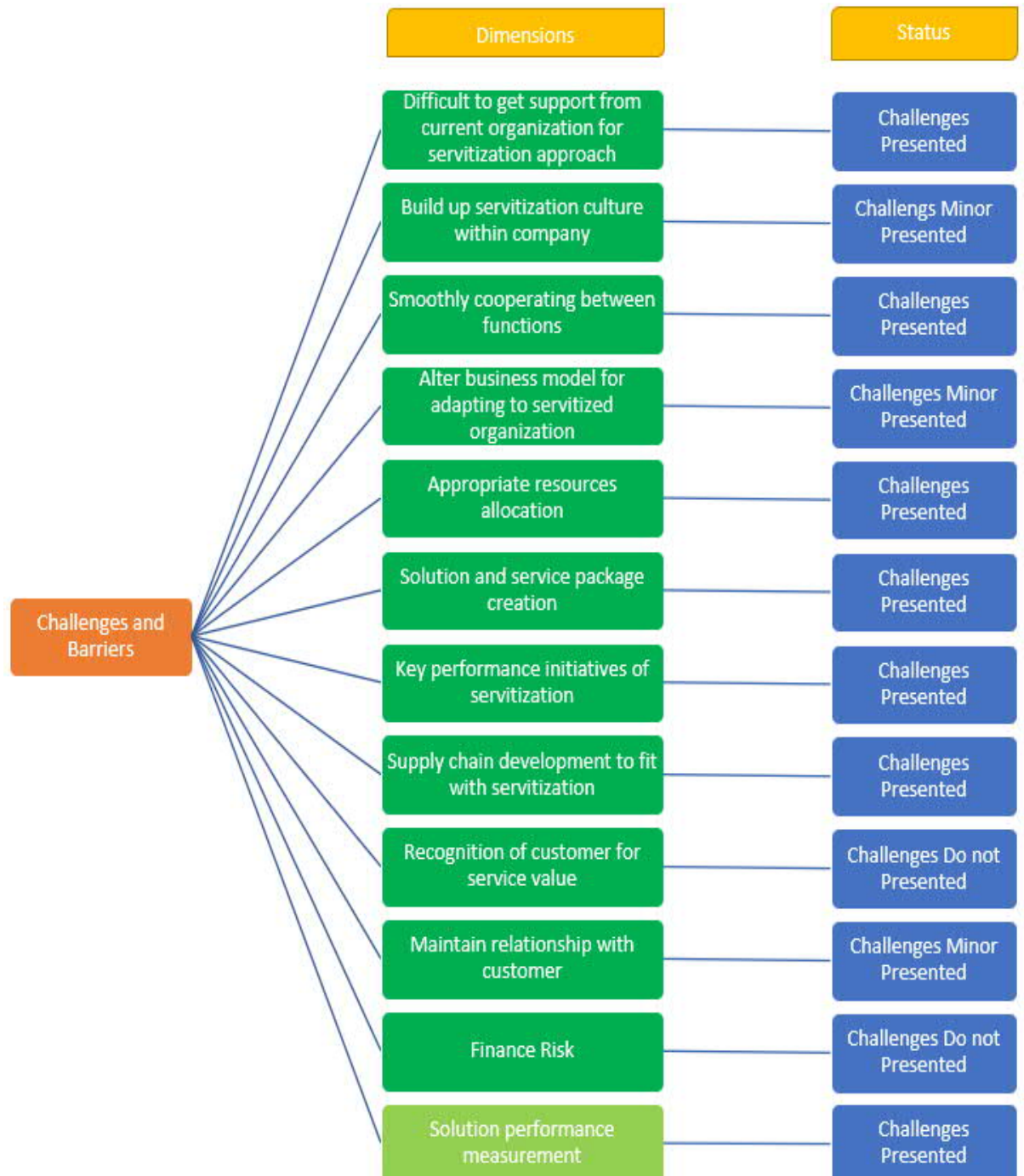


Figure 13. Challenges and Barriers Status

In above Figure 13, challenges presented describes that the challenge from the dimension were found during the emperical studay. Challenges minor presented means that the challenge showed slightly. And Challenges do not presented, obviously pointed out that the related challenge was not discovered by the study.

And the Figure 14 inbelow, shows how the industry responding to the challenges and barriers.

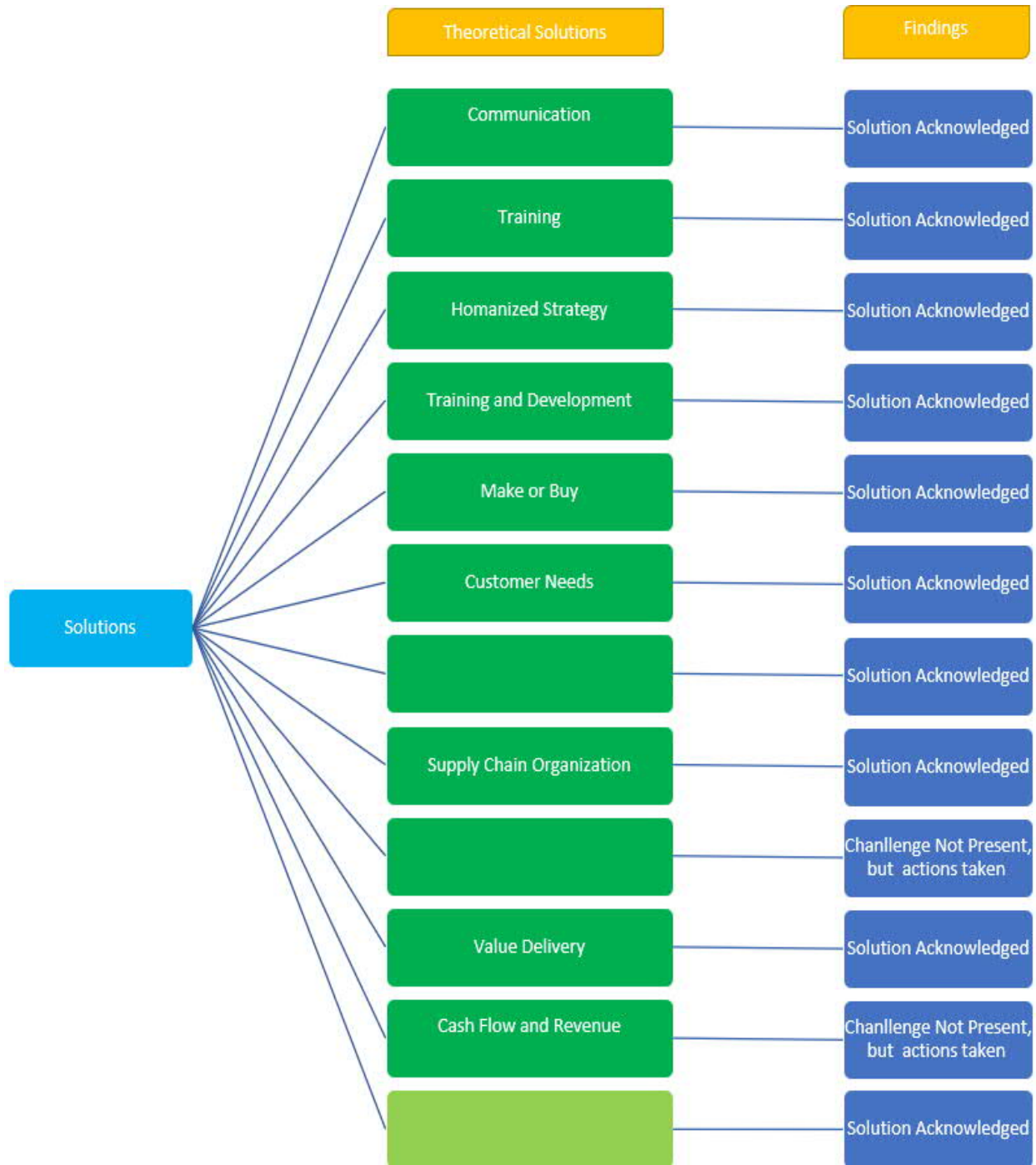


Figure 14. Solutions and Findings Status

In Figure 14, the solution acknowledged means that the related solutions from theoretical study was known and welcomed by the manufacturing industry. And the challenge not present but actions taken, points out that even the related challenges in Figure 13 not discovered by the study but some actions for improving the situation were taken by the case company and its customer.

By presenting the holistic pictures above, there is a common understanding between the reader and the author for the linkage among the researched questions and its findings. The focus of this chapter is on presenting the facts and findings from empirical study. Through the analysis of the facts and findings, the results are demonstrated explicitly in this chapter. And the combination of the analyzed findings approaching to the final results is presented indispensably as well. So, this thesis finally presents the reader with a comprehensive answers to the research questions.

4.2 Analysis

The research process was started with the literature review according to the research questions. From the research questions and the theoretical framework, the interviews and the case company material was arranged and obtained. Clearly, the different parties is holding the different cognitions towards to the same topic. So, this thesis explores the research questions from both sides of industry seller and its customers. However, because the research topics are more inclined to discover the potential contradictions and problems of the seller side, therefore, the research and analysis of the case company are more emphasized. But, it does not mean that the voice of customer side was ignored. On the contrary, the voice of the customer is a useful supplement to a comprehensive understanding of the problem and better confirms the problem of the seller side. So, the results are presented both from company view and customer view. To respect the willingness of interviewees and the case company, some sensitive words and description are not shown when quoted for analysis in below.

4.2.1 Company View

Organization Support

Servitization approach is a strategy for most of the companies in manufacturing industry. It is a stable business for the case company as well. It is proven not only during the interviews, but also from the case company materials, as mentioned by the interviewee B:

“We have quite strong product organization in case company, both service and capital organizations.”

But, when the topic is switched to how is the support from organization, the tone of the interviewee A and interviewee B is changing into uncertainly and differently.

Interviewee A mentioned:

“I would say there are at least one big thing is that our organization model doesn't support fully this kind of approach.”

And interviewee B mentioned that there has improvements opportunity but it is in good level of supporting generally:

“...of course, there is always rooms for improvements. We have large entity of different offering, and sometimes making those as a working customer, customer packages is bit of difficulty. But I say in general I get good support for whatever I need.”

The statements from interviewee A and B, it looks like that presenting the status of the case company differently. But it actually just describes the complexity of the servitization status in the case company. Both statements from interviewee A and B gives the facts that there are something in the case company can be done better when towards to servitization approach. But as the fact that the case company has adopted the servitization as its strategy, so the support from the organization has to be in a certain level to fulfill its needs in different functions and different segments. So, the interviewee A and B confirmed each other's understanding of the facts and judgment of the servitization situation in the case company, and described a general framework.

To further understanding how the organization supports could be done better for servitization approach in the case company, the interviewee A emphasized:

“Basically we are running our service quite heavily in silos. Which basically means that we have a ... structure in place, which actually support that we are selling individual product instead of large scope bundle kind of solutions to customer.”

This gives the hint which is to provide the customers with a comprehensive service package, needs to break the isolation from different business units of the organization. By doing this, the service business as a action of the servitization strategy, will not running in silo. So the bundle solutions can be provided to customer, as emphasized by interviewee A in its subtexts. The organization model in a way, needs to support the servitization strategy and to help growing its service business share continuously and stably. The company policy for doing business, especially for the large enterprise, needs to adapt towards to the servitization.

Build up Servitization Culture

A successful company must have its own corporate culture. Companies that focus on servitization approaching must also be supported by the corresponding internal culture of the organization. When talking about the servitization culture building up inside of the case company, both interviewee A and B are agreed that employee understand the meaning of servicing to customer, and work with the basic principle which obtained from individual life time or society. The understanding level among employee is vary and depending on personal experience. The fact presented by interviewee A:

“I think that in everyday life, people have seen in consumer business... So the people understand really this kind of trend in overall in the consumer business, but also in the industrial.”

“So people has the good knowledge about it. And I think they respond it based on their own experiences. They are supporting to this direction.”

And also mentioned by interviewee B:

“Well, not really. The guy I work with has quite long experience about the subject. But of course, always understanding the customer need, it can vary and there can be difficulties concerning the servitization of our offering.”

According to the findings listed in above, it can be seen that the servitization culture in the case company, is in a spontaneous status in their organization. The way of how to conduct with customer does not fully revealed from the interview. But as a supplement, the content from the case company material shows some evidence that the servitization oriented culture was organized in an understandable and explicit way. It is quoted from the case company material as below:

“Over the years we have been constantly developing our services to improve the reliability and performance of your processes.”

“To give you the best service experience we have defined our core commitments to you.”

“We invite you on a shared journey ...”

From above statements, it is obviously that the organization of the case company has very vividly vision about the servitization and its culture. The customer is seen as partner in the same journey towards to success with the case company. The question is why the understanding of servitization stays in a individual level and varies a lot. Obviously, in the understanding of servitization, the consistency of corporate goals should be highlighted, which can reduce the deviation of understanding and increase the operability at the employee level. In this sense, it also be confirmed from interviewee A:

“So I don't see any that kind of problem that not understand why we should do it. But more it is how we should do it, is the question.”

As mentioned by interviewees, the reason why industry is towards to servitization is not a issue for understanding by employee. But the true question is how to take actions to serve this goal in a daily work. This gives companies an opportunity to sort out management processes and serve servitization strategy. It also can further enhance corporate development space and business expansion.

Smoothly Cooperating

When discussed about how the cooperating situation is in the case company among different functions, here is some clarifications from interviewee A:

“So as a conclusion, there is no clear principle to support this kind of collaborations between business ...”

and also from interviewee B:

“But in the end, this is quite big organization, there always has challenges to have split targets and common efforts based on those.”

Due to the sensitive and confidential reason, some of the words cannot directly show in this thesis. But according to the discussion with interviewees and the hint from above direct statements, it is clear that there is challenges for smoothly cooperating in the case company as well as in such big enterprise and organizations.

From the discussion, the author believes that in many organization and enterprise, there are varying degrees of cooperation and communication problems. As the case company shows, there is reasonable cooperation and communication among various departments of the company. However, because the company does not coordinate the Key Performance Indicators (KPIs) established by various functions in a reasonable and effective manner when managing and operating, it caused problems in work collaboration.

“Well, maybe more systematic cross functional way to operation how we work could work better...” (Interviewee B.)

So as suggested from interviewees, the synchronized KPIs and target settings as a basic fair principle, is considered as a necessary action to do in the case company. It leads every functions working in the same direction to cooperate smoothly and systematically. This suggestion basically solves the task when functions supporting each other to efficiently complete the company's goals while the division of labor is clear.

Business model

Because the essentail of the semi-structured interview, there are many times discussions which related to the business model topics with interviewee A and B, especially when discussing the operation, cooperation of each functions and organization support of the case company. As described earlier, there are challenges to harmonize the relationship between each functions when their seperated KPIs are

not associated together. Based on this fact, there is needs to adjust the business model to support the common goal of the case company efficiently.

In the case company, there are different business functions and units. Commonly, their business results are supporting each others in certain industry areas to expand the company's business volume. But in different functions, they have different interests as well which guided by their KPIs. The business relationship are basically supporting each other with inner stresses. This creates an internal environment that is both collaborative and competitive. It is also shown on the interface when dealing with the customer.

“...But maybe customer oriented offering servitization offering towards customer is something that we could put our more efforts into.” (Interviewee B.)

There is also evidence which shows that the case company acknowledged the issues, and deal with it actively. According to the case company's internal material, one action has been taken by combined the solutions and service package with one other functions's product in 2015 already. But there are still rooms for improvement for harmanizing the business model to support servitization.

Resource Allocation

“And our capacity is quite limited, so in general what we plan and what we executed are two different things. There are capacity issues probably.” (Interviewee B.)

“Rising labor cost and skills shortages. How to get the right expertise when needed.” (The case company material.)

From the interviewee and the case company material, both recognizes the resource and capacity issues. There are two problems in this regard. One is sufficient available resources, and the other is effective qualified resources. Both are related to resource allocation appropriately. In today's world, companies can obtain resources in various ways and through different channels. How to use and allocate resources rationally is a problem that all enterprises including the case company need to consider.

In the discussion with interviewees, it is a consensus that products based on the core competitiveness of the company should not be obtained through buying but making. Non-strategic competitive products can be delivered from other market player as a

sub-contractor globally. Obviously, these measures have not only ensured the company's competitive advantage, but also expanded its business scale.

The challenge is to define the scope for buying and making, as well as to allocate limited internal resources efficiently. This depends on the current operating conditions of the company, work load matching, personnel adjustments and many other factors. From below statement, it also easily can see that purchasing strategy sometimes also need to be used to keep the competences for industry players.

“Yes, the key components should be made on our own. At least keep the supply chain scattered in between the different suppliers so that we had kept the competence and know how of the key components.” (Interviewee B.)

Solution and Service Package Creation

“Solutions to your needs” (The case company material.)

This sentence summarizes briefly and clearly how to create solution and service package towards to customer. Easier said than done, it involves two aspects which are recognize the customer true needs and create implementable and competitive solution correspondingly. Such recognition is similarly confirmed by the customer side, as described by the customer during interview:

“So customer has to have needs and get view of own needs, what is your needs, and understand what you are buying. Of course service provider has to understand what they are selling. So they have common understanding of what they are selling and what you are buying. That is the first thing to have.” (Interviewee C.)

From this perspective, the customer needs and company service package have to be matched. To mapping both sides, a common understanding of the customer needs is shared between each other explicitly. The initial investment to obtain the order will be increased for the company due to site visiting and communication oftenly with customers. But on the other hand, it helps to maintain a good reputation and relationship with the customer, meanwhile it increase the customer satisfactions.

To implement the solution to customer safely, the resource coordination and project management are emphasized by interviewee C:

“Then you have different people who working with you. You have subcontractors, you have own people, of course there has so many variates.”

“One of the key issue is that you have the big schedule, and you have your own work, which is also all the schedule ... If we cannot keep the scheduel, immediately it effects on other things.”

Communication during the implementation is very improtant, told by the customer. One changes effects to another’s schedule. So, to achieve a satisfied results to the customer, it is a must to coordinate smoothly between different counter partes. Varies of actions has been taken to keep the communication, such as email, phone call, meeting etc. The customer also points out that safety is a must and foundation to successful result. It never can be neglected.

Key Performance Initiatives

Key performance initiatives are specific action plans formulated by the company to support its strategic decisions, which are different from the key performance indicators used for evaluation functions performance. Actions towards to servitization, has been discussed directly or around it all the time with interviewees. It has also been shown from the case company material as listed in below:

“Safety comes first, Close to you, Solutions to your needs, People you can trust, Realiability, Performance, New technology”

From all these aspects, it servers the final target which is to guarantee the success of the customer. All the initiatives target to the customer needs. The initiatives can be summarized as safety implemented solutions from a easier reached supplier. The technology guarantees the solution stably performed by professionals.

One challenge to the case company to improve the customer experence is to have a universal platform for connecting with customer. This helps customer to understand the company easily. This can be set as one key performance initiatives for the case company. It is appointed by interviewee A:

“...so if they gave you 5,6,7,8,9 phone call numbers, how you feel about it? Do you feel this is a great experiences for you about the dealership?”

“We should have one on-call number globally to call if they have a problem. And then our people in switch board to decide what kind of problem you have and find the experters to solve the problem.”

A commonly frontier representing eases the difficulties and lowers the barriers for customer to reach the company for consulting. This supports to another goal set by the case company, which is "Close to you" (The case company material.). This gives the good example for built up the initiatives. It is clear that initiatives has to be sorted up carefully when setting up. Because they could supporting each other or bring conflicts to.

Supply Chain

"Supply chain is vital part of servitization... How we can then combine our supply and our sub partners as a combined customer package, in my sense, it is vital for our operations, very important." (Interviewee B.)

As pointed out by interviewee B, the supply chain is playing a very important role in servitization oriented organization. Partially it reflects how well the resource allocation is from the company as well. When the business went globally, the resource utilization is more wider than before. Considering the local regulations and marketing certificates, local resources and supply chain must be built up to server customer closely. That is why it is very important to business growing and company operating.

As discussed with interviewee B, the supply chain development has more contents just than resource management, but also contains the quality securing and supplier development activities. Through different actions, the supply chain is working better and better for the case company. But the combination of sub partner as part of the customer package, it is still a big job to think through carefully and plan well.

Maintain supply chain towards to servitization oriented business, is always a continuous development topic inside of organizations. The reason is that the environment is changing all the time, and the needs of customer is changing as well as the technology development.

Recognition of Customer for Service Value

When discussed about the customer recognition of the service value, the interviewee A mentioned:

“Of course we have a continuing customer experiences survey kind of process in place in case company. Which is giving the indication overall customer experiences.”

Through this survey, the case company can identify what is the customer satisfaction level in overall situation. For specific events, it is possible to take targeted measures and initiatives. As a tool for the company to grasp customer feedback, surveys and interviews have realized information exchange between customers and companies after the transaction is completed.

But, the customer also indicated another fact, which is the survey should be arranged in a reasonable interval, not too less not too often. When it is too often, it just disturbs the customers daily work and will be ultimately a formality. Interviewee C just pointed out during the discussion:

“Customer satisfaction survey they are good in some interval. But we do not want they are all the time because after a while you are just only answering the survey. That is just not the key thing to do those.”

When discussed with the customer, the most key indicators which are effects on the customers satisfactions, are the quality of work, well organized resources, safety, runnability of the product, as well as the competitiveness service from cost performance point of view. After transaction finished, the customer are also welcoming the reasonable return visiting and reachable emergency response plan from the company. These are the essential factors which customer cares about the most. Survey, however it provides a way as closed loop to bring the feedback back to supplier’s view, and allows the company to develop further. This also confirmed by interviewee A:

“So we are sending 4000 survey to customer annually, at least a target in service level...We get the information how customer feels about it. And for specific cases that we have specific interviews.”

Maintain Relationship with Customer

The importance of relationships between company and customer, has been confirmed at both sides. Both parties believe that this has greatly helped the development of the business. It confirms that the cornerstone of maintaining customer relationships is to provide customers with satisfactory products and services. High-value supply makes it easier to maintain the relationship.

"I would say good cooperation between customers and suppliers, are very important thing. You know exactly what is going on...the relationship should be so close, that you know what there is happening even you do not have big business in there." (Interviewee C.)

"I think this is as a global company, that we have local people who speak local language. I think this is real benefits. how you are doing, how you take care of the customer, that's our values to the customer." (Interviewee A.)

"People you can trust." (The case company material.)

These statements mutually support the importance of maintaining customer relationships. High value-added products and services are undoubtedly the key to customer satisfaction. From the perspective of customer care, regular return visits and giving enough attention have also become an essential part.

Finance Risk

Based on the current business model and operating, there is no big finance risk been recognized by the case compan. One possible reason is that the commercial volume is not large enough to form a higher financial risk, or the company's cash flow is very abundant and has a strong ability to resist risks.

"No, not big ones, not big ones..." (Interviewee A.)

But when talking about the customer cooperation way changing from original product selling to product leasing and service leasing, then it is a challenge due to the amount of investment.

"That is the problem. We are not the bank, we are not credit company. So that creates the challenge absolutely." (Interviewee A.)

4.2.2 Customer View

Customers are the judges who ultimately evaluate the quality of service and product, so their opinions are an indispensable part when review the status of one company's servitization-oriented business. This thesis is presenting some suggestions and ideas towards to servitization also in below from customer's perspective. The dimensions customer brough comments on are mainly focused on evaluation of service and

solution package, solution performance measurements and some discussion concerning to maintain relationship with customer as well. What are the most factors which effects on the selection of supplier by customer, is also presented.

Evaluation of Service and Solution Package

“The challenges always be that you have the needs. There have many needs for many different kind of things. Of course that there are many different service providers. They have different skills and you have to know them. And who is capable of doing, what are their resources, of course quality of work and prices and lots of things. ” (Interviewee C.)

“Of course you have lot of things and certain schedules, and different mills have different needs. They has somehow match to each others.” (Interviewee C.)

As described by interviewee C, the criteria that customer focus on are a company’s know-how, the quality of product and service, resources and cost performance. These basically are how a customer select supplier. Also, the historical data of success cases, is also mentioned by the interviewee C when they made the decision to select suppliers. In other words, the reputation of the company is also an aspect that customers consider. From this sense, Enterprises not only need to provide customers with first-class service and solution packages, but also need to maintain good customer reputation. This is confirmed again as a challenge from customer side as well.

On the other hand, the customer pointed out that a good service package may not be what the customer needs. Products that can meet and match the real needs of customers are good service packages. Mapping the customer needs, is very critical in here as emphasized by interviewee C: “ So they have common understanding of what they are selling and what you are buying. That is the first thing to have.”.

During the implementation for the service package, resource organizing, and project managing are also where the customer gives credits on for supplier. Due to the large number of on-site personnel, and all units’ plans restricting each other, so coordinating the progress of all parties appropriately can smoothly implement and complete the project. It clearly helps to increase the customer satisfaction.

Another point that the interviewee C mentioned is that the tailor-made solution sometime must be created for certain cases. The company has their own technical specifications with standard product. But to serve to different needs, the flexibility of the solution needs to be increase in fulfilling the customer's requirements.

Solution Performance Measurement

Solution performance measurement is recognized as a pain point by customer during the interview. As a company's commitment to the quality of products, quality assurance and performance guarantee are widely used in industry sales. But as mentioned by interviewee C, that is still insufficient.

"I would say that performance guarantee they are must, but they are not enough...If something goes wrong, how we react on those, how the risk guarantee. In a way, how we are going to do and so on. So there should have a detailed plan how to proceed on those."

So, afterwards there is a need for risk management also when the transaction accomplished. It will guide the customer to solve unexpected problems or take appropriate measures and contact the company for help. This kind of plan plays the role of the last defensive and guarantee line for customer. Under normal circumstances, emergency handling instructions are included in the product manual. However, some unlisted special circumstances should be included in the general description or notified to customer formally in more detail.

Another point focused by customer is how the performance guarantee be calculated. The sub-text is the performance guarantee should be understood from both parties not only by the literal index value but also by how that value been defined and calculated. If this measure can be implemented, it will further improve the performance guarantee's transparency and credibility.

"There should be a way how we calculate the gurantees. So both parties are understanding how they are calculating, what are the circumstances and so on."
(Interviewee C.)

During the discussion, it also has been touched for how to maintain the relationship with customers. One interest view is that the regular based communication is welcomed by the customer. So, the company and the customer can mutually

understand the current status of each other. But a customer satisfaction survey should be kept in a reasonable interval, so that will not disturb the customer's daily work.

4.3 Results Synthesis

Because there are many dimensions and perspectives when discussing servitization, so the analysis and suggestions are also from multiple directions. To provide the reader a clearly understanding of the phenomenon and results from the empirical study, this results synthesis is necessary to bring in here for this purpose. In this section, the author presents the result from two direction. One is the description of the relationship between different challenge points within the enterprise and towards to customer recognition and relationship. Another is the suggestions and research results obtained for different challenges in the research process.

Through interviews with the employees of the case company and their customers, it is found that there is an interaction between various challenges. For example, the cultural value of a company and its corresponding business model are the cornerstones of a company which adopts service-oriented strategic decision. Based on this, there will have multiple key performance initiatives to achieve the strategic goal through smoothly cooperation and sufficient supports. Naturally, the resource allocation and supply chain will be built up correspondingly. When these are implemented, company is able to create customer-oriented solution and service package, furthermore to control the finance risk. The recognition of customer and relationship will be increased after all. On the contrary, customer feedback also affects the internal management of the enterprise and its strategic adjustment. So, it is illustrated in below Figure 15 for the relationship between the various challenges within the enterprise and the mutual influence between the enterprise and its customers.

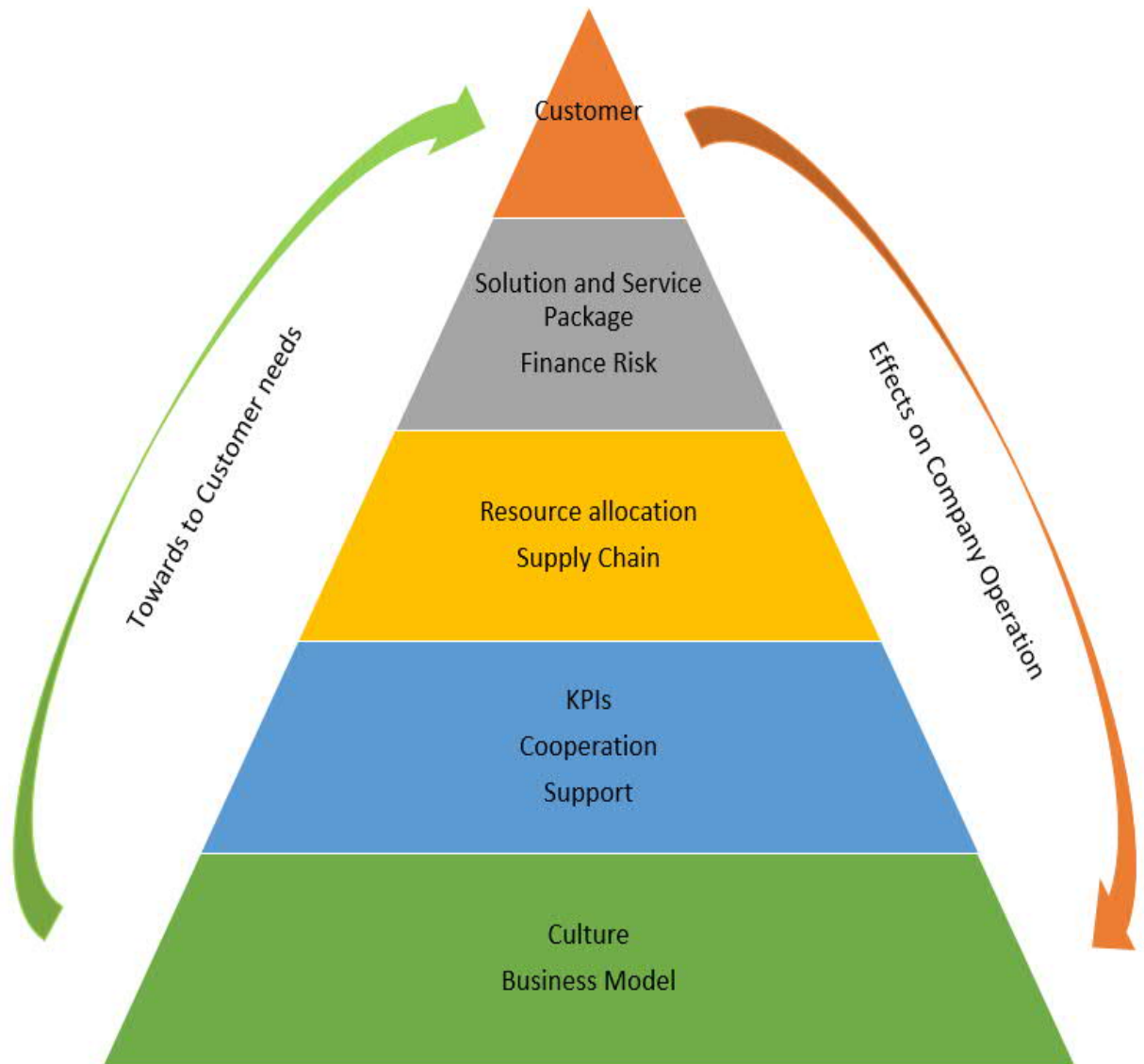


Figure 15. Challenges and Barriers Status

Based on the interrelationship between the above challenges, combined with the content of empirical study, the author believes that there are useful information and suggestions towards to the research questions. All the information from the study, are aligned with the literature review results. It also in some level, completes the solutions for some dimensions of the challenges. The results combined with the theoretical framework, are presented in below Figure 16.

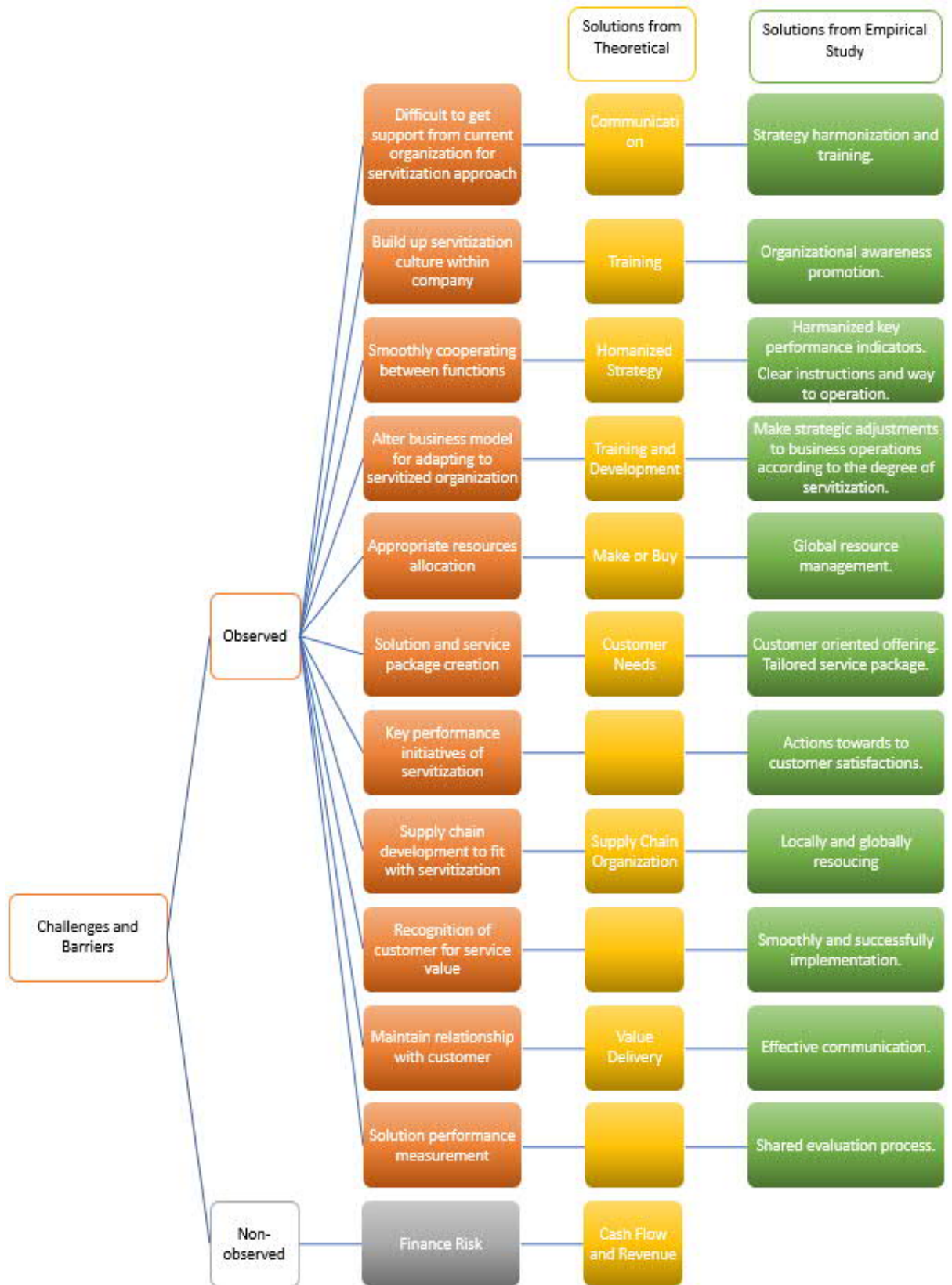


Figure 16. Observed Challenges and Barriers with Solutions from Theoretical Framework and Empirical Study

The above Figure 16 summarizes the research results of this paper. For unidentified financial risk challenge, no specific measures have been listed. But there is more discussion about it in discussion chapter.

5 Discussion

Since the results have been presented in last chapter, so in this chapter, it is needed to evaluate and discuss it from different directions. It is explained how well the research questions answered and fulfilled the needs from managerial implications. Also, the research limitations are brought to the reader, as well as the suggestions for future research.

5.1 Answers to the Research Questions

In order to further analyze the difficulties of manufacturing enterprises in the strategic adjustment and transformation of servitization, and to help enterprises find ways to overcome the difficulties, the author therefore explores related issues in this thesis. First, the relevant research questions are selected and stated as follows:

Q1: What are the challenges/barriers to implementing servitization from the company and customer points of view?

Q2: How to overcome the challenges and improve the level of servitization in the B2B manufacturing industry?

Then through empirical study, the research questions were answered. These two questions are connected with each other. The answers point out methods and actions which can be adopted by companies for servitization approach.

Challenges/Barriers

After literature research, assumption of related potential challenges and solutions are listed. The plan has been formed in theoretical framework, which is through the research of both the case company and the customer, to identify the status and severity of each challenges in the business operation. The interviewee A and interviewee B was selected from the servitization functions of the case company and the interviewee C was selected from one of the customer of the case company. The interviewee C also represents as the customer side to all kind of service providers, in other words, the voice of interviewee C widely is the requirements from the customer of the whole industry.

Totally there are 12 challenges area which were assumed. 1 key challenge's evaluation from customer side are also mentioned in the theoretical framework, which is evaluation of solution and service package. After the discussions with interviewees and comparing to the material from the case company. Most of the challenges are confirmed and only 1 challenge is not presenting in the case company and customer side either. The confirmed challenges are briefly introduced in here:

Hard to get organization Supports

Build up servitization culture

Cooperating between functions

Business model for adapting to servitized organization

Resources allocation

Solution and service package creation

Key performance initiatives of servitization

Supply chain development

Recognition of customer for service value

Maintain relationship with customer

Solution performance measurement

The non-confirmed challenge is Finance Risk. During this stage, there is no such kind of big risks. The author believes the reason is related to the company's operation and business model.

Among these areas, the solution and service package creation has been focused on discussion with customer. Through the evaluation, it has been extended to other challenges and barriers also.

Solutions from Empirical Study

After analyzing the solutions obtained from the literature research, the author designed the corresponding interview questions. By analyzing the interviewer's conversation recording, the answers to the confirmation question was obtained. As expected by the author, the interviewees gave more suggestions for solution and service packages creation. And they also put forward valuable suggestions on how to better support servitization-oriented from companies' internal organization.

Solutions from literature review are confirmed for the recognized questions during the study by interviewees. The solutions from the empirical study are listed briefly as below:

Strategy harmonization and training.

Organizational awareness promotion.

Harmonized key performance indicators. Clear instructions and way to operation.

Make strategic adjustments to business operations according to the degree of servitization.

Global resource management.

Customer oriented offering.

Actions towards to customer satisfactions.

Locally and globally resource

Smoothly and successfully implementation.

Effective communication.

Shared evaluation process.

5.2 Managerial Implications

Through the analysis of the existing challenges in servitization, this thesis has obtained relevant solutions. It can play a corresponding guiding role for companies during their actual operation process. For companies that have implemented a servitization strategy, more detailed measures can be formulated accordingly. For enterprises that have not yet implemented servitization, the necessary reference and preliminary guidance are provided from this thesis.

Companies can improve their operational efficiency and refine departmental collaboration guidelines and policies by systematically advocating corporate culture related to servitization and establishing corresponding business models. On the basis of unifying the understanding of servitization-oriented, companies can have more efficient internal communication, appropriate resource allocation, reasonable supply chain and collaboration.

The requirements from customer side are presented for companies also. It is able to provide a guidance when create service package and solutions to customers. And it also brings the idea how to maintain the relationship with customers and how to improve the customer satisfactions. Especially one pain of the customer not identified, is the needs of sharing the calculation methods for solution performance measurements. This brings the new idea when communicate with customer for service package creation.

In summary, in order to better realize the servitization of manufacturing companies, companies should focus on the following aspects. First, unify the cognition of the service-oriented operation culture within the enterprise. Second, harmonize the KPIs of various business units to serve customer-oriented business development. Third, appropriately follow up customer experience tracking and keep customers in touch. Fourth, share the evaluation methods of service indicators with customers to make them open and transparent. Fifth, establish and improve customer local support

capabilities. In the end, explore how to improve the level of service-oriented strategy and increase customer dependence

5.3 Contribution to Existing Literature

According to the results of literature research, the hypothetical challenges have been verified in empirical study. Most of the challenges are also related to actual cases and find their prototypes in the reality. Although based on the details, the case company has its special attributes, but it more or less pointed out that the direction of the literature research is correct, and confirms that most of the solutions given by the literature research are feasible.

In addition, as a useful supplement to the literature research, this study found that the coordination of key performance indicators of various departments of an enterprise plays a vital role in the smooth implementation of servitization. Customers are more interested in the calculation of operating performance indicators given by enterprises. An open and transparent evaluation model is beneficial to the company's customer relationship and the expansion of the company's business.

In the empirical study, this thesis analyzes the interrelationship of various challenges within the enterprise. It provides useful clues for enterprises to distinguish between primary and secondary contradictions when implementing the servitization strategy. It complements and confirms the logical relationship of the challenges in the existing literature. Also, this thesis analyzes various challenges from the both side of perspectives of suppliers and customers. It presents readers with a clear fact about the servitization of manufacturing industry in a more comprehensive manner.

In empirical study, the only difference from literature research is the perception of finance risk. Under normal circumstances, only when the customer wants to use the product in the form of lease, it will require financial support by the supplier(Baines & Lightfoot 2013, 8). In the large-scale machinery industry, due to the enormous price of products, it is usually difficult for companies to form effective financing for customers. Therefore, no cases of leasing have been found for such products at present, so there is no financial risk to the supplier. The case company also does not show the evidence that the servitization of the manufacturing industry at this stage

has caused big financial risks. The author thinks there are two possible reasons. One could be that the servitization has not become the main strategy of the case company. Another reason could be that the cash flow of the case company is very stable and its ability to resist risks is very strong.

On a certain basis, this thesis is a useful supplement and confirmation to the existing literature. From different perspectives, it provides a channel to understand the whole picture of the servitization-oriented manufacturing industry. It plays an active role in theoretical research.

5.4 Research Limitations

Since the research object of this thesis is large multinational manufacturing enterprises, so the research results tend to provide guidance for the servitization of the manufacturing industry. All data used in the research comes from the relevant service department of the case company and its direct customer. As an enterprise in the manufacturing industry, all data are valid for the manufacturing industry. Therefore, the research results of this thesis are applicable to the servitization implementation and transformation of all manufacturing enterprises. But, for small service industries, due to the limitation of the scope of challenges covered in this thesis, it is not included in the discussion and does not have a special guiding role.

Because the data collection channel is highly related to the research objects and the collection method is direct and reliable, the author believes that the research results of this thesis are relatively reliable. But, because it is an empirical study, it is unavoidable to be subject to be subjectively influenced by the interviewees and the researcher themselves. Therefore, it will be subject to certain constraints in terms of objectivity. However, these supervisory influences are mostly eliminated in the process of mutual verification by all research subjects participating in the process. The remaining impact also fluctuates within an acceptable range. Therefore, it does not affect the objectivity of the research results of this thesis.

One possible limitation for data collection is that there were only 2 interviewees from the case company. The number of interviewees are relatively OK but not in a

high level. Another limitation is that the customer interview is too less. There only has one customer been interviewed due to the 2020 pandemic. And also the interval is too long between interviews with the case company and with the customer. So data continuity is affected but not necessarily reflected on the research results.

5.5 Recommendations for Future Research

Enterprises have resources and customers have needs. Through an equation or so called enterprise operation management, enterprises can appropriately use their resources to meet customer needs with high efficiency, low cost and high quality, which will become the core of manufacturing servitization. Truly, the author believes that research on the servitization of manufacturing should continue to be carried out in depth. There is still a lot of unfinished work to be done in this area. The addition of more research and demonstration will make the development of the industry more smoothly and orderly.

First of all, the challenge and analysis of the servitization of the manufacturing industry can continue. This can confirm whether all the challenges continue and whether the response solutions are effective. Because over time, the situation faced by the company will also change. Real-time follow-up on the research topics of this thesis can solve current problems more effectively.

Secondly, this thesis adopts qualitative research methods. In the follow-up research, quantitative analysis methods can be adopted to track and verify the research results of this thesis. It is possible to demonstrate the universality of the challenges and the consistency of the solutions by expanding the number of research objects and case companies.

Another direction that can continue to be studied is how to advance the servitization of manufacturing to a higher level. For example, whether the products of the manufacturing industry can be financed by the industry company itself for customers to operate. In the implementation of the servitization of the manufacturing industry, can companies distinguish their service between hard power products and soft power service capabilities to help customers achieve operational success? So the

companies will not only provide the technology with product and service, but also the knowledge of know-how for running the product in customer site. Author believes that will definitely bring finance risk into the challenge area. And it is very interesting to see how this area can be studied further.

References

- Ahamed, Z., Inohara, T. & Kamoshida, A., 2013. The servitization of manufacturing: An empirical case study of IBM corporation. *International Journal of Business Administration*, 4(2), 18.
- Osterwalder, A. 2004. The business model ontology: A proposition in a design science approach. Accessed on 15 December 2018. Retrived from https://s3.amazonaws.com/academia.edu.documents/30373644/thebusiness-model-ontology.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1547279747&Signature=R9U%2BJKJgWOOU4tCLzXPugODLNow%3D&response-content-disposition=inline%3B%20filename%3DThe_Business_Model_Ontology_a_propositio.pdf
- Athyantha Nalina. 2017. Servitization: The Changing Face of Manufacturing and Service. *Salesforce Blog*. Accessed on 11 November 2018. Retrived from <https://www.salesforce.com/uk/blog/2017/04/servitization-the-changing-face-of-manufacturing-and-service.html>
- Baines, T., Lightfoot, H., Peppard, J., Johnson, M., Tiwari, A., Shehab, E. & Swink, M., 2009a. Towards an operations strategy for product-centric servitization. *International Journal of Operations & Production Management*, 29(5), 494-519.
- Baines, T. S., Lightfoot, H. W., & Kay, J. M. 2009b. Servitized manufacture: Practical challenges of delivering integrated products and services. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 223(9), 1207-1215.
- Baines, T.S., Lightfoot, H.W., Benedettini, O. & Kay, J.M., 2009c. The servitization of manufacturing: A review of literature and reflection on future challenges. *Journal of manufacturing technology management*, 20(5), 547-567.
- Baines, T., Lightfoot, H., & Smart, P. 2011. Servitization within manufacturing: Exploring the provision of advanced services and their impact on vertical integration. *Journal of Manufacturing Technology Management*, 22(7), 947-954.
- Baines, T. & Lightfoot, H. 2013. *Made to serve: How Manufacturers can Compete Through Servitization and Product Service Systems* (2nd Edition). Somerset, NJ, USA, John Wiley & Sons, 2013, ProQuest ebrary, Web. 6 October 2015.
- Barquet, A.P.B., de Oliveira, M.G., Amigo, C.R., Cunha, V.P. & Rozenfeld, H. 2013. Employing the business model concept to support the adoption of product-service systems (PSS). *Industrial Marketing Management*, 42(5), 693-704.
- Benedettini, O., Neely, A., & Swink, M. 2015. Why do servitized firms fail? A risk-based explanation. *International Journal of Operations & Production Management*, 35(6), 946-979.
- BRAX, S. 2005. A manufacturer becoming service provider - challenges and a paradox. *Managing Service Quality*, 15, 142.

- Cook, M. B., Bhamra, T. & Lemon, M. 2006. The transfer and application of Product Service System- from academia to UK manufacturing firms. *Journal of Cleaner Production*, 14, 1455-1465.
- Corbin, J. & Strauss, A. 2008. *Basics of qualitative research: Techniques and Procedures for Developing Grounded Theory*. Los Angeles: Sage cop. 2008, 3rd Ed, ISBN: 978-1-4129-0644-9.
- C.R.Kothari. (2004). *Research Methodology, Methods and Techniques*. New Age International Publishers.
- Cusumano, M.A., Kahl, S.J. & Suarez, F.F., 2015. Services, industry evolution, and the competitive strategies of product firms. *Strategic management journal*, 36(4), 559-575.
- Dipeso, J. 2000. P2: Putting Environmental Issues in a New Light. *Environmental Quality Management*, 10, 13-24.
- Drisko James W. & Maschi Tina, 2016. *Content Analysis*. Oxford University Press 2016, ISBN:9780190215491
- Durugbo, C., & Erkoyuncu, J. A. 2016. Mitigating uncertainty for industrial service operations: a multi case study. *International Journal of Operations & Production Management*, 36(5), 532-571.
- Dubruc, N., Peillon, S. & Farah, A., 2014. The impact of servitization on corporate culture. *Procedia CIRP*, 16, 289-294.
- Edvardsson, B., Gustafsson, A. & Roos, I. 2005. Service portraits in service research: a critical review. *International journal of service industry management*, 16(1), 107-121.
- Edwards R. and Holland J. (2013). *What is qualitative interviewing?* British Library Cataloguing-in-Publication Data. ISBN: HB: 978-1-7809-3852-3
- Elo Satu & Kyngäs Helvi. (2007). The qualitative content analysis process. Accessed on 20th Nov.2018, Retrived from <https://student.cc.uoc.gr/uploadFiles/192-ΣΠΕΝ407/CONTENT%20ANALYSIS.pdf> .
- Eloranta, V. & Turunen, T. 2015. Seeking competitive advantage with service infusion: a systematic literature review. *Journal of Service Management*, Vol. 26 No. 3, 394-425.
- Eriksson, P., & Kovalainen, A. (2008). *Qualitative Methods in Business Research*. SAGE Publication.
- EY. 2016. *Operating models, Delivering on strategy and optimizing processes*. © 2016 Ernst & Young LLP. Accessed on 8 December 2018. Retrived from [https://www.ey.com/Publication/vwLUAssets/Operating-models/\\$FILE/Operating-models.pdf](https://www.ey.com/Publication/vwLUAssets/Operating-models/$FILE/Operating-models.pdf)
- Matthew E., Mark W. J. & Hari N. 2011. *New Business Models in Emerging Markets*. Harvard Business Review. Accessed on 25 December 2018. Retrived from <https://hbr.org/2011/01/new-business-models-in-emerging-markets>

Fang, E., Palmatier, R.W. & Steenkamp, J.B.E. 2008. Effect of service transition strategies on firm value. *Journal of marketing*, 72(5), 1-14.

Foresight, 2013. Future of manufacturing: a new era of opportunity and challenge for the UK Summary Report, The Government Office for Science, London. Accessed on 17 January 2021. Retrived from [The future of manufacturing: a new era of opportunity and challenge for the UK - project report \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/262222/the-future-of-manufacturing-a-new-era-of-opportunity-and-challenge-for-the-uk-project-report)

Field Service News. 2018. Welcome to the New Age of Servitization. Filed Service Nes, Future of Field Service. Accessed on 25 August 2018. Retrived from <http://fieldserviceneeds.com/welcome-to-the-new-age-of-servitization/>

Flick Uwe. (2013). The SAGE Handbook of Qualitative Data Analysis. Accessed on 22 January 2021. Retrived from http://www.ewi-psy.fu-berlin.de/einrichtungen/arbeitsbereiche/qualitative_sozial-_bildungsforschung/Medien/58869_Flick_The_SAGE_HB_of_Qualitative_Data_Analysis_Chapter1_mapping-the-field.pdf.

Gentner, D., 1983. Structure-mapping: A theoretical framework for analogy. *Cognitive science*, 7(2), 155-170.

Hawkins, R. 2001. The "Business Model" as a Research Problem in Electronic Commerce, SPRU – Science and Technology Policy Research.

Heiskanen, E. & Jalas, M. 2003. Can Services Lead to Radical Eco-efficiency Improvements? - A Review of the Debate and Evidence. *Corporate Social Responsibility and Environmental management*, 10, 186-198.

Hill, CE, Thompson, BJ & Williams, BJ (1997). A guide to conducting consensual qualitative research. *The Counselling Psychologist*. vol. 25, no. 4, 517–72.

Hou, J. & Neely, A. 2013. Barriers of servitization: Results of a systematic literature review. *Frameworks and Analysis*, 189-195.

Hypko, P., Tilebein, M., & Gleich, R. 2010. Benefits and uncertainties of performance-based contracting in manufacturing industries: An agency theory perspective. *Journal of Service Management*, 21(4), 460-489.

HSO. 2018. The rise of Servitization in manufacturing. Home, News, blogs & events, HSO. Accessed on 25 December. Retrived from <https://www.hso.com/en-gb/blog/rise-servitisation-manufacturing/>

Johnson, P., 2006. Business Models. In *Astute Competition*. Emerald Group Publishing Limited. 53-72.

Johnson, R. Burke & Larry Christensen. 2014. Educational research: Quantitative, qualitative, and mixed approaches /R. Burke Johnson, Larry Christensen. —Fifth edition. Copyright © 2014 by SAGE Publications, Inc.

Johnstone, S., Dainty, A. & Wilkinson, A. 2009. Integrating products and services through life: an aerospace experience. *International Journal of Operations & Production Management*, 29(5), 520-538.

- Jovane, F., Westkämper, E. & Williams, D., 2008. *The ManuFuture road: towards competitive and sustainable high-adding-value manufacturing*. Springer Science & Business Media.
- Kananen, J. 2013. *Design Research (Applied Action Research) as Thesis Research: A Practical Guide for Thesis Research*. JAMK University of Applied Sciences.
- Kastalli, I.V., Van Looy, B. & Neely, A., 2013. Steering manufacturing firms towards service business model innovation. *California Management Review*, 56(1), 100-123.
- Kim, W.C. and Mauborgne, R. 2004. Blue ocean strategy. If you read nothing else on strategy, read these best-selling articles., 71-80.
- Lay, G. ed., 2014. *Servitization in industry*. Springer.
- Latonen, T., 2017. *Servitization: Approach towards advanced services contract*.
- Levitt Theodore. 1969. *The marketing mode—pathways to corporate growth*. New York: McGraw-Hill Books.
- Li, J. H., Lin, L., Chen, D. P., & Ma, L. Y. 2015. An empirical study of servitization paradox in China. *The Journal of High Technology Management Research*, 26(1), 66-76.
- Lincoln, YS & Guba, EG (1985). *Naturalistic inquiry*, Sage, London.
- Linder, J. and S. Cantrell 2000. *Changing Business Models: Surveying the Landscape*, accenture Institute for Strategic Change.
- Magretta, J. 2012. *Understanding Michael Porter*. Harvard Business Review Press.
- Mont, O. K. 2002. Clarifying the concept of product-service system. *Journal of Cleaner Production*, 10, 237-245.
- Morse J.M., Hupcey J.E., Mitcham C. & Lenz E.R. 1996. Concept analysis in nursing research: a critical appraisal. *Scholarly Inquiry for Nursing Practice* 10(3), 253–277.
- MaRS Discovery District. 2012. *Workbook 2, Business Model Design*. MaRS, ENTREPRENEUR WORKBOOKS, *Fundamentals of Entrepreneurial Management*. MaRS Discovery District, ©November 2012. Accessed on 8 December 2018. Retrieved from <http://www.marsdd.com/wp-content/uploads/2012/12/Business-Model-Design-WorkbookGuide.pdf>
- Martinez, V., Bastl, M., Kingston, J. & Evans, S., 2010. Challenges in transforming manufacturing organisations into product-service providers. *Journal of manufacturing technology management*, 21(4), 449-469.
- Macdonald, E. K., Wilson, H., Martinez, V. & Toossi, A. 2011. Assessing value-in-use- A conceptual framework and exploratory study. *Industrial Marketing Management*, 40, 671-682.
- Maxwell, D., Sheate, W. & Vorst, R. V. D. 2006. Functional and systems aspects of the sustainable product and service development approach for industry. *Journal of Cleaner Production*, 14, 1466-1479.

- Morrow, SL (2005). Quality and trustworthiness in qualitative research in counselling psychology. *Journal of Counselling Psychology*, vol. 52, no. 2, 250–60.
- Nalina A. (2017). Servitization: The changing Face of Manufacturing and Service. In Customer service Manufacturing of Salesforce. Accessed on 11th.Nov.2018. Retrived from <https://www.salesforce.com/uk/blog/2017/04/servitization-the-changing-face-of-manufacturing-and-service.html>
- Neely A.D. 2009. Exploring the Financial Consequences of the Servitization of Manufacturing. *Operations Management Research*, 2, 1, 103-118.
- Neely A.D. 2013. What is Servitization?. Accessed on 12 November 2018. Retrived from <http://andyneely.blogspot.com/2013/11/what-is-servitization.html>
- Nicholas W. (2011). *Research Methods, the basics*. Taylor & Francis e-Library, 2011. ISBN 0-203-83607-3 Master e-book ISBN © 2011 Nicholas Walliman.
- Nordin, F., Kindström, D., Kowalkowski, C., & Rehme, J. 2011. The risks of providing services: Differential risk effects of the service-development strategies of customisation, bundling, and range. *Journal of Service Management*, 22(3), 390-408.
- Nudurupati, S.S., Lascelles, D., Yip, N. & Chan, F.T. 2013. Eight challenges of the servitization. In *Proceedings of the Spring Servitization Conference*. Vol. 2013. 8-14.
- Oliva R. 2003. Managing the transition from products to services. *International Journal of Service Industry Management*. Vol. 14 No. 2, 2003 . 160-172 ©MCB UP Limited. DOI 10.1108/09564230310474138
- Orio G. D., Matei O., Scholze S., Stokic D., Barata J., Cenedese C. 2016. A Platform to Support the Product Servitization. (IJACSA) *International Journal of Advanced Computer Science and Applications*, Vol. 7, No. 2, 2016
- Ottman, J. A. 1999. Green marketing: Make your next new "product" a service. In *Business*, 21, 37.
- Petrovic, O., Kittl, C. & Teksten, R. 2001. Developing business models for ebusiness. *International Conference on Electronic Commerce 2001*, Vienna.
- Porter, A., 2009. *Operations management*. Download free at Book Boon. com.
- Porter, M.E., 1996. *What is strategy*. Published November.
- Porter, M.E., 1989. How competitive forces shape strategy. In *Readings in strategic management*. 133-143. Palgrave, London.
- Porter, M.E. & Advantage, C. 1985. Creating and sustaining superior performance. *Competitive advantage*, 167.
- Porter, M. 2008. The Five Competitive Forces that Shape Strategy. *Harvard Business Review*, 78-93.
- Raddats, C., Baines, T., Burton, J., Story, V.M. & Zolkiewski, J. 2016. Motivations for servitization: the impact of product complexity. *International Journal of Operations & Production Management*, 36(5), 572-591.

- Reim, W., Parida, V., & Örtqvist, D. 2015. Product–Service Systems (PSS) business models and tactics—a systematic literature review. *Journal of Cleaner Production*, 97, 61-75.
- Reinartz, W. & Ulaga, W. 2008. How to sell services profitably. *Harvard Business Review*, Vol. 86 Iss. 5, 90-96.
- Ren, G, Gregory. M. 2007. Servitization in manufacturing companies. paper presented at 16th Frontiers in Service Conference, San Francisco, CA.
- Schmenner R. 2009. Manufacturing, service, and their integration: some history and theory. *International Journal of Operations & Production Management*, Vol. 29 No.5.
- Sharma, S. & Mahajan, V. 1980. Early warning indicators of business failure. *Journal of Marketing*, 44(4), 80-89.
- Shepherd. E, Yeo. G. 2003. *Managing Records: A handbook of Principles and Practice*. London:Facet Publishing.
- Shafer, S.M., Smith, H.J. & Linder, J.C., 2005. The power of business models. *Business horizons*, 48(3), 199-207.
- Sheth, J. & Sisodia, R. 2005. Why good companies fail. *European Business Forum*, 22, 24-30.
- Seppelin Sini (2018). *Qualitative Research Methods*. Qualitative Research course material, Jamk.
- Slack N.2005. Patterns of “Servitization”: Beyond Products and Services. Institute for Manufacturing, Cambridge.
- Slack, N., Chambers, S., Johnston, R. 2010. *Operations Management*, 6th edn. Pearson Education Limited, Harlow.
- Slack, N., Lewis, M. 2011. *Operations Strategy*. 3rd edn. Pearson Education Limited, Harlow.
- Slack, N. 2005. Operations Strategy: Will it Ever Realize Its Potential?. *Gestão & Produção*, 12(3), 323-332.
- Slack, N. and Lewis, M. 2002. *Operations Strategy*, Harlow: Pearson Education.
- Sousa Daniel. (2014). Validation in Qualitative Research: General Aspects and Specificities of the Descriptive Phenomenological Method. *Qualitative Research in Psychology*, 11:211–227, 2014. Copyright © Taylor & Francis Group, LLC. ISSN: 1478-0887 print/1478-0895 online .DOI: 10.1080/14780887.2013.853855
- Steinberger, J. K., Van Niel, J. & Bourg, D. 2009. Profiting from negawatts: Reducing absolute consumption and emissions through a performance-based energy economy. *Energy Policy*, 37, 361-370.
- Stiles, WB (1993). Quality control in qualitative research. *Clinical Psychology Review*, vol. 13, 593–618.

- Stremersch, S., Wuyts, S. & Frambach, R. T. 2001. The Purchasing of Full-Service Contracts: An Exploratory Study within the Industrial Maintenance Market. *Industrial Marketing Management*, 30, 1-12.
- Stevenson, W.J. *Operations Management, Chapter 1: Introduction to Operations Management*. 13th Edition. McGraw Hill Education. Accessed on 15 December 2018. Retrived from <https://www.mheducation.co.uk/he/chapters/9780077133016.pdf>
- Susheelendra B., Sundarajulu V., Samiksha H., Ajay S., 2016. *Servitization in Manufacturing – The Final Frontier*. Tata Consultancy Services.
- Tellus Institute. 1999. *Servicizing: The Quiet Transition to Extended Product Responsibility*. Tellus Institute, Boston, MA.
- Timmers, P. 1998. Business Models for Electronic Markets. *Journal on Electronic Markets* 8(2): 3-8.
- Tuomi, J. & Sarajärvi, A. 2009. Laadullinen tutkimus ja sisällönanalyysi (Qualitative research and content analysis). Kustannusosakeyhtiö Tammi, Helsinki.
- Vandermerwe, S. & Rada, J. 1988. Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), 314-324.
- Vandermerwe, S. 1990. The marketpower is in the services: Because the value is in the results. *European Management Journal*, 8, 464-473.
- Vandermerwe, S. 1994. Quality in Services: The 'Softer' Side is 'Harder' (and Smarter). *Long Range Planning*, 27, 45-56.
- Visintin, F. 2012. Providing integrated solutions in the professional printing industry: The case of Océ. *Computers in Industry*, 63(4), 379–388.
- Weill, P. & M. R. Vitale. 2001. *Place to space: Migrating to eBusiness Models*. Boston, Harvard Business School Press.
- Western Sydney University. 2017. *Library Study Smart: Literature review purpose*. Accessed on 7 December 2018. Retrived from https://www.westernsydney.edu.au/_data/assets/pdf_file/0006/1254786/Literature_review_purpose.pdf
- White, A., 2009. *From comfort zone to performance management*. White & MacLean Publishing.
- White, A. L., Stoughton, M. & Feng, L. 1999. *Servicizing: The Quiet Transition to Extended Product Responsibility*. U.S. Environmental Protection Agency Office of Solid Waste.
- Wise R., Baumgartner P. 1999. Go downstream: the new profit imperative in manufacturing. *Harvard Business Review*, No. September/October, 133 - 141.

Appendices

Appendix 1. Interview questions

Current situation investigation

What is the common understanding of servitization in your work environment?

What kind of support do you get from current organization?

Is the support enough for your work and why?

How people react on the servitization approach and why?

What is your experience on successfully selling of service package? How can that be a better situation than now?

What is the feedback from customer for the service and why?

How do you think of the service and solution you got from seller?

Challenge identification

What are the challenges/barriers to implement servitization from your point of view?

Are there any finance risks? What is that? And how to avoid it?

What are the challenges for you working with service provider?

So far, what is the most critical thing to effect on the transaction process? What kind of actions you can suggest seller to do?

Framework auditing

What do you think of the business model and organization structure? Are those helping to business in servitization approach?

What is the cooperating situation within different function? If this is a problem how to make it better?

How do you feel about the resource utilization? What can be done to optimizing the resource using?

Does company have KPI for servitization? Does that work and why?

How do you think of the supply chain situation in helping the servitization? Any suggestion to improve it?

Does the relationship effect on the success of servitization? What can be done to make it better?

Normally there should have performance guarantee in the contract, do you think that is enough? If not, what should be added into?

Suggestion collection

How to overcome the challenges?

Do you have any suggestion on solving these issues?

What kind of actions can increase the customer satisfaction level?

How can that be solved for you from your point of view?

What effects on the successful implementation of the solution?

How to improve the situation so that you are more willing to purchase the service from seller?

What could be done after sell from seller? Why that are needed?

Appendix 2. Interviewee List

As agreed with all the interviewees, their information in here presented as anonymous.

Interviewee A.	VP of Service Business Development	27.11.2019
Interviewee B.	Manager of Service Department	16.01.2020
Interviewee C.	Project Manager	12.01.2021