



Challenges in servitization of Thai manufacturing companies

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Abstract

Purpose: According to the increased pressure in the manufacturing sector in recent years, Thailand is potentially losing its competitive advantages to other countries. Thus, a servitization strategy is considered to be one of the methods to maintain competitiveness, and create additional value for the manufacturing sector in Thailand. There are, however, a few studies regarding servitization within Thailand. As a result, there are significant gaps in existing research that must be filled. **Research design, data and methodology:** Qualitative case study research of servitization companies in construction and automotive areas was conducted, and in-depth interviews with 6 key informants who were involved in adopting the servitization strategy were investigated to explore the main challenges to be faced, and how to facilitate the successful transition into servitization of the Thai manufacturing company.. **Results:** There are four main phases of challenges in transforming to servitization of the Thai manufacturing industry. Firstly, in the design phase, the company must consider both internal and external factors that can affect the needs of customers. Secondly, the design stages that are the mindset of employees, the organization structure, working process, and infrastructure need to be changed. Thirdly, the deliver stage is the company needs to find the suitable partner to offer services to the customers. Finally, the company needs to set an appropriate KPI to measure the service performance. **Conclusions:** Customer-centric, internal cooperation, and supplier collaboration are the key factors to success in adopting to servitization Furthermore, the study demonstrated that having a good evaluation plan is also a key factor to being successful in the transformation into servitization of the Thai manufacturing companies.

Keywords : Servitization, Manufacturing companies, Thailand

JEL Classification Code: L60, L80, N65, O14

1. Introduction

Joining the ASEAN Economic Community: AEC affects the structural transformation of the economy in Thailand because the cost of production in Thailand is higher than other countries in AEC, while the movement of products is easier due to trade liberalization. This is supported by the data on minimum wages provided by an analysis of each ASEAN country's labor force illustrating that Thailand is among those high-wage countries of AEC countries (Suttiwichienchot & Sampattavanija, 2019). As a result, Thailand is in the position of potentially losing competitiveness because the country may not be able to compete on price against other AEC countries. Although the global economy has been expanding over the years, Thailand could not export extensively as it was because the demand of the global economy was still unstable (Suriyathanin, 2015).

In addition, the private sector's investment is slowing down since they are waiting for a positive signal from the

overall economy. While, the government spending had some limitations due to the onset of economic reforms and reduced populist policies (Srivastava et al., 1998).

Only the service sectors are currently growing well, acting as a backup engine that has helped Thailand's economy recover (Suriyathanin, 2015). In conclusion, the intensity of price rivalry and market liberalization has prompted Thai manufacturing enterprises to expand their services to complement their products, resulting in a shift from traditional manufacturing to servitization (Suriyathanin, 2015; Thamjai, 2013).

Servitization is a shift in the company's strategy from focusing on selling products to making more value by integrating products and services into a package, to maintain competitive advantage (Baines & Lightfoot, 2013; Vandermerwe & Rada, 1988; Wise & Baumgartne, 1999; Zhang & Banerji, 2017). The implementation of a service strategy could provide benefits to the company in terms of financial, strategic, and marketing benefits (Mathieu, 2001).



This method has been employed by several Thai manufacturing enterprises to acquire a competitive advantage in market share. However, not all Thai businesses succeed in their endeavors (Suriyathanin, 2015). This is because, in order to successfully apply servitization, manufacturing organizations must change their guiding principles, structures, and operations (Oliva & Kallenberg, 2003). As a result, it is important to remember that servitization is a difficult work, and it is proposed that in order to successfully execute servitization, the company must understand value through the eyes of the client and apply these perspectives to operations management (Smith et al., 2014). As a result, it is vital to identify the major problems that Thai manufacturing businesses encounter while transitioning to a servitization model, as well as the critical components that must be applied in order to successfully transform into a servitization.

To summarize, it is necessary to understand the challenges of servitization in the Thai manufacturing sector in order to accommodate the higher competitive scenario, which leads to significant gaps in the existing literature that need to be clarified and how a Thai manufacturing company can successfully transition into servitization. The following are the primary research questions:

RQ1: What are the key challenges faced when a Thai manufacturing company implements a service-based strategy?

RQ2: What are the key factors to move successfully from product offering into a service provider of the Thai manufacturing company?

2. Literature review

2.1 Definition of servitization

Vandermerwe and Rada (1988) coined the term "servitization" to describe the mixing of products and services in packages or bundles to add value to core products. Many writers provide additional meanings of servitization (Martinez et al., 2010; Oliva & Kallenberg, 2003; Tukker, 2004; Wise & Baumgartne, 1999). They appear to share a similarity in a certain component of meaning across a variety of their definitions. To summarize, servitization is a shift in a company's strategy away from selling items and toward integrating products and services in order to preserve a competitive advantage.

Servitization is developed from the blurred boundary between products and services (Vandermerwe & Rada, 1988). The importance of this phenomenon expanded into various industries in the late 1990s, such as manufacturing, automotive, and airlines (Hahn & Morner, 2011). During the 1990s, several leading companies, such as General Electric, Xerox, and IBM, shifted from solely selling products to the integration of services, which contributed to the increase in profit of the enterprise (Martinez et al., 2010). In addition, the transformation of the company to become a products-service provider resulted in changes in operation management such as the change from focusing on cost and quality reliability to innovation and flexibility, company strategies, organization structure, and technology (Araujo & Spring, 2006; Lele, 1997; Oliva & Kallenberg, 2003; Slepnirov et al., 2010; Wise & Baumgartne, 1999).

2.2 Drivers of servitization

In discussing the drivers of servitization from a variety of researchers, they commonly bring up three significant factors that encourage businesses to adapt from their current position to become products-services providers, which are financial, strategic, and marketing factors (Baines & Lightfoot, 2013; Mathieu, 2001; Oliva & Kallenberg, 2003).

Integrating tangible products and services is expected to increase revenue for the company in terms of finance (Gebauer & Friedli, 2005; Mathe & Shapiro 1993). This view is supported by Wise and Baumgartner (1999), who measured that the profit margin of the services sector in some industries can range between one- or two-digits higher revenues than launching only products into the market. An agreement with this illustrated that some companies can remain profitable by offering their services to customers during a significant drop in total market sales (Sawhney et al., 2003).

In terms of strategic benefits, it is viewed as an increase in the company's competitive advantage (Coppett, 1988; Wise & Baumgartne, 1999). This is due to the fact that cheap pricing and innovation make it difficult for enterprises to maintain market share (Bitner, 1997; Lele, 1997). Service offers are significant in the firm since they can set it apart from competitors in the same field (Baines and Lightfoot, 2013). Many scholars agree that the expansion of services in a manufacturing firm can provide a



significant competitive advantage by providing a barrier to others competitors in the market (Gebauer & Friedli, 2005; Oliva & Kallenberg, 2003).

The provision of services is one of the ways to build a good relationship between the producer and the customer. They can make repeated purchases from their existing customers, which consequently leads to customer loyalty (Baines & Lightfoot, 2013). Service offerings can provide more choices to customers so that they can choose what they want from a variety of choices (Oliva & Kallenberg, 2003). Therefore, it has the potential to persuade clients to buy products from a specific company.

2.3 Challenges in the servitization transformation

Companies used to focus their value creation efforts on enhancing products and production processes in order to meet client requests. Over the last few years, thanks to the concept of servitization, which can develop value in terms of product functionality for customers, a manufacturing company's value creation has changed (Smith et al., 2014). Many authors have supported this viewpoint; for example, Baines & Lightfoot (2013) pointed out that transitioning manufacturing to servitization can provide more value than merely providing goods. For example, offering services to clients accounted for half of Rolls-total Royce's revenue. In conclusion, the application of servitization can increase value through service offerings since a client may be prepared to pay more money if they know they will receive good service (Mathieu, 2001).

To better understand the mechanisms of value in servitization, the creation of value is classified into 3 distinct stages, consisting of the define stage, design stage, and deliver stage (Pawar et al., 2009). A company should define what value is in the view of customers in the define value stage, and design values in consistency with the operational systems, and deliver that value to participants. The aforementioned three stages of values in servitization can be used as a basis to explore the challenges that an organization needs to handle if it decides to transform itself towards servitization.

The importance of defining service value through client and shareholder perceptions is the first stage of servitization (Smith et al., 2014; Vargo & Lusch, 2008). Many authors believed that defining client business activities and operations is the underpinning for servitization because service offerings can generate more

revenues for a corporation than product sales (Pawar et al., 2009; Vendrell-Herrero et al., 2017; Wise & Baumgartner, 1999). However, there are various issues that can arise during the defining value stage that the organization must be aware of in order to avoid economic concerns (Tukker, 2004). Therefore, the costs and the benefits of the servitization must be considered thoughtfully.

In designing the value, Bitner stated that services should be designed to accommodate the needs of customers (Bitner, 1997). Building on Bitner's work, the organizational networks need to be re-designed in order to share capabilities to manage the customer's needs (Vargo & Lusch, 2008).

Hence, organizational networks must be designed simultaneously with services and products (Pawar et al., 2009; Vendrell-Herrero et al., 2017; Zhang & Banerji, 2017). It becomes obvious that a company needs to design and improve processes within the organization.

The features of value were described by Baines et al. (2009) into three categories of operations: product-focused operations, product-centric servitized activities, and services-focused operations.

In conclusion, the characteristics of the business model for the product-focused operation tend to focus on producing and selling products, whereas customers tend to define value on ownership of the artifact. The order-winning characteristics of this operation could be price, quality, features, and product innovation.

Furthermore, for the product-centric servitized operation, the business model tends to be based on a combination between relationships and transactional, while the customer tends to value the performance of the operation, and the key order winning is total cost of ownership of the products, and also features of products and services.

While, for services-focused operations, the business model tends to work towards the delivery of services while the customers perceive the value of the services offered and the features (Baines et al., 2009). Focusing on the product-centric servitized operation, it is necessary to understand clearly the characteristics of working units operating by servitization (Baines & Lightfoot, 2013).

A servitization manufacturing company's operation units can be classified into three categories: top management or strong center, back end, and front end (Pawar et al., 2009). The traditional production of products for sale to consumers is the back-end group, whereas the front-end is a new group which must be implemented in the organization to respond to customers with tailored product solutions. As a result, the organization structure must have been redesigned in order to accommodate the front-end section into the organization (Pawar et al., 2009).

As a result, when a company transitions to servitization, methods, processes, organizational structure, and infrastructure that were initially created for a typical product offering organization must be restructured (Martinez et al., 2010).

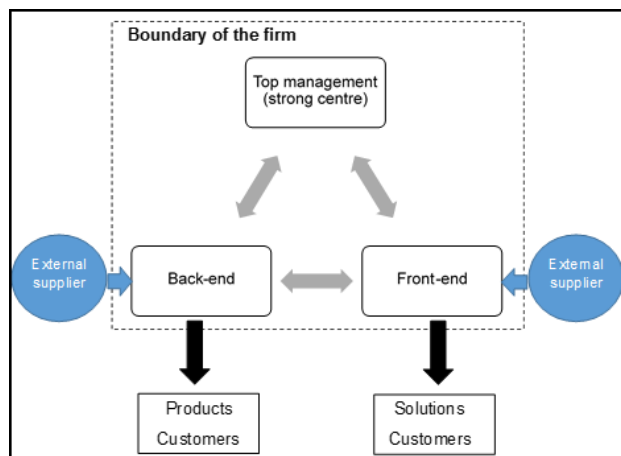


Figure 1: Types of operation units in a servitization manufacturing company (Pawar et al., 2009).

According to Pawar et al. (2009)'s figure 1, a servitization corporation has three primary operation units: a strong center, a back-end, and a front-end. The back-end will focus on the traditional product, while the front-end will handle the product-service offering to clients.

For the delivery of value stage, it is to work on the required activities in order to offer those created values to customers (Martinez et al., 2010). It may be necessary for a company to identify, select, and manage potential partners in order to deliver the values to their customers (Tukker, 2004; Vargo and Lusch, 2008). This is because many companies may not have expertise in delivering those services themselves. Collaboration amongst partners, therefore, needs to be considered to ensure that the

customers' satisfaction is fulfilled (Pawar et al., 2009). Hence, the company needs to consider collaborative options for a servitization strategy in a delivery value stage in order to cope with the risks, costs, and resources in an effective way while still maintaining a competitive advantage (Mathieu, 2001).

The collaboration continuum of servitization can be divided into three levels consisting of internalizing, outsourcing, and potential partners, and it is recommended that the company needs to do benchmarking in order to explore which collaborative options are suitable and tend to offer higher benefits to the company (Mathieu, 2001).

Apart from the challenges in selecting a collaboration option for delivering value to customers, the alignment of mindset amongst the service providers needs to be considered, as the attitudes toward suppliers may be changed over time due to the pressures on the delivery of products-services integration (Martinez et al., 2010).

3. Research methodology

The qualitative case study research approach was selected as an appropriate research methodology. The reason for choosing this research methodology is that the objective of this study is to explore and examine the key factors faced when implementing servitization to the Thai manufacturing company. Hence, the case study can provide in-depth knowledge and experiences through a range of data collection methods (Blumberg et al., 2008; Creswell, 2003).

Multiple case studies were used in this study to allow for a more thorough exploration of theoretical evolution and research questions. This form of case study also creates a more convincing hypothesis when the ideas are more intensely founded in diverse empirical evidence. The case study was selected based on the purposive sampling technique, aiming to target particular cases and research participants which are relevant to the research questions (Siggelkow 2007).

Two companies were chosen as case studies for interviewing in order to determine the co-challenges and compare and contrast the issues faced when implementing servitization as the primary challenges in the Thai manufacturing industry. Because these are the primary



businesses in Thailand and their valuable contribution to the Thai economy.

One selected company is in the automobile industry, and another is in the building products area, which includes some parts of the plastics industry. In order to represent the Thai industry, both selected companies are among the top three ranked by revenue in their industry. However, due to the sensitive nature of the information, the researcher will refer to the automobile and construction product companies as Thai automotive and Thai construction product companies respectively.

The data was conducted through a semi-structured interview as it allows the researcher to ask additional questions to follow up on the interviewee's answers (Siggelkow 2007). In addition, semi-structured interviews can provide the perspectives of participants on the issues and enable researchers to confirm the information that they have (Blumberg et al., 2008).

According to a review of the literature, the functioning of a manufacturing company may be divided into three parts: the strong center, the back end, and the front end. As a result, one representative from each group from each organization will be chosen as interview participants. Because this is a vital component of monitoring the workers in the organization and also coordinating both front end and back end, the center will choose one of the interviewers from each firm in the area of operation control or planning.

As a result, he or she may be able to give employees a perspective on the issues of servitization. Furthermore, interviewers for the back end are picked from the fields of logistics or supply chain management since they have direct contact with suppliers and can clearly describe the influence of the servitization plan to them. In the front end, responders are chosen from sales or marketing departments who are dealing with and responding to customized product solutions; it is hoped that the issues faced by consumers can be uncovered.

To summarize, six interviewers in the role of senior decision-makers from two different companies, one in the leading automotive industry, and another in the construction products manufacturer, were chosen to conduct the interviews, which lasted about an hour each. The case study data was gathered in the form of a semi-structured interview. Every interview is taped and transcribed. In order to facilitate data triangulation, these interview data are complemented with secondary data such as the company's internal reports and press releases, which enables a limited bias due to poor interviewee recall or reflexivity. Besides, all of the interviewees are at the management level because they might have enough experience to explain in depth. The further details of the interviewees are illustrated in table 1 as shown below

Table1: Demographic profile result of interviewees

	strong centre	front-end	back-end
The leading construction products manufacturer	A manager of the operation and strategic development. (Interviewee: A)	A manager of customer management department in the building products. (Interviewee: B)	A manager of the supplier management and demand planning department. (Interviewee: C)
The leading automotive company	An assistant manager of the production and operation control department. (Interviewee: D)	A manager of sales and marketing department in a domestic car sale. (Interviewee: E)	A manager of the new projects and logistics management department. (Interviewee: F)

The tasks of interviewee "A" for the leading construction products manufacturer included infrastructure investment and establishing the company's direction and

strategies. He has been working for the company for fourteen years. Interviewee "B" is dealing with retail customers who want to build a house in order to improve



their working performance and support their customer's needs. His experience in this company is eight years. The interviewee, "C," has the responsibility of sourcing materials from the vendor, and then controlling the distribution of products to the company's dealers. His experience is four years in this position.

For the leading automotive company, the interviewee 'D's job is to take care of the production system, and control efficiency and productivity of employees in the plant. He has been working in this position for five years. The interviewee 'E's role is to promote the domestic car sales and take care of the domestic dealers. He has been working for this company for sixteen years. The interviewee 'F' is a manager of the new project and logistics management, and her responsibility is to liaise among production, R&D, and suppliers, and her scope of work is mainly focused on the launching of the new car.

The case data was examined using a thematic data analysis approach based on Clarke and Braun (2014), which includes five thematic analysis steps: (1) Data familiarization, (2) Initial code creation, (3) Theme development, (4) Refinement, and (5) Theme designation are the five steps in the theme development process.

Thematic analysis can be used by the researcher to identify subjects that are relevant and significant to the research questions. Following these five key steps of thematic analysis, the interview transcripts and documents were familiarized, followed by the data-driven initial coding process to capture and label (1) the categorization of the challenges involved in implementing their servitization and (2) the significant factors to successfully implementing servitization to the company.

When there are no new codes in the world to add to the knowledge of the issues in servitization from the interview, the themes were developed and refined, indicating that theoretical saturation had occurred. The themes designation step focuses on creating unambiguous labels for the elements involved in the servitization process, as well as matching the details of each challenge's strategic responsibilities in supporting the important factor to be concerned about when servitization is implemented.

4. Results

RQ 1: What are the key challenges faced when a Thai manufacturing company implements a service-based strategy?

During the define phase, the respondent 'E' mentioned that the organization has to research client demand as well as investigate competitors to determine if they provide similar services. "...if they don't, it needs to figure out how they work, what their best practices are, and what their limitations are." It's a struggle, according to interviewee 'B' because there are so many variables that can influence the client's needs. "...certain elements are easier to regulate, such as product and service quality, while others, such as external factors like government regulations, are difficult to monitor."

For the challenges in the design stage, "...it is difficult to design an operation consistent with the defined service because the company needs to change the mindset of people in the organization to be aware of the benefits of services, and this contributes to the change in organizational culture and organization charts," said interviewee 'C'. Furthermore, servitization may make employees' regular work more challenging. "...the employees may not only examine a design or function during the development of new products, but they will also have to consider the complexity of design services to ensure that the product is easy to repair," according to respondent 'F'.

For the challenges in the delivery stage, servitization may have an impact on the firm's vertical integration, such as the process of selecting suppliers, as interviewee 'F' suggested: "...the organization may have to turn to the most timely and reliable provider." "...if the services are vast in scale, the corporation may need to restructure the organization, IT systems, and people in order to accommodate to the change in delivery channel," said interviewee 'C'.

For the challenges in the evaluation phase, providing a good measurement criterion for every activity in servitization could help the company to achieve their target as mentioned by interviewee 'A' "...if the quality of service is low, it may affect the company's image." In addition, interviewee 'D' mentioned that "...having a good measuring scale of the service levels in the organization is a key to improving the company's performance, and resulting in a sale that meets targets each year."



RQ2: What are the key factors to move successfully from product offering into a service provider of the Thai manufacturing company?

Being customer-centric implies that everything should be tailored to the needs of the customers. "...we need to comprehend the consumer's requirement by thinking about what we actually want if we were a customer of our company," said interviewee 'B'. As a result, it is necessary

to study the customer's perspective before making any changes in the firm, as respondent 'E' suggests: "...by putting yourself in the shoes of the consumer and contemplating how customers can be satisfied before making any changes in the organization."

The executive must have a good strategic strategy in place for internal cooperation. "...the success of the servitization implementation is influenced by a defined purpose of a change in organizational structure, and business culture"; interviewee 'A'. This strategy would be carried out through collaboration between blue- and white-collar workers, as suggested by interviewee 'D', who stated that "...this top-down practice will make everyone engaged in what is going on in the organization, and they will perform at their best, while the results will be sent from the bottom to the top, and it is called bottom-up."

According to interviewee 'C,' "having a good rapport with the suppliers is one of the most crucial components" in supplier collaboration.

5. Findings

1. When a Thai manufacturing business implements a service-based approach, there are a number of issues to consider

This research suggests that there are four main challenging stages when implementing a service-based strategy, including the define, design, deliver, and evaluation stages.

For the challenges during the defining phase, the company needs to research the demand from customers and explore the competitors to see whether they offer such a service or not. As a result, the company must evaluate external factors affecting clients' wants as well as the benefits and drawbacks of having the services in the company in order to avoid becoming unable to compete in the market.

Due to the overlapping of work that arises from the inclusion of a service into the organization, re-allocation of jobs and responsibilities may occur during the design stage. Furthermore, if the services are responsible for a substantial amount of work, the company's infrastructure, including IT systems, facilities, as well as the personnel and resources of the organization, may need to be modified.

For the challenges in the deliver stage, the interviewees highlighted that there are many challenges when delivering the service to the customers with high performance according to the goals that have been set. For example, servitization may affect the vertical integration of the company, such as the process of selecting suppliers. This view is supported by existing literature that the company needs to consider collaborative options for a servitization strategy in a deliver value stage in order to cope with the risks, costs and resources in an efficient way and at the same time maintain its competitive advantage (Mathieu, 2001). In addition, the company may also need to restructure their operational system to conform with the delivery channel. Also, the company will maintain a relationship with significant suppliers to use the capability of a supplier to serve the customer needs".

For the issues in the evaluation phase, the interviewee's responses show that the company must control the quality and performance of the service after it is delivered. Furthermore, giving a good measuring criterion for each action in the servitization process could aid the organization in meeting its goal. Hence, KPI needs to be introduced to measure the service performance and quality to ensure customers' satisfaction.

2. The most important aspects to consider while transitioning from a product providing to a service provider for a Thai manufacturing firm

The findings revealed that the Thai manufacturing company's move from product selling to servitization is influenced by three primary factors: customer-centricity, internal cooperation, and supplier collaboration. Furthermore, the respondents indicated that the organization should have a key measurement indicator in place at all times in order to increase the quality and productivity of their work.

Being customer-centric implies that everything should be tailored to the needs of the customers. As a result, prior to making any changes in the company, it is necessary to research the customer's perspective.

The executive must have a good strategic strategy in place for internal cooperation. It may be necessary to assess present capacity and whether or not the personnel have sufficient capacity at this point. Furthermore, workers' mindsets must be shifted through training or public awareness inside the firm.

In terms of supplier collaboration, the interviewees stated that in order to give value to customers in a systematic

manner, the organization needs to have a good relationship with the providers.

These three primary variables to support the successful transition into servitization of the Thai manufacturing company, as well as the evaluation strategy in each stage, may be summarized in Figure 2 based on all of the above acquired information.

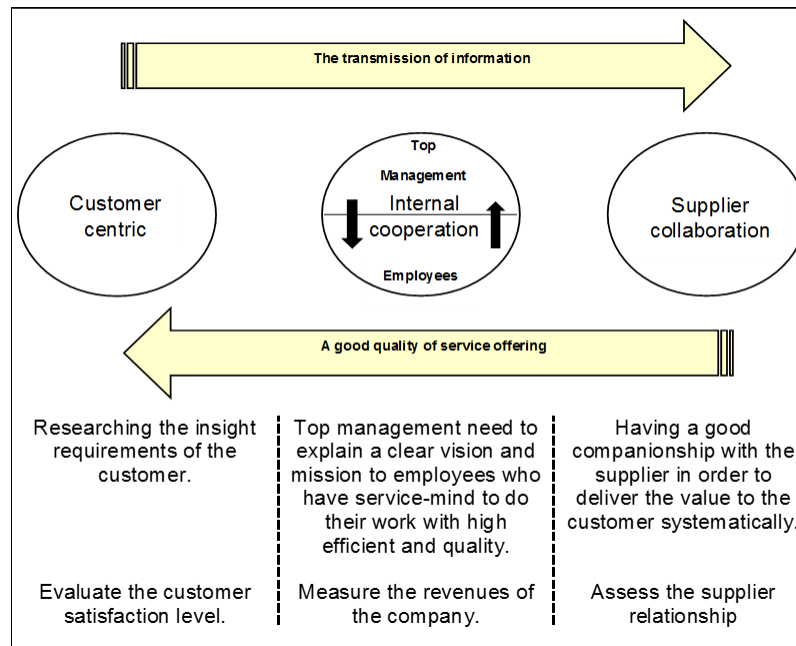


Figure 2: Three main factors for a successful transition into servitization of the Thai manufacturing company (Created by author)

Figure 2 shows the three primary characteristics that lead to a successful transition to a service provider: customer centricity, internal cooperation, and supplier collaboration. Starting with the customer, the organization must investigate the client's insight requirements, then translate the client's expectations into the enterprise's vision and goal in terms of internal cooperation. This stage necessitates collaboration between senior management and staff to achieve a common purpose, as well as a service mindset in day-to-day operations. In order to carry out these operations, the organization must have an evaluation plan in place to monitor performance at each stage.

6. Discussion and conclusion

According to the review of literature, the challenges in transforming to servitization can be divided into three phases; the defined stage where the company needs to understand what is the value in the eyes of customers and company, the design phase where the company looks through how the organization is affected when it integrates services in the manufacturing industry, and the delivery stage where the vertical integration or collaboration with potential partners to avoid the risk of transforming to servitization takes place (Baines and Lightfoot, 2013; Hahn and Morner, 2011; Pawar et al., 2009). Similar to the results of the interviews in case study, those three stages are the main challenging phases when



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transforming into servitization. However, the interviewees highlighted that the evaluation phase should be included.

According to the conclusions of this study, when a company shifts to servitization, methodologies, procedures, and an organizational structure that were originally built for a traditional product offering organization must be restructured to correspond to the new services offering. This leads to changes in the company's infrastructure, as well as the organization's structure and culture, employee mindset and skill, IT systems, vertical integration, and the company's new KPI.

To do this, the management board, also the CEO of the company, needs to understand the advantages and challenges of implementing servitization in the manufacturing company clearly. Hence, the project team needs to summarize the benefits and risks of implementing servitization through the use of tools such as PESTEL, or SWOT analysis for the management board. At the same time, the board needs to learn from the experiences of other companies which are already implementing servitization successfully. After the management team sets up the target of servitization, they must communicate their servitization strategies to the employees through the communication channels in order to make sure everyone in the company understands the goals. The gathered data from interviews shows that a major challenge in bringing the service into the organization is the resistance from staff who might have some suspicion of the benefits of following such a strategy. Therefore, the mindset of employees needs to be changed through the use of training.

Empirical findings from this research demonstrate those key factors for the Thai manufacturing company to successfully turn into servitization, which are customer centric, internal cooperation, supplier collaboration, and evaluation indicators of performance. For the customer-centric approach, the company needs to research the insight requirements of the client and transform the client's expectations into the vision and mission of the enterprise in the internal cooperation aspects. This requires cooperation between the top management and the employees, who need to have the same goal and also have the service mind in their normal operation. Then, it needs to have a good relationship with the supplier in order to deliver the value to the customer systematically. Nevertheless, the company needs to have a key performance indicator to control the quality and productivity of their services. To achieve this, it is required

to evaluate the performance of servitization in the company in four main aspects.

1. Measurement of whether or not the implementing servitization project is on schedule in every step
2. Assessment of employees' satisfaction levels.
3. Evaluation of the performance of the company in terms of financial benefits, strategic advantages, marketing opportunities, and also the efficiency and productivity of the company.
4. Judgement of the customer's satisfaction levels.

This research suggested a range of theoretical and managerial implications. The identification of obstacles in the servitization of Thai manufacturing enterprises underlines the necessity for future research on operation management to include the domain of servitization. This study also adds to the body of servitization knowledge by demonstrating how each servitization phase should be addressed and managed to assist enterprises in creating new value and enabling new services.

Furthermore, as a result of the disruption caused by economic regression, this research has crucial implications for practitioners (i.e. senior decision-makers in a corporation) to investigate the prospects of servitization in creating product-service offerings. The four main challenges in servitization transformation are primarily associated with the three main factors leading to a successful transition to a service provider, as well as developing their capabilities and knowledge in order to manage the upcoming servitization journey, resulting in a competitive advantage.

7. Limitations

This study examines the problems faced by a Thai manufacturing firm in transitioning from traditional manufacturing to servitization. As a result, due to differences in industrial features between Thailand and other countries, it may not be suitable to western companies or other parts of the world to use this data without further analysis. In terms of data collecting, the participants in this study were largely from Thailand's large corporations. As a result, the generalization of this research is limited due to a lack of data acquired from small and medium-sized



businesses. As a result, it may not be acceptable to apply this research to small and medium businesses because there may be some differences in the points of concern between large and small businesses. Furthermore, some business areas, such as computer and peripheral equipment, have a scarcity of data; therefore, future study should try to collect additional data to cover all industries.

Regarding to the limitation of this research is the leading point to be concerned as a beginning step for further research in order to fit this gap on this following subjects. Firstly, because of the data in this research mostly conducted from the big business in Thailand, hence, it is leading to the future study to focus on the case of the challenges in servitization of the small and medium business in Thailand in order to explore the issues to be concerned in the case of SME in Thailand to go servitization. Secondly, since this study presents an overview of challenges in servitization of the Thai manufacturing industry, while, some industry may have specific point to be concerned. It is beneficial to focus the further study on the specific industry in order to investigate and determine whether or not those industry have the same challenges with the overall Thai industry.

8. Acknowledgements

The authors would like to express his sincere gratitude to all of the participants in this study who contributed their significant knowledge and industrial insights to the investigation of the challenges of servitization in Thai manufacturing companies.

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