

The Roadmap of Servitization for Manufacturing Companies to Strength Buyer-supplier Relationships

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ABSTRACT—*The article aims to introduce the concept of servitization in lubricant industry, as well as why and how it can be a useful concept for industrial firms. This study first discusses recent literature related to the concept of servitization to understand how it can strengthen relationships and create value for clients in the lubricant industry. This study also constructs a roadmap to identify and illustrate service value, and proposes a four-step procedure for servitization in the lubricant industrial context. Results suggest that lubricant industry can develop new service-based and relationship-based value propositions, and servitization can strengthen relationships and creates value for clients. The road map can be useful when introducing the importance of services and the inter-relatedness between the service department and other parts of the organization, which communicates a better internal understanding of the servitization.*

Keywords—Servitization, Buyer-supplier relationships, Logistic support

1. INTRODUCTION

Today, manufacturers are increasing their competitive advantage by delivering portfolios of products and value-added services. Many products have been transformed into services, and this trend is called the servitization of products in the management literature [1]. Vargo & Lusch [2] believe that the new perspectives are converging to form a new dominant logic for marketing, one in which service provision rather than goods are fundamental to economic exchange. But what counts as a product or a service is dependent on the nature of and the institutional structure of production rather than on any essentialist feature of products or services [3].

A company must possess particular capabilities and create value for its customers using services [1] [4]. These services and these capabilities can be a part of business solutions, becoming the company's unique strength and enabling them to develop new business models, transferring manufactured product into service product. If this service can meet customer needs and be cost effective, manufacturers can gain a competitive advantage and increase customer loyalty. Oliva and Kallenberg [5] offered three reasons why B2B product-centric businesses enter the services market: competitive, economic, and customer-based. Manufacturers can increase their revenues through servitization because services tend to have higher margins and provide a stable revenue stream throughout the life of the product [6].

Taiwan is most excellent for manufacturing and its products or components are purchased by many international companies and retailers. However, product/service become more homogenous, more alike, making it lower switch costs, and higher price sensitivity in market. Concerning emerging Asia countries with cheaper wages trying to replace Taiwan's production, Taiwan's manufacturers have been paying attention to how to become a global brand's important partners and how to take the opportunities to achieve competitive advantage through closer customer relationships and higher profit margins. The purpose of the paper is to investigate how product-centric businesses in Taiwan, operating in a business-to-business environment, develop industrial services to align with their services strategies and sources of market differentiation.

Researchers have developed various customer service models to facilitate the B2B process [7] [5]. However, previous studies focus on products or services individually and often neglect the integration of these two. This study proposes a servitization model as a means of enhancing the value of a lubricant and differentiating it from competing products in the

market. Servitization creates value in the eyes of the customer, as it supports their core activities. This study first discusses recent literature relevant to the concept of servitization to determine why servitization is becoming an attractive strategic option for certain manufacturing companies. This study also constructs a model to identify and illustrate new service value, and presents a roadmap for servitization in the lubricant industry context. Finally, this study discusses the contribution of this research to the B2B service and describes its managerial implications.

2. THE SERVICE PROBLEMS OF MARINE LUBRICANT INDUSTRY

Petrol chemicals can be categorized as bunker and lubricant. Bunker is an upstream product and lubricant is a downstream product. Lubricant is categorized as auto, industrial, and marine lubricant. The main application of marine lubricant is for vessel engines and related machines. A shipping company plans its routes based on transportation demand, sailing to over 700 ports around the world. To ensure that each vessel arrives in port on time and enjoys smooth operation during sailing, marine lubricant suppliers must supply lubricant when vessels are pier-side. Some vessels only stay pier-side for few hours, which makes the lubricant supplier's accurate service and lubricant provision speed is essential. Lubricant suppliers provide regular lubricant analysis and technical service to improve engine efficiency, enhance equipment utilization, and reduce maintenance costs.

The entry barrier in the marine lubricant industry is high, but product compatibility is high among existing competitors. Though some manufacturers in the lubricant industry have customer service departments to offer after-sale services, their functions are limited to passively handling customer complaints, answering customer inquiries, or providing auxiliary services. Unlike the sales department, the customer service department is not the core function of the whole business process, and may be neglected by top management. Many shipping companies purchase different brands of marine lubricants at the same time; in other words, brand loyalty is low. Thus, enhancing customer loyalty and increasing market share is an important and critical issue for lubricant suppliers.

Most lubricants suppliers adopt functional organization. Clients from shipping companies always request variety of services, and these services usually involve a series of activities across departments. There is no crossover-function center to handle customer inquiries which many staff from different department are involved in lubricant firm, making the service process time-consuming and inconsistent. For example, a wrong lubricant is supplied at a distant port in a different timing zone. The vessel berthing time is only 2 hours, providing no time to drain the wrong product and re-supply the correct product. Chief engineer of shipping company must report the incident to the port engineer at headquarters via satellite phone, but the port engineer is uncertain whom he should contact at the lubricant supplier to solve the problem. Normally, the port manager contacts sales people and technical engineers first, but they are usually out of touch. As a result, they try to contact the customer service staff, most of whom lack the commercial and technical knowledge to solve the problem. Thus, service is lag behind, and the customer's request cannot be solved immediately. Under the lubricant's service framework, customer service personnel's work are often overloaded and feel frustrated when they fail to fulfill customer requests. Besides, customers will lose patience, complain about inefficiency, and even waver in their loyalty.

The current service framework cannot meet customer's needs and time-consuming, so the lubricant company's service processes need to be adjusted. Thus, this study recommended that lubricant company should organize a team across product and service departments to integrate all relevant functions into a servitization. By taking the initiative to speed up the service process, a lubricant firm can view servitization as a new measure of customer care that can add higher value to customer core business activities.

3. LITERATURE REVIEW

This study identifies three main views in the literature related to servitization: resource-based perspective, transaction cost theory, and relationship-school perspective. Within these approaches, each firm can find some unique resources that represent a source of long-term competitive advantage.

Resource-based perspective: The resource-based view (RBV) focuses on the attributes of firms that are difficult to imitate as sources of competitive advantage. These attributes may be grouped into people-dependent resources, such as expertise and ability to learn, or people-independent resources, such as contracts and databases [8]. These attributes can be categorized as physical, intellectual, and cultural assets that subsequently lead to capabilities that may be sources of sustainable competitive advantage [9]. According to the definition of servitization [5][10], manufacturers are integrating services in their total offering which can facilitate the sales of their goods, strengthen customer relationships, create growth opportunities, and are costly to imitate. Therefore, this study considers the attributes of competitive advantage for lubricant firm are people-dependent resources ("skills") and knowledge [2]. This kind of intangible skill is an important source of competitive advantage because it is difficult to imitate and non-substitutable, which makes it difficult to transfer to other contexts [11].

Transaction cost theory: Based on the transaction cost theory, the choice of governance structure should be guided by the level of product customization in the transaction and transaction frequency [12]. Transaction costs include four

separate costs: (1) search costs, (2) contracting costs, (3) monitoring costs, and (4) enforcement costs [13][14]. Opportunism increases asset specificity, which in turn increases transaction costs. Williamson [13] identified site, physical and human asset specificity as obvious types of transaction-specific investments. Although contracts are the primary means for safeguarding transactions, previous authors have offered alternative methods, such as relational or goodwill trust [15], reputation [16]. When asset specificity and uncertainty are low, transactions are frequent, transactions are governed by markets, and there is generally apathy toward relationships with suppliers. In contrast, high asset specificity and uncertainty lead to transactional difficulties and hierarchical governance. Bilateral relations and cooperative alliances appear between these extremes. Therefore, servitization is a good way to ensure asset specificity and reduce transaction costs for buyers and sellers. Therefore, servitization is an alternative method for safeguarding transactions.

Relationship-school perspective: This view emphasizes the benefits of relations between the buyer and seller, focusing on aspects such as mutuality, win-win, trust, and information sharing. Therefore, inter-firm knowledge-sharing routines and trust-based relationships with suppliers are means of gaining competitive advantages. If suppliers can offer customized solutions to solve customer problems, they can gain a differentiation advantage and develop bonds with customers. Relationship-oriented business is linked to servitization, focusing on creating value for the buyer, and fulfilling customer needs rather than just selling goods and services with high quality and low cost. The client should be a co-producer of service, and interacting with the client should be viewed as a marketing process [2].

However, effective servitization focuses on customer service and requires the coordination of manufacturing systems, maintenance systems; spare parts supply systems, logistics systems, etc. [17]. It is not enough to provide a range of associated services by traditional customer service center. Therefore, the effectiveness of servitization encompasses many organizational function departments. Furthermore, servitization requires a careful synchronization of products and services to deliver a complete package to customer. This synchronization requires the support and coordination of cross-functional integration in an organization. For future success, a corporation should integrate related departments into a unit of customer service department and design a customer-specific package that includes physical goods, services, and information, or any combination of these, rather than a primary offering of tangible goods accompanied by services [18].

4. METHODOLOGY

This study uses the case study method to allow greater flexibility in examining the circumstances in lubricant industry. Four firms were selected to allow the findings to be contrasted and replicated, improve external validity, and reduce observer bias [19]. The sample in this study includes three major shipping companies and one lubricant supplier in Taiwan. In-depth interviews were used to collect data. To obtain more comprehensive and accurate information, the interviewees included the top-level management and executives. First, we went on company visits and conducted informal interview. The initial data gathered during these discussions offered an initial idea about the servitization process for marine lubricant. The purchasing types of lubricant influenced the logistics and related services, which serve as a guideline for a semi-structured interview.

Eight interviews were conducted over a period of 2 months. Each interview ranged from 45 minutes to two hours. Company documentation and publicly available information were used to triangulate the data obtained from the interviews. The analysis followed the comparative procedures suggested by [19]. Each interview was analyzed separately to identify the key points. These key points were compared with the background of each case to find the similarities and differences between cases. A case study report was prepared and sent to the interviewers to validate the data.

5. ANALYSIS

5.1 Lubricant purchasing process

The first interview revealed three types of lubricant purchasing process. (1) New vessel: It is a brand new vessel. A lubricant supplier for a brand new ship is decided from a list recommended by the engine manufacturer. (2) Switchover/contracted: Shipping companies may consider changing marine lubricant suppliers upon expiration of the current contract. The key considerations for switchover are different for large and small shipping companies. Big companies consider quality first and then price, whereas small companies consider price first and then product quality. (3) Spot Purchase: Shipping companies may buy lubricant products on the spot for various reasons. The main reason is the contracted supplier fails to supply lubricant, or the shipping company is dissatisfied with the supplier's service quality. When market price fluctuates over a wide range, a shipping company may request spot purchases.

The purchasing process usually starts with the chief engineer, who will choose the possible lubricants and volume. After the engineering division evaluates the lubricant model, the purchasing department submits the proposal to top management for final approval. The key considerations in lubricant purchasing are the engine manufacturer recommendations, previous experience, service network, and price. However, price becomes the major issue for small companies, followed by product quality and availability. Spot purchases do not occur often, but the cost is less than contract sales and ex ante service is good.

When the top managers of a shipping company make a final purchasing decision, they are concerned with the price of lubricant and the usage experience of marine field workers. The interviewees and survey results of this study indicate that the most important factors in lubricant purchasing are quality, relationship, service, network supply capability, and price. Top managers are very concerned with price, relationship, quality, and service. Although marine field workers are also concerned about product quality and service, they are more concerned with the network supply capability than the price itself. Therefore, lubricant suppliers should focus on products and services when marketing their products to potential buyers.

5.2 The important elements of lubricant servitization

This study identifies four important and interrelated factors for building the servitization process in the marine lubricant industry.

5.2.1. Product and service

As mentioned by the interviewees, shipping companies buy not only products, but also services related to those products. Thus, integrated offerings can reduce the transaction costs resulting from asset specificity and uncertainty. According to the relational view; frequent customer interactions offer many opportunities to develop new service/product ideas that may satisfy current customer needs. Buyers and suppliers can co-develop new products suited for future business, but the antecedents of this cooperation include inter-firm knowledge-sharing routines and trust-based relationships. Knowledge-sharing and trust-based relationships can offer customized solutions to shipping company needs, releasing them from some of their tedious job or problems.

For example, Cylinder Oil is the only synthetic oil, that perfectly matches future engines and increases the efficiency of a cargo ship, but its price is a little higher than that of regular oil (mineral oil). Thus, sales representatives usually do not promote synthetic oil to customers. However, shipping companies can accept a higher price if the product is effective and cost efficient (as three interviewees mentioned). Legislators have recently reviewed cleaning the waste discharges and requiring recycling to reduce CO₂ emissions and boost environmental performance. Because environment protection is going to be an issue for shipping companies, recycling will be a topic of concern in the near future.

5.2.2. Logistic and service

Marine lubricant after-sales services usually include order taking and logistics. Order taking includes receiving an order from a shipping company and confirming quantity/product availability before arranging delivery. Logistics includes the whole process of delivering lubricant to the vessel. When customer service receives an order from a client, order taking focuses on accurate information about lubricant, while logistics focuses on efficient and timely delivery. For the first-time customer, a new account is set up after the accounting department checks the customer's credit. The next step is to record the order details, and note whether the order requires special handling. The importance of the customer can be identified from the record.

Container and bulk carrier vessels require different lubricant services. Containers are always fixed routes, and dock in international ports, while bulk carrier routes are not defined. Therefore, the lubricant supplier's capacity in a small port is important to bulk carrier. A shipping company usually places an order seven days before the ship docks in port. The lubricant company confirms the order as soon as possible and presents any extra expenses to the shipping company for final confirmation. Final order confirmation might take from 5 minutes to 3 days; normally, a shipping company expects to get the confirmation the next day. The staff in charge of lubricant delivery confirms the ship's docking schedule with the shipping agency, and makes sure the lubricant is there before the ship dock in port. It is helpful to be well informed to arrange the appropriate time for pumping oil. Before pumping oil, the delivery crew confirms with the ship crew about the lubricant name, usage, filling pipeline, and drain line. This procedure helps avoid any problems caused by a language barrier.

A port manager, who reports to regional managers, oversees the operations of the port and is supported by dozens of sales representatives. If the lubricant supplier fails to deliver on schedule, the port manager should immediately report this to clients, and supply the oil at the next scheduled port. At the same time, sales representative should prepare the report of service mistake, and customer service will clarify the incident to the client by face to face interaction. Consistently using the same supplier and model makes it easy to identify the problem and avoid arguments about responsibility. Bunker oil usually comes with a two-week warranty, while engine lubricant has a lifetime warranty. Careful inspection of main engine lubricant on regular basis can keep lubricant up to date and prevent engine burn out. A lubricant company will face problems when delivery mistakes happen. In the event of a problem, lubricant staff should inform the shipping company as soon as possible, and act immediately to find a solution. Otherwise, it would make the problem worse, creating machine problems. One way to avoid such problems is to keep both lubricant logistic employee and the ship crew informed about ship docking schedule and lubricant information, and communicate well with each other. However, this requires a knowledge-sharing system to improve the current situation.

Lubricant clients request efficient and on-time delivery, and an invoice with accurate prices, quantity, and charges. Especially, the formula for calculating the total price should be comprehensive and simple, and the invoice format should be client-oriented. Logistic integration is a coordination activity, and an inter-organizational team can help each process of the logistic to be managed and controlled.

5.2.3. Technical support

The interviewees in this study indicated that technical service can be divided into two areas. One area focuses on solving product-related technical problems that involved services standardization to lower costs. The other area is relevant to customer relationships and nonstandard service processes with high asset specificity, and involve a certain degree of customized problem solving and information exchange. A shipping company that can garner the direct assistance of lubricant supply can develop a superior solution.

From the shipping company point of view, technical services include oil analysis, on board visit, lube charts, and technical consultation. Lubricant suppliers and shipping companies tend to have different views on lubricant usage. Shipping companies tend to depend on their ship's crew first-hand experience, and do not fully trust the laboratory certified analysis provided by lubricant suppliers. Lubricant suppliers often hold seminars to explain their laboratory certified results to clarify the different views on lubricant usage. The lubricant quality and effect is the same for all suppliers: base oil and additives come from the same sources. Each lubricant company submits their laboratory experimental results to demonstrate how great their products are and how bad the products of their competitors are. There is no authority to endorse these experimental results. Therefore, efficiency in services is very important to shipping companies. Based on interviewees' suggestions, this study identifies four elements that can increase efficiency in technical service.

(1) Account manager

Suppliers should assign one person to handle the main account, and let clients know who that person is for further consultation. The qualified associate should have an engineering background and good attitude, which is very helpful for communication with clients. The lubricant company and shipping company should exchange information. Frequent customer interactions offer more opportunities for developing new product ideas that may satisfy current customer needs. When an oil analysis report contains something abnormal, the account manager should notify the shipping company immediately and suggest a solution as soon as possible. The account manager should be aware of lubricant companies' future engines design, which is beneficial for lubricant development.

(2) On-line seminars and case studies

A technical seminar is a benefit to shipping companies. Teaching material should be updated to avoid simply repeating the same information and emphasizing the oil usage. Attendees prefer simple and easy-to-understand evidence, numerical proof, and theoretical support materials. However, the ship crews usually are aboard the ship, so they have no time to join the seminar. Ship crews expect they can get this teaching material for future reference from web-based learning programs provided by the lubricant company. Lubricant suppliers can share information from their cases worldwide, providing valuable data. Even if the case is negative, sharing the solution is better than hiding bad news, and can convince a shipping company of the capability of the lubricant supplier.

(3) Agile technical support

Accurate technical services are highly connected with professional technician knowledge. A wrong recommendation of lubricant model or the wrong usage instruction or wrong procedures can seriously damage the life of the machine and even make sailing unsafe. Senior technicians can usually suggest a suitable model for ship usage to reduce costs, while junior technicians only focus on the purchasing quantity saving, which may not be appropriate for ship usage. There should be a balance between volume and usage from the point of view of shipping companies.

The lubricant company is required to provide consistent quality service in each port to make the customer feel secure. Good service can win customers even at a higher price. For example, a shipping company may ask a lubricant company technician to propose a cylinder oil (which has the largest volume and highest cost) cost saving plan. This plan includes the best volume for feed rate and machine wearing. The technical service instruction and troubleshooting of a lubricant technical engineer can help extend the vessel engine life and increase sailing safety. Shipping companies expect the technical engineers of lubricant suppliers to have chief engineer experience in the vessel company, so that they can provide an immediate response to the ship crew's urgent needs.

From the vessel crew's perspective, the best solution comes from experience. This is unlike the technical engineers, whose best solution is based on laboratory results and paper evidence, which is long-term orientated experience to protect the rights of the lubricant supplier and ship owner. The right solution is provided by either the vessel crew veteran or technical engineers. This is why shipping companies suggest that the qualified candidates of lubricant technical engineers should have chief engineer experience on a vessel, which makes it easier to communicate and cooperate with each other

to get the best results. When it comes to a disagreement of lubricant solution, a thorough investigation and web-based report is necessary.

(4) SOP

The service of customer service member is based on the establishment of rules. If there is a full coverage SOP of lubricant company, then there should be no problem in the accuracy of back office. This is important to avoid reporting problems to customers at the last minute. If it is a negative event, the customer service department should provide a solution option at the same time to make the customer comfortable. The current supplier's customer service center is located in Shanghai. The efficiency is not good because its Taiwan subsidiary must get directions from Shanghai. The customer expects a flexible service from the lubricant company. The service members should exhibit sufficient professional knowledge and initiative attitude to solve customers' problems, not just waiting direction from Shanghai.

Based on interviewees' suggestions, this study includes a knowledge-based technology service diagram. Effectiveness of vessel machines long-life and sailing safety is the main concerned of shipping companies. To achieve this goal, knowledge-based technology services include oil analysis, lube charst, on board visits, and seminars. The keys to successful technology services are lubricant company's technical capability, marine engineering knowledge and maritime science practice. Technical service should consider the tangibility, reliability and commitment, and reaction and care characteristics to increase its capability and efficiency [20]. Based on this, a lubricant supplier can keep accurate records of client's usage history to understand the customer's point of view, providing immediate consultancy, service, and assistance.

5.2.4. Customer service

Green and Inman [21] suggested that market orientation involves two dimensions: customer focus and needs assessment. The needs-assessment dimension is particularly important to a servitization provider. They must constantly monitor their commitment to customer needs, routinely measure customer satisfaction and quality of services, and freely disseminate data about customer experiences and satisfaction. Lubricant suppliers rely on repeat business from loyal clientele, especially those 20% loyal customers that account for 80% of the business. Lubricant suppliers currently not use database to tracked clients' purchase patterns; they do not have sophisticated software for data management to anticipate clients' needs.

The inaccuracy of information provided by a lubricant company affects the trust of a shipping company. For example, the lack of details about price list makes the liquid measure conversion (liter, quart, gallon, pint; liter = 1.0567 liquid quarts) inconvenience for the client. In addition, the separate round off (round up or down) method adopted by each side made the totals amount inconsistency between shipping companies and lubricant suppliers. The shipping company must accept this situation to meet the numbers in the invoice. The itemizing on invoice did not meet each shipping company's individual required items, because of the diversity of systems among companies. In the end, shipping companies had to adjust the format to meet their company system and made it suitable to lubricant company's record. Customer service representatives had to explain the discrepancies to client repeatedly, which makes shipping companies skeptical of their service ability. Shipping companies sometimes make purchases at a local branch, but pump the lubricant in a distant foreign country. In this situation, ship receipts will arrive at the lubricant local branch a few months after refilling has been done. The invoice to the shipping company would be late due to the delay of ship receipts, which cause shipping company problem in bookkeeping.

The technical services between large and small size shipping company is different. Normally, big shipping companies have their own engineer team. The team members are experienced mechanical experts and knowledgeable about marine engineering and maritime science. Therefore, big shipping companies do not need too much consultant service from lubricant companies, and only require basic and regular oil analysis. On the contrary, small shipping companies need all relevant technical services from lubricants supplier. Consequently, the service cost for small size shipping companies is higher than big size shipping companies. An "on board visit" is a kind of customer relationship building, because some crew members would be the future candidates of engineer team in headquarter, and the team is the main decider of lubricant purchasing. Service employees visit customer to update the ship schedule and understand customer's requirements monthly. Beside the service of sample test and records for individual ship, shipping companies also expect some innovated services from lubricant companies including: fair pricing, internet and information technology, value-added services, service recovery.

5.3 Servitization system building

The servitization system should be actor-to-actor orientation [22], which points toward a dynamic, networked and systems orientation to value creation. The important elements of lubricant servitization provide a valuable framework for building servitization roadmap. Lubricant supplier can develop services related to their own products, focusing services in the customer's operational environment, for which relationships with customers are created. This study proposes a four-step procedure for building lubricant servitization system. Each of the processes is discussed as follows.

5.3.1 Need identification stage

It is necessary to identify customer needs to satisfy those need by the innovation service being proposed. Thus, the theoretical development of a servitization system begins with the identification of the needs of shipping companies. Service idea can get from the results of the survey and customers' expectations research, sometimes by placing a hierarchy on these expectations through value analysis. This value analysis is ideal for a one-to-one relationship and is particularly relevant in the case of B-to-B service innovations. Since customers are the center of the service [2] and service is a customer co-created process [23], so customer's needs should incorporate into all service schemes [24]. Lubricant firms must identify what the customer needs and verify what economic value can enhance for shipping companies. Therefore, customer-oriented or marketing concept must be incorporated into the service strategy. Ballantyne et al. [4] showed how reciprocal value propositions can be used to initiate and guide resource integration activities between initiators and participants across a range of stakeholders of the firm.

Lubricant's account manager should contact with the liaison person of shipping company on a weekly basis. Because of the frequency of the interaction, they often developed close bonds and built trust between the two of them. Account manager may get some idea from their liaisons of what service shipping companies is needed in their own business process. Lubricant firms can get the initial idea of servitization to integrate services and products with brainstorm technique.

5.3.2 Integrated service and products

The marine lubricant industrial requires wide worldwide supply. Due to this special characteristic, shipping company weighs after sales services as important as product quality when make purchase decision. Moreover, under current purchasing process, the level of lubricant specificity is more exhaustive and comprehensive than usual consumer product. Most of shipping companies agree with integration of product and service regarding lubricant supply can increase efficiency for both sides. For both matter separation and integration, the main focus of a shipping company main is flexible, prompt, and precise service. So the finding through this in-depth interview reflects highly positive towards the servitization in marine lubricants industrial and this also confirmed by the survey result of one marine lubricant supplier. Overall, this way can provide value-added services with integration solutions of hardware and software, products and services.

Efficient servitization focus on developing integrative services based on the service process as the platform to formulate the service-product package. As addressed by Bowen et al. [25], the service should be provided at the customers' convenience and satisfy customer's needs, this research integrate product and various function of services based on shipping company's needs for servitization. Figure 1 shows the marine lubricant servitization roadmap, which suggestion four key dimensions should be taken into account to deliberate on servitization for lubricant industry. It includes: (1) Product: Based on the knowledge-sharing and trust-based relationships, buyer and supplier can co-develop efficient lubricant to satisfy shipping company's customization need and add value; (2) Customer Service: Being close to the customer has already been a goal of business. Good relationship and market sensitive are the key success to be a successful sales representative. Excellent customer services need various basic support resources; (3) Technical Support: Various technical services (tangible, reliable, commitment, reaction and care) with knowledge-based technology services enable update product effectiveness for machine life and sailing safety; (4) Logistic: Standardized and customization operation procedure with agile (flexibility, promptitude, precision and initiative elements) wide supply network enable service differentiation.

To strengthen this servitization, this study conducted a 3rd interview for getting responses to this system. Large size shipping companies and small companies are agree with this servitization, most of who think it can add service value to lubricant product. Langedard and Eiglier [26] showed that service performance is also based on the final performance of the service result and on the experience of the customer. Also the best service is to create new services which customer not conscious yet.

5.3.3 The validation stage

This stage is to validate the chosen servitization options through the construction of a prototype. The goal here is to respond to the latent needs of the customers by presenting it to future users. Validation is a stage of great consequence in project development because it will result in the decision to stop the project, or re-develop it. Lubricant suppliers should give careful consideration to the degree of uncertainty surrounding the project, the cost of the test, and the costs of a redevelopment [27]. In other words, the project manager must strike a balance between the additional costs of earlier testing and the value of information that early testing can provide.

The key to success in this step is depending on customer's ability and willingness. Lubricant suppliers must get customers' identification of an added value provided by the service innovation and highlight the tangible nature of servitization, such as provider-customer interface as a service delivery. Lubricant suppliers should clearly state the technology that the service is based and describe the main characteristics of the service so that the customer can have a

clear scenario about the servitization. While the service is being provided, front office personnel play a leading role in the success or failure of the new service. Contact personnel often serve as a liaison between the customer and the service, requiring that the servitization be accepted by the contact personnel first. Therefore, personnel should be trained in the service process before validation stage. The type of models used during testing, the methods of copy of the environment of service delivery, the timing of these tests and the identity of the customers being tested. The interdependency of these problems makes the conception the validation stage particularly sensitive.

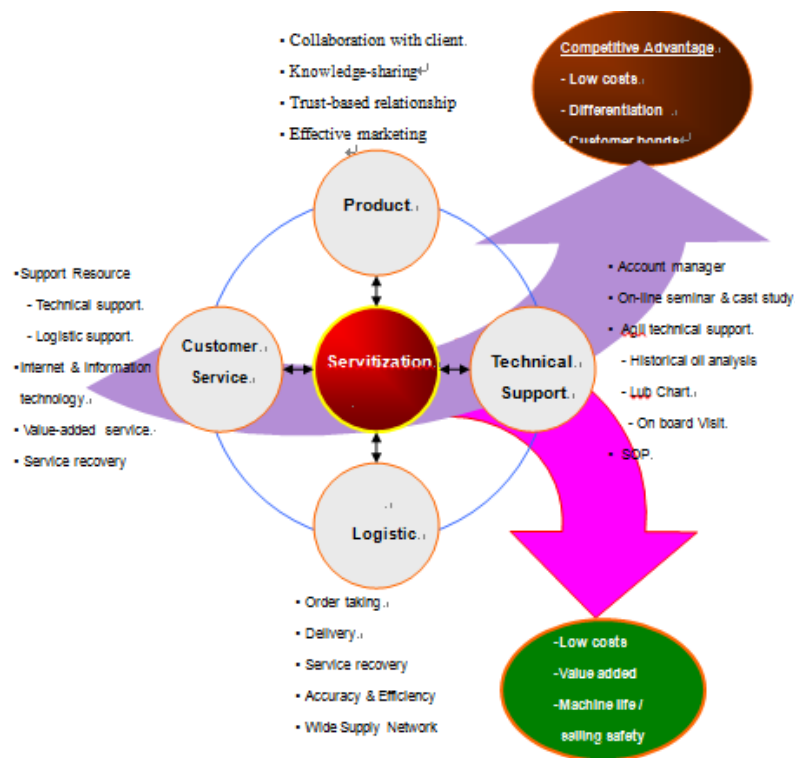


Figure 1: Servitization Roadmap

5.3.4 Tie Strength

From the tie strength perspective, servitization has benefits for buyers and sellers alike. Granovetter's [28] four dimensions of tie strength include relationship length, mutual confidence, reciprocal services, and emotional intensity. Relationship length is a significant characteristic of close relationships, suggesting that tie strength grows over the time. As a result, the interdependence in buyer and seller raised, and the entrusting and favorable buyer purchase behavior are better. The interaction in such relationships contains relevant information and their partner's future needs [29].

Mutual confidence emerges from this type of servitization. Relationships between companies with a high degree of mutual confidence can involve high frequent, extensive exchange of sensitive and confidential information through formal channel of communication [30]. Servitization can strengthen reciprocal services, making both parties to take active responsibility for the partner firm's well-being, as well as their own. In the end, both sides can live together in unity and solidarity [31] [32]. Emotional intensity captures the affective nature of the relationship, referring to the degree that partners have feelings for each other beyond the economic transaction. Servitization can tighten the emotional bonds between the two sides and gather support for new product develop [33].

When a buyer purchases products at a steady rate and follows an order process, seller can manage production, inventories, sales and support in an effective and efficient way [34]. Therefore, the servitization can stimuli buyer to engage a steady, frequent, and large amount of purchasing from seller. Keeping costs low is essential, but this is seldom a significant differentiator in business markets. Thus, to keep a competitive advantage, service offerings must be differentiated while costs are kept low. In addition, an increasing demand for turnkey solutions, often customized to each customer of their unique requirements, would seem to emphasis the importance of retaining control over the relationship with customers [35]. Structural bonds or a relationship marketing strategy of locking-in customers can lead to competitive parity in the long term. The emphasis is on the interaction between two parties that co-participate in the development of the solution.

Throughout the period, the two companies can grow more and more interdependent and create trust atmosphere in

which problems can be resolved quickly. In addition, employees of both companies got to know each other very well. The relationships were strengthened through many intercompany social events out of work. Eventually, the strong ties between the companies resulted in strong verbal and contractual commitments. Trust-building behaviors in dyads that align expectations mitigate opportunism, and foster cooperation [36]. Trust-building is an integral part of tie strength [37].

6. CONCLUSION

This study selects marine lubricant industry to study and exploration of how the product and services are jointly developed to achieve customers' satisfaction. In fact, this framework is a win-win situation. As a result, lubricant supplier can keep low cost, develop valued and differentiated offerings, and maintain positive bonds with customers, being innovative and responsive to customers' needs. On the other hand, a shipping company can achieve target of low costs, value added, longer machine life and sailing safety. As mentioned before, each of these four dimensions has its own special role in servitization.

This study proposes a four-step guideline for lubricant companies to seek services-led growth and raise relationships with clients. The starting point for lubricant with services used to help create their own products differentiation. To offer services, suppliers should consider the customer's operational environment, increasing value from the eyes of customer, with more services that support a client's core activities. Ensuring the proper functioning of the servitization after transition from product-dominant business, the supplier can display its capability to manage the whole of the customer's operational processes, which can lead to build strong relationships with clients and offer a chance to become a more strategic supplier to client.

To develop services, increasing internal integration and external integration is important to differentiation and strategy in the marine lubricant market. Integration relates to the organizational issues of culture and communication, management metrics and cross-functional integration [38]. The means for achieving internal integration are making strong use of the high-skilled staff and multi-disciplinary teams needed to consolidate functions, a key for successful service innovation. Better management of relationship refers to the inter-organizational links, which need to be managed effectively to achieve a sustainable logistics and transportation solution. The lubricant solutions rely on information sharing. They may be better achieved via the adoption of the servitization model, with respect to internal and external integration, through improved relationships and knowledge management.

7. REFERENCES

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