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## **A Literature Review of Servitization: A Preliminary Analysis**

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**Abstract:** Currently more and more manufacturing companies are considering including service as a value-added activity. This recent movement is usually called servitization in the literature. The purpose of this paper is to analyze this issue by conducting a literature review. Key-words such as “servitization” and “product-service systems” were employed to gather articles in data bases such as emeraldinsight, blackwell-synergy, sciencedirect, extenza-eps, and others. Other sources were obtained by cross reference. The article identifies some different modes of servitization and offers a classification of them. Based on an analysis of the literature, a proposal of a preliminary theoretical-conceptual model is discussed. Since this is an on-going research project these results need a deeper analysis as well as theoretical and empirical validation.

**Key-words:** servitization; product-service systems; service operations.

### **1. Introduction**

The role of the value chain in traditional manufacturing companies – production and sale of products – has become less attractive as the demand for products has stagnated throughout the economy (Wise and Baumgartner, 1999) and the profit on products sold has been decreasing. By

these reasons, companies in developed countries rarely survive exclusively as purely manufacturing enterprises (Karlsson, 2007). Thus, increasingly more companies are adding value to their business via services (Vandermerwe and Rada, 1988) seeking to increase customer loyalty and revenue with post-sales (Karlsson, 2007).

This is a trend in almost all industries and is perceived by the companies as a way to improve their competitiveness (Vandermerwe and Rada, 1988). Today services are a significant part of the modern economy (Easingwood, 1986; Vandermerwe and Rada, 1988; Menor, Trikonka and Sampson, 2002).

The move to offering services and solutions through products has been called “servitization” by Vandermerwe and Rada (1988) who define it as the offer of integrated packages of products, services, support, self-service and knowledge to add value to the company’s core business. Nevertheless, exploring opportunities for service delivery requires a new way of thinking about company strategy (Wise and Baumgartner, 1999) and its processes in an overall way. Companies must radically change the way they operate, since a number of interdisciplinary processes must be established, which affect especially product development, the logistical structure and services operation (Karlsson, 2007). Moreover, to capture the value of this business, the company needs to expand its definition of the value chain, change its focus on operational excellence to alliances with customers and rethink the meaning of vertical integration (Wise and Baumgartner, 1999).

For this to happen, business strategies become increasingly more demanding, and production is aligned with complex needs and requires a significant change from producing goods to providing systematic solutions with intense applied knowledge (Morelli, 2002). Moreover, according to the same author, in this move industrial production changes its focus from mass consumption to individual behavior and highly personalized needs.

Recently, this has become a topic of interest to the academic community (Easingwood, 1986; Vandermerwe and Rada, 1988; Menor, Trikonka and Sampson, 2002) and the management of service operations has become one of the most important areas of research in operations

management (Santos, 2006). Nevertheless, the number of studies that focus on the process of transition of manufacturing companies to service companies is still very limited (Brax, 2005; Neely, 2007; Oliva and Kallenberg, 2003). The objective of this study is to characterize the process of servitization, by identify its different modes and how the offers resulting from this process should be classified. In addition, its goal is to outline how the process of transition of companies from manufacturing to servitized companies occurs and to make a preliminary proposal for a model that help to define the modes of servitization and how this process occurs.

## **2. Research design**

The present study can be classified as theoretical-conceptual. The research was divided into two stages, a broad bibliographical survey on servitization, and a proposals for a theoretical decision-making model and a typology of the process of servitization.

The search to carry out the bibliographical review was initially done by key word in the following journal data bases: emeraldinsight; blackwell-synergy; sciencedirect; extenza-eps. First the search included articles which used the term “*servitization*.” Then articles which dealt with the transition from manufacturing companies to companies that include services in their offers, and also articles on “*product-service system*.” Other references were obtained by cross reference.

This review sought definitions of the process of servitiation, the identification of different classifications of offers by these companies, a description of different modes of servitization and of how these transition processes take place.

Then a theoretical model of decision making for the process of servitization was proposed, as was a typology of this process, based on the analyses done in the first stage.

## **3. Theoretical background**

In general, service refers to a wide number of different activities and they can be seen as part of a product or vice-versa (Hytönen, 2005) provided in order to satisfy customer needs (Grönroos,

1990). The majority of products offered on the market today consist of both products and services, with a greater emphasis on the product offered (Hytönen, 2005).

Manufacturing companies have several reasons for including services in their portfolio: to facilitate sales of their products; to increase customer loyalty; to create opportunities for growth in mature markets; to balance the effects of economic cycles on different cash flows and to respond to demands (Brax, 2005). In addition to the factors mentioned above, services in general have higher margins than products (Anderson et al. 1997).

This does not mean that products cease to exist, but since the business vision that guides product production in traditional manufacturing companies is very limited, the focus of the company should be on supporting the process of creating value for the customer (Grönroos, 2000). Traditional manufacturing companies need to change their business perspective from pure products to offering products-services packages where the product is just one part of the total service. According to Parrinelo (2004), among the transition processes that are occurring, the service sector is no longer being led by the manufacturing sector and is becoming the leading area.

Nevertheless, given the differences existing among service and manufacturing companies, this requires a managerial approach (Normann, 1991) and different organizational structures than for products (Brax, 2005) which is very challenging, especially for the areas that had been growing under the industrial paradigm (Santos, 2006). These differences arise due to the perishable, complex and multifunctional nature of service activities (van Biema and Greenwald, 1997). Therefore, becoming a provider of industrial services is not just a question of offerings; the entire organization needs to change the focus of its attention (Brax, 2005).

### **3.1 Service concept**

The structure of products can be considered as a set of functional elements of the product and a number of basic components, including the mapping of functional elements in the physical

elements and the specifications of the interfaces of interactions among their components (Ulrich, 1995).

Services generally refer to a broad, heterogeneous group of activities (Hytonen, 2005) of a more or less intangible nature that is provided as a solution for some customer demands (Grönroos, 2000) and which does not have an effect on the properties of the items in question (Kotler, 2001).

It is generally known that services are different from manufacturing goods in several respects that can make a difference in the way services are managed. Among some of the peculiarities of services; there are four that appear more frequently in the literature and have properties that differentiate them from products: intangibility, simultaneity, heterogeneity and perishability (Easingwood, 1986; Hytönen, 2005; Vargo and Lusch, 2004; Bowen, 2002).

Given these characteristics, several new aspects need to be considered by manufacturing companies that intend to enter the market, such as: the process of innovation and development of services, the process of production and delivery systems, the means of evaluation and the relationship with customers in itself, etc. that demand new organizational principles, structures and processes (Oliva and Kallenberg, 2003).

### **3.2 Servitization**

There are several authors who suggest that manufacturing companies include services among their main offers (Wise and Baumgartner, 1999; Braz, 2005; Mathieu, 2001). According to Sawhney et al. (2004) manufacturers can find new business opportunities by adding services to their chain, carrying out activities formerly done by the customer or introducing adjacent chains. According to Brax (2005), to add value to the main chains, services can be combined with tangible products to differentiate them from competing products. Further, according to this author, there are several reasons to include services among the companies' offerings, among them: prolonging the relationship with customers, creating opportunities for growth in mature markets, balancing the economic cycles with different cash flows, etc.

Vandermerwe e Rada (1988) define the term servitization as the move by which companies expand their offerings through integrated packages of products, services, support, self-service and knowledge to add value to the core business of the company. According to Ren and Gregory (2007), the concept presented above has been clearly defined, being, however simplified in subsequent studies. These authors define servitization as “a process of change of strategy where manufacturing companies opt for an orientation to services and/or develop more and better services with the goal of satisfying customer needs, obtaining competitive advantages and improving the company’s performance”. However, Morelli (2003) defines it as the evolution of the product identity from one based on its material content to a position where the material component is inseparable from the system of services.

Other studies of the transition of manufacturing companies to service companies were found in the literature (Oliva and Kallenberg, 2003, Wise and Baumgartner, 1999; Mathieu, 2001; Martin and Horne, 1991), which does not, however, mention the term servitization. These studies focused on diverse issues, which range from an analysis of how this transition takes place to a survey of the challenges and benefits associated with it. As shown in these studies, there are several modes of servitization (Ren and Gregory, 2007; Wise and Baumgartner, 1999) and, as described by some authors, the transition process takes place in stages (Davies, et al, 2003; Oliva and Kallenberg, 2003).

Another topic which has received some attention recently and which appears to be strongly related to the issue of servitization and the Product Services Systems (PSS) was defined by Goedkppop et al. (1999) as a combination of products and services capable together of meeting user needs. Baines et al. (2007) state that “the concept of PSS is a special case of servitization that values the performance or utilization of products instead of their properties and obtains differentiation through the integration of products and services that provide use value for the customer.” However, Mont (2002a) states that even though there is no consensus in the academic realm about the definition of the term. Further, according to the author, despite the fact that the issue of products

migrating to services is not new (over 40 years) the issue has arisen again recently, this time however, associated with the solving environmental problems. This has prompted discussion of the differences between products and services and their environmental performance.

In similar fashion, Vandermerwe and Rada (1988) state that companies have always been in services, nevertheless what is happening with the movement toward servitization is a trend toward creating specialized services associated to the manufactured product, to the sale of company know how of companies and the creation of companies and units specific to activities related to these services.

Oliva and Kallenberg (2003) say that these services should not be restricted to those associated to the product, but should include all the services required by end users to obtain the desired functionalities.

### **3.3 Classification of services according to company offerings**

In the literature, nomenclature can be found for the offerings of manufacturing companies that include elements of service, as described by Oliva and Kallenberg (2003): industrial services, strategy for manufacturing services, services related to products, service products, post-sale services, etc.

In this section we describe some of the classifications of company offers, directed mainly to those which combine services and products. This classification will be important to understanding the move toward servitization and the changes resulting from this process for the organization, as well as the company offers themselves. The categorization was based on the predominant characterization found in the literature, and there might be a superimposition of offers in some of the categories.

Kotler (2001) proposes five types of services based on the nature of the offers that range from the extreme of pure products to pure services: including pure tangible products, tangible products with accompanying services; hybrids, main services with minor products or services, and

pure services. In this sense, Vandermerwe and Rada (1988) present some modules which might constitute the offer of servitized company: tangible product, services, self-service, support and know-how.

Homburg and Garbe's (1999) classification considers the timeframe of services, dividing them into pre-purchase services, services at the time of purchase and post-sale services. Considering the purpose of the offer, the following classification can be found. Matheiu (2001) classifies services into three categories: customer services, products services and services as a products. Customer services have to do, mainly, with technical support services for products and generally the price of these services is included in the product. Product-services are those that support the products' users. "Service-like products" refer to those that are not related to the company's product, and in this respect, support competitor's products and consumer activities. Another classification found considers only two categories or services devoted to supporting consumer products (SSP) and services directed to supporting the customer's activities (SSC) (Mathieu, 2001b; Oliva and Kallenberg, 2003). Wise and Baumgartner (2003) present four business models for the transition of manufacturing to service companies. Except for the last model (control over distribution), the offers resulting from these models fit the classification proposed by Mathieu (2001). Another aspect to consider is the proportional relation among products and service, which can vary case by case inside the company and even over time for the same solution (Morelli, 2002).

If the nature of the interaction with customers is taken into consideration, services can be classified into services based on transactions and service based on relationships (Oliva and Kallenberg, 2003). Service-based transactions are those that occur occasionally, differently from relationship-based services, where there is a service agreement, generally with pre-established duration and prices. In these types of relationship, the service provider assumes higher risks, thus making costs to customers more predictable.

Another way to classify the offers would be to consider the range of their coverage. Davies et al. (2003) present four categories of services which, according to the categorization

criteria in this study, have been considered predominantly as based in the coverage of services: systems integration, consulting services, financing and integrated solutions. Ren and Gregory (2007) add a fifth type of offer: problem solving. It can be complemented by the service classification of Maister and Lovelock (1982) or Silvestro et al (1992), which include visions of customization and the volume of services.

### **3.4 Modes of servitization and the process of transition from a manufacturing company to a servitized company**

Competitive advantage doesn't occur solely through service delivery, but in how the services are combined with products to provide high-value solutions (Davies et al, 2003). In this section it is presented the different modes of servitization found in the literature, which are based basically in the way products and services are combined.

A study by Wise and Baumgartner (1999) presents four business models aimed at approximation with customers. Maintaining the different nomenclatures, these models can be considered as different modes of servitization (except the fourth model, which has to do with controlling distribution and is more related to changes in positioning on the value chain and not combining products and services in manufacturing companies). The models presented represent the ways that manufacturing companies add value to the offers by including services, which are: built-in services, coverage services and integrated solutions. By offering built-in services the company has the opportunity to increase the value of its offers, including services for its traditional offers and eliminating activities that should be performed by customers. Coverage services refer to services that cannot be integrated into the products, but which, due to the privileged position with suppliers, these use this channel to offer services related to customer activities. The third mode refers to providing integrated services, where the company provided a range of services together with its products.

Davis et al. (2003), in treating the transition of manufacturing companies from the branch of products and complex systems to services, present four modes by which this can occur: systems integration, systems operation, business consulting and financial consulting. Ren and Gregory essentially combine the studies by Wise and Baumgartner (1999) and Davies et al (2003) and propose a structure that contains five modes of servitization: problem solving, consulting, systems integration, financial and integrated solutions.

Mathieu (2001) presents a typology of this transition that is divided into two dimensions: specificity of the service and organizational intensity. In the transition process, in addition to the modifications that occur with respect to the nature of the offer along the dimension of specificity of the service (customer service, products-services or product like services), the dimension of organizational intensity represents the depth of the scope of this modification to the company (tactical, strategic or cultural). Depending on the actor, alterations in the cultural level involve a changes in the company mission and in the fundamental characteristics of the organization. A strategic change adds some key competencies to the company portfolio, without changing its mission or values; while a tactical change is limited to some specific activities, mainly in the company's mix of products.

Sawhney's study (2204) shows some similarity to what was proposed by Matheiu (2001) where new opportunities for service are broken into two categories: a focus on growth (the where) and the type of growth (how). The result of this division is a two-by-two matrix of growth opportunities, where the company can add or reconfigure the activities of customers in the primary, or the adjacent, chain.

Earlier studies showed the changes that took place in the company offers and their results. Nonetheless, they do not specify the way these transactions take place in the companies. Oliva and Kallenberg (2003) say that the transition of a manufacturing company into a service provider requires new capabilities, metrics, incentives and an emphasis on the changing from a business model based on transactions to a model based on relationships. According to Davis (2003), this

process occurs gradually, beginning with providing integrated systems and arriving at the provision of integrated solution. Oliva and Kallenberg (2003) say the same thing, suggesting that the transition process will occur in stages.

The authors propose a theoretical process that reflects this transition and that occurs in four stages: the consolidation of products related to services; entry into a service market related to the products, the expansion of services related to products to services based on relationship and services centered in processes, and the last stage would be when the company takes over the operations of the final user.

In sum, the first stage, the consolidation of products related to services, consists in consolidating the offers (which had formerly been fragmented throughout the organization and were considered an evil necessary for selling the product) into a single organizational unit. Along with this change comes “the development of a monitoring system to evaluate the effectiveness and efficiency of the service”, which will make possible an analysis of the market and the service’s contribution to the company (Oliva and Kallenberg, 2003).

The next stage would be entry into the product-related services market, which means identifying lucrative opportunities and establishing the processes and structure to exploit them (Oliva and Kallenberg, 2003).

Once the structure for operating the service has been established, the transition can take place in two distinct ways. The first would be a change from interactions based on transactions to relationship-based transactions. The second refers to the change in focus from product effectiveness to the efficiency and effectiveness of the product in the end users’ operations. This means changing the emphasis of the manufacturer’s business to becoming a provider of solutions (Oliva and Kallenberg, 2003).

In the last stage, the company assumes operational risks and the end user processes (Oliva and Kallenberg, 2003).

#### **4. Preliminary proposal**

Based on the bibliographical review, a decision-making model for the transition of companies from manufacturing to servitization can be proposed. This model does not pretend to detail all the stages and activities necessary for this transition, but it does present a logical chain of activities at this point on a macro level.

The move to servitization obliges companies to deal with three decision making issues: what, how and how much. The “what” is strongly centered on the company’s mission and its present market positioning. The “how much” has to do with the changes needed in the company’s offers across all categories. The “how” refers to changes in the organizational and physical structure of the company, in its competencies, its position in the value chain, in the positioning of its services on the market, etc. resulting from the changes defined earlier. The model would be centered in a continuous positioning of the companies’ offers, mainly with respect to their nature, purpose and coverage along the four axes: product, service, customer services and product services.

At the first decision point ( the “what”), a clear description of the company’s mission and an analysis of its present positioning should be capable of defining whether or not there is a misfit between its present situation and the position the company desires. This analysis can take into consider issues about the company’s positioning on the value chain, the nature and value proposal of the offer to customers and its coverage, for example, as well as the company mission. Based in this analysis, the existing gaps can be identified which can serve as references to define action plan that can guide the move to servitization. Making a parallel to Mathieu’s (2001) typology, at this decision point, the level of culture of the dimension of organizational intensity would be under analysis.

At a second decision-making point (“how much”), based on the analyses done at the first point, the company should define the alternatives necessary in its offers in the several categories presented earlier. This definition can be compared to the “maneuverings” of companies along the dimension of specificity of services proposed by Mathieu (2001) and reflected in an analysis of the

tactical level of the dimension of organizational intensity. Nevertheless, since the proposed model also involves analyzing the company products, the term services has been replaced by the term offers. In this way, the company will be able to define the specificity of the offer, considering the categories of nature, purpose, coverage and also the proportionality of each component within the offer. The changes made along the axis of the specificity of the offer and the present positioning of the company will determine the changes along the organizational axis (according to the typology of Mathieu, 2001), which should be considered at the third decision point and will guide the strategic activities needed to implement them.

At a third point in time, the activities necessary to carry out the strategies should be defined, such as those to develop new services and products, for fitting the company's infrastructure to its repositioning in the value chain, to developing competencies, to defining its production strategies and promotion on the market, among others. These activities can be put into three levels of the dimension of organizational intensity, resulting in different modes of servitization, as described by Davies et al (2003), Wise and Baumgartner (1999), Ren and Gregory (2007), Sawhney (2004) and Mathieu (2001) and which will take place according to the process described by Oliva and Kallenberg (2003).

To summarize, defining the specificity of the offer seems to be a central point in the decision making model, since it will direct the other modifications in the process of servitization. For example, a change in the purpose of an offer from support services for a product to a service that supports customer activity, will lead to the unfolding of a series of actions, with a change in positioning on the value chain and the need for an alteration in company infrastructure, which could fit into any of the three levels of organizational intensity.

Considering what was explained above, a modification of the topology of Mathieu (2001) is proposed, where two dimensions are considered, the dimension of the specificity of the offer, which in addition to the three levels proposed by Mathieu (2001) also encompasses the other classification and the dimension of organizational intensity. Nonetheless, the proposed typology does not yield as

a result, a matrix with nine different possibilities, the result of combining the two axes, but first requires positioning the company along the first axis (specificity of the offer) which will define the impacts on the different levels of the dimension of organizational intensity.

## **5. Discussion and concluding remarks**

The results presented in this paper are derived from a work still in its earlier stages that will require a deepening of analyses and applications to practical cases for validation. This article presents a bibliographical review of the process of manufacturing companies to servitized companies, showing a categorization of the classification of the offers, the different modes of servitization and a theoretical process that will describe how the companies accomplish this transition.

Despite there being some differences deriving mostly from the approach used by the authors to analyze the modes of servitization, there is a convergence with respect to what these modes would be. With respect to the way the transition processes occurs, the number of studies dealing with this issue is still very limited. Nevertheless, the process described by Oliva and Kallenberg (2003) seems capable of representing the different modes of servitization found in the literature. Categorization of the classification of offers figures as an important tool to define the modes of servitization and to define the transition processes.

Based on the literature, a model for making decisions about the process of servitization may be proposed, divided into three stages or decision-making points. The model might be strongly centered in the categorization of offers, since it was discovered that independently of the moves that the company will be making, the decision making process always has to go through an analysis of the modifications or and its present position related to these categories. It can be preliminary concluded that the modes of servitiation resulting from the decision made at the three decision-making points, that are made concrete at the time of defining the activities, which can be of different organizational intensity.

A typology of the servitization process is proposed, expanding what is suggested by Mathieu (2001), since it considers not just the purpose of the offering along the access of specificity of the offer, but also other aspects such as coverage, proportion, interaction and timeframe, for example. According to the proposed typology, characterizing the move to servitization would not be just a question of positioning at some point along the matrix, but a combination of them.

In this sense, the results of the article can be considered to complement the studies of the modes of servitization (at an initial level) and how this process takes place and to aid in understanding it. Further work will concentrate in enhancing this proposal.

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