

Linkages between servitization strategies and sourcing decisions: a preliminary study.

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Abstract. This paper develops a conceptual framework for ensuring the sourcing decisions are compliant with the servitization strategies of manufacturing companies. We argue that the choice of a servitization strategy, and the development of the PSS offering, should be driven by the customer’s perception about the product’s complexity and criticality. The sourcing decisions to configure the supply network, and the typology of relationships to be established with the supplier, should be taken accordingly.

Keywords: servitization, PSS, product-services, supply chain, supply network, buyer-supplier relationships.

1 Introduction

Previous works dealing with sourcing decisions in service delivery network (mainly focused on after-sales and product support services), pointed out the drivers influencing the level of vertical integration of the network that provides the product service system (PSS). The core of this value chain is the servitized organization (SO), usually a manufacturing company, that is responsible for configuration, planning, and coordination of the PSS supply network. These drivers are: the service volumes and the required level of (in-house) control [1]; the existing sales distribution channel(s) [5],[6] and the product substitutability [5]; the product (physical) features [10]; the wish to earn direct revenue through product-services [4],[10], the cost of creating direct distribution channels, and the required degree of control over customer support quality [4]. In particular, supply chain relationships are pointed out to be critical to retain the value coming from the customer interactions, and to achieve differentiation. Nordin [7] suggests that the more the service offer is strategic and customized, the more important is “to retain service processes internally or to align with external partners in close relationships”. In such a situation, the “positive bonds” with

customers can be leveraged to achieve a competitive advantage in the long run. According to [3], when the provision of materials and/or services is outsourced, the level of integration between the buyer and the supplier can be described by the following aspects: 1) the level of information exchange, 2) the operational linkages, 3) the legal bonds, 4) the cooperative norms and 5) the relation-specific adaptations. We adopt these criteria to characterize four different classes of the buyer-supplier relationships, as in Table 1. In line with the works from [8], although a continuum of buyer-supplier relationships exists between the two extremes (Open Market Negotiation and Insourcing), hereinafter we will consider only three intermediate configurations: Co-operation, Collaboration and Partnerships. Co-operating firms are engaged in medium-term contracts [11]. In this situation, information exchange and operations management integration techniques are implemented to increase the efficiency of the market transactions. Collaboration is achieved through a more structured approach to the buyer-supplier interactions, adopting techniques for coordinating common processes, such as just-in-time, and integrating information flows. In partnership, along with a higher operational integration, the parties develop mutual trust and commitment, enforced by relational investments and asset specificity [2].

Table 1. Typologies of buyer supplier relationships.

<i>Characteristics</i>	<i>Open Market Negotiation</i>	<i>Co-Operation</i>	<i>Collaboration</i>	<i>Partnership</i>
Information Exchange	None	Low to Medium	Medium to High	High
Operational linkages	None to Low	Medium to High	Medium to High	High
Legal Bonds	None	None to Low	Medium	None to High
Relationship-specific adaptations (by the buyer or the supplier)	None <i>(manufacturer)</i> Low to Medium (in case of Captive supplier)	None to Medium <i>(None or Low for the manufacturer, Low to medium for the supplier)</i>	Low to High <i>(Low to Medium for the manufacturer, Medium to High for the supplier)</i>	Medium to High
Cooperative Norms	Very low	Low	Medium	High

2 Linking servitization strategy to sourcing decisions

In this section we present the supply network structure and the typology of buyer-supplier relationship that company should establish in order to deliver different typology of PSS. In doing so we will refer to the framework proposed by Rapaccini et al. [9] which identifies the typology of PSS that company should offer based on two main drivers: the product complexity and criticality. Referring to the quadrant I of figure 1 (adapted from [9]), the customer expectations in terms of services are low; as a result, the product-service sourcing decision should aim at reducing the product-service delivery costs at their minimum. Since products are perceived as simple, the SO can easily find providers for both SPU and SPF services, and make use of its bargaining power to reduce the delivery costs. The financial benefits of outsourcing are particularly relevant in case the installed base of products is widely spread over large territories. In such a situation, the cost of providing, directly, decent fix & repair services can be very high, especially if compared with the benefits that this provision can generate for both the SO and the customers. As result, outsource to small local providers, located close to the customers, turns out to be a cost-effective decision.

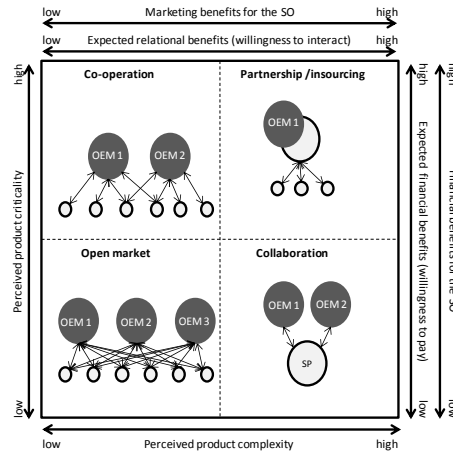


Fig. 1. A framework for configuring the PSS supply network.

In this case, the buyer-supplier relationship is, basically, based on an open-market negotiation, with a minor exchange of information (e.g. interventions performed under the warranty period, spare parts used, etc.). In such a situation, the service provider will serve more than one SO, in order to obtain scale and scope economies and make its business sustainable. As a result, he/she will not be willing to sign exclusivity agreements with the SO. In quadrant II, each product in the installed base is a potential cash-generator unit. However, the product criticality makes customer very demanding in terms of product availability (and thus, in terms of delivery time). In addition, the perceived (low) product complexity makes the customers uninterested in interacting with the SO. As a result, customers are basically interested in having SPF timely and effectively delivered when needed. In these cases, the SO could likely provide basic SPU on its own. However, setting up a totally owned network to meet customers' requirements, can be very expensive, especially in case of very large customer bases. Here again, the decision to outsource the service delivery to local third parties seems to be reasonable. Being the product simple and the provision of SPF services profitable, it is not too complex to find a supplier able to satisfy the customer need. These third parties, on the one hand, become suppliers of the SO, in the sense that they deliver service to the product end users, on behalf of the SO itself. But, on the other hand, they act as customers, since they buy spares and consumables. Hence, even the service provider network becomes a cash generator for the SO. By setting up such a supply network, the SO creates a captive market, and, at the same time, meets the customer requirements. The profits for the provision of the PSS will be shared among the SO and the other parties of the supply network. In such a negotiation, however, the SO can rely on a higher bargaining power. It is worth to point out that, since SPF services are product-related services, the SO (which has engineered and manufactured the product) has a very good knowledge about the content and the cost/time required to provide the services. As a consequence, he/she can efficiently control the service provider even in absence of a hierarchal relationship. The relationships between the SO and the service provider, in this case,

can be effectively described as a co-operation. A moderate information exchange is required, and pertains, for example, to the technical documentation update, or to the inventory control of spare parts. Operational linkages should be established via enterprise information systems, to enable an effective exchange of the aforesaid information, to optimize the inventory, the distribution, the shortage and obsolescence of spares, in order to reduce the logistic costs for the whole supply network. This, in turns, may require specific adaptations on the supplier side, to become compliant with the standards imposed by the SO. In this case, the legal bonds are represented by agreements that fix the territory to cover and the performance to assure. The most critical aspect in this kind of relationships is to establish trust, cooperative norms, in fact, are not to be taken for granted. The difference in bargaining power, in fact, can encourage opportunistic behaviours on the SO side, which could try to retain most of the profits, just increasing the price charged to the supplier for the sales of spare parts and consumables. That could determine dissatisfaction on the supplier side, that can result in a deterioration of the service performance and, eventually, in dissatisfaction of the final customer. In the same fashion, opportunistic behaviour may emerge in case the SO is “hostage” of the only supplier available to deliver services in a certain area. It usually results in a delay in the service delivery and in an exaggerated consumption of spare parts. In this case, incentives and effective control systems are required to align the objectives of the supply network. In quadrant III, the SO needs to provide, in addition to basic SPF, also SPU services that will have a major impact on the customer satisfaction. The provision of SPU services, however, represents a complex task. In fact, on the one hand, a manufacturer usually does not have the experience, the competences and the technologies to provide customer-care services, whose direct recipient is a person. On the other hand, because of the customer unwillingness to pay, these services do not ensure any short-term return. Therefore, the SO has to choose between investing money in acquiring/crafting the resources to provide SPU services or, finding a specialized supplier to whom outsource them. Even in the latter case, a major effort is required to identify the supplier and to set-up a relationship, especially when the product complexity is caused by the technological contents. Consequently, the outsourcing of these services requires a lot of interactions between the SO and the supplier. Their relationship should be seen as a long-term collaboration, characterized by a consistent information exchange. On one direction (SO to supplier) a large amount of technical information have to be provided to make it possible for the supplier’s personnel, to provide remote technical support to customers. On the other direction (supplier to SO) information pertaining the most recurring issues and customer complaints have to be fed back to support product improvement. Obviously, this requires consistent operational linkages that, in turn, will require relationship specific adaptations (e.g. dedicate personnel of the supplier to handle only the technical requests of SO’s customers). These relationship-specific investments, on the one side, may require the deployment of complex legal contracts that make opportunistic behaviour less likely to occur. In quadrant III, manufactures need to provide basic fix and repair services as well. Here, again, the cost of providing these services internally, especially for companies with large installed base, can be overwhelming. Thus, SO are encouraged to outsource the provision of SPF services to big, specialized, multimandatory suppliers that can leverage scale and scope economy to make the provision of these services economically sustainable. In

this case, the provider of SPF services could be the same that provides SPU services. Finally, in quadrant IV, services represent a very important part of the company value proposition. As a result, a full outsourcing of these strategic activities is not advisable, since it would undermine the company competitive edge in the long run. However, if the SO requires to rely on a supplier for some specialized services (e.g. remote monitoring and diagnosis), then it should establish some sort of strategic partnership, in certain cases even based on equity. Such a partnership should prevent the supplier to leverage the experience carried out with the SO and its customers to become a provider of competitors of the SO. On the contrary, the SO and its partners should leverage their relationship to provide services even to the competitors' customers.

2 The case studies

We have used case-based research to try to validate our framework. Cases have been selected among the companies participating in the ASAP Service Management Forum (www.asapsmf.org). Data were collected through face-to-face or telephone interviews with managers, as well as through public sources (annual reports, internet sites, etc.) and presentations given in workshops. We have used pseudonyms to preserve the anonymity of the companies. A summary of the cases is presented below.

Company I is an Italian based multinational company producing heating tubular steel radiators and design radiators. It employs 1200 people and has a turnover of 250 million €. Company I owns four production facilities located Europe and Asia and three trade branches in Europe. Its products are perceived as extremely simple and not critical. Final customers need to interact with the vendor only in case of product failure. Failures, however, given the low technological content of the product, hardly ever happens (even if the product working lifetime is longer than 20 years). The product-service offered is, therefore, limited to: i) substitution or repair services under the warranty period; ii) product disposal, as required by law; iii) call center services. Hence, the PSS offered is just a core PSS. In order to deliver it to its huge and geographically sparse customers' base, Company I outsources the service provision to a network of almost 500 multimandatory service providers. The relationship with these providers is transactional in nature, characterized by a very modest exchange of information and almost no operational linkages. Information are exchanged by email or fax. In addition, no financial and/or marketing objectives are assigned to the service provider, and their performances are not monitored at all. The buyer-supplier relationships are characterized by no mutual adaptations. In addition, Company I esteems that around the 20% of the interventions under warranty are performed by unauthorized providers, but does not perceive it as a serious threat.

Company II is an Italian-based corporation operating in the HVAC industry that employs, worldwide, 7200 people and has a turnover of 1,2 billion €. Company II manufactures its products (boilers, water heaters, solar thermal, heat pumps, air conditioners, burners) in 18 different facilities, located in 10 countries. Products are sold with 5 different brands in 150 countries, by means of 41 commercial branches. In this paper, however, we will focus only on the Italian market, which accounts for the 16% of the worldwide turnover. Products are perceived by final customer as critical, but rather simple to operate. As a matter of the fact, customers need to interact with the company only when the product has to be installed and/or in case it needs some

maintenance. Coherently with these perceptions the product-services that Company II attaches to its products are: i) installation, maintenance and repair services, all of them delivered at customer site; ii) toll free call center service to collect service requests.

The PSS offered is, therefore, a typical functional oriented PSS. However, its delivery represents a complex task. The average product working lifetime is up to 10 years, the installed base (in Italy) is made of 1.100.000 units and increases of 100.000 units per year. This gives rise to almost 110.000 intervention request per year, and to the need of handling more than 40.000 items of spare parts. The Mean Time To Repair expected by customers ranges from 2 hours to 36 hours. In order to meet these expectations, Company II chose to outsource the service delivery to a supply network made of almost 3000 multimandatory Technical Assistance Centers (TACs). The relationship crafted between the Company II and its TACs can be defined as a co-operation. The information exchange pertains, in one direction (TACs to company) the orders of spares, the direct costs (materials and labour) sustained to perform interventions under warranty, that will be subsequently refunded by the company. On the other direction, (company to TACs), it pertains the transfer/update of technical information about new product releases, and, in case, the emerging of recurring issues. Such a technical update takes place, on average, 2/3 times every year. The provision of spare parts is fully automated: orders can be triggered directly from the company's web-site (which happens 90% of the times) and are fulfilled in one business day. Since TACs are multimandatory, neither thigh legal bonds nor significant relationship-specific investments characterize the buyer-supplier relationship. Such a relationship, instead, is characterized by a certain conflict of interest; in fact, almost the 6% of the company' turnover comes from the sales of spares, thus TACs are seen as both a third-party service provider and a cash generating unit to exploit. In order to avoid unsatisfactory TACs performance and, as a consequence, a deterioration of the final customer satisfaction, Company II performs extensive customer satisfaction surveys.

Company III is the Italian branch of a leading multinational Asian corporation. It employs 300 people and has a turnover of about 600 million €, made through the indirect distribution (recurring to general trade) of consumer electronics, such as audio-video devices, laptops, digital cameras and recording systems. Products are mostly perceived as non-critical by customers, with the partial exception of mobile phones or laptops for professional users. Having a significant technological and innovation content, however, the perceived product complexity is quite high. In brief, services have to be considered an extension of the product offer, rather than the core of the PSS, and are based on: i) web-enabled self-service SPF, such as user manuals, technical information, and drivers - all downloadable from the company website; ii) field support services, provided through a network of third-party suppliers on the territory; iii) end-user oriented services supporting the product usage (SPU) offered on the web (such as FAQs, technical support forums, etc.) and through a contact centre. Capabilities for service provision are, as well, acquired externally, resorting to 180 small suppliers of field-services. In addition, a supplier of customer-care services is used for the contact centre. Lacking a direct contact with its customer, the contact centre's interactions turn out to be relevant to match customer's expectations, differentiate the brand, increase satisfaction and repurchase intentions. Therefore, a supplier able to provide state-of-the-art customer care services was strongly needed.

The company chose a global provider of business process outsourcing solutions in high tech industries; in Italy, this provider has two sites and employs around 650 people. The relationship crafted between the two parties is long-term oriented and can be defined as a collaboration. High attention is given to performance management and operating systems. Critical aspects were the definition of the Service Level Agreement, the definition of KPIs and the establishment of monthly meetings to discuss specific cases, compelling issues, to find causes and solutions and so forth. Pricing is based on the volumes managed by the supplier, and moderated by the gap between the expected vs. the actual performance. The supplier guarantees the attainment of a threshold value, while bonuses can be reached with superior performance. The information exchange is considered vital by both parties: the supplier receives forecasts of the volumes for the service demand, information and product variations, promotions and technical training, while company III receives the feedbacks on customer satisfaction, complain rates and their causes. In term of relation-specific adaptations, a team of professionals from the supplier is dedicated exclusively to the helpdesk of Company III, while Company III provides technical training to the team.

Company IV is an European manufacturer of white goods, such as dishwashers, washing machines and refrigerators, and of appliances for professional markets, such as laundry equipments and disinfection equipments for surgery. Product quality and reliability are the main values, which are transmitted to customers. The Italian branch employs 150 people and distributes professional and household appliances, reaching a turnover of about 100 million €. The professional customers are mainly in the HORECA sector (hotel, restoration and catering), self service laundries, and hospitals. Professional washing (and drying) machines are the most important product category, making around 70% of the professional business revenues. Today, the company philosophy is based on three pillars: i) continuous improvement of products, through technological innovation and environmental consciousness; ii) “A customer is forever” approach, based on product and service quality, listening and satisfying customer requirements; iii) crafting partnerships downstream the value chain, to explore different businesses and enable new service delivery channels. Therefore, from the early 2000s the company shifted from offering professional appliances plus basic services, towards offering a solution oriented PSS. In particular, in the self-service laundry equipment business, the PSS offer encompasses a wide set of services, ranging from the supply of professional washing machines and dryers, to the layout design, the sales of branded detergents, training programs, full-risk maintenance contracts, etc. Moreover, a “tutor” is assigned to each entrepreneur opening self service laundry. The tutor acts as a key account and supports the entrepreneur also in managerial decisions. The aim is to provide the start-up of a business with turn-key solutions, designing the laundry layout, supplying appliances, detergents and monitoring systems, training and tutoring people with consultancies. In order to deliver this offer, company IV crafted an equity-based partnership with a specialized supplier of self-service laundry design and equipments. The two companies set up a new company (owned at 25% by Company IV). The branding of the new company and the facilities images recall Company IV institutional images and colours.

3 Concluding remarks

As concluding remarks, it is possible to state that: i) a linkage among the servitization strategies (described in terms of PSS provided) and the SO sourcing decisions does exist; ii) four different classes of the buyer-supplier relationships can be identified (open market negotiation, coordination, co-operation, insourcing / partnership). These relationships can be easily described using the Cannon and Perrault model [3]; iii) manufacturing companies that servitize to get marketing and strategic benefits should consider to (re)structure their service delivery network, in order to introduce some higher levels of collaboration and/or partnership with their providers. On the contrary, companies that want to obtain (mainly) financial benefits from servitization, should outsource the service provision, should establish a co-operation with the service provider to make the service delivery efficient and should use their bargaining power to secure most of the profits coming from service.

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