

Product-Service Systems across Life Cycle

Intermixed product and service boundaries: exploring servitization in sheet metal industry

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Abstract

In the sheet metal industry, single machines or more complex production systems are integrated with a software needed to control them. While it is clear both for the company and the client that the machine is a product offered with the related services, the software deserves more attention. In the company where our team has been involved in an action research program, the software is conceived as a product with its related services, but this concept has not been properly transmitted to clients, who don't recognize it and pretend software services for free. In this industry, machinery is linked to its software and both are enhanced by the related services, so the final product-service bundle should be made by four components.

In order to better clarify this concept and illustrate the solutions our research team has identified to promote a complete PSS offer, the four-leg chair metaphor is proposed. The proper value of the whole PSS offer can be transmitted by an effective communication process, supporting sales people with instruments such as predefined packets for software services. Organisational changes should be adopted such as job enlargement for software technicians and cross-training with salespeople. By the former, software technicians, who are frontline employees in direct contact with customers during the training phase, can be transformed into internal entrepreneurs by proper incentives. Since they lack marketing education and sometimes trust of salespeople, cross-training is proposed as an effective way to keep in touch software technicians with salespeople with mutual learning.

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1. Introduction

Servitization refers to innovation of a company to shift from selling physical products to integrated systems combining product and intangible services [1]. The role of industrial services has gained importance among traditional product manufacturing companies as new technologies are emerging for value co-creation [2]. Product-Service Systems (PSS) are Western concepts to differentiate from low cost competitors and combine operational knowledge with physical product deliveries [3].

In this paper servitization in the sheet metal industry is investigated, where some industry-specific issues arise and

deserve further attention. As research methodology, we have adopted the action research approach, which aims both at taking action and creating knowledge or theory about that action [4]. As stated in [5], the relevance of action research is usually guaranteed by working with management on an issue the enterprise itself wants to address. The grounded, iterative, interventionist nature of action research ensures closeness to the full range of variables in settings where those variables may not all emerge at once. The members of the system are no longer merely the object of the study, but participate actively. On the other hand, researchers act as facilitators of the actions and reflection within an organization: their role

moves from detached observers in positive science to actors and agents of change in action research [4].

In the following sect. 2, to better connect with recent studies a brief state of the art is proposed. The product-service issues faced by the company in which our action research has taken place are identified and conceptualized in sect. 3. In sect. 4 some actions to address the problem are proposed, while in sect. 5 organizational changes needed to trigger a complete PSS offer are explained. Conclusions and further research are summarized in sect. 6.

2. State of the art

Product-service systems have been described by a number of recent studies from theoretical and modelling points of view [6], [7]. Adding service products on top of current existing good-dominant product portfolio is not a successful strategy in transition to services [8].

According to literature, actions in a wider perspective is needed in transformation [2]. Certain characteristics from recent studies are:

- The role of information technology supporting the transition is widely accepted [9].
- The co-creation of service and interaction with customer needs to be acknowledged as part of service satisfaction [10].
- Life-cycle approach on products [11] is one approach to change mindset toward operational excellence from selling goods.

According to Gudergan et al. [12] companies have different stages in development and this process can be evaluated by using capability maturity modelling approach. Ultimately the product service system strategy needs to connect the business model and operational business tactics of a company [13].

A common factor for many studies is that the perspective is typically for large scale companies, which have a large installed base, existing service products, and a good geographical presence in many locations [2]. The reason is that these are typically leading companies in the PSS area. Nevertheless, smaller companies in the business-to-business environment have similar needs and not all practices cannot be copied directly. Practices in implementation may vary due to the available resources.

3. The product-service problem assessment

The starting point of our action research can be identified as March 2015, when we entered in contact for the first time with a company operating in the machinery sector. The current offer of the company can be summarized as follows: the firm produces and delivers machines for sheet metal manufacturing (i.e.: punching, shearing, bending, laser cutting and so forth) and its technicians perform the related machine maintenance, both preventive and corrective, according to the service

package chosen by the customer. As it emerges already from the company website, the firm provides its customers with a wide range of possibilities from which to choose for the machinery after sales services.

Each machine or combination of machines (the so-called “Systems”) is moreover integrated with a software, which permits the correct and flexible utilization of the machinery and in most the cases has to be customized according to the customer’s specific needs. The company, in fact, serves customers who operate in many different business segments (agriculture, aerospace, automotive, domestic appliances, industrial vehicles and further more) and who all need specific features for the software they benefit from, therefore customization is an indispensable part of software service. Beside customization, other important software-related services consist of troubleshooting, preventive interventions, enhancements, constant upgrades and so on. All these services are essential and unavoidable for the software, in order to have it continuously updated and well performing from a technical perspective. Generally, there is a transition from physical products towards larger share of intangible services. The objective is to have longer and more stable revenue stream over the system life-cycle.

The firm, however, is currently facing a relational problem with its customers, who are not willing to pay for software service and in many cases they expect it as a free-of-charge benefit associated with the agreement they have signed. This type of service, however, often requires a lot of labor by software specialists and hence cannot be delivered for free. Therefore, at the moment of our involvement in the company dynamics, the management was wondering why such an unpleasant situation arises and asked our research team to investigate the reasons and to possibly propose any viable solutions to the problem.

After several interviews and meetings with sales people and with the sales managers, it came to light that the sales people themselves don’t have a clear idea and a solid experience about how indispensable software services are and how they can be promoted in an appealing way, and this leads to non-precise and ambiguous relations with customers. They admitted the lack of a solid communication process in this sense and pointed at the lack of a clear software service offer as the main pitfall of the organization, as complained also by customers. We could easily verify these assertions surfing through the company website, which doesn’t provide any information about software maintenance and the necessity of an ongoing software development process and doesn’t propose any service solution in respect to the software. While software appears in the products menu together with machinery, it doesn’t appear in the service menu. This often provokes the emergence of a series of misunderstandings between the firm and the customers and the subsequent need of additional meetings and communication flows in order to clarify this inconvenience. Moreover, this kind of criticality can also lead to the customer dissatisfaction, since he realizes afterwards that the agreement doesn’t comprise everything he expected as included in it.

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