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Overcoming the product-service model adoption obstacles

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Abstract

Product-Service Systems (PSS) benefits are not limited to its providers and costumers, but the whole society might also take advantage from its sustainability impact. Nevertheless, many PSS projects still fail, and lots of customers stick to buying mere products or services in a transactional rather than a relational context. Shifting to the PSS paradigm requires a mind-set/organizational culture change both from the PSS' provider and customer. On one hand, the manufacturing companies should change from production scale to use scale, therefore producing fewer products that will be more used, and the profit will be rather based on the services they provide. On the other hand, the customer must be flexible to give up product property in favor to product use when it pays off in the long term. Not surprisingly, this paradigm shift creates some obstacles that could deter companies from adapting the product-service concept, as a successful PSS will require different societal infrastructure, human structures and organizational layouts in order to function in a sustainable manner. This paper analyses the benefits and obstacles from/for PSS and proposes a self-assessment questionnaire that point to the needed business model changes in companies interested in adopting PSS.

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1. Introduction

Product Service-System (PSS) is a business approach where manufacturing firms' revenue shifts from only selling physical products to also selling services, where the value delivered ranges from more product to more service shares [1, 2, 3]. In business-to-business (B2B) applications the PSS might also called Industrial Product-Service Systems (IPSS). In this paper these two are referenced indiscriminately as PSS. PSS benefits are not limited to the PSS' providers and costumers, the whole society might also take advantage from its sustainability impact, once it can both potentially reduce resources consumption and pollution [4]. In PSS, the interrelations between the physical product and the non-physical services need to be considered proactively during the development process [5]. PSS are therefore complex systems, in which the design process must take into account products, services, support systems, business elements, and the work flow and interactions amongst them [6].

Nevertheless, many PSS projects still fail, and lots of customers stick to buying mere products or services in a transactional rather than a relational context [3]. Shifting to the PSS paradigm requires a mind-set/organizational culture change both from the provider and the customer. On one hand, the manufacturing companies should change from production scale to use scale, therefore producing fewer products that will be more used, and the profit will be rather based on the services they provide [3]. On the other hand, the customer must be flexible to give up product property in favor to product use when it pays off in the long term [7].

This paper makes a literature-based analysis about the PSS impact aspects related to the PSS provider, the PSS receiver, and the offered product-service system itself. The final paper contribution is a set of PSS readiness self-assessment questions for companies planning this paradigm shift. The questions support understanding the change consequences, and the definition of a new business model, based on the Business Model Canvas [8].

This paper is structured as follows, in order to also show the work rationale and methodology. The PSS analysis, particularly in terms of categorization and the obstacles for adoption, as showed in section 2, were made to facilitate its linking to the Business Model Canvas' elements, as presented in section 3. The questionnaire itself and its implication to the business model definition are described in section 4. Section 6 presents the final remarks and the plan for future research.

2. Product-Service Systems (PSS) and related benefits

Successful PSS relies on lifecycle-long relationship between its provider and customer [3]. This relationship acts like a fulcrum, by guaranteeing both the flow of money and information that will enable and sustain the PSS.

From the provider point of view, the longer the relationship the higher is the profit from setting the structure to support the customer's use. This relationship creates a customer– provider intimacy and mutual dependence, which supports a learning process where the providers better understand the product use and the market, thus better serving the customers, creating opportunities to differentiate, setting barriers for competitors imitate, and creating competitive advantage [3].

From the customers' point of view, longer relationships mean providers' better understanding of their needs and accurately providing the right PSS. These PSS release customers from the responsibilities of asset ownership [2], and from capital lock-up and knowledge restrictions to using newer and even more complex technologies, once the PSS provider can apply sharing mechanisms that reduce individual cost and risks, and thus optimizing the use phase [3].

In the society perspective, longer relationships might preserve the usability of the PSS and prolong the product's lifecycle. Once the ownership remains with the provider, there is greater motivation to establishing closed loop recycling management with reuse services [7, 9]. It might exploit information exchange with the customers and other stakeholders during the after sales and end of life phases to increase the PSS lifespan. Multiple usage phases' also make a PSS competitive by maximizing the utilization of resources.

2.1. PSS categorization

The importance of understanding the diverse PSS types lies in the different challenges they pose to companies' adoption. PSS classical categorization is based on the value delivery shift from more product to more service shares [7]. Tukker [4] detail these categories into eight archetypical business models. Ostaeyen et al. [10] suggest a different typology, where they consider the revenue mechanisms on different levels of abstraction. The here presented business models organization is a combination from the literature (Fig. 1).

In a product-oriented PSS (type 1), while the product ownership remains with the customer, the provider sells additional services. Revenue is transferred from the customer to the provider according to the delivered products or services (input-based, IB). The offered services might include those needed during the product's use phase, and advice and consultancy about the most efficient product use. [10]

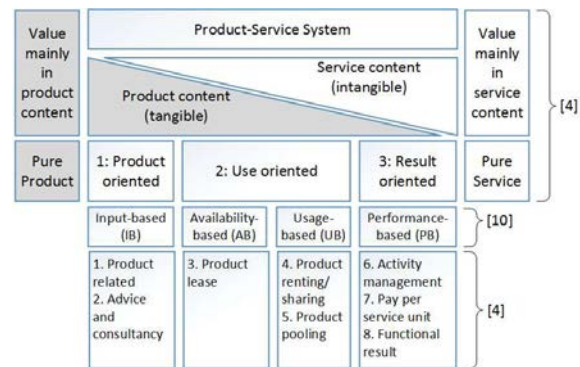


Fig. 1 – PSS' categorization.

In a use-oriented PSS (type 2), ownership (and related risks) remains with the provider and usage rights are sold to the customer. An availability-based (AB) revenue mechanism means that revenue is transferred from the customer to the provider based on the time period during which the product or service are available (unlimited and individual access) for the customer. In this case the customer still has a feeling of ownership, once he/she has complete access to the product during the contracted time. In type 2, ownership can also remain with the provider and usage rights are sold to the customer with a usage-based (UB) revenue mechanism during the actual usage of the product or service (i.e. product renting, sharing, or pooling).

In a result-oriented PSS (type 3) the provider's role is expanded from offering usage rights (type 2) to selling functional results. In a result-oriented business model the process performance responsibility is transferred to the PSS provider, as the customer pays for the faultlessly results. A performance-based (PB) revenue mechanism means that revenue is generated based on the functional performance of the product or service. This is the most complex PSS type, once it is more difficult to negotiate indicators, and it requires continuous feedback about customers' satisfaction and possible behavior and expectations changing trends.

2.2. Obstacles to PSS

While type 1 PSS is probably easily applicable by traditional product oriented firms, greater benefits, particularly in terms of sustainability, are achieved by the other business model types, which progressively require a more service oriented approach. [4]. This paradigm shift creates some obstacles that could deter companies from adapting the product-service concept. There are three main uncertainties regarding the applicability and feasibility of a PSS: the readiness of companies to adopt them, the readiness of consumers to accept them, and their real environmental implications.

2.2.1. Obstacles to providers success (OS)

Lack of ownerless consumption enthusiasm in the B2C (OS1): The assumption that the customer is more interested in

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