

Product-Service Systems across Life Cycle

Creating product-service system opportunities for small and medium size firms using service design tools

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Abstract

This paper describes a process, based on Service Design tools, of product- and service-discovery that has been used in workshops with two Swiss small and medium-sized firms. Both of the firms were manufacturing high-quality products and under pressure on price. The use of individual Design Thinking tools had not provided a route to deliver the product- and service-innovation required; what was missing was a method to combine the individual tools to create a process. The leaders of the firms confirmed that the process described allowed them to expand their thinking from product development to a broader product-service system development process.

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1. Introduction

In this section the initial problem faced by Small- and Medium-size Enterprises (SME) will be described, followed by an introduction to the literature that formed the foundations for the research.

1.1. Problem description

The basis of the research described in this paper is from the position of how to support Swiss SME firms through a more “holistic” innovation based on product-service systems. The removal of the EUR/CHF peg has put additional pressure on manufacturing firms to drive out costs and to improve their customer value proposition. In the past there has been a reluctance to innovate away from the traditional product development aspects whereas today there is a growing acceptance that the innovation must be undertaken within a broader context [1]. Service innovation in particular has been documented in the SME segment [2] as an area where new

approaches were needed. Without combined product- and service-innovation in this area, firms run the joint risks of failing to defend existing markets while also not developing new markets.

The firms in this study had in the past used individual Design Thinking and Service Design tools to help create innovative ideas that could be further developed into improved or new services or products. This had not been satisfactory according to the management, and they were eager to test a possible solution to what they perceived as fragmented approach that failed to link product development with services that lead to an unsatisfactory outcome.

1.2. Approaches to this problem

A number of different approaches have been taken to the problem of product development. ‘Engineering Design’ is well described [3] and has worked well in many instances and the value in the detailed specifications to assist the design is supportive to creating good products, while the iterations also

greatly assist in the development speed. However, it is harder to specify intangible aspects in this form. Both the fuzzy front end [4] and Lead User [5] methods help to capture some of the tacit and more informal aspects, but their application in an SME environment on product-service system innovation can lead to a complex, time-consuming process. Design Thinking [6,7] places the user in the centre and demands a multidisciplinary approach that focusses equally on tangible and intangible aspects.

1.3. Value of a Design Thinking approach

Building a more compelling customer value proposition is not trivial and the use of Design Thinking [6,7] and Service Design [8] approaches is considered to be valuable as it focuses on users' experiences, particularly the emotional ones. Using Design Thinking models, it is often possible to create models that allow complex problems to be examined and solutions to be developed. This has been seen particularly important where customer value is created from the intangibles around the products and services that are delivered by the supplier. Other benefits of the Design Thinking approach are:

- It is tolerant to failure/embraces risk taking within a sharing/supportive learning environment
- It is an approach that can help simplify and humanize situations
- It helps people to accept more ambiguity and multiple solutions
- It helps to bring together the Product Development team and service departments to co-create

1.4. Identification of the users, customers and stakeholders through ecosystem analysis

The use of the Design Thinking approach in the service environment requires the concept of the 'user'. However, before it is possible to identify the user, it is first necessary to understand the ecosystem in which the firm operates. Ecosystem innovation [9] is a relatively new approach and replaces the linear supply chain and more accurately describes the interactions between all the participants of this market. The use of ecosystem mapping has been promoted by Service Design [8] as a way to better identify the stakeholders that have influence over a firm's business with the end user or equipment owner.

1.5. Identification of the users needs through persona analysis and empathy mapping

There has been criticism of the empirical results that are generated through persona and empathy mapping [10], however as tools to use in a workshop to provide a visual that the group can work on they are highly valuable. They create a user-centric approach to both design and marketing, which in product-centric firms can provide insights that lead to improved innovation and market understanding. Using persona and empathy mapping allows the group to better understand the problem and communicate it [8].

Empathy mapping provides a complementary view to more traditional customer segmentation methods [11]. Particularly of value is the analysis of the gaps between see/hear and do/say as this provides deeper understandings into the behaviours of the persona that can later be applied in the creation of the value proposition. Finally, the pains and gains for the persona can be directly transferred to the customer side of the value proposition of Osterwalder's model [10].

1.6. Job-to-be-done

The job, rather than the customer/user, is considered the fundamental unit [14, 15]. The approach is complementary to that of the persona's and empathy mapping [8], in that:

"... every job people need or want to do has a social, a functional, and an emotional dimension. If marketers understand each of these dimensions, then they can design a product that's precisely targeted to the job".

The identification of the job-to-be-done results in a common understanding, that it is not a product nor a service which usually covers the needs of the persona, but a more precisely tailored product-service system. It also supports the situational analysis in that one 'customer' in one situation may buy a product whereas in another situation they may rent the same product. This provides more insight into the individual behaviour by helping people to understand the outcome that is being sought [16].

1.7. Development of the customer value proposition

By understanding and combining the pains and gains from the empathy maps with the job-to-be-done, the customer side of the customer value proposition [13] can be quickly and efficiently completed. This leaves the supplier side to be completed so that the customer value proposition can be delivered to the customer. The visual approach to value proposition design provides a tool that can be used to create the value proposition that is recommended [17, 18].

2. Methodology

Two different firms were selected for the workshops to allow prototyping; the participation of the firms was needed to provide direct feedback of the applicability of the tools being tested. The participants in the workshops were chosen to provide a mixed group (product development, service, sales; managers and employees). Both workshops were introduced in a similar way to reduce the variability, first with some theory and then into the main content of the workshop shown in Fig. 1. They were then provided with the opportunity to use the tools. A log was made of the sheets created and a list of new ideas to work on at a later stage.



Fig. 1. General structure of the workshops

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