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## From ownership to service-oriented business models: a survey in capital goods companies and a PSS typology

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### Abstract

The evolution of capital goods companies towards a “service-oriented” business model is challenging and requires fundamental changes in the company. Main aims of this study, that is a part of a large research project, are to understand how business models of companies that operate in capital goods sector are configured and to identify different PSS types that can help companies to better understand the shifting toward a service-oriented business model. To achieve these results, we developed a framework, based on the Canvas model and carried out an exploratory survey among 95 European companies to understand the relevant issues that characterize business model configuration in servitization context.

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### 1. Introduction

New trends for manufactures push towards not to sell the product (ownership) but rather to sell either the usage of the product (e.g. renting, pay-x-use) or the product performance (e.g. pay-x-performance). The phenomenon concerning the evolution from a “traditional” business model, based on the transfer of ownership, to new usage-oriented business models, has been discussed in literature since the ‘90s and above all from the year 2000s. The literature conceptualizes the shift from products to solutions through various concepts, such as “servitization” [1, 13], “transition from products to services” [2], “going downstream in the value chain” [3], “product-service systems” [4], “moving towards high-value solutions, integrated solutions and system integration” [5,6], “manufacturing/service integration” [8] and “service infusion in manufacturing” [7, 10, 12]. These views converge into the concept of solutions, defined as innovative combinations of products and services leading to high-value and unified responses to customers’ needs .

Strategic realignment toward services should be mirrored in changes in the company’s business model (BM), evolving to a service-based business model [9]. In fact, business models based on the provision of solutions and Product-Service Systems (PSS) instead of traditional products change the manufacturer’s perspective about the costs and revenues arising during the product lifecycle. Even though the strategic importance of services has been highlighted by literature, product-centric firms frequently struggle with service innovation [14,16]. This happens because it is hard to shift from the engineering and product-centred core culture to a more relational and customer-centred attitude [2, 15, 17].

Literature shows a limited application of these new business models, especially in the context of SMEs operating in capital good sectors.

Given this context, the present paper, which stems from a research project (T-REX) funded by the European Commission that addresses the development of service-oriented business models in the domains of machinery, automation and transportation, aims to:

- briefly analyse the current level of adoption of service-oriented business model in capital goods sector;
- design a business model framework that can be suited to analyse the evolving of the offering from product to service in the journey towards servitization;
- review the classical PSS typology, defining different PSS types using building blocks and variables outlined in the new business model framework.

The paper is structured as follows: section 2 provides a brief explanation of the methodology adopted, Section 3 reports a summary of the main findings of a survey that has been carried out in the earliest phase of the project, and used to better understand the actual business models configuration in the target sectors. The new PSS typology is introduced in section 4 while conclusive remarks and directions for future research are drawn in section 5.

## 2. Methodology

In order to analyse the current development and adoption of service-oriented business models, an explorative survey was carried out on European companies operating in the three industry sectors addressed by the T-REX project (machinery, automation, and transportation). In fact, survey research is usual in the early research stages of a phenomenon, when the objective is to gain preliminary insights on a topic [18]. As the literature has not quite scrutinized the issues about adoption of service-oriented business model in SMEs operating in capital goods sectors, in the survey the respondents were allowed to add further items to improve the answers. Aiming at making data collection and analysis of the results more interpretable, the survey has been designed on the base of a business model framework (Fig. 1) grounded on the business model Canvas developed by Osterwalder and Pigneur since the early 2000s [19-21].

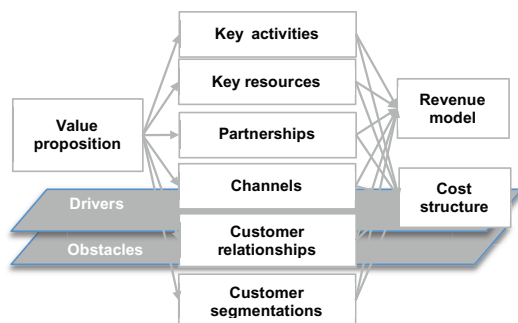


Fig. 1. Business model framework

According to the authors, the business model Canvas is a well-defined concept that allows the company easily to describe and manipulate business models to create new strategic alternatives. The model is constituted by nine elements (building blocks) that are: Customer segments (i.e. groups of people or organizations a company aims to reach and serve), Value propositions (i.e. products and services that create value for a specific customer segment), Channels (i.e. company's interface with its customers), Customer

relationships (i.e. types of relationships a company establishes and maintains with specific customer segments), Revenue streams (i.e. revenue a company generates from each customer segment), Key resources (i.e. assets required to offer and deliver the aforementioned elements), Key activities (i.e. activities involved in offering and delivering the aforementioned elements), Key partners (i.e. network of suppliers and partners that support the business model execution) and Cost structure (i.e. costs incurred when operating a business model). This model has been applied and tested in organizations all over the world, such as IBM, Deloitte, Ericsson, and many more. Nowadays the model is increasingly adopted both by practitioners as a conceptual tool that helps companies to identify, understand, design, analyse, and change their business models and by scholars, as a unit of analysis in empirical investigations.

Nevertheless, the Canvas model is not sufficient to understand the transition towards a more service-oriented business model. Therefore, the framework presented in this paper has refined the Business Model Canvas in two ways:

- through the identification, for each building block, of a set of relevant variables that can be used for analysing the configuration of each block and their service orientation. These variables have been derived from existing literature, refined thanks to research experience and validated in preliminary case studies carried out on the industrial project partners;
- with the addition of two new layers: Drivers, namely the elements that drive firms to develop a new product-service offer [22] and Obstacles, that represents the challenges that companies face in the transition “from products to services” [2; 23] (i.e. elements that slow down the adoption of new business model).

## 3. Main results

As mentioned before, in order to give an overall picture of the topic addressed in this paper, this section briefly reports the main findings of the survey carried out within the T-REX project among European companies that operate in the machinery, automation and transportation sectors. In fact, the T-REX project aims to develop and implement a new business platform whose main elements are a new service-oriented business model, an improved design of the products and a re-engineering of traditional support services for companies operating in the above-mentioned sectors.

Therefore, starting from the identification and definition of different variables related to each BM building blocks (see Section 2), 40 questions were elaborated with measurement scale and set of items specifically defined for each variable (the detailed lists of questions and items are available at the T-REX website). Slightly more than 400 firms were contacted: 95 companies, mainly medium and large (Micro 6%, Small 19%, Medium 29%, Large 43%) that operates in Italy (49%) and Germany (32%), responded to the survey. The survey has also received 17 answers from Spain and 1 answer from Finland. Responding companies mainly operate in the Machinery sector (64); the remaining answers are in the Automation (15) (i.e. robot manufacturers and system

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