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Changes in the intellectual basis of servitization research: A dynamic analysis

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ABSTRACT

The aim of this paper is to identify the changes in the intellectual structure of research on servitization between 1980 and 2015 by using a proven methodology such as bibliometric technique. The results show that the provision of services in any organization is taking on greater strategic importance. This paper contributes to understand how this topic has evolved thus completing the investigation carried out by other authors. It also highlights the research lines that have been developed until now and the future directions for servitization research.

1. Introduction

Servitization is the process of increasing value by adding services to products (Vandermerwe and Rada, 1988). It is a means of creating value added capabilities that are distinctive and sustainable in comparison with those of competitors (Baines et al., 2009). The process of servitization is the innovative development of an organization's capabilities in the sense that rather than merely offering products it can provide customers with complete product-service systems (Neely, 2008; Visnjic Kastalli and Van Looy, 2013). Competing strategically through the provision of services is becoming a distinctive feature of innovative manufacturing firms (Lightfoot et al., 2013). The provision of products into which services have been integrated is the means adopted by many enterprises to differentiate themselves from their competitors and obtain a competitive advantage. There is consequently a growing interest in the role these services play in maintaining the competitiveness of manufacturing companies, and this has led to the appearance of a series of research works analyzing the academic literature, with the intention of evaluating the state of the art, identifying the advances made, and proposing future research agendas (Cavalieri and Pezzotta, 2012; Beuren et al., 2013; Bustinza et al., 2017a,b).

It may be posited that as a discipline advances, thanks to the contribution made by researchers proposing original theories and novel concepts, academics commonly examine the state-of-the-art through literature reviews, seeking to understand the impact that specific contributions have made to the subject. Hence it is no surprise that several literature reviews have been published, to which we shall refer in due course, designed to identify and analyze the main research streams in servitization. These reviews have adopted a qualitative approach. In other words, the studies that analyze each one of the literature reviews have been chosen based on the expert knowledge and critical judgement of the scholars conducting the review.

Specifically, Baines et al. (2007); Beuren et al. (2013) and Sakao et al. (2009) examine how the literature characterizes the concept of product-service systems (PSS) in terms of scope and content. Baines et al. (2009) classify the studies on servitization and

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hybrid value creation (respectively) according to the key themes they address. Similarly, [Lightfoot et al. \(2013\)](#), identify the themes that are of greater interest for different research communities involved in servitization-related studies.

Beyond previous reviews on the state of the art in servitization, [Baines et al. \(2017\)](#) develop a plan for practitioners seeking to servitize. For this, they review the literature to identify what has been published. Databases were identified to cover the broad range of relevant research communities comprehensively (these included Scopus, Web of Science, among other). Then they used a simple grading system to rank papers according to the extent to which they address servitization, and associated topics of PSS and advanced services. Identify 232 articles.

[Brax and Visintin \(2017\)](#) focus on the path or process by which manufacturing companies transition to service business. (p. 20) “the main goal was to identify original patterns of servitization-related organizational < transition >”. To this end, they review the literature to identify what has been published on the subject. For this they analyzed all major article databases (Ebsco, Emerald, ProQuest, Sage, Science Direct, Springer and Taylor & Francis) in February 2015. The first coding round focused on identifying servitization related content, possible transition patterns, requirements for servitization and ‘in servitizing’, and different configurations of offerings such as integrated solutions. 154 articles, according to the authors' opinion, provided an original model of servitization as organizational transition were thus identified as the ‘core articles’ in the data-set. The work maps most of the models and examples that have appeared in the scientific literature.

Few authors have incorporated other novel approaches to literature reviews as [Luoto et al. \(2017\)](#) or [Rabetino et al. \(2017\)](#).

[Martín-Peña et al. \(2017\)](#) identify the studies and disciplines that have had the greatest impact on servitization among manufacturing firms, with a view to illustrating the intellectual structure of this discipline. This article is based on bibliometric techniques of citations and co-citations. As it can be seen, all reviews of literature – whether qualitative or quantitative – begin by identifying what is published on the subject under analysis. In reviews of the literature in which qualitative methods are used, it is the researcher who determines the relevance of each document unlike what happens in a bibliometric analysis of cities and co-cities in which the relevance or influence of a document is determined from the analysis of co-citation.

In short, only one study has been published that uses bibliometric analyses ([Martín-Peña et al., 2017](#)), in which a future line of research involves the need to analyze the intellectual structure of servitization from a dynamic perspective. With the exception of [Kowalkowski et al. \(2017\)](#) that analyze the evolution of the research on service growth, but without using bibliometric techniques.

In order to cover this gap, the aim here is to identify the changes that happened in the intellectual structure of research on servitization. With this purpose in mind, we have studied the evolution of the literature on servitization using bibliometric techniques. The bibliometric techniques used in this paper are known as citation and co-citation analysis. This paper therefore complements prior reviews. In this study, we gain a better understanding of the nature and evolution of extant servitization-related research thanks to the use of bibliometric techniques.

Bibliometric analysis applies a set of quantitative methodologies based on statistical analytical techniques and social network techniques, considering an analysis of the co-citations made in scientific articles. The analysis of co-citations is an effective methodology for the detailed mapping of the relationships between the core ideas of a particular scientific domain, and also serves to identify the scientific articles that are fundamental to the respective scientific field ([Ferreira et al., 2016](#)). Citation and co-citation analysis are based on the premise that authors cite documents they consider to be important in the development of their research. Therefore, frequently cited documents are likely to have exerted a greater influence on the discipline than those less frequently cited. The consensus in the previous literature, apparent in the structure of co-citations, permits identifying what has been referred to as a discipline's knowledge base or intellectual structure. An analysis of co-citations reveals a discipline's intellectual structure in an objective manner, as it allows empirical verification and replication.

In sum, this paper contributes to servitization literature in a number of ways. First, we identify four subperiods, identifying in each one the main clusters of servitization. This can help servitization scholars become more aware of the sub-fields of research and encourage more collaboration between researchers. Second, a study is made of the changes that have taken place in the paradigms that have informed the research on servitization over time. Third, the study aims to establish future research directions for servitization. This should provide some fresh insight and contribute further understanding about servitization research. Finally, this work contributes by filling a gap in the literature with the intention of providing a robust review and synthesis of the previous literature on servitization.

This work is structured in three sections, the first section provides a description of the methodology used, with the aim being to identify the most influential documents and their evolution over time by means of an analysis of cites and co-citations. The second section presents the results of an empirical study and its discussion. Finally, the conclusions, limitations, and future lines of research are covered in the last section.

2. Research methodology

The procedure followed to develop this analysis consists of four steps: i) identification of the scientific studies published on servitization in the period analyzed; these documents comprise the so-called citing sample, ii) establishment of the subperiods of analysis, iii) identification of the intellectual structure of each subperiod, and iv) analysis of the intellectual structure's changes in influence on servitization.

Once the scientific studies on servitization have been identified and the subperiods of analysis established, the next step involves using the articles published in each stage to study the bibliographical references that the articles cite through an analysis of co-citations. The analysis of co-citations has been one of the more widely used bibliometric methods in recent decades when presenting the intellectual structure of a field of research ([Sánchez-Riofrío et al., 2015](#)). Furthermore, the analysis of social networks has enabled

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