Chapter 23
Bibliometric Analysis of Supply Chain Digitalization

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ABSTRACT

"Digital transformation" or "digitalization" is a rapidly evolving concept that is gaining popularity in various different disciplines and highlighting a wealth of ideas, theoretical anchors, and research directions. In the present chapter, the authors try to understand the structure underlying research on supply chain digitization, the topics investigated which need more attention, how the existing literature could be classified, and how the discipline could be advanced. Using a bibliometric approach, this chapter analyzes 638 articles published between 1995 and 2020. The authors use VosWier to analyze the mapping information and Alceste for a detailed lexical analysis. The analyses reveal the main trends in supply chain digitalization and suggest an agenda for future research that includes a systemic approach to the analysis of digitalization, supply chain digitalization to create new strategic value, and digitalization as a dynamic capability.

INTRODUCTION

The growth of e-commerce has disrupted the transport and logistics sectors and reshaped the competitive environment. For multinational companies such as the e-commerce giant Amazon became a credible competitor when it began offering logistics services to its customers. Through the vertical integration of all its logistics activities and the size of its operations, Amazon is threatening the positions of established players and of its current logistics partners including USPS, FedEx, and UPS (Cheng, 2019). From a different perspective, the most promising start-ups are using algorithms and new transport optimization

technologies to enhance their responsiveness and flexibility to offer innovative solutions to prospective customers, threatening incumbents' actual services. For all companies, the strength of an effective supply chain lies in its responsiveness and flexibility in all circumstances. Thanks to the development of information systems and information technologies, supply chain coordination has rapidly improved, impacting the extended supply chain which encompasses all suppliers and partners involved in production and distribution of goods. The digitalization of supply chains resulted in the optimization of products, costs, logistics, and deadlines and increased, in the end, the overall customer satisfaction (Mentzer et al., 2001). So, the digitalization of supply chain confers a competitive advantage, a differentiation, on which companies rely to be more competitive and more resilient, especially during pandemics periods.

As a result of this competitive advantage due to the digitalization of the supply chain, consumers, governments, and stakeholders expect companies to be socially, environmentally, and economically transparent (Chen and Paulraj, 2004; Manavalan and Jayakrishna, 2019). For practitioners "The digital supply chain enables the strategic supply chain transformations through design process optimization, product optimization, planning & inventory efficiency, risk management, supplier collaboration, operational efficiency, logistics optimization, sales optimization and after sales service" (Ageron et al., 2020). Today supply chain success is therefore tightly related to an effective information exchange capable to provide supply chain actors with the necessary information, traceability, and visibility.

While the role of information technologies in supply chains is a traditional theme in literature, the spree of innovation of recent years has increased the interest for both academics and practitioners in supply chain digitalization. The aim of the present chapter is to present a state-of-the-art review of supply chain digitalization literature. To achieve this, we conducted an extensive bibliometric analysis of the literature and addressed the following research questions:

Q1: How is academic research on supply chain digitalization structured?
Q2: What are the main topics dealt with in the existing literature?
Q3: What are the relevant issues which have yet to be discussed?

The chapter is organized as follows. The background section covers the digital revolution in supply chain operations insisting on its complexity. The section "Main focus of the chapter" describes the bibliometric analysis, the research protocol, and the results (based on linguistic analysis of keywords, paper titles and abstracts). Three complementary aspects of supply chain digitalization are identified and discussed: 1) the artificial intelligence and supply chain optimization techniques, 2) the role of big data, and 3) smart manufacturing digital technologies. The "Solutions and recommendations" section presents three trends in supply chain digitalization emerging from the literature and identified by the cluster analysis: 1) the artificial intelligence to improve quality and efficiency of supply chain management, improve human decision-making processes, and increase productivity, 2) digitization, digitalization and big data are the drivers of supply chain agility and business resilience to risk, and 3) industry 4.0 technologies are enabling smart manufacturing in a global context. The "Future research directions" section proposes three directions for future research: 1) a systemic approach to analysis of supply chain digitalization, 2) digitalization leads to a rethinking of performance and 3) beyond innovative digitalization technologies, dynamic capabilities are at the core of performance and a systemic approach. Then, we conclude this chapter in the last section.

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