Chapter 8
Digital Supply Chain Insights From Large Factories: How Intercollaborations Accelerate Digitalization

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ABSTRACT

In today's digital age, many managers need to find new ways to manage collaborations where complementary partners co-create digital solutions. Collaborations with partners are at the centre of digital projects, but managing these collaborations is challenging. The research objective is to investigate how collaborations with business partners contribute to digital transformation through a qualitative investigation of Brazilian and British large manufactures that are already on their journey towards digitalization. Interviews and questionnaires and non-participant observations were collected, followed by content analysis. The findings indicate that the companies, mainly the Brazilian cases, are at the early stage of building a digital ecosystem for a more connected supply chain. The use of digital solutions in cases brings obstacles but also opportunities and advantages for supply chains in the near future. The study discussed these implementation challenges and what digital technologies are under development and already used to make the supply chain smarter and more connected.

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INTRODUCTION

The dynamic and competitive business environment in which most organizations operate requires the development of capabilities to support technological and organizational transformations. The rapidly increasing adoption of digital technologies requires collaborative R&D efforts (Rocha et al., 2021; Benitez et al., 2020; Kahle et al., 2020; Rong et al., 2015), and consequently the need to manage collaborations with complementary partners to co-create digital solutions. Collaborative partnerships are at the center of digital projects (Camarinha Matos et al., 2019), but they pose significant challenges.

The need to improve supply chain management drives companies to collaborate with suppliers, customers and other business partners, seeking gains in distribution and efficiency, expansion of product diversification, and increased manufacturing flexibility and agility (Abdalla & Nakagawa, 2021). A company's innovative capability can be advanced by such collaborations (Rocha et al., 2021), particularly due to the sharing of market intelligence that results in the expansion of its knowledge base.

The adoption of digital solutions such as IoT, Cloud Computing, Big Data & Analytics, Artificial Intelligence, and Blockchain is widely acknowledged as a powerful drive of increased efficiency and adaptability of firms. By taking advantage of digital technologies, organizations can collect data on the status of their internal and external environments, analyze and transform such data into relevant information, and disseminate it in real time, allowing better decision making. The use of these technologies allows tracking information about product origin, placing of orders, and performing transactions in a digital trust environment (Silkina, 2019). However, the mere implementation of digital technologies is not sufficient (Abdalla & Nakagawa, 2021). In a world where talent and valuable know-how are widely distributed, organizations cannot pursue innovation independently, no matter how large or capable they are (Burchardt & Maisch, 2019). Disruptive digital technologies cannot be used in isolation, demanding organizational changes that encompass not only the technological architecture, but also the strategic, managerial, and social domains (Rocha et al., 2021; Bogers et al., 2019a; Schwab, 2017), a perspective that is encompassed by the Digital Transformation (DT) concept (Nambisan et al., 2019).

The change introduced by digital technologies brings opportunities, as well as obstacles, for most enterprises. The advantages of using digital technologies to manage a supply chain are limited without including inter-collaborative innovation activities that transcend organizational borders (Rocha et al., 2022; 2021). This issue is significant as open innovation practices (Chesbrough and Bogers, 2014) are increasingly facilitating organizational digitalization. The process of supply chain digitalization allows firms to seize opportunities in unstable and agile markets, bringing potential benefits such as improved customer service, more integration with suppliers, increased sales, and greater agility and quality in deliveries (Agrawal et al., 2019).

A renewed focus on customer-centric orientation has also led to the need to engage in closer collaborations and integration in supply chains, improving efficiency, increasing transparency, adaptability, and trust. However, traditional mechanisms of supply chain management are unable to quickly identify and meet the expectations of customization of increasingly demanding end-users. A smarter and more integrated supply chain requires technological infrastructure for advanced logistics. The supply chain of the digital age needs to incorporate digital solutions to shift from traditional, simple, and linear economic relationships to adaptable and harmonized partner networks (Shcherbakov & Silkina, 2021).

Recent literature on DT has explored the application of disruptive technologies in supply chain management (Wamba et al., 2020; Frederico et al., 2019; Büyüközkan & Göçer, 2018). The extant literature has investigated the impact of disruptive technologies on supply chains, such as for IoT (Gunasekaran et