

Chapter 5

RPA Implementation and the Digitalization of Logistics Operations in the COVID–19 Era: A Case Study

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ABSTRACT

The COVID-19 pandemic has altered many organizations' operations management and accelerated the failure of those without resilient supply chains. It has greatly accelerated organizations' adoption of digital technologies and digital transformation. Digital technologies such as robotic process automation (RPA) play important roles in companies' operations-management activities and digital supply-chain transformation in the COVID-19 era. However, empirical research on RPA implementation in supply chains remains scarce. To fill this research gap, this case study was conducted to examine a global retail company's RPA implementation initiative to enhance its digital supply-chain capabilities. The authors examined three key project phases: pre-implementation, implementation, and post-implementation. They identified patterns of managerial practices and challenges related to digital technology implementation. The findings could help other organizations understand the most important issues to be addressed when seeking to implement RPA for operations activities and supply-chain processes.

DOI: 10.4018/978-1-7998-9715-6.ch005

INTRODUCTION

The COVID-19 pandemic has contributed to huge uncertainties in demand and the disruption of global supply chains (Ye, Liu, Li, Lai, Zhan, & Kumar, 2022) and, overall, organizations' operations management; key challenges include delivery delays and goods shortages (Tietze, Vimalnath, Aristodemou, & Molloy, 2020). Disaster recovery programs have been activated to stabilize organizations' processes and operations (Siderska, 2021), for instance by shifting to online business operations (Atilgan, 2020). Business continuity capability – the ability to ensure essential functions during and after a crisis, collapse, catastrophe, disaster, or pandemic – is the most important priority for organizations in the COVID-19 era (Siderska, 2021). Organizations must mitigate the negative impact of the pandemic on their operations; many have optimized their supply chains to ensure a certain amount of safety stock and the on-time delivery of goods to customers (Choi, 2021).

To build resilient supply chains, organizations strive to improve their operations efficiency by redesigning and managing their business processes. Automation is an invaluable asset in this respect. Digital technologies can support organizations' achievement of end-to-end transparency, replace employees who are absent because of COVID-19, predict potential risks across supply chains, and reduce demand uncertainties (Ivanov, Dolgui, & Sokolov, 2019). They play key roles in supporting organizations' implementation of resilient supply-chain strategies, and supply-chain digitalization is a major investment priority for numerous organizations. The most frequently cited disruptive digital technologies deployed throughout supply chains, which can enhance business operations resilience and continuity, include artificial intelligence, robotics, big data, cloud computing, virtual reality, and digital information technologies (Mbunge, Akinnuwesi, Fashoto, Metfula, & Mashwama, 2021; Nah & Siau, 2020). Automation strategies play key roles in firms' digital supply-chain transformations (Attaran, 2020), enhancing supply-chain processes and sustainability, and thereby resilience (Frederico, 2021; Paul, Moktadir, & Ahsan, 2021). Robotic process automation (RPA), an advanced digital technology, is increasingly used in the redesign, optimization, and automation of supply-chain processes (Doğuç, 2021). Supply-chain managers are leveraging technologies such as RPA to improve operations and create value for customers and resilience and sustainability in the COVID-19 environment (Doğuç, 2021; Viale & Zouari, 2020). RPA considerably reduces costs and saves time, increasing organizations' competitiveness (e.g., Viale & Zouarie, 2020). The automation of logistics processes and supply-chain management is advancing rapidly, and most operational logistics functions could be handled with nearly full autonomy by 2029 (Junge, Verhoeven, Reipert, & Mansfeld, 2019; Nitsche, 2021). Practitioner articles and consultancy white papers have documented the potential benefits of RPA in terms of opportunities for digital supply-chain and operations management and supply-chain resilience (Doğuç, 2021; Syed et al., 2020). However, few guidelines and best practices for the realization of these benefits have been established (Syed et al., 2020). Strategic issues related to RPA implementation have been discussed (Viale & Zouari, 2020), and recent publications provide examples of the requirements for and challenges stemming from the shift toward digital supply-chain management (e.g., Hennelly, Srai, Graham, & Fosso Wamba, 2019). Academic studies of the impacts of RPA adoption on organizations' processes, capabilities, and professionals remain scarce (Flechsigg, Anslinger, & Lasch, 2021).

The establishment of guidelines for successful RPA implementation across organizations is important. According to Zangiacomì, Pessot, Fornasiero, Bertetti, and Sacco (2020), the successful adoption of digital technologies and practices entails disruptive changes and far-reaching opportunities. Digitalization strategy development requires the consideration of elements such as advances at the managerial,

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