Chapter 1
Hyperautomation: The Next Frontier in Supply Chain (SC) and Manufacturing

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ABSTRACT

The integration of automation within supply chains (SC) and manufacturing has been propelled by technological advancements, with hyperautomation emerging as a transformative paradigm. This paradigm combines artificial intelligence (AI), robotic process automation (RPA), machine learning (ML), and the Internet of Things (IoT) to enhance operational efficiency. Despite its growing relevance, hyperautomation remains unexplored. Thus, this chapter examines hyperautomation

DOI: 10.4018/979-8-3373-2434-0.ch001

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through a theoretical framework, analyzing scholarly articles, industry reports, and relevant publications. It presents an understanding of hyperautomation as a pivotal technology for future SC and manufacturing systems. The findings clarify its core principles, operational workflows, and underlying mechanisms, highlighting its capacity to redefine business processes, SCM, production, and logistics. By synthesizing diverse perspectives, this study seeks to address the current knowledge gap, offering theoretical insights that advance scholarly discourse and inform future developments in SC and manufacturing automation.

INTRODUCTION

Technology has changed the pattern of logistics management and manufacturing systems by adding intelligent solutions to operations (Frikha & Hlali, 2023). The essential business functions in today's industrial sector are increasingly automated through the application of machine learning (ML), robotics, and generative AI (GenAI). In addition, the integration of data and ML has driven this development of intelligent solutions (Kusiak, 2024; Surur et al., 2025).

With the advancement of technology and AI, revolutionary approaches are reforming supply chain management (SCM) (Kumar et al., 2022). Organizations are increasingly embracing work environments that prioritize people and leverage intelligent systems (Haleem et al., 2021). This shift marks the beginning of a new phase for organizations that rely on technological innovation and automated solutions to maintain a competitive edge. By integrating automation technologies, organizations can move beyond the isolated benefits of these tools to achieve agility and scalable adaptability (Haleem et al., 2021). This integration of advanced technologies in the field of automation is referred to as “hyperautomation,” a term coined by Gartner, a research group. It underpins the autonomy of manufacturing and supply chains' (SC) by focusing on the advancement of digitization and modeling beyond traditional automation frameworks (Haleem et al., 2021; Kusiak, 2024). It enables the integration of AI and ML capabilities into automation processes via pre-built modules (Haleem et al., 2021). With the increasing complexity and globalization in SC (Chen & Hasan, 2023; Hasan et al., 2024), there is a growing demand for improved efficiency, accuracy, and resilience (Kaswan et al., 2025). Hyperautomation can address these needs by facilitating real-time data integration, predictive analytics, and intelligent decision-making.

In today’s dynamic business landscape, SC is under increasing pressure to improve adaptability and operational efficiency (Hasan et al., 2025). Industry forecasts indicate that by 2026, approximately 30% of enterprises will automate more than half of their network-related processes, a sharp rise from under 10% recorded in

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