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## Impact on Artificial Intelligence on Business Operation in Supply Chain Management

**Safeela Nasmin Kv**

Assistant Professor, KMCT Arts and Science college Chathamangalam,  
Nitec, Calicut, Kerala, Email: nazminazr29@gmail.com

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### ARTICLE DETAILS

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### ABSTRACT

Artificial Intelligence (AI) is transforming supply chain management (SCM) by optimizing business operations, enhancing efficiency, and enabling data-driven decision making. This article explores the growing integration of AI technologies – such as machine learning, predictive analytics, and robotics-into various stages of supply chain, including procurement, inventory management, logistics, and customer service. AI facilitates real time visibility, demand forecasting, and risk mitigation, leading to cost reduction and improved service levels. By automating routine tasks and uncovering hidden patterns in complex datasets, AI empowers business to respond swiftly to market fluctuations and disruptions. This paper also addresses the challenges of implementation, such as data quality, integration complexity, and ethical considerations.

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### Introduction

Artificial Intelligence (AI) has the potential to revolutionize various aspects of business operations. AI can be used to analyze data and make predictions about demand, optimize logistics and transportation routes, and identify inefficiencies in the supply chain. This can lead to improved responsiveness to changes in demand, reduced lead times, and lower costs. This paper reviews and analyzes the applications of AI in supply chain management (SCM) using the Scopus database (Baha M. Mohsen). Moreover, the study assesses challenges faced during the AI adoption process, such as data quality, infrastructure requirements, and employee training, as well as the future potential of AI to further



transform the supply chain (Kalpana Devram Lanjewar, et al.) This article presents a systematic literature review (SLR) of empirical studies concerning Artificial Intelligence (AI) in the field of Supply Chain Management (SCM). Over the past decade, technologies belonging to AI have developed rapidly, reaching a sufficient level of maturity to catalyze transformative changes in business and society. Within the SCM community, there are high expectations about disruptive impacts on current practices. However, this is not the first instance where AI has sparked business excitement, often falling short of the hype. It is thus important to examine both opportunities and challenges emerging from its actual implementation. (Giovanna Culot et al.).

**Introduction** In the era of digital transformation, Artificial Intelligence (AI) has emerged as a game-changer for businesses across industries. Organizations are leveraging AI-driven solutions to enhance operational efficiency, optimize decision-making, and improve supply chain management. AI technologies, such as machine learning, predictive analytics, and robotic process automation, enable businesses to streamline workflows, reduce operational costs, and improve accuracy in demand forecasting (Irshad Ullah Asim Mohammed et al.)

### **Features of Artificial intelligence in supply chain management**

According to Shankha Shubhra Goswami, et al, the potential of Artificial Intelligence (AI)-enabled supply chain management (SCM) as a groundbreaking technology capable of revolutionizing supply chain operations and ushering in a new era of possibilities. In today's dynamic business landscape, where agility and efficiency are paramount, AI plays a pivotal role in redefining how supply chains operate. The journey commences with an in-depth exploration of AI's fundamental concepts and its manifold applications within SCM, shedding light on its adaptability across various aspects of the supply chain, from demand forecasting to inventory optimization. Moreover, this paper illuminates the myriad benefits that AI brings to SCM practitioners. These advantages encompass heightened operational efficiency through real-time data analysis, cost reduction through predictive maintenance and optimized routing and a superior customer experience resulting from improved demand prediction and personalized service offerings. However, acknowledging the transformative power of AI in SCM, we must also acknowledge the hurdles in its implementation. To address the current scientific gap of AI in SCM, this study aimed to determine the current and potential AI techniques that can enhance both the study and practice of SCM. Gaps in the literature that need to be addressed through scientific research were also identified. More specifically, the following four aspects were covered: (1) the most prevalent AI techniques in SCM; (2) the potential AI techniques for employment in SCM; (3) the current AI-improved SCM subfields; and (4) the subfields that have high potential to be enhanced by AI. A



specific set of inclusion and exclusion criteria are used to identify and examine papers from four SCM fields: logistics, marketing, supply chain and production. This paper provides insights through systematic analysis and synthesis (Reza Toorajipour, et al.)

### **Impacts of Artificial Intelligence on business operations in supply chain management**

Artificial intelligence (AI) is increasingly considered a source of competitive advantage in operations and supply chain management (OSCM). However, many organizations still struggle to adopt it successfully and empirical studies providing clear indications are scarce in the literature. This research aims to shed light on how AI applications can support OSCM processes and to identify benefits and barriers to their implementation (Violetta Giada Cannas ,et al.).

The impact of artificial intelligence (AI) on supply chain management, focusing on enhancing demand forecasting, operational efficiency, and customer satisfaction, while also managing costs and streamlining logistics operations. The adoption of AI in supply chains offers significant opportunities to improve service delivery and operational capabilities, which are crucial for maintaining competitiveness in the rapidly evolving business landscape. The study underscores the importance of AI technologies in reshaping supply chain dynamics by providing a comprehensive analysis of both the benefits and challenges associated with its implementation. Key benefits highlighted include the optimization of inventory management, enhanced accuracy of demand forecasting, reduced operational costs, and improved customer service. These enhancements are pivotal in achieving a competitive edge and adapting to changing market demands. However, the integration of AI into supply chains is not devoid of challenges. The paper identifies critical obstacles such as the need for significant cultural shifts within organizations, data security concerns, and the complexities of navigating legal and regulatory frameworks. These challenges require strategic management to ensure successful AI adoption and to mitigate associated risks. The research includes case studies of Arab companies that have integrated AI into their supply chains, offering practical insights into the real-world application of these technologies (Mohamed Kamal Aldin Ismaeil).

### **Methodology**

In this study systematic literature review (SLR) of empirical studies concerning Artificial Intelligence (AI) in the field of Supply Chain Management (SCM). Over the past decade, technologies belonging to AI have developed rapidly, reaching a sufficient level of maturity to



catalyze transformative changes in business and society (Giovanna Culot, et al.,). This can lead to improved responsiveness to changes in demand, reduced lead times, and lower costs. This paper reviews and analyzes the applications of AI in supply chain management (SCM) using the Scopus database (Baha M. Mohsen). The systematic and descriptive review of the literature and identifies the various AI and ML methods applied in different phases related to SCRM. Also, it investigates the different categories of SC risks and the existing articles based on the AI technique used. This analysis focuses on research articles related to SCRM from three scientific databases published between 2010 and 2021 for detailed study (A. Deiva Ganesh et al.,). . As industries progress, the need to incorporate AI technologies that improve decision-making and operational resilience while ensuring sustainable practices becomes increasingly critical. This systematic review aims to explore how AI is transforming SCM through these industrial transitions (Alexander Samuels).

### **Analysis**

The study underscores the importance of AI technologies in reshaping supply chain dynamics by providing a comprehensive analysis of both the benefits and challenges associated with its implementation. Key benefits highlighted include the optimization of inventory management, enhanced accuracy of demand forecasting, reduced operational costs, and improved customer service. These challenges require strategic management to ensure successful AI adoption and to mitigate associated risks. The research includes case studies of Arab companies that have integrated AI into their supply chains, offering practical insights into the real-world application of these technologies. (Mohamed Kamal Aldin Ismaeil). Artificial Intelligence (AI) has the potential to revolutionize various aspects of business operations. AI can be used to analyze data and make predictions about demand, optimize logistics and transportation routes, and identify inefficiencies in the supply chain. This can lead to improved responsiveness to changes in demand, reduced lead times, and lower costs. This paper reviews and analyzes the applications of AI in supply chain management (SCM) using the Scopus database. The objective is to address the current research gap of AI's impact on the performance of SCM, determining the AI techniques that can enhance the performance of SCM, the SCM subfields that have high potential to be enhanced by AI, the impact of AI application on the performance of SCM, and how the performance can be described in agile-lean perspective (Baha M. Mohsen). It is thus important to examine both opportunities and challenges emerging from its actual implementation. Our analysis clarifies the current technological approaches and application areas, while expounding research themes around four key categories: data and system requirements, technology deployment



processes, (inter)organizational integration, and performance implications. We also present the contextual factors identified in the literature. This review lays a solid foundation for future research on AI in SCM. By exclusively considering empirical contributions, our analysis minimizes the current buzz and underscores relevant opportunities for future studies intersecting AI, organizations, and supply chains (SCs). Our effort is also meant to consolidate existing research insights for a managerial audience (Giovanna Culot, et al.). The dawn of generative artificial intelligence (AI) has the potential to transform logistics and supply chain management radically. However, this promising innovation is met with a scholarly discourse grappling with an interplay between the promising capabilities and potential drawbacks. This conversation frequently includes dystopian forecasts of mass unemployment and detrimental repercussions concerning academic research integrity. Despite the current hype, existing research exploring the intersection between AI and the logistics and supply chain management (L&SCM) sector remains limited. Therefore, this editorial seeks to fill this void, synthesizing the potential applications of AI within the L&SCM domain alongside an analysis of the implementation challenges. In doing so, we propose a robust research framework as a primer and roadmap for future research. This will give researchers and organizations comprehensive insights and strategies to navigate the complex yet promising landscape of AI integration within the L&SCM domain (Soumya Deb Chowdhury, et al.).

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