Chapter 12
Artificial Intelligence and the Future of Supply Chains:
A Crossroads of Innovation and Disruption

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ABSTRACT

The supply chain is a complex and dynamic field that requires effective planning, coordination, and execution to meet customer demands while minimizing costs. In recent years, artificial intelligence (AI) has emerged as a disruptive technology with the potential to transform various aspects of supply chain management. This chapter provides a comprehensive analysis of the role played by AI in supply chain management, highlighting its applications, benefits, challenges, and future prospects. This chapter explains how AI can improve supply chain visibility, demand forecasting, inventory management, logistics optimization, and risk mitigation. In addition, it explores the impact of AI on decision-making processes and collaboration within the supply chain network. The chapter also discusses the potential challenges and ethical considerations associated with the adoption of AI in supply chain management. By taking a deep dive into the current state of AI in Supply Chain and analyzing its potential future developments, this chapter aims to provide valuable insights.

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1. INTRODUCTION

Ensuring the efficient flow of goods and services from suppliers to customers, Supply Chain Management (SCM) plays a crucial role in the success of businesses. Artificial intelligence (AI) is a disruptive force that has garnered a lot of attention due to rapid improvements in technology. Artificial intelligence (AI) is the advancement of human intelligence in computer systems that can process and understand huge amounts of data, recognize patterns, and make sound judgments. Traditional supply chain processes could be transformed by incorporating AI, which would also improve operational performance, profitability, and customer satisfaction. Organizations can use AI technologies to improve decision-making across the supply chain, optimize logistics operations, and extract useful insights from large and complex data sets.

This chapter aims to explore the role played by AI in GCS. It will look at various applications of AI in different aspects of the supply chain, including demand forecasting, inventory management, logistics optimization, supplier selection, and risk management. By examining case studies and real-world examples, this work will present the practical implementation of AI in SCM and highlight its impact on supply chain performance. In addition, this work will shed light on the benefits and challenges associated with integrating AI into SCM processes. While AI offers immense potential, organizations must also address challenges related to data quality and integration, address organizational and cultural barriers, and ensure ethical and responsible use of AI technologies.

This chapter will not only give an in-depth understanding of the state of AI in SCM today, but it will also review current trends and potential future developments. It will examine how supply chain operations can be improved by combining AI with other cutting-edge technologies like the Internet of Things (IoT) and blockchain. In addition, the work will discuss the importance of ethical considerations and responsible AI practices in GCS and highlight the potential of predictive and prescriptive analytics to shape the future of information chain management. Companies can successfully use this revolutionary technology to optimize their supply chain operations, reduce costs, improve customer satisfaction, and gain a competitive advantage in a rapidly changing business environment by gaining insights into the role of AI in supply chain management.

2. CONTEXT AND POSITIONING

In the context of the modern supply chain, companies are facing increasing challenges in operations management, decision-making, and process optimization. The globalization of markets, the expansion of e-commerce, consumer expectations for