Chapter 14
Enhancing Supply Chain Efficiency and Decision-Making With Cloud-Based Predictive Analytics

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ABSTRACT

This chapter explores how cloud-based predictive analytics is transforming supply chain management by improving efficiency, accuracy in demand forecasting, and strategic decision-making. It discusses the benefits of integrating cloud computing with advanced analytics to enhance real-time data visibility, streamline operations, and enable proactive decision-making across the supply chain. Through detailed use cases, the chapter explains the practical applications of predictive and prescriptive analytics for optimizing inventory levels, forecasting demand fluctuations, and mitigating risks. The chapter highlighting the increasing significance of artificial intelligence, IoT integration, and edge computing

INTRODUCTION TO CLOUD-BASED PREDICTIVE ANALYTICS IN SUPPLY CHAINS

In an era characterized by rapid technological progress and global market instability, supply networks have grown more intricate and dynamic. Organizations increasingly face the challenge of sustaining efficiency, robustness, and agility while overseeing extensive data created throughout their supply chain networks. In this

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environment, cloud-based predictive analytics has become a vital tool, allowing firms to make data-informed decisions, anticipate interruptions, and enhance operations in real time. Cloud-based predictive analytics utilize advanced algorithms and cloud computing to analyse large datasets, providing insights for supply chain managers to improve demand forecasting, inventory management, supplier performance, and logistics planning. A primary benefit of implementing cloud-based solutions is scalability. Cloud platforms provide nearly limitless storage and computational capacity, allowing enterprises to effortlessly expand their analytical capabilities. Moreover, cloud-based technologies enhance interorganizational cooperation by enabling stakeholders to access and exchange insights in real time from any global location. This chapter examines the significance, core uses, and influence of cloud-based predictive analytics in supply chains. It examines how firms utilize predictive models to forecast demand variations, reduce interruptions, and enhance resource allocation. Furthermore, the chapter focuses on real-life case studies and success stories that show how businesses are using these tools to gain a competitive edge and effectively deal with major supply chain issues. By the conclusion of this chapter, readers will possess a thorough comprehension of how cloud-based predictive analytics is transforming supply chain management, enhancing efficiency, and cultivating resilience in a progressively uncertain company landscape.

Overview of predictive analytics and cloud computing

Predictive analytics is a powerful data-driven method that uses past data, machine learning algorithms, and advanced computing power to predict future demand patterns, find potential supply chain disruptions, and make better operational decisions across many parts of the supply chain (Seyedan & Mafakheri, 2020). By applying advanced techniques from statistics, data mining, and machine learning, organizations can extract meaningful patterns from their supply chain data. This capability enables businesses to make more informed decisions, optimize operations, and improve overall supply chain performance. The fundamental elements of predictive analytics include data gathering, data preprocessing, model construction, validation, and deployment. Data is collected from several sources, including previous sales records, supplier information, and market trends. We construct predictive models using techniques like regression analysis, decision trees, and neural networks after cleaning and preprocessing the data. These models are subsequently tested for precision and implemented to produce actionable insights. As supply chains increase in complexity, the significance of predictive analytics will intensify. Organizations that proficiently employ predictive analytics will be more adept at managing unpredictability, minimizing operating expenses, and improving overall supply chain efficacy. On the other hand, cloud computing means the supply of computing