Chapter 1
Applications of Artificial Intelligence (AI) Across Diverse Functional Areas in Supply Chain Management (SCM)

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ABSTRACT

This study examines the wide-ranging uses of artificial intelligence (AI) in many functional areas within supply chain management (SCM), providing insight into its significant impact on transformation. AI transforms operations in the supply chain, improving efficiency and resilience by implementing demand forecasting and logistics optimization. The present aims to study the application of artificial intelligence in the various functional areas of supply chain management. As per the convenience

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sampling method, the data are collected through structured questionnaire from 128 individuals who are the part of operational areas of supply chain management in Bangalore city. The collected data are analysed with descriptive statistics, ANOVA and regression. Finally, this study concludes that there is a positive effect of inventory management and control material and purchase management, demand estimation, order picking process, customer relationship management, transport network modelling on operational performance of supply chain management.

INTRODUCTION

Artificial Intelligence (AI) is revolutionizing Supply Chain Management (SCM) by improving efficiency, precision, and agility across several operational domains. AI utilizes previous data and market patterns to forecast future demand, aiding in the optimization of inventory levels and the mitigation of stockouts in demand forecasting and planning. AI-powered inventory management systems continuously monitor stock levels in real-time, automatically placing orders for supplies to ensure ideal levels and minimize the costs associated with carrying inventory. AI enhances supplier selection and procurement procedures by assessing supplier performance and automating repetitive chores, resulting in improved terms and more efficient operations. AI enhances production planning by utilizing demand estimates and resource availability to optimize schedules, resulting in less downtime and costs. AI's route optimization and load management enhance logistics and transportation by ensuring punctual delivery and minimizing fuel use. AI-powered robotics significantly improve warehouse operations by efficiently performing tasks such as picking and packing with better precision and speed. Artificial Intelligence (AI) enhances risk management by accurately forecasting and minimizing potential disruptions in the supply chain. AI chatbots enhance customer service by providing real-time order updates and efficiently handling inquiries, hence improving customer happiness. Artificial intelligence (AI) helps the maintenance of quality control by continuously monitoring and analyzing production processes in order to accurately detect and identify any defects or flaws. In addition, AI aids in monitoring the environmental consequences and adherence to regulations, so fostering sustainability. In general, the incorporation of AI into supply chain management (SCM) leads to substantial enhancements in efficiency, cost reduction, and customer satisfaction.

Artificial Intelligence (AI) is a powerful force that is transforming the old methods and providing creative solutions in the ever-changing field of Supply Chain Management (SCM). AI applications are transforming operations, enhancing efficiency, and promoting resilience in several functional areas within supply chain management (SCM). Artificial Intelligence (AI) has revolutionized Supply Chain