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Supply Chain Data Quality in the Age of Ai

Taeho Park*San Jose State University, the United States*

Abstract

The success of global business operations increasingly hinges on efficient and resilient supply chains. High-quality supply chain data is paramount for effective decision-making in both supply chain execution and risk management, a fact consistently emphasized in supply chain management literature. The exponential growth of data within supply chain functions in the business presents both significant opportunities and complex challenges for supply chain managers. Traditional data management approaches, relying on structured databases, relatively limited supply chain data, enterprise resource planning systems, and manual analysis, are struggling to cope with the sheer volume, variety, and velocity of modern supply chain big data. Meanwhile, artificial intelligence (AI) techniques have emerged as powerful tools for extracting actionable insights from complex data environments, with Generative AI representing the cutting edge of this technological evolution. Previous research highlights that Generative AI can significantly enhance key supply chain functions, yet its benefits are often accompanied by challenges, particularly concerning data quality. This research investigates the evolution of data quality in supply chain operations, contrasting traditional data management methods with emerging AI and Generative AI approaches. Our findings indicate that traditional methods offer stability but lack the adaptability required for volatile market conditions. Conversely, while Generative AI models provide unprecedented capabilities in improving data quality, they introduce new challenges related to transparency and context-awareness.

Keywords: Big Data; Challenges; Evolution; Generative Ai; Operations