

Artificial Intelligence in Supply Chain Management: A Bibliometric, Scientometric, and Semantic Analysis of Intellectual Foundations, and Future Research Directions

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Abstract

Artificial intelligence (AI) is increasingly transforming supply-chain planning, procurement, logistics, and risk management amid growing volatility, sustainability pressures, and data intensity. However, prior research remains fragmented across algorithmic, operational, and organizational perspectives, limiting an integrated understanding of the field's intellectual foundations, conceptual evolution, and future research opportunities. This study maps the scientific and thematic structure of managerial and organizational research on AI use in supply-chain management. Records retrieved from Scopus and Web of Science were normalized, deduplicated through DOI and fuzzy-title matching, screened using two automated title–abstract classifiers, and enriched with OpenAlex metadata. The final corpus comprises 5,088 publications from 1986 to 2026. Bibliometric and scientometric performance indicators, collaboration analysis, co-citation, bibliographic coupling, keyword co-occurrence, and non-negative matrix factorization were combined to examine the field. Scientific output grew rapidly between 2004 and 2025, reaching 1,342 publications in 2025. Research has shifted from demand forecasting, inventory control, and supplier selection toward resilience, sustainability, organizational performance, interorganizational coordination, and AI-supported decision-making. By integrating bibliometric, scientometric, and semantic evidence, the study identifies persistent knowledge gaps and provides a framework for future research on AI adoption, organizational capabilities, data governance, human–algorithm interaction, value creation, and supply-chain performance across contemporary, digitally enabled supply-chain management contexts.

Keywords

Artificial intelligence, Supply chain management, Bibliometric analysis, Scientometric analysis, Science mapping, Semantic analysis, Topic modeling.