

# The Application of Blockchain in Supply Chain Management : Knowledge Mapping Analysis Based on Citespace

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**Abstract:** *This study examines the present scholarly research on blockchain technology in supply chain management. The primary purpose of this working paper is to visualize and perform a scientometric review of 468 publications and research published between 2007 and 2021 from the Web of Science database. Co-author analysis, co-word analysis, and co-citation analysis highlight main concepts and research hotspots and provide light on important specializations and developing trends. This study primarily uses Citespace5.8. R1 to conduct a systematic analysis of author collaboration networks, keyword co-occurrence networks, keyword clustering, keyword burstiness, and literature co-citation graph spectrum networks in the domain of blockchain in supply chain management to identify the research state, development trend, hotspots, and frontiers. Research shows that :(1) since 2017, the literature on the application of blockchain in supply chain management has expanded rapidly. China and the United States are particularly advanced in this area compared to other nations. (2) The "blockchain in supply chain management" research mainly focuses on technical framework theory, which uses distributed ledger technology and smart contracts to control supply chain operations. Simultaneously, technical innovation should be combined with artificial intelligence, the Internet of Things, and other technologies to enhance the trust, transparency, traceability, performance index, and security of the supply chain. (3) The horizon of study in this area is the integration of RFID and blockchain technology for technical innovation in Industry 4.0, intending to improve and optimize each supply chain node.*

**Keywords:** Blockchain; Supply Chain Management; Current status; Hotspots; Knowledge mapping; CiteSpace

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## 1. Introduction

A supply chain consists of at least three entities involved downstream and upstream movement of commodities, services, finances, and/or information from a source to a customer (Mentzer et al., 2001). It includes producers of finished goods, assemblers of those

products, distributors, retailers, transportation firms, and other cooperating businesses. Additionally, as globalization accelerates, businesses are increasingly likely to look for partners worldwide, necessitating a more flexible approach to material flow coordination. Supply chain complexity brings tremendous challenges to supply chain management (Shakhbulatov et al., 2020).

Supply chains are becoming more intricate, extensive, and international (Abeyratne & Monfared, 2016). As a result, several hazards are associated with contemporary supply chain management, including the risks associated with material flow, financial flow, and flow of information (Tang & Musa, 2011). The opacity of information, the difficulty of traceability, and the distrust among participants have all become considerable risks in supply chain management (Abeyratne & Monfared, 2016). Therefore, avoiding these risks and achieving information transparency, data traceability, and transaction security have become critical in supply chain management. Businesses and academics have undertaken numerous investigations and efforts, and blockchain technology is one of them.

S. Nakamoto coined the term "blockchain" in 2008 (Nakamoto, 2008). Blockchain technology is a distributed ledger (Shakhbulatov et al., 2020) that incorporates many unique attributes, including a decentralized organization, distributed notation and storage system, consensus algorithm, intelligent contracts, and asymmetric encryption, to provide information security, accessibility, and transparency (Dutta et al., 2020). Based on the features of blockchain, it is clear that it will improve supply chain management and performance, mainly through cost reduction and increased customer satisfaction, as well as an increased exchange due to increased confidence in the supply chain (Dujak & Sajter, 2019).

Blockchain develops a more significant and pervasive presence in supply chain management and expands relevance. There are numerous ways in which blockchain could impact operations and supply chain management, including increasing product safe and secure environment, enhancing quality control, reducing the incidence of illegal counterfeiting, advancing inventory control and replenishment, eliminating the need for intermediaries, influencing the design and development of new products, and reducing the cost of supply chain transactions (Cole et al., 2019; Dutta et al., 2020).

From a research standpoint, the first article on the use of blockchain in the supply chain was published in 2016, with an upward trend beginning in 2017. The scholarly debate on this topic has never slowed in the last five years, and a massive number of publications have been published. However, a review of the Web of Science platform reveals that there is still a scarcity of research on the application of knowledge mapping analysis to sort and on the characteristics of blockchain in supply chain management. Furthermore, such research must strengthen to analyse the present state of research, hotspots, and frontiers in this subject. This article analyses the academic literature on blockchain in supply chain management statistically and qualitatively from 2017 to 2021 using CiteSpace. The primary purpose of this study is to address the following concerns:

- i. to address the increasing tendency in this field's literature.
- ii. to investigate the literature from the standpoint of the publishing country/region, publisher, and journal type.
- iii. to examine the high frequency and burstiness of keywords.
- iv. to discuss the current hotspots and frontiers.