

Bibliometric review of application of blockchain in supply chain management

Akash Mishra¹, Ayush Saini², Ansh Jini³, N. Yuvraj⁴

¹Student, B.Tech (Mechanical Engineering), Delhi Technological University, New Delhi, India

² Student, B.Tech (Mechanical Engineering), Delhi Technological University, New Delhi, India

³ Student, B.Tech (Mechanical Engineering), Delhi Technological University, New Delhi, India

⁴Associate Professor, Dept. of Mechanical Engineering, Delhi Technological University, New Delhi, India

Abstract - This paper analyzes the current state and potential of blockchain technology in supply chain management through bibliometric analysis. The study employs bibliometric data-driven analysis using the Web of Science and Scopus databases to collect relevant literature from 2013 to 2023. The Vos Viewer software is used to visualize the collaborative relationships and themes among the sampled literature. The co-word analysis reveals that the development of blockchain technology is centered on supply chain management, traceability and transparency, supply chain financing, and sustainability. The study highlights the potential of blockchain technology in facilitating developed supply chains, and its combination with the Internet of Things, that can drive significant changes across various industries and supply chains. This paper provides valuable insights for academic researchers and industrial managers in adopting blockchain to improve supply chain management performance. The study identifies the technical features of blockchain that can address challenges in SCM and highlights its potential to improve consumer trust, secure transactions, and efficient management. However, technical limitations and the need for ongoing research and development remain challenges for large-scale implementation.

Key Words: Supply Chain Management, Blockchain Technology, Smart Contract, Vos Viewer Software, Scopus, IOT, financing, sustainability

1. INTRODUCTION

Efficient supply chain management practices are critical for boosting performance and efficiency, but a fundamental challenge remains the lack of trust across various parties[1]. Blockchain technology, with its openness, visibility, and disintermediation qualities, offers enormous promise for addressing security issues in the trade process and building mutual confidence among all supply chain participants. However, its present supply chain use is restricted, and additional study is required to incorporate it into e-commerce supply chain management.

Blockchain has been widely adopted in many areas of life and industrial sectors in China as a strategic frontier technology. It efficiently tackles the issue of information opacity and asymmetry while ensuring the confidentiality of

operational data[2]. While there are several studies on blockchain industrial applications, there has been minimal study on its integration into e-commerce supply chain management.

This paper illustrates bibliometric analysis to witness how blockchain technology has been used into supply chain management. We gathered academic articles on blockchain and supply chain management that had been published internationally using Scopus, a bibliographic database. The search returned 19,062 research articles with the keywords "blockchain" and "supply chain management," all of which were written between 2016 and 2023.

The paper analyses how blockchain technology has the potential to improve supply chain management, notably in the areas of payment and supply chain management. The Vos Viewer software was used to build visualizations of the linkages and themes in the gathered literature on blockchain-powered supply chains.

The analysis discovered that the number of blockchain studies was modest in the years after 2016, but that the number of relevant studies increased substantially from 2018 to 2022. This increase was most likely caused by the advent of new data connected to the properties of blockchain technology, such as the Internet of Things and big data. Furthermore, extensive blockchain research and implementation are related with the introduction of new technologies.

A co-word analysis diagram was developed using 4,106 keywords to comprehend the new advancements in the domains being addressed and to uncover new links between pre-existing scientific fields. According to the findings, blockchain technology development is centred in the areas of supply chain management, traceability and transparency, supply chain financing, and sustainability.

The methodology and study strategy of a bibliometric analysis examining the integration of blockchain technology in supply chain management are discussed in this paper. The research on blockchain technology is also centered on the sectors of supply chain management, traceability and transparency, supply chain financing, and sustainability.

2. Theoretical Background

A digital transaction ledger called a blockchain allows numerous parties to safely and openly share and access data without the need for middlemen. Blockchain technology allows users to validate and add transactions to a safe, impenetrable database.

2.1 Blockchain Technology

Transactions in a blockchain are organized into blocks and added to the ledger in chronological order. Each block contains a one-of-a-kind code known as a "hash" that uniquely identifies the block and all its transactions [3]. This hash also includes the hash of the preceding block in the chain, forming a chain of blocks and giving rise to the term "blockchain."

One of the key benefits of blockchain technology is its decentralized nature. The blockchain, rather than depending on a central authority or middleman to run the network, is controlled by a distributed network of nodes that collaborate to validate transactions and maintain the ledger [4]. Because of this decentralization, the blockchain is more resistant to hacking and fraud, while simultaneously increasing transparency and trust between parties.

Numerous uses for blockchain technology are available, including voting systems, supply chain management, cryptocurrencies, and more. It offers a secure and effective method of storing and moving data without the involvement of middlemen, which has the potential to change how we interact and conduct business. Blockchain technology, however, also has drawbacks and restrictions.

2.2 Integration of Blockchain in Supply Chain

As blockchain technology continues to expand, it is finding its way into various industries, and the supply chain sector is not left out. Blockchain integration in supply chain management is becoming increasingly popular as it provides a way to improve transparency, accountability, and security in the supply chain.

Blockchain technology is essentially a decentralized digital ledger that records and stores data in a secure and transparent way. When integrated into the supply chain, it helps to create a decentralized system that allows all stakeholders in the supply chain to have access to the same information simultaneously, without the need for intermediaries. One of the key benefits of blockchain technology in the supply chain is the ability to increase transparency. With blockchain, all participants in the supply chain can view the entire transaction history of a product, from the manufacturer to the end consumer. This level of transparency helps to prevent fraud, counterfeiting, and other illegal activities that can occur within the supply chain[5].

Another significant benefit of blockchain technology in the supply chain is improved traceability. By using blockchain, manufacturers and suppliers can easily track products from their origin to their destination, providing customers with more information about the product's quality and authenticity.

Additionally, blockchain technology also offers improved security. By using cryptography, blockchain can ensure that all transactions are secure and tamper-proof, which reduces the risk of cyberattacks and data breaches. Several companies have already implemented blockchain technology in their supply chain management[6]. For example, Walmart, one of the world's largest retailers, uses blockchain technology to track its food supply chain. The system allows the company to quickly trace the origin of contaminated food products and remove them from store shelves before they cause any harm to customers.

Another example is Maersk, the world's largest container shipping company, which partnered with IBM to develop a blockchain-based platform called Trade Lens. The platform enables all stakeholders in the supply chain to access real-time information about the location of their shipments, reducing the risk of delays, theft, and other disruptions.

In conclusion, the integration of blockchain technology in the supply chain sector provides several benefits, including increased transparency, traceability, and security. Companies that have already adopted this technology are reaping the benefits of reduced costs, improved efficiency, and enhanced customer satisfaction. As more companies continue to integrate blockchain into their supply chain management, we can expect to see even more advancements in this field.

2.3 Hash Algorithm

Blockchain is a decentralized digital ledger that securely and transparently records transactions. The hash function, which is responsible for transforming data into a fixed-length value known as a hash, is a key component of blockchain technology. The hash function is an important feature of blockchain because it protects data integrity by making it impossible to change the data without changing the hash value.

A hash function takes any size input and returns a fixed size output. Because the output, or hash, is unique to the input data, even minor changes in the input data result in an entirely new hash value. The hash function is supposed to be a one-way function, which indicates that determining the original input data from the hash result is very difficult[7].

In blockchain, the hash function is used to generate a hash for each block, which is subsequently put to the block's header. The block header provides information such as the block's timestamp, the preceding block's hash, and the

current block's hash. By connecting the blocks with the hash function, a tamper-resistant chain of blocks is formed.

The hash function is also used to verify the validity of blockchain transactions. Each transaction is assigned a one-of-a-kind identification known as a transaction hash, which is generated by applying the hash function to the transaction data. The hash value of the transaction is then added to the blockchain, ensuring that the transaction cannot be changed without modifying the hash value.

To summarize, the hash function is an important part of blockchain technology since it maintains the data's integrity and security. It is used to generate a unique identifier for each block and transaction on the blockchain, making tampering with the data almost difficult. The hash function is an essential component in the creation of a decentralized and secure digital ledger system.

2.4 Smart Contract

Smart contracts have been around for a long time, but their use in industrial practices has grown in popularity with the arrival of blockchain technology[8]. A smart contract is a script recorded on a blockchain that executes automatically without the intervention of the contract's signer. It is highly secure and does not require middlemen, making it a suitable option for a wide range of sectors like insurance, healthcare, and smart cities.

Blockchain-based smart contracts can be used in the insurance business to handle and analyze pay-as-you-go vehicle insurance data. Smart contracts can help the healthcare business by assuring safe access to electronic health information. Smart contracts may also be used to promote interoperability between institutions and national healthcare delivery capacities, as well as to secure healthcare privacy[9]. Smart contracts in the supply chain sector can shorten cash flow cycles and minimize supply chain operating risks in traditional supply chain finance models. Smart contract transaction information is commonly employed in this industry because to its benefits such as traceability and irreversibility.

Smart contracts are also being used in the agricultural supply chain to boost transaction reliability and operational efficiency. Furthermore, smart contracts may be employed in smart city contexts to perform autonomous distributed administration of community electricity grids and smart metre technologies[10].

Overall, smart contracts provide a highly safe and efficient method of conducting transactions without the use of middlemen, making them a suitable option for a wide range of sectors. With the continuous advancement of blockchain technology, smart contract use cases are expected to evolve and spread even more.

3. Research Design

The systematic review analysis is performed in this study by employing a bibliometric analysis. This part of the paper presents the research design and methodology of this study, and the idea of application of the blockchain technology in the area of supply chain management has been profoundly explored and discussed to help to better understand this budding integration of the two massive areas of study.

3.1 Data Collection

A data of all research papers published across the world on our topic of study on integration of blockchain and supply chain management were collected via Scopus. For the purpose of research, previous publications concerning blockchain and supply chain management were gathered as samples. Scopus is a crucial tool for accessing global academic information. In order to gain a deeper understanding of the development trends of blockchain in the field of supply chain management, this study utilized the core database of Scopus. Scopus is a bibliographic database and a tool for accessing global research literature in various disciplines, including natural sciences, social sciences, engineering, and health sciences. The search for relevant research papers published between 2016 to 2023 utilized the keywords "blockchain" and "supply chain management", yielding a total of 19,062 research papers. In the next section these research papers will be analyzed thoroughly in order to drive key insights and share areas of budding interest and research.

3.2 Bibliometric Study

Bibliometric analysis is a quantitative approach used to analyze and evaluate scholarly publications and their impact. It involves the statistical analysis of bibliographic data, including citation counts, authorship patterns, and publication trends, among others. Bibliometric analysis is commonly used in the evaluation of research productivity, impact, and collaboration, as well as in identifying emerging research trends and gaps. Bibliometric indicators such as the h-index and impact factor are widely used to measure research impact and inform decision-making.

Therefore, this paper tries to disclose the development trend of blockchain technology and its application in supply chain management by employing a bibliometric analysis. The complicated interactions of objective items could be depicted and reflected through the similarity definition realized by the VosViewer mapping technology. VosViewer enables us to explore the structure and characteristics of the research field or a set of publications through bibliometric maps, which show relationships between authors, institutions, keywords, and other bibliographic elements. VOSviewer allows us to create maps based on co-citation analysis, co-authorship analysis, and keyword analysis, among others. The purpose of the VosViewer technology is to reflect the similarity

between each pair of items in a two-dimensional space based on their spacing distance as accurately as possible.

3.2.1 Co Word Analysis

Co-word analysis is a bibliometric method used to identify and analyze the relationships between words or concepts within a set of documents. Co-word analysis can be used to map the structure of a research field or to identify emerging trends and topics. It involves several steps, including selecting a relevant set of documents, identifying the key concepts or keywords in those documents, creating a co-occurrence matrix that counts the frequency of pairs of words, and using various statistical and visualization techniques to analyze the relationships between the words. To help better understand this topic, the VosViewer analysis is employed to draw a keyword co-occurrence network diagram to explore the evolution of blockchain technology, contributing to summarizing the overall development trend and future research opportunities

3.2.2 Network Analysis

Network analysis is a method used to study the relationships between entities in a network or system. It involves analyzing the connections between nodes or entities, to identify patterns, trends, and important features of the network. The analysis typically involves identifying the nodes and links between them, and then measuring various properties of the network, such as centrality, clustering, and connectivity. Centrality measures the importance of a node within the network, while clustering measures the degree to which nodes tend to cluster together in subgroups. Connectivity measures the overall connectedness of the network, such as the number of links between nodes. Network analysis in our research involves creating visual representations of the network, using VosViewer, to help identify patterns and trends. Through the network analysis, we can judge the diversified development of the application of blockchain in different fields. Furthermore, through the co-occurrence matrix of high-frequency feature words construction, the development trend and research hotspots can be figured out.

3.2.3 Research Framework

This paper performed and bibliometric analysis by addressing the collected literature on blockchain and supply chain management from 2016 to 2023. According to research, the use of blockchain technology has the potential to facilitate developed supply chains, particularly in the areas of payment and supply chain management. The study employed bibliometric analysis with VosViewer software to reveal the intricate visualizations and interconnections of blockchain-powered supply chains. The research results and themes are then summarized.

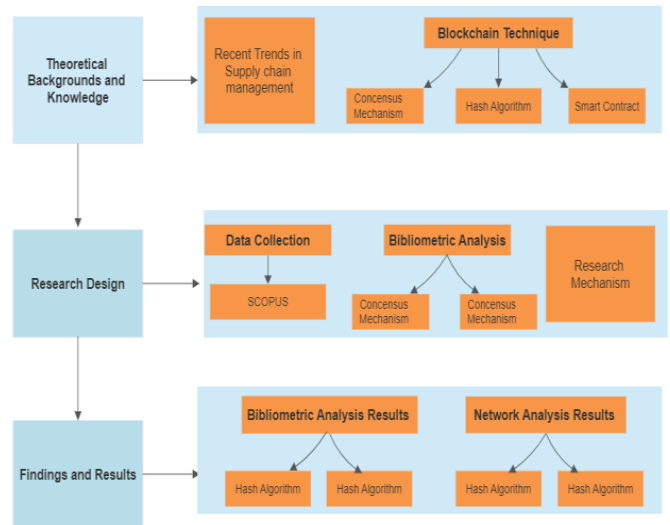


Fig 3.1: Research Framework

4. Findings and Results

4.1 Overview Analysis Results

4.1.1 Source Level Analysis

To examine academic research on blockchain, we searched for related papers in the core database of Scopus using the keywords "blockchain," and "supply chain management[13]." This bibliometric analysis collected 21,148 references. Our findings indicate that academic research on blockchain began in 2016 and has steadily increased until 2022, as illustrated in Figure 2. Although the number of studies on blockchain was minimal in the following years after 2016, the relevant studies have grown rapidly since 2018, with the most rapid growth occurring from 2018 to 2022. We can speculate that the emergence of new data, such as the Internet of Things and big data, which are related to blockchain technology's characteristics, has led to blockchain's development. Additionally, we found that the widespread research and application of blockchain are associated with the emergence of new technology.

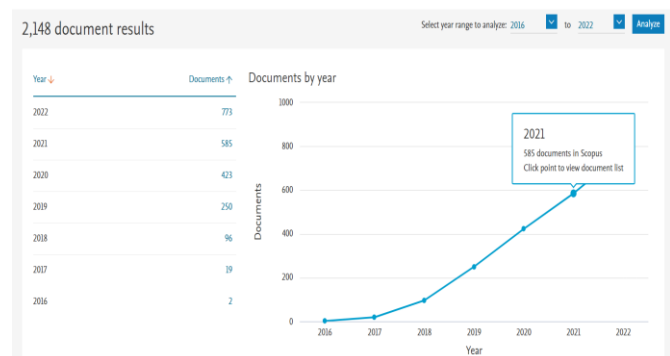


Fig 4.1: Year Wise Research Publications

Figure 4.2 presents that the top 10 countries in blockchain research based on the number of publications. India exhibits its predominance in production and influence with 446 papers, followed distantly by the USA and China. USA has less than half as many publications as India. The worldwide distribution of blockchain publications shows that academic research on blockchain is being published and pursued aggressively in all regions of the world.

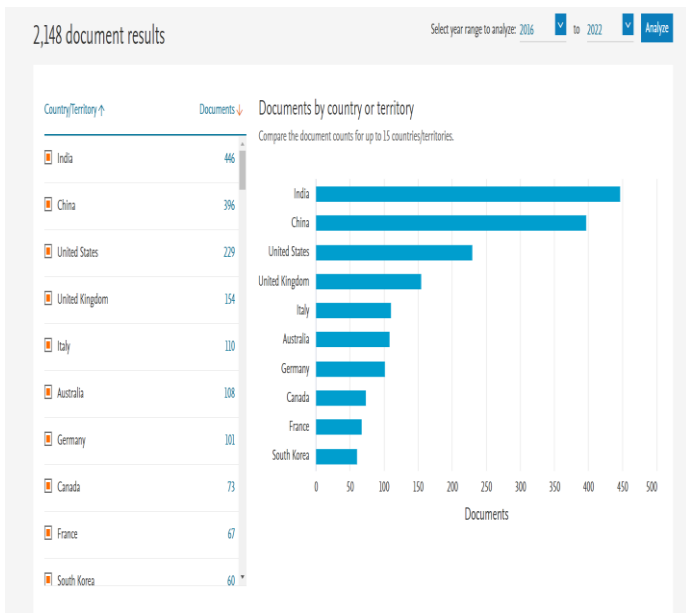


Figure 4.2: Country Wise Research Publications

This figure shows the country wise distribution of research papers published per country since 2016 till 2022 on the overlap of topics 'Supply Chain Management' and 'Blockchain'.

This graph depicts the countries in the world who are heading the innovations and research in this unique overlap of these big fields of science. Moreover, it depicts how the top 3 countries' researches are easily outnumbering the other countries quantitatively.

All of these key insights were fetched using the database of scopus which provided us with the data of these publications vis a vis their countries and publication year.

According to Figure 4.3, China leads in blockchain research with a total link strength of 214, followed by the United Kingdom with a total link strength of 191. Other countries such as India, Australia, USA, and France also show a significant interest in blockchain technology. This global attention and investment in blockchain technology suggest its potential to revolutionize various industries.

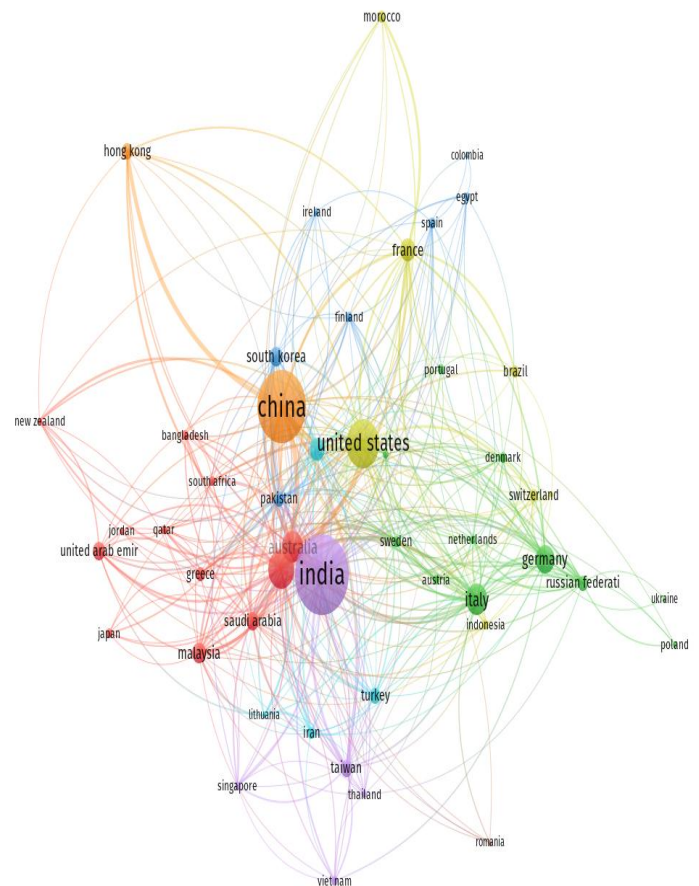


Figure 4.3 : Analysis of Cooperation in different countries on the topic under discussion

As a result, numerous countries are prioritizing its development as a strategic technology for the future, particularly China and the United Kingdom.

4.2 Network Analysis Results

4.2.1 Literature Analysis

Table 1 presents the top 5 high cited papers in blockchain research. According to the highly cited papers, the mainstream research direction was explored thoroughly. Most of these articles discuss the application of blockchain and AI in various aspects of supply chain management. Blockchain has great development prospects in supply chain, agriculture, and other fields. The role of blockchain is examined in achieving key Supply chain management goals for enterprises by establishing a framework. The combination of blockchain and the Internet of Things will drive major changes across multiple industries and their supply chains, as well as the development of new business models and distributed applications.

The following table shows us the most cited papers in the domain being studied.

| Item | Journal Name | Theme | Total Citations |
|------|---|--|-----------------|
| 1. | International Journal of Production Research 57(7), pp. 2117-2135 | Blockchain technology and its relationships to sustainable supply chain management | 1250 |
| 2. | Telematics and Informatics 36, pp. 55-81 | A systematic literature review of blockchain-based applications: Current status, classification, and open issues | 967 |
| 3. | International Journal of Information Management 39, pp. 80-89 | Blockchain's roles in meeting key supply chain management objectives | 859 |
| 4. | International Journal of Production Research 57(3), pp. 829-846 | The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics | 704 |
| 5. | 2018 IoT Vertical and Topical Summit on Agriculture - Tuscany, IOT Tuscany 2018 pp. 1-4 | Blockchain-based traceability in Agri-Food supply chain management: A practical implementation | 569 |

Table 4.1: Top 5 most cited papers

4.2.2 Co-Word Analysis

Using the 4,106 keywords gathered by the authors, we created a co-word analysis diagram depicted in Figure 5. Co-word analysis is a content analysis technique that can proficiently showcase how keywords co-occur in datasets and expose the structural network relationships. This helps us understand the new developments in the fields being discussed as well as find the new linkages between pre-existing scientific fields. This gives us a clear understanding on the thought and ideas of existing researches in the discussed fields[14]. The co-word analysis is based on the proposed formula $T = (-1 + \sqrt{(-1 + 8I)})/2$ where I_1 represents the number of words with frequency 1, and T denotes the minimum frequency value of high frequency words. The T index is used to distinguish the high frequency and low frequency words, and the T value calculated in this study is 41. Therefore, we chose keywords with more than 41 occurrences as the analysis content to ensure the effectiveness of the network diagram. VosViewer utilizes the VOS clustering algorithm for conducting clustering analysis. To capture the prominent areas of research, only nodes with a frequency of occurrence exceeding 41 were considered for clustering, resulting in the identification of three distinct clustering groups. Figure 5 depicts the nodes in proportion to their frequency of occurrence, with larger nodes indicating higher frequencies. Each node is color-coded to reflect the research hotspot at a particular stage, while the connecting lines depict the knowledge flow transitioning from purple to yellow, representing the chronological order.

Cluster 1 pertains to the use of blockchain technology in diverse industrial sectors such as big data, AI, logistics, monitoring, and supply chain. The decentralized and immutable nature of blockchain enables its potential for broad applications in several fields. For instance, blockchain enables transparent tracking of logistics processes, thereby allowing both businesses and consumers to access real-time information, ultimately improving information flow efficiency. Additionally, blockchain facilitates the traceability of products in the supply chain, ensuring confidentiality for all parties involved. As a result, blockchain technology helps to establish a robust network with a complete trust mechanism in the supply chain.

Cluster 2 shows the in depth analysis of the use of blockchain technology in the varied fields and the technology behind it. It talks about the concept of smart ledgers, consensus mechanism and the entire tech side of blockchain and its application. It also talks about the integration of game theory and blockchain in order to enhance the efficiencies of modern supply chains. These parts of this cluster are simply informing us about all the technologies and theories that are being discussed under the conjunction of these topics. This gets us to pace with all the research being carried out from 2016.

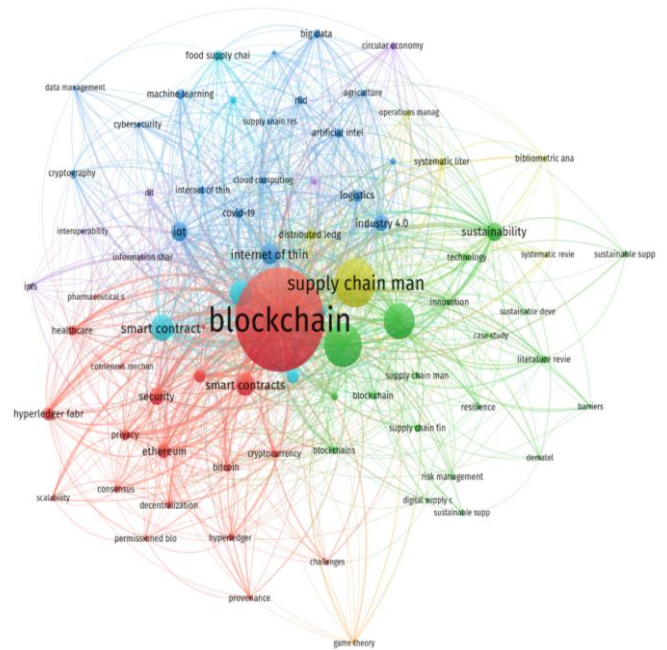


Figure 4.4: Co-occurrence of keywords by author-keywords

Cluster 3 lastly discusses sustainability and other case studies on the application of blockchain to supply chain management discussing the execution and implementation side of things. It talks about the application of blockchain and big data in food and high value goods supply chain. It also discusses the risk management aspect of the supply chains as blockchain will be a big driving force to making these

supply chains risk averse and safe for all of its beneficiaries. The logistics part of this amalgamation is being discussed in this cluster. Moreover the talks and moves towards making these supply chains more sustainable has also been discussed.

Our findings indicate that most of the research conducted between early 2019 and April 2019 predominantly focused on blockchain technologies, specifically exploring consensus mechanisms and smart contracts. Subsequently, from April to August 2019, research interest shifted towards the integration and implementation of other technologies, such as the Internet of Things, supply chain management, personal privacy protection, cloud computing, data sharing, and traceability. In 2020, the research focus was on exploring the industrial applications of blockchain in diverse sectors, including but not limited to personal analysis, services, resource management, trust management, smart cities, public key, and Industry 4.0.

4.3 Research Themes

Based on the bibliometric analysis of blockchain development trends, it is evident that research on blockchain technology is particularly concentrated in the domains supply chain management, traceability and transparency, supply chain financing, and sustainability. This section aims to examine the research trends of blockchain technology in these topics.

4.3.1 Traceability and Transparency in Supply Chains

Supply chain management involves the coordination of various activities and partners involved in the production, transportation, and delivery of goods and services. Ensuring transparency and traceability in supply chains is crucial for improving the efficiency, accountability, and sustainability of the supply chain. Blockchain technology, with its inherent characteristics of decentralization, immutability, and transparency, can be used to provide a secure and transparent platform for supply chain management. By utilizing blockchain technology, businesses can create a digital ledger of all transactions and activities involved in the supply chain, from the point of origin to the destination.

With blockchain technology, every participant in the supply chain can have access to the same information, and every transaction and activity can be recorded in real-time. This enables stakeholders to have complete visibility of the supply chain, including the origin of goods, their movement throughout the supply chain, and their final destination. Transparency in supply chains provided by blockchain technology can help businesses identify and address inefficiencies and bottlenecks in the supply chain. It also promotes ethical practices and accountability by enabling businesses to track the environmental and social impact of their supply chain activities. By maintaining a transparent

and traceable supply chain, businesses can also mitigate risks associated with counterfeiting, fraud, and product recalls. Blockchain technology can also facilitate the implementation of end-to-end traceability in supply chains. End-to-end traceability involves tracking the entire journey of a product from its origin to the end consumer. This enables businesses to monitor the quality of the product, ensure compliance with regulations, and provide consumers with information on the origin and safety of the product.

End-to-end traceability provided by blockchain technology can be particularly beneficial in industries such as food and pharmaceuticals, where safety and quality are of utmost importance. By utilizing blockchain technology, businesses can trace the origin of raw materials, monitor the production process, and track the distribution and sale of the final product.

4.3.2 Supply Chain Financing Using Blockchain

Supply chain financing refers to the practice of providing financial solutions to businesses that are involved in the supply chain process. The goal of supply chain financing is to improve the efficiency of the supply chain by optimizing cash flow and minimizing the risks associated with the supply chain. One technology that has the potential to revolutionize supply chain financing is blockchain. Blockchain technology is a decentralized, distributed ledger that allows for secure and transparent transactions without the need for intermediaries. It provides a way for businesses to share information and conduct transactions in a secure and efficient manner, without the need for a central authority to verify and process the transactions. This makes it an ideal technology for supply chain financing, where there are many parties involved in the process and a need for secure, transparent transactions.

- One of the main benefits of using blockchain for supply chain financing is that it can improve transparency and reduce the risk of fraud. By using a decentralized ledger to record transactions, all parties involved in the supply chain can have access to the same information in real-time. This allows for greater visibility into the supply chain process and can help to prevent fraud by identifying and addressing any discrepancies or errors in the supply chain.
- Another benefit of using blockchain for supply chain financing is that it can improve the efficiency of the process by reducing the need for intermediaries. Currently, many businesses involved in the supply chain process rely on banks and other financial institutions to provide financing solutions. However, with blockchain, businesses can directly interact with each other, without the need for intermediaries. This can help to reduce costs and streamline the supply chain process. Overall, the

use of blockchain for supply chain financing has the potential to revolutionize the supply chain industry. By improving transparency, reducing the need for intermediaries, and providing greater security, blockchain can help to streamline the supply chain process and make it more efficient and cost-effective for businesses.

4.3.3 Sustainability in Supply Chain using Blockchain

Sustainability has become an increasingly important focus for businesses across the globe, and the supply chain is no exception. Supply chain sustainability refers to the practice of creating environmentally and socially responsible supply chains that are able to meet the needs of the present without compromising the ability of future generations to meet their own needs. Blockchain technology has the potential to play a significant role in enhancing the sustainability of supply chains in the following ways:-

- by providing greater transparency and traceability. Blockchain enables the recording of data in a tamper-proof manner, meaning that once data is recorded, it cannot be altered or deleted. This makes it an ideal technology for tracking the movement of goods and materials through the supply chain, from their origin to their destination. By providing greater transparency and traceability, blockchain can help to ensure that products are sourced and transported in an environmentally and socially responsible manner. For example, a blockchain-based platform could be used to track the movement of goods and materials from their origin to their destination, providing real-time visibility into the entire supply chain. This could help to identify any potential sustainability issues, such as excessive use of resources, unethical labor practices, or environmental damage. By identifying these issues early, businesses can take proactive steps to address them and ensure that their supply chains are more sustainable.
- Another way in which blockchain can support supply chain sustainability is by providing greater accountability. By recording data in a tamper-proof manner, blockchain can help to ensure that businesses are held accountable for their sustainability practices. For example, a blockchain-based platform could be used to record information about a business's sustainability practices, such as their use of renewable energy sources or their efforts to reduce waste. This information could then be shared with stakeholders, such as customers and investors, providing greater transparency and accountability.

→ Finally, blockchain can also support supply chain sustainability by enabling the creation of decentralized networks. Decentralized networks are networks that are not controlled by a single entity, but rather are governed by a consensus of all participants. This can help to promote greater collaboration and cooperation between businesses in the supply chain, enabling them to work together to address sustainability challenges. For example, businesses could use a blockchain-based platform to share information and resources related to sustainability, such as best practices for reducing carbon emissions or strategies for reducing waste. In conclusion, blockchain technology has the potential to significantly enhance the sustainability of supply chains.

By providing greater transparency and traceability, enabling greater accountability, and promoting greater collaboration and cooperation, blockchain can help to ensure that supply chains are more environmentally and socially responsible. As businesses continue to prioritize sustainability, we can expect to see an increasing use of blockchain technology in the supply chain industry.

5. CONCLUSIONS

- This paper provides a comprehensive analysis of the existing literature on the use of blockchain in supply chain management, highlighting its potential to address challenges in this area.
- The research hotspots in recent years mainly focused on the Internet of Things, supply chain, intelligent community, cloud computing, chemical industry, aviation, and other fields. In addition, we focused on analyzing the research trends of blockchain technology in supply chain management domain mainly pertaining to financing, traceability, transparency and sustainability. We also found that application of blockchain in these areas can help resolve issues pertaining to consumer trust, awareness, secure transactions, cost savings and efficient management
- In addition, this study also reveals some theoretical enlightenments and practical significances. The blockchain technology can help supply chain to carry out flexible management and efficient allocation of resources by innovative management practices.

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