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Mapping the Landscape of Blockchain and Fintech: A Bibliometric Analysis and Future Research Directions

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ABSTRACT

The current study aims to review the existing literature on fintech and blockchain from 2018 to 2024. The adoption of this technology by FinTech companies constitutes the next step toward expanding blockchain and its sustainability. The literature was extracted from the Elsevier Scopus database by following the prismatic flow chart. This paper conducts a mapping study on the research topics, limitations, gaps, and future trends of blockchain in FinTech using RStudio (statistical package). Two types of bibliometric techniques have been conducted: performance analysis and content analysis. The result shows a performance analysis of the most prominent authors, countries, journals, and articles in this literature. In content analysis, two types of analysis have been performed, such as thematic evolution and factorial analysis. The factorial analysis reveals four distinct clusters focusing on themes like environmental sustainability and resource management, economic, technological, and social innovations, environmental sustainability and resource management, supply chain management, and knowledge-based innovation. This study also sheds light on various future avenues in the field of blockchain technologies in finance, such as privacy, latent, and supply chain fields. This study can contribute to researchers as a starting point for their investigation, as well as a source for recommendations on future investigation directions regarding blockchain in the FinTech sector.

Keywords: Blockchain, Fintech, Bitcoin, Cryptocurrency, Bibliometric Analysis .

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1. Introduction

Blockchain is a highly discussed subject in both the corporate and academic spheres. Introduced in 2008 alongside Bitcoin, it functioned as a peer-to-peer payment system for electronic transactions, enabling various financial entities to transfer payments directly to one another without the mediation of a central authority, such as a central bank, thereby mitigating the double-spending issue (Nakamoto, 2008). Its characteristics are those of a distributed, transactional database. After each node in the network authenticates the information, it is transmitted by their public keys to the other nodes (Tschorsch & Scheuermann, 2016). Public and private key systems were established long before the advent of blockchain technology. In 1976, Diffie and Hellman pioneered asymmetric cryptography, marking a significant milestone in the evolution of key systems. In a public key system, two parties can transmit information over a public network using public methods while establishing a secure connection. It operates when one party transmits information encoded with the other side's public key. To decode the communication, the counterparty would utilize its decryption key (Diffie & Hellman, 2022). The public and private keys are interdependent, necessitating their simultaneous usage. This is derived from a mathematical technique that establishes the exclusive link between this pair of keys. Public keys may be disseminated to an unlimited number of people, but private keys must be securely maintained and kept confidential (Konashevych & Poblet, 2018). Miners are among the most crucial participants in blockchain technology. Miners authenticate the information inside the network by resolving cryptographic challenges and achieving consensus. This process ensures the security of the blockchain (Macrinici et al., 2018). Each time a miner solves the challenge, a transaction is recorded. The blockchain's reward mechanism incentivizes miners by awarding Bitcoins for each solved challenge. Miners possessing superior resources are more likely to resolve the riddle first, securing the prize. The decentralized nature of Bitcoin is facilitated by this arrangement (Eyal et al., 2016). Upon first access to a blockchain, a new miner may view the whole chain, from the genesis block to the most recently validated block. The genesis block, recognized as the initial block or root of the chain, is included in the client software that underpins the legitimate blockchain. Miners must solve puzzles, known as proof-of-work (PoW), rendering a new transaction legitimate only upon the creation and addition of a new block to the current blockchain (Fanning & Centers, 2016). Blockchain is a system that is independent of specific assets. It can store, maintain records, and transfer all asset kinds. This paper introduces a mapping study that aims to comprehend the research topics, limitations, gaps, and future trends of blockchain technology in FinTech companies. It can serve researchers as a starting point for their investigation or as a source of information on future trends regarding blockchain in the FinTech sector.

1.1. Definition of Research Questions

A systematic mapping study is defined by its provision of a framework or summary of the research domain. This is a vital connection in the evidence continuum from academic research to practical application since both practitioners and academics utilize journals as a source of knowledge. A meticulously conducted, scientifically rigorous mapping analysis on a precisely delineated topic is crucial as it delineates existing research, establishes the boundaries of what has and has not been explored, and identifies the principal gaps in the literature. This analytical perspective is crucial and underscores significant supplementary topics (Donthu et al., 2022). This study identifies the quantity and categories of research conducted within the sector. Diverse attributes can be mapped, such as publication date trends or the specific topics within the explored area. Research questions (RQs) can help outline these topics more easily:

RQ1: What trends by publication year can be observed?

RQ2: What are the most prominent articles, authors, countries, and journals in the blockchain and fintech field?

RQ3: What are the main research topics addressed in the current blockchain research?

RQ4: What policy implications and future directions can be considered in this literature?

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The remaining paper are structured as follow section 2 presents research methodology, section 3 presents results and discussion, section 4 presents future directions and policy implications, section 5 presents discussion of the study and section 6 concludes this article.

2. Research Methodology

Bibliometrics is widely used to evaluate and assess the impact of scholarly work, analyze citation patterns, explore trends in research output, and identify influential documents and authors within a field (Donthu et al., 2021).

2.1 Search Criteria and Article Selection

The bibliometric analysis begins by selecting keywords and using Boolean logic ("AND" or "OR") to combine these keywords (TITLE-ABS-KEY (Fintech AND Blockchain) OR (TITLE-ABS-KEY (Fintech Sector AND Blockchain Technologies) to assist in identifying relevant literature. The selected keywords precisely captured the intersection of Blockchain and finance literature. The authors conducted their search using the Scopus database, applying a variety of keywords. The initial search yielded a total of 2,577 records. To ensure maximum relevance, filters for the period from 2018 to 2024 were applied, resulting in the removal of 62 records and leaving 2,515 highly pertinent entries. Further screening by subject areas led to the elimination of 1,894 records, with 621 records remaining for additional assessment. Applying filters for document types limited to journal articles excluded 378 records, leaving 243 for evaluation. Subsequently, only records published in English were retained, which led to the elimination of 9 more records. In the final inclusion phase, 234 records were deemed eligible and included in the comprehensive analysis.

3. Results and Discussion

3.1.Performance Analysis

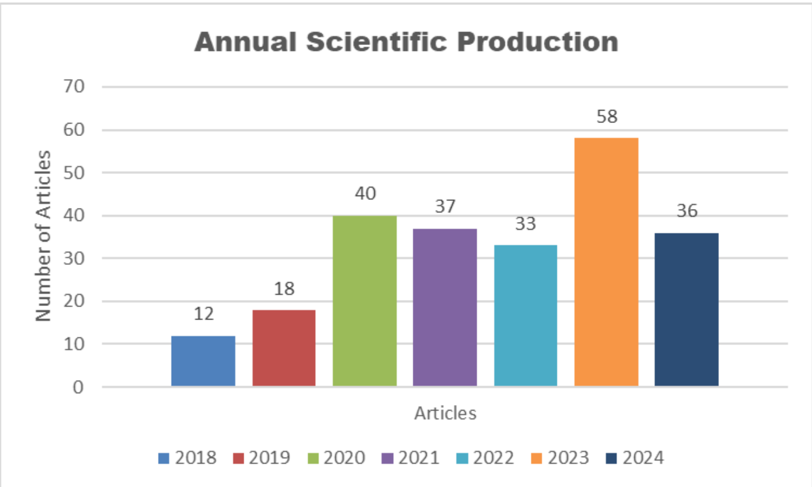

Figure 1: Annual Scientific Production; *Source: RStudio Output*

Figure 1 displays the annual scientific production in the articles on blockchain and fintech from 2018 to 2024. After 12 articles in 2018, 18 in 2019, and 40 in 2020, the number increased significantly. The output dropped to 37 and 33 items in 2021 and 2022. The year 2023 witnessed a huge increase to 58 items, the highest. The number of articles dropped to 36 in 2024, but it was still greater than in prior years. Growth fluctuates, peaking in 2020 and 2023.

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Table 1: The Ten Influential Journal

Sr. No.	Source	h_index	g_index	m_index	Total Citations	Documents
1	Technological Forecasting and Social Change	8	10	1	954	10
2	Journal Of Management Information Systems	1	1	0.125	816	1
3	Journal Of Financial Intermediation	1	1	0.167	462	1
4	Journal Of Business Venturing Insights	2	2	0.333	362	2
5	Electronic Commerce Research and Applications	5	5	0.714	358	5
6	Journal Of Economics and Business	3	3	0.375	354	3
7	Accounting And Finance	2	2	0.25	250	2
8	IEEE Transactions on Engineering Management	3	4	0.5	248	4
9	Production Planning and Control	1	1	0.167	241	1
10	Technology In Society	2	2	0.333	229	2

Source: RStudio Output

Table 1 shows the top ten most influential journals performance metrics, include h-index, g-index, m-index, total citations (TC), and number of papers in the field of blockchain and fintech. The journal *Technological Forecasting and Social Change* stands out with the highest h-index (8) and total citations (954), reflecting its strong impact and research significance over time. *Journal of Management Information Systems* and *Journal of Financial Intermediation* each have a low h-index and g-index of 1, indicating limited breadth in citation influence, though the former shows a significantly higher total citation count (816). Other journals, such as *Electronic Commerce Research and Applications* and *IEEE Transactions on Engineering Management*, demonstrate moderate influence with higher m-index values, suggesting consistent scholarly contributions over a shorter timeframe.

Table 2: The Ten Impactful Articles

Author	Title	Journal	Total Citation
(Gomber et al., 2018)	On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services	Journal of Management Information Systems	816
(Thakor, 2020)	Fintech and banking: What do we know?	Journal of Financial Intermediation	462
(Adhami et al., 2018)	Why do businesses go crypto? An empirical analysis of initial coin offerings	Journal of Economics and Business	331
(Chen & Bellavitis, 2020)	Blockchain disruption and decentralized finance: The rise of decentralized business models	Journal of Business Venturing Insights	319

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(Chang et al., 2020)	How Blockchain can impact financial services – The overview, challenges, and recommendations from Expert interviewees	Technological Forecasting and Social Change	316
(Milian et al., 2019)	Fintechs: A literature review and research agenda	Electronic Commerce Research and Applications	248
(Fosso Wamba, et al., 2019)	Bitcoin, Blockchain, and Fintech: a systematic review and case studies in the supply chain	Production Planning & Control	241
(Du et al., 2020)	Supply Chain Finance Innovation Using Blockchain	IEEE Transactions on Engineering Management	217
(Albayati et al., 2020)	Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach	Technology in Society	214
(Du et al., 2019)	Affordances, experimentation, and actualization of FinTech: A blockchain implementation study	The Journal of Strategic Information Systems	209

Source: RStudio Output

Table 2 shows the most influential articles that explore fintech and blockchain fields. Gomber et al. (2018) lay the foundation by examining the transformative forces driving fintech in financial services, garnering the highest citation count (816), and reflecting its foundational importance. Thakor (2020) builds on this by exploring the intersection of fintech and banking, addressing critical gaps in understanding how traditional finance integrates with new technologies. Adhami et al. (2018) complement this perspective by focusing on the rise of cryptocurrencies and initial coin offerings, illustrating the shift towards digital assets. Further extending the discourse, Chen and Bellavitis (2020) highlight blockchain's potential to disrupt traditional business models through decentralization, while Chang et al. (2020) delve into its implications for financial services, identifying challenges and providing actionable insights. Milian et al. (2019) broaden the scope by offering a comprehensive review of fintech, setting a research agenda for future studies. Fosso Wamba et al. (2019) integrate blockchain and fintech within the supply chain, offering practical case studies, whereas Du et al. (2020) focus specifically on blockchain-driven innovations in supply chain finance. Albayati et al. (2020) shift attention to customer perspectives on blockchain and cryptocurrency adoption, bridging technological advancements with user acceptance. Lastly, Du et al. (2019) explore the experimental and practical implementation of fintech, rounding out the discussion by emphasizing the importance of real-world applications.

Table 3: Top Ten Impactful Authors

Sr. No.	Author	Institution	No. of Articles	Total Citation	Citation Per Document
1	Gomber Peter	Goethe University of Frankfurt, Germany	1	816	816
2	Kauffman Robert j	Singapore Management University	1	816	816
3	Parker Chris	Pennsylvania State University	1	816	816
4	Weber Bruce W.	University of Delaware	1	816	816
5	Thakor Anjan v.	Washington University in St. Louis	1	462	462
6	Bellavitis	Syracuse University	2	362	181

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	Cristiano				
7	Giudici, Giancarlo	School of Management, Italy	2	346	173
8	Martinazzi Stefano	School of Management, Italy	2	346	173
9	Adhami Saman	Bocconi University, Milan, Italy	1	331	331
10	Chen Yan	Ming Chuan University	1	319	319

Source: RStudio Output

Table 3 displays the most influential authors based on citations in the field of fintech and blockchain. In this, Gomber Peter R, Kauffman Robert J, Parker Chris R and Weber Bruce W lead with quality of research with 816 total citations. Author Thakor Anjan v (Washington University in St. Louis) leads with 462 citations, followed by Bellavitis Cristiano and Giudici Giancarlo with 362 and 346 citations respectively. Adhami from Bocconi University (331 citations per document) and Chen from Ming Chuan University (319 citations per document) further diversify the global scholarly efforts, with their work focusing on cryptocurrency and blockchain applications.

Table 4: Top 10 Countries

Rank	Top Ten Countries	No. of Articles	Total Citations
1	United States	40	2706
2	China	36	1670
3	United Kingdom	26	1424
4	Germany	10	1090
5	France	12	975
6	Singapore	4	828
7	Australia	14	802
8	Italy	14	511
9	India	28	488
10	Belgium	2	463

Source: RStudio Output

Table 4 shows the most influential countries in the field of blockchain and fintech. The United States leads the table with 40 articles and 2706 citations followed by 36 articles and 1670 citations. The third-ranked United Kingdom has fewer articles 26) but a really high citation count 1424), suggesting excellent or influential work. Though their publishing counts 10, 12, and 4, respectively Germany, France, and Singapore have high citations per article, therefore emphasizing significant contributions especially Singapore with an outstanding 828 citations for just 4 publications.

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3.2. Science Mapping

3.2.1. Factorial Analysis

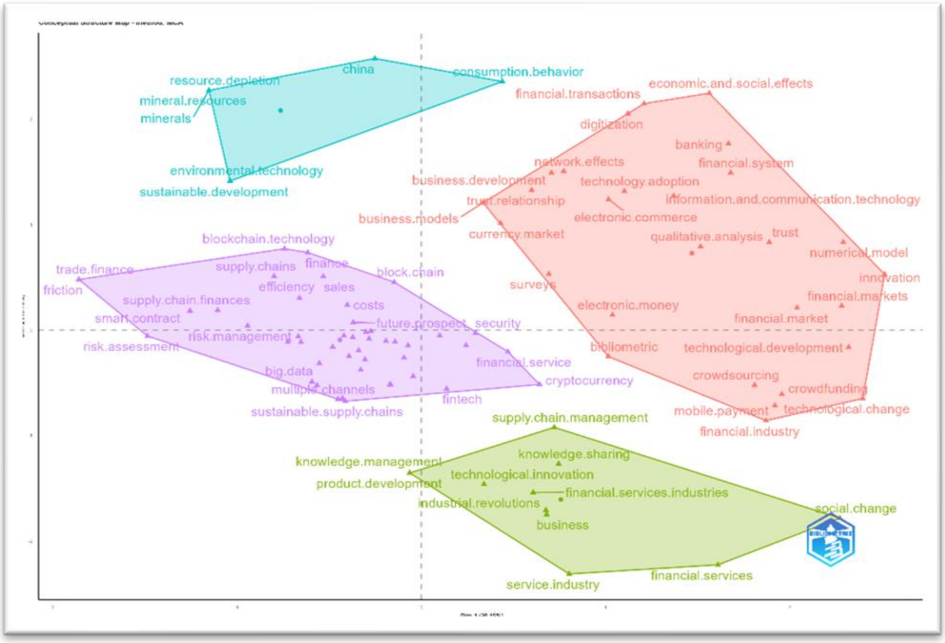

Figure 2: Factorial Analysis Map

Factorial analysis reveals hidden correlations between observable data. This study uses multiple correspondence analysis (MCA) to explore relationships across several categorical variables, specifically for multi-way categorical data. The conceptual structure map (Figure 2) illustrates the proximity and divergence within the research area.

Two primary dimensions were identified through the factorial analysis. Dimension 1 (Dim. 1) represents the correlation among variables in the same direction. High factorial loadings in this dimension indicate strong associations between variables, which are crucial for identifying patterns within the data. Conversely, Dimension 2 (Dim. 2) reflects data variability beyond the primary dimension (Dim. 1). Variables with strong loadings on Dim. 2 may exhibit behaviors distinct from those on Dim. 1. Combining these dimensions enhances our understanding of the dataset's structure and interconnections, revealing key patterns and trends.

1. Blue Cluster: Environmental Sustainability and Resource Management:

This cluster, located in the top-left quadrant, highlights terms including resource depletion, mineral resources, sustainable development, and environmental technologies. It encompasses research aimed at reconciling the use of natural resources with sustainable methodologies and technological advancements. The presence of China indicates a geographical emphasis, potentially underscoring the nation's pivotal position in global resource use and sustainability efforts. This cluster highlights the pressing necessity to tackle resource shortage via creative solutions, rendering it particularly pertinent to global environmental concerns and policy debates.

2. Red Cluster: Economic, Technological, and Social Innovations:

The red cluster centers on the dynamic interaction among technical adoption, economic systems, and societal effects. Keywords such as financial markets, mobile payment, innovation, economic and social impacts, and trust highlight the research on the transformational influence of technology in redefining sectors and consumer behavior. The inclusion of terminologies like crowdfunding, crowdsourcing, and network effects indicates a transition towards

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decentralized, participatory frameworks of financial and technical involvement. This cluster highlights bibliometric analysis, indicating its essential function in delineating and comprehending these transitions. It is a convergence of economic, social, and technological disciplines, providing insights into the wider ramifications of the digital revolution for society and commerce.

3. Purple Cluster: Blockchain Technology and Supply Chain Optimization:

This cluster, situated in the center-left area, is defined by buzzwords like blockchain technology, supply chains, fintech, smart contracts, and risk management. It emphasizes the utilization of blockchain as a transformative technology, especially in enhancing supply chain transparency, efficiency, and risk evaluation. The use of words such as trade finance, friction, and prospects signifies a robust emphasis on addressing inefficiencies in conventional financial and logistical frameworks. This cluster connects technological innovation with practical applications in global trade and business, highlighting the increasing significance of blockchain in transforming operational frameworks.

4. Green Cluster: Supply Chain Management and Knowledge-Based Innovation

Located in the bottom-right quadrant, the green cluster highlights information management, technical innovation, supply chain management, and financial services sectors. It emphasizes the significance of information dissemination and technology progress in propelling supply chain transitions and facilitating economic revolutions. The inclusion of terminology such as social transformation, business, and service sector indicates a wider emphasis on the socio-economic effects of these advances, especially in service-oriented economies. This cluster represents the intersection of strategic management techniques with technical advancement, providing avenues for firms to attain resilience and flexibility in swiftly evolving contexts.

3.2.2. Thematic Evolution

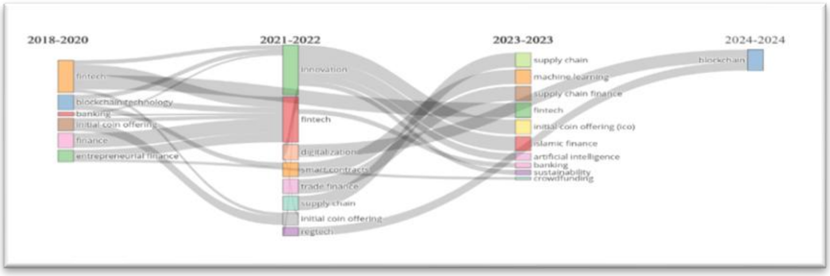

Figure: Sankey Diagram of Thematic Evolution Map

Figure 3 represents the Sankey diagram of the thematic evolution map. Each column represents a time frame: 2018–2020, 2021–2022, 2023–2023, and 2024–2024. The links between fields demonstrate how research focus areas are interconnected and how they transition between periods.

2018–2020: Research topics such as “fintech,” “blockchain technology,” “banking,” and “entrepreneurial finance” dominated, with a strong emphasis on “blockchain” and “initial coin offering.”

2021–2022: This period saw the emergence of themes like “innovation,” “digitalization,” and “smart contracts,” highlighting a shift toward exploring technological advancements and their applications in trade and supply chain finance.

2023–2023: The focus diversified further, with themes like “supply chain finance,” “machine learning,” “artificial intelligence,” and “Islamic finance,” showing increased adoption of AI and ethical financial systems.

2024–2024: “Blockchain” reemerged as a prominent independent focus area, indicating a resurgence of interest or technological breakthroughs in this domain.

4. Discussion

The integration of blockchain technology within the FinTech sector presents significant opportunities and challenges, fundamentally reshaping financial services. Blockchain enhances efficiency, transparency, and security in transactions, addressing issues such as supply chain inefficiencies and administrative overheads (Kursh & Gold, 2016). Its decentralized nature allows for secure data storage and transfer without intermediaries, which contrasts sharply with traditional banking systems (Kumari & Devi, 2022). Use cases include cross-border payments, trade finance, and digital identity verification, showcasing its versatility. However, barriers such as scalability, regulatory compliance, and high transaction fees hinder widespread adoption (Du et al., 2019). Furthermore, the rise of cryptocurrencies and fintech startups has revolutionized business models, prompting companies to embrace these technologies for transactions and fundraising through ICOs (Renduchintala et al., 2019). Overall, while blockchain holds transformative potential, addressing its challenges is crucial for its successful integration into FinTech.

5. Future Directions and Policy Implications

5.1. Future Direction

The results of this work may be beneficial for further research. The deficiencies identified in this mapping study indicate that, despite a growing number of publications on blockchain in recent years, the knowledge framework within the discipline remains fragmented, with a significant proportion of topics and research avenues still largely unexamined. Nevertheless, the primary results of the mapping research indicate that interest in the subject is increasing and its framework is expanding. This mapping study establishes a conceptual framework that lays the foundation for future empirical research and enhances awareness in the blockchain domain within the FinTech industry.

Recommendations for the study paths of this technology include:

1. Additional technical exploration needs to provide answers for the primary issues and limits mentioned. If the challenges are addressed inside the blockchain network comprehensively, FinTech businesses will swiftly adapt and implement these solutions to contemporary difficulties. The growing interest in the technology, particularly after 2016, includes several publications that broadly explain blockchain; nonetheless, there is a deficiency of studies addressing its limits with practical solutions.
2. Additional investigation on matters such as privacy and latency. These are critical challenges that have not garnered as much attention as security or scalability, yet are essential to the advancement of blockchain technology.
3. Continued advancement of smart contracts. For FinTech firms to thrive in the use of blockchain technology, smart contracts are essential for maximizing their potential.
4. Creation of apps for FinTech enterprises beyond the banking industry. Various industries, including manufacturing, trade, real estate, construction, and utilities, possess the potential to adopt blockchain technology for diverse applications. The use of blockchain in the supply chains of these industries might enhance interest in blockchain and facilitate the exploration of answers to its primary difficulties.

5.2. Theoretical And Practical Implications

The theoretical and practical implications of fintech and blockchain are profound, reshaping the financial landscape through enhanced security, efficiency, and transparency. Theoretically, blockchain's decentralized nature fosters trust and reduces reliance on central authorities, which is crucial for mitigating fraud and ensuring transaction integrity. Practically, fintech firms leveraging blockchain experience significant benefits, including cost reductions from intermediary elimination and revenue growth through asset tokenization and efficient cross-border payments.

Furthermore, interoperability protocols are essential for integrating blockchain with existing financial systems, driving innovation and efficiency. However, challenges such as scalability, regulatory uncertainty, and the need for robust security measures remain critical areas for ongoing research and development. Overall, the integration of blockchain into fintech not only enhances operational capabilities but also necessitates a reevaluation of traditional financial practices.

6. Conclusion

Blockchain is a decentralized network with a shared ledger that makes all transactions public. Using protocols and cryptography, it offers privacy, security, transparency, and anonymity. However, these advantages also provide obstacles and restrictions that require consideration. To analyze the scholarly literature on blockchain and Fintech, a comprehensive mapping analysis was conducted. This mapping research aimed to examine the present state, themes, difficulties, and limitations of blockchain technology in the FinTech sector. A total of 234 articles were extracted from the Scopus database and two types of bibliometric techniques have been performed using RStudio statistical software. Prominent journals like Technological Forecasting and Social Change and Journal of Management Information Systems are recognized for their significant influence, while highly cited works by Gomber et al. (2018) and Thakor (2020) highlight essential insights into fintech innovation and its relationship with banking. Top authors, such as Gomber Peter and Kauffman Robert demonstrate outstanding research quality, as shown by their impressive citation counts. The United States leads in publication volume and citations, with China and the UK trailing behind, while countries such as Singapore make a significant impact despite their smaller output. The findings highlight the collaborative and worldwide aspects of blockchain and fintech research, carrying important implications for future academic and practical developments. The science mapping analysis using MCA and thematic evolution highlights distinct research clusters and transitions in the blockchain and fintech domains. Key themes include environmental sustainability, economic and technological innovation, blockchain-driven supply chain optimization, and knowledge-based advancements in supply chain management. The Sankey diagram reveals evolving research priorities, with early emphasis on blockchain and fintech shifting toward AI, digitalization, and ethical finance. The findings underline blockchain's transformative role across disciplines, with its resurgence in 2024 reflecting sustained innovation and interest in this domain.

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