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Digital Wallets and Crypto Payment Systems: A Bibliometric Study of FinTech Integration

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ABSTRACT

This study presents a comprehensive bibliometric analysis of the academic literature surrounding digital wallets and crypto payment systems, two pivotal components of the evolving FinTech landscape. By utilizing data from the Scopus database and visualizing it through VOSviewer, the study maps co-occurrence of keywords, co-authorship networks, institutional collaboration, and country-level partnerships. Findings reveal that blockchain technology serves as the central anchor of research, connecting diverse themes such as smart contracts, authentication, digital assets, and decentralized finance (DeFi). Temporal analyses show a progression from foundational infrastructure studies to more application-driven topics like non-fungible tokens (NFTs) and crypto wallets. Co-authorship and collaboration networks highlight key contributors and regions, with India, the United States, and select European countries leading scholarly production and partnerships. The study provides theoretical contributions by identifying core research clusters and emerging themes, while offering practical implications for regulators, developers, and financial service providers aiming to integrate digital and crypto payment solutions. Limitations include database scope and the inherent constraints of bibliometric methods, suggesting avenues for future mixed-method or qualitative enrichment.

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1. INTRODUCTION

In the past decade, the global financial ecosystem has undergone a significant transformation driven by rapid advancements in financial technologies (FinTech) [1], [2]. Among the most notable innovations are digital wallets and crypto payment systems, which have redefined how individuals and businesses transact in an increasingly digital economy. Digital wallets—applications or devices that store payment credentials—enable users to make transactions without the need for physical cards or cash, offering convenience, speed, and often enhanced security. According to [3], the number of digital wallet users globally is expected to surpass 5 billion by 2026, with Asia-Pacific leading in adoption due to mobile-first economies and expansive e-commerce growth.

Parallel to this digital wallet boom is the proliferation of cryptocurrencies and the

establishment of crypto payment infrastructures. Originally designed as decentralized alternatives to fiat currencies, cryptocurrencies have evolved from speculative assets to mediums of exchange in certain industries and regions. Platforms such as BitPay, CoinGate, and Crypto.com have enabled crypto-to-fiat conversions, allowing merchants and users to engage in seamless transactions using Bitcoin, Ethereum, and stablecoins like USDT. As a result, crypto payment systems are increasingly viewed as viable complements—or even disruptors—to traditional banking systems, especially in countries facing currency devaluation or restricted financial inclusion [4]–[6].

The convergence of digital wallets and crypto payment systems signifies a broader shift in FinTech integration. Traditional financial service providers and FinTech startups are racing to build interoperable platforms that support both fiat and crypto payments. Major players like PayPal and Visa have expanded their services to include crypto wallet functionalities and crypto-fiat conversion services, reflecting growing institutional interest in blockchain-based payments. This integration highlights a new era in FinTech, where decentralized finance (DeFi) principles are being embedded into mainstream financial applications, bridging legacy systems with novel technologies [7].

Beyond the consumer-facing benefits, digital wallets and crypto payments also influence macroeconomic and regulatory landscapes. Central banks, for instance, are responding to the rise of private digital currencies by exploring Central Bank Digital Currencies (CBDCs). These government-backed digital assets are expected to work alongside private wallets and may challenge the current dominance of decentralized crypto networks. Regulatory bodies are increasingly focusing on ensuring anti-money laundering (AML) compliance, know-your-customer (KYC) standards, and transaction transparency, particularly in regions where crypto adoption outpaces legal frameworks [8].

Despite these developments, the academic literature on digital wallets and crypto payment systems remains fragmented, spanning multiple disciplines such as information systems, economics, legal studies, and cybersecurity [9]. While numerous empirical studies, case analyses, and conceptual frameworks exist, there is a lack of comprehensive mapping of how these two innovations intersect within the broader FinTech domain. A bibliometric analysis which systematically maps the landscape of academic publications, offers a powerful tool to understand the evolution, trends, and knowledge structure of this rapidly evolving topic.

Although both digital wallets and crypto payment systems have received growing scholarly and industry attention, there is limited integrative research that examines their intersection and integration within the FinTech ecosystem. Existing studies often treat them as separate entities, neglecting the synergistic impacts of their convergence on digital finance. Moreover, due to the multidimensional nature of FinTech, encompassing finance, technology, law, and consumer behavior, the academic discourse is dispersed across numerous journals and conferences, making it challenging to synthesize cumulative knowledge. The absence of a consolidated bibliometric review limits our understanding of dominant research themes, influential authors, institutional collaboration patterns, and evolving hot topics in this domain. This study aims to conduct a bibliometric analysis of the academic literature on digital wallets and crypto payment systems within the context of FinTech integration.

2. METHODS

This study adopts a **bibliometric analysis** approach to systematically explore the intellectual and thematic landscape of scholarly publications related to digital wallets, crypto payment systems, and their integration within the FinTech ecosystem. Bibliometric methods allow researchers to quantify patterns in academic literature, such

as co-authorship, keyword co-occurrence, citation networks, and institutional collaboration. This method is particularly suitable for mapping interdisciplinary fields like FinTech, where technological, financial, and regulatory domains intersect. By focusing on scientific outputs rather than qualitative synthesis, the bibliometric approach provides an objective overview of the development, structure, and dynamics of research in this emerging area.

The data for this study were collected from the Scopus database, which was selected due to its comprehensive coverage of peer-reviewed journals, conference proceedings, and global research outputs. The search strategy involved using keywords such as *"digital wallet"*, *"e-wallet"*, *"cryptocurrency payment"*, *"crypto payment system"*, and *"FinTech"*. Boolean operators (AND, OR) and wildcard symbols were used to maximize the retrieval of relevant documents published between 2010 and 2025. Only articles written in English and classified as journal articles, conference papers, or reviews were included. The final dataset was exported in CSV and RIS formats for compatibility with bibliometric software.

To analyze the bibliographic data, the study employed VOSviewer, a widely used software for constructing and visualizing bibliometric maps. The analysis included co-authorship mapping (authors and institutions), co-citation analysis (authors and countries), and keyword co-occurrence clustering to identify dominant themes and research trends. VOSviewer's graphical visualizations were used to interpret the density, proximity, and strength of linkages between key terms and scholarly actors. Through this method, the study aims to reveal core research clusters, influential publications, and emerging directions that shape the convergence of digital wallets and crypto payment systems in the FinTech literature.

3. RESULTS AND DISCUSSION

3.1 Keyword Co-Occurrence Network

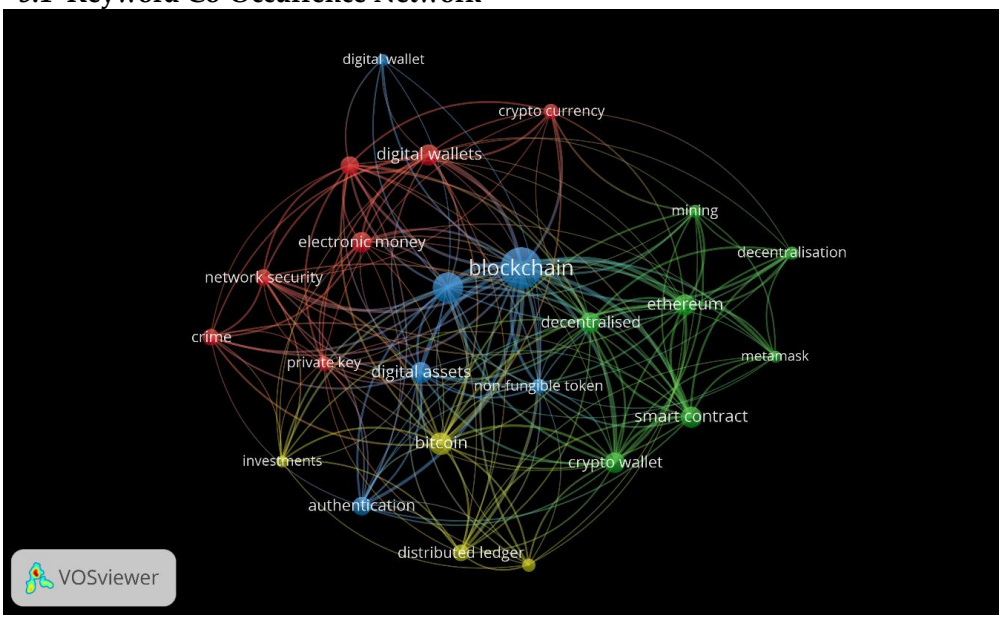

Figure 1. Network Visualization

Source: Data Analysis Result, 2025

The most dominant and centrally positioned keyword in the network is "blockchain", indicating its foundational role in the literature surrounding both digital wallets and crypto payment systems. The thickness of the connecting lin

es (links) between "blockchain" and other key terms such as *smart contract*, *digital assets*, *bitcoin*, *authentication*, and *ethereum*

suggests that blockchain functions as the core enabler of integration between crypto payments and financial technologies. Its centrality also implies that most academic discussions tend to converge on blockchain as the backbone infrastructure for digital finance innovation.

To the upper left of the visualization, a red cluster emerges around "digital wallets", "electronic money", and "network security". This group represents literature focusing on the security, usability, and infrastructure of digital wallets, including their relationship with legacy systems like electronic money. The proximity of keywords such as *private key*, *network security*, and *crime* to digital wallets suggests a strong scholarly emphasis on privacy concerns, data breaches, authentication protocols, and regulatory safeguards. This cluster reflects the convergence of technological innovation with legal and cybersecurity domains, a critical aspect of FinTech research especially in relation to consumer trust and regulatory compliance.

The green cluster on the right revolves around "ethereum", "smart contract", "decentralisation", and "mining", pointing to a second major thematic domain: crypto-native infrastructures and their implications for payment systems. This part of the map deals with decentralized finance (DeFi) mechanisms, showing how smart contracts and platforms like Ethereum and Metamask are at the forefront of autonomous, peer-to-peer payment processing. The presence of terms like *crypto wallet* and *mining* reveals a distinct research stream that is technically focused but deeply interlinked with innovations in user interfaces and cross-chain wallet compatibility, offering insight into how crypto payments evolve independently and in parallel with traditional digital wallets.

In the lower center, a yellow cluster is formed around "bitcoin", "digital assets", "investments", and "distributed ledger". This region emphasizes cryptocurrencies as financial instruments and the infrastructural underpinnings supporting them. Unlike the green cluster which centers on infrastructure, this one leans toward financialization, discussing crypto assets in terms of investment, storage, portfolio diversification, and economic value. The link to authentication and private key also highlights security mechanisms necessary to manage these assets securely. This reflects scholarly interest in the integration of crypto-assets into institutional investment strategies and digital asset management systems.

The visualization also shows dense cross-cluster linkages, which reflect the interdisciplinary nature of research in this domain. For example, keywords such as *non-fungible token* and *digital assets* appear at the intersection of several clusters, suggesting their relevance in multiple contexts—ranging from technological frameworks to investment and legal discussions. The inclusion of *metamask*—a specific software wallet—hints at a growing number of studies focusing on user experience (UX), wallet interoperability, and decentralized application (dApp) usage. The tight network density overall suggests a mature and rapidly consolidating research field, with increasing interconnectivity among themes of finance, technology, security, and regulation.

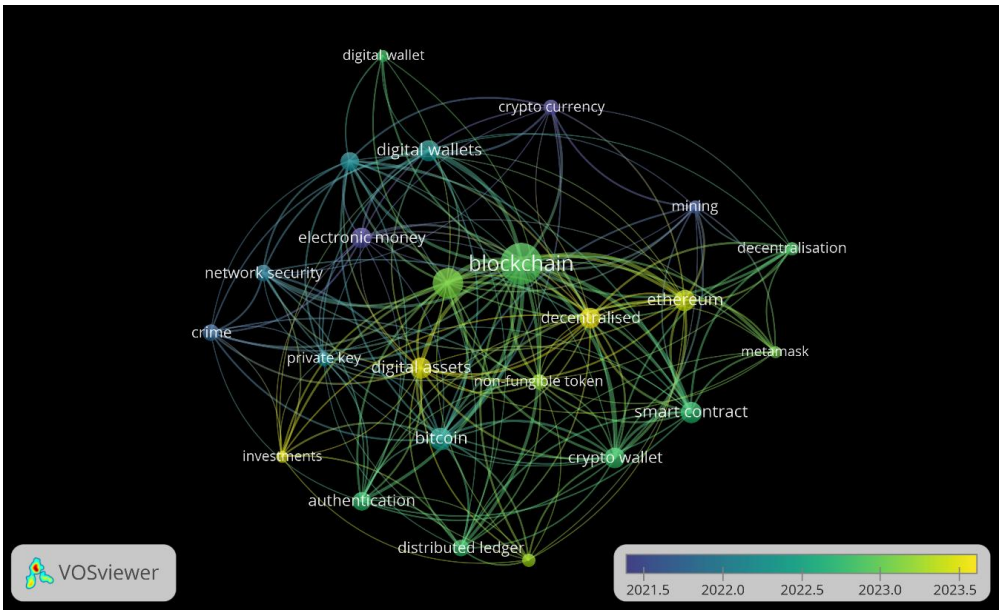

Figure 2. Overlay Visualization

Source: Data Analysis Result, 2025

Figure 2 above reveals the temporal evolution of research topics in the integration of digital wallets and crypto payment systems. Central terms such as "blockchain", "digital wallets", "bitcoin", and "network security" appear in cooler colors (blue/green), indicating that they have been long-standing research interests particularly since 2021. These keywords represent foundational technologies and concerns that established the groundwork for later studies in the FinTech ecosystem, especially concerning infrastructure, authentication, and early crypto-based transactions. In contrast, keywords like "digital assets", "non-fungible token" (NFT), "ethereum", "decentralised", and "smart contract" are shaded in yellowish tones, signifying more recent scholarly attention, especially from late 2022 to 2023. These emerging terms highlight the growing shift from foundational blockchain discussions toward application-level innovations in decentralized finance (DeFi) and token economies. The presence of "metamask" and "crypto wallet" in similar hues suggests increased focus on user-centric tools for interacting with DeFi ecosystems and managing multi-chain digital assets securely and efficiently. The visualization also demonstrates a temporal layering of research maturity. Foundational concepts like "distributed ledger", "electronic money", and "private key" initiated early scholarly work, while newer studies are progressively focusing on integration layers and user interaction. The dense interconnections between older and newer keywords reflect an ongoing integration of traditional FinTech with decentralized frameworks, signaling a maturing field that is increasingly concerned with real-world application, interoperability, security, and regulatory readiness

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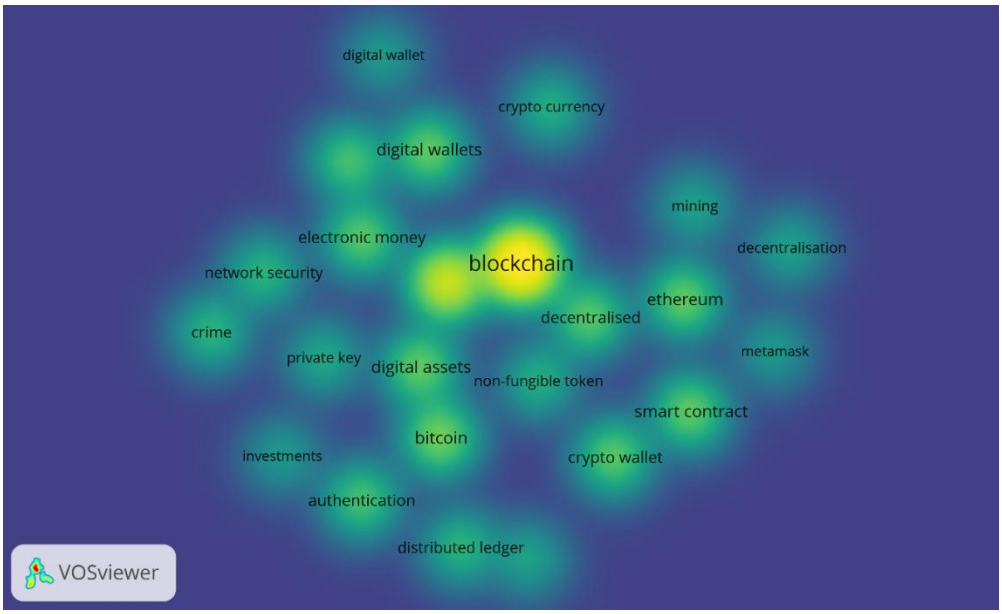

Figure 3. Density Visualization

Source: Data Analysis, 2025

Figure 3 clearly highlights "blockchain" as the most dominant and frequently occurring keyword in the literature, signified by its bright yellow intensity at the center of the map. This suggests that blockchain serves as the central concept in scholarly discussions on digital wallets and crypto payment systems, acting as the technological backbone underpinning both. Closely surrounding it are moderately dense terms like *digital assets*, *bitcoin*, *decentralised*, *ethereum*, and *digital wallets*, which appear in greenish hues. These keywords indicate high research relevance, though less than that of blockchain, and point to significant thematic overlaps in areas such as asset tokenization, decentralized infrastructure, and the evolution of wallet technologies. In contrast, keywords such as metamask, mining, crime, and distributed ledger appear in darker green to blue zones, reflecting lower frequencies or more niche focuses in the analyzed literature. Their positions at the periphery suggest emerging or specialized discussions that are still gaining traction. The presence of terms like network security, private key, and authentication also signals a continuing concern with security and trust mechanisms in digital and crypto-financial environments.

3.2 Co-Authorship Network

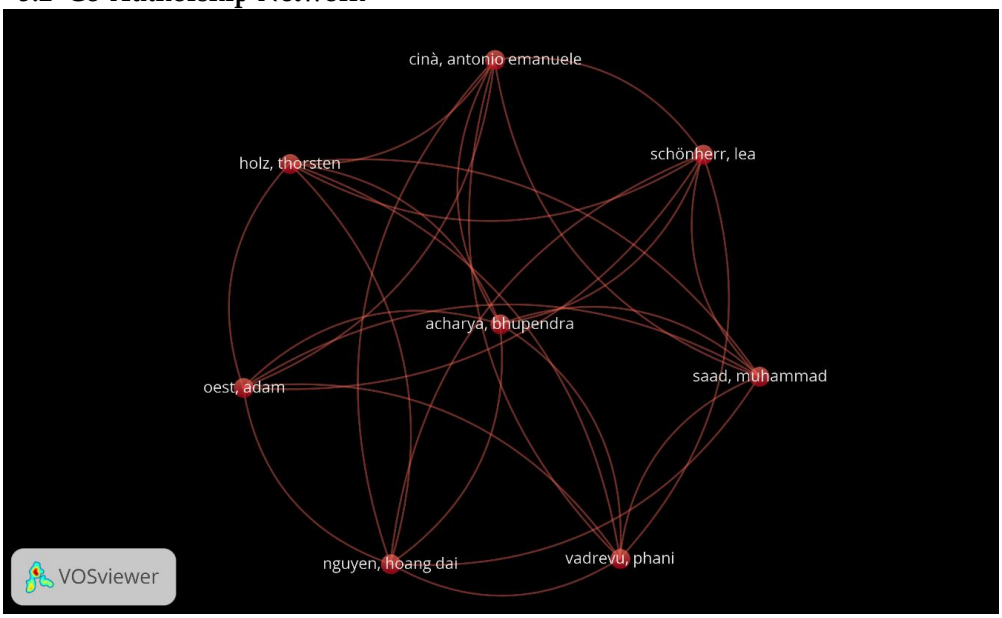

Figure 4. Author Collaboration Visualization

Source: Data Analysis, 2025

Figure 4 illustrates a highly collaborative research network among a select group of authors in the field of digital wallets and crypto payment systems. At the center of this network is Acharya, Bhupendra, who appears to act as a central hub, maintaining strong co-authorship ties with nearly all other researchers, including Saad, Muhammad, Nguyen, Hoang Dai, and Vadrevu, Phani. This indicates Acharya's potential leadership or coordinating role in multi-author publications. The network is densely interconnected, with most authors, such as Schönherr, Lea, Cinà, Antonio Emanuele, and Holz, Thorsten sharing links with multiple peers, suggesting a collaborative research culture rather than isolated scholarship.

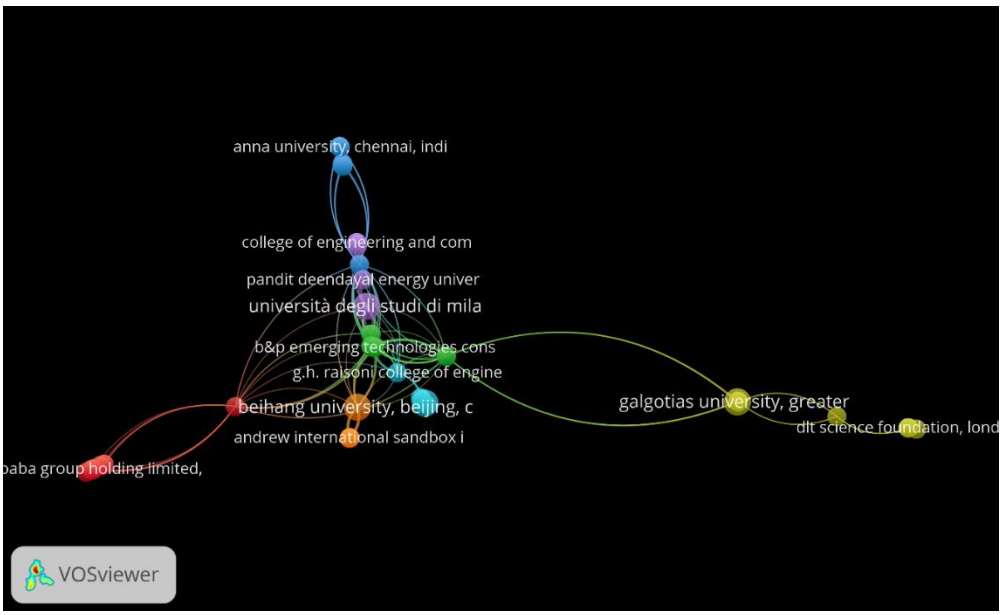

Figure 5. Affiliation Collaboration Visualization

Source: Data Analysis, 2025

Figure 5 reveals a multinational network of academic and corporate partnerships in research on digital wallets and crypto payment systems. Several distinct clusters are visible, indicating regional or thematic collaboration patterns. The blue cluster centers around Anna University, Chennai, showing strong internal collaboration within Indian academic institutions. The red cluster includes prominent Chinese institutions such as Beihang University, Beijing and Alibaba Group Holding Limited, suggesting a corporate-academic link likely focused on blockchain applications. In the green and yellow clusters, institutions like Galgotias University and the DLT Science Foundation, London bridge regional divides, acting as connectors between South Asian and European research networks. The central area features shared affiliations between Indian and Italian universities like Università degli Studi di Milano demonstrating growing cross-border scholarly synergy, particularly in applied technology and engineering.

Figure 6. Country Collaboration Visualization

Source: Data Analysis, 2025

Figure 6 illustrates a globally distributed yet regionally clustered network of research activity in the domain of digital wallets and crypto payment systems. India emerges as the most prominent node—indicated by its larger label size and thicker connections—reflecting its central role in scholarly output and international partnerships, particularly with the United States, Italy, and the United Arab Emirates. Meanwhile, Germany and Malta are seen bridging the Western and Eastern parts of the map, suggesting their role as intermediary research hubs in Europe. The United Kingdom forms a distinct cluster on the far right, actively collaborating with Germany and Malta but less so with India and the US.

3.3 Citation Analysis

Table 1. Top Cited Research

Citations	Authors and year	Title
83	[10]	A framework to make charity collection transparent and auditable using blockchain technology

Citations	Authors and year	Title
69	[11]	Understanding the risks associated with wallets, depository services, trading, lending, and borrowing in the crypto space
61	[12]	Exploring trust in bitcoin technology: A framework for HCI research
50	[13]	A Survey: Security, Transparency, and Scalability Issues of NFT's and Its Marketplaces
40	[14]	The Smart Performance Analysis of Cyber Security Issues in Crypto Currency Using Blockchain
38	[15]	New secure approach to backup cryptocurrency wallets
35	[16]	COINHOARDER: Tracking a ukrainian bitcoin phishing ring DNS style
34	[17]	Beginning Ethereum Smart Contracts Programming: With Examples in Python, Solidity, and JavaScript
29	[18]	Cyber ethics and cyber crime: A deep dwelved study into legality, ransomware, underground web and bitcoin wallet
25	[19]	Are cryptocurrencies currencies? Bitcoin as legal tender in El Salvador

Source: Scopus, 2025

Practical Implications

This study provides valuable insights for practitioners, policymakers, and FinTech developers by mapping the evolving landscape of digital wallets and crypto payment systems. The identification of key themes such as blockchain infrastructure, smart contract applications, and security and authentication protocols offers practitioners a clearer understanding of the technological priorities and innovation trajectories within the sector. For financial institutions and technology firms, the results underscore the need to bridge the gap between traditional digital wallets and decentralized payment systems, ensuring seamless user experience, compliance, and interoperability. Moreover, the emergence of topics like non-fungible tokens (NFTs) and crypto wallets highlights the growing significance of consumer-facing DeFi applications, which could influence strategic investment and product development decisions. Regulatory bodies may also benefit from this study by observing patterns of international collaboration and focusing oversight on areas like data privacy, anti-money laundering (AML), and cross-border crypto transactions.

Theoretical Contribution

This research enriches the academic discourse by offering a comprehensive bibliometric synthesis of a field that is typically fragmented across disciplines such as information systems, finance, computer science, and legal studies. By using VOSviewer-based co-occurrence, co-authorship, and collaboration mapping, the study contributes to theory-building in three key ways. First, it identifies blockchain as a theoretical anchor around which subfields such as digital wallets, crypto assets, and smart contracts converge. Second, it reveals the multidimensional nature of FinTech integration, where technological development, regulatory adaptation, and user behavior intersect. Third, the study contributes to understanding the temporal evolution of scholarly interest, indicating a shift from foundational infrastructure studies to applied financial innovations and user-centric design. This mapping offers a springboard for developing new conceptual frameworks that link digital payment infrastructure, innovation diffusion, and financial inclusion in both developed and emerging markets.

Limitations

Despite its contributions, this study is not without limitations. First, the scope of data is limited to the Scopus database, which, while comprehensive, may omit relevant works published in non-indexed journals,

preprints, or other academic repositories (e.g., SSRN or IEEE Xplore). Second, the bibliometric approach is inherently quantitative and lacks the contextual richness that qualitative or mixed-methods reviews might provide—for example, deeper insights into the motivations behind co-authorships or theoretical framing within papers. Third, the study focuses on keyword-level analysis, which may overlook latent or emerging constructs not explicitly named in titles or abstracts. Additionally, language and regional biases may influence the representation of contributions from non-English-speaking scholars or underrepresented regions. Future research should consider expanding the dataset, incorporating content analysis, and integrating expert interviews or surveys to provide a more nuanced and holistic perspective.

4. CONCLUSION

This bibliometric study has illuminated the dynamic and evolving landscape of research on digital wallets and crypto payment systems within the broader FinTech ecosystem. By leveraging tools such as VOSviewer, the analysis has revealed that blockchain stands at the core of scholarly discourse, serving as the foundational technology linking innovations like smart contracts, digital assets, and authentication mechanisms. The study also highlights a shift in academic focus from infrastructure-based discussions to application-level developments, including user-centric technologies such as crypto wallets and NFTs. Collaborative networks among authors, institutions, and countries show a growing yet still fragmented global research community, with India, the United States, and several European nations playing pivotal roles. The findings offer both practical and theoretical value while also pointing to the need for deeper interdisciplinary collaboration and inclusion of underrepresented regions.

REFERENCES

[1] T. Fareed, "A systemic review of payment technologies with a special focus on digital wallets," *Financ. Technol. DeFi A Revisit to Digit. Financ. Revolut.*, pp. 89–97, 2023.

[2] J.-P. Boly *et al.*, "The ESPRIT project CAFE—High security digital payment systems," in *European Symposium on Research in Computer Security*, Springer, 1994, pp. 217–230.

[3] N. V. KANDIMALLA and V. BARI, "Digital wallet payments," 2019.

[4] P.-W. Chen, B.-S. Jiang, and C.-H. Wang, "Blockchain-based payment collection supervision system using pervasive Bitcoin digital wallet," in *2017 IEEE 13th international conference on wireless and mobile computing, networking and communications (WiMob)*, IEEE, 2017, pp. 139–146.

[5] M. R. Ahmed, K. Meenakshi, M. S. Obaidat, R. Amin, and P. Vijayakumar, "Blockchain based architecture and solution for secure digital payment system," in *ICC 2021-IEEE International Conference on Communications*, IEEE, 2021, pp. 1–6.

[6] A. Bana and A. Osmanourtashi, "Blockchain and Private International Law: Implications for Crypto, Payment Systems, Digital Wallets and Jurisdictional Concerns," *Bus. L. Int'l*, vol. 24, p. 121, 2023.

[7] R. Widjojo, "The development of digital payment systems in Indonesia: a review of go-pay and ovo e-wallets," *Econ. Altern.*, vol. 3, pp. 384–395, 2020.

[8] R. Gupta, C. Kapoor, and J. Yadav, "Acceptance towards digital payments and improvements in cashless payment ecosystem," in *2020 International Conference for Emerging Technology (INCET)*, IEEE, 2020, pp. 1–9.

[9] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *J. Bus. Res.*, vol. 133, pp. 285–296, 2021.

[10] M. S. Farooq, M. Khan, and A. Abid, "A framework to make charity collection transparent and auditable using blockchain technology," *Comput. Electr. Eng.*, vol. 83, p. 106588, 2020.

[11] A. Mikhaylov, "Understanding the risks associated with wallets, depository services, trading, lending, and borrowing in the crypto space," *J. Infrastructure, Policy Dev.*, vol. 7, no. 3, p. 2223, 2023.

[12] C. Sas and I. E. Khairuddin, "Exploring trust in Bitcoin technology: a framework for HCI research," in *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction*, 2015, pp. 338–342.

[13] S. Bhujel and Y. Rahulamathavan, "A survey: Security, transparency, and scalability issues of nft's and its marketplaces," *Sensors*, vol. 22, no. 22, p. 8833, 2022.

[14] J. Logeshwaran, V. A. K. Gorantla, V. Gude, and B. Gorantla, "The Smart Performance Analysis of Cyber Security Issues in Crypto Currency Using Blockchain," in *2023 6th International Conference on Contemporary Computing and*

Informatics (IC3I), IEEE, 2023, pp. 2235–2241.

[15] H. Rezaeighaleh and C. C. Zou, "New secure approach to backup cryptocurrency wallets," in *2019 IEEE Global Communications Conference (GLOBECOM)*, IEEE, 2019, pp. 1–6.

[16] A. Holub and J. O'Connor, "COINHOARDER: Tracking a ukrainian bitcoin phishing ring DNS style," in *2018 APWG Symposium on Electronic Crime Research (eCrime)*, IEEE, 2018, pp. 1–5.

[17] W.-M. Lee, "Beginning ethereum smart contracts programming," *With Examples Python, Solidity JavaScript*, 2019.

[18] R. Upadhyaya and A. Jain, "Cyber ethics and cyber crime: A deep dwelved study into legality, ransomware, underground web and bitcoin wallet," in *2016 International Conference on Computing, Communication and Automation (ICCCA)*, IEEE, 2016, pp. 143–148.

[19] F. Alvarez, D. Argente, and D. Van Patten, "Are cryptocurrencies currencies? Bitcoin as legal tender in El Salvador," *Science (80-.).*, vol. 382, no. 6677, p. eadd2844, 2023.