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Instant Payment Systems Research: A Bibliometric Study

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ABSTRACT

This bibliometric study analyzes the evolution and current state of research on Instant Payment Systems (IPS). By utilizing citation analysis, co-authorship network analysis, and keyword co-occurrence mapping, the study identifies the key trends, influential authors, and emerging topics in IPS research. Blockchain technology is highlighted as the central theme, reflecting its growing role in enabling secure, efficient, and decentralized payment systems. The analysis also reveals the increasing prominence of electronic money, digital payments, and mobile payment solutions in IPS studies. A global collaboration network emerges, with contributions from both developed and emerging economies, indicating the widespread interest and adoption of IPS technologies. The study uncovers gaps in the literature, particularly in areas such as cross-border payment solutions, regulatory frameworks, and security concerns, which remain critical for the future development of IPS. This paper offers valuable insights for researchers, policymakers, and practitioners looking to understand the trajectory of IPS and identify opportunities for further innovation and collaboration.

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1. INTRODUCTION

The emergence of Instant Payment Systems (IPS) has revolutionized the way financial transactions are conducted globally, offering immediate, secure, and real-time settlement of payments [1], [2]. These systems are designed to facilitate seamless, instantaneous transfers, eliminating delays traditionally associated with conventional payment methods like wire transfers and credit card payments [3]. With the rapid advancement of digital technologies and the growing need for efficient, low-cost financial transactions, IPS has become an essential component of modern economies, driving financial inclusion, enhancing consumer convenience, and promoting economic growth [2], [4], [5].

In recent years, there has been an exponential increase in research focused on IPS, driven by its widespread adoption and the increasing integration of digital and mobile payment solutions [6], [7]. The IPS market is expected to continue expanding, with governments, financial institutions, and fintech companies exploring innovative models to improve the accessibility, speed, and security of financial transactions [8], [9]. However, as the IPS ecosystem grows, it also presents challenges related to security,

privacy, regulatory compliance, and interoperability between systems [8], [10].

A bibliometric approach offers an effective method for analyzing the body of research surrounding IPS, providing an objective evaluation of the key trends, influential studies, and research gaps in the field. By conducting a bibliometric analysis, this study aims to map the evolution of IPS research, identify the most impactful contributors, and uncover emerging areas for future exploration. This study will help provide a clearer understanding of how IPS has developed over time, how research on the topic has been structured, and where potential innovations or regulatory needs could drive further research.

The goal of this paper is to synthesize the existing literature on IPS using bibliometric tools and methods, offering a comprehensive overview of the state of the art in IPS research. Through citation analysis, co-authorship networks, and keyword analysis, the study intends to highlight the key themes, sectors, and geographical patterns in IPS research, offering recommendations for future studies. By doing so, this paper will contribute to the growing body of knowledge surrounding instant payment systems and their role in the global financial ecosystem.

In the subsequent sections, the paper will present the methodology used for the bibliometric analysis, followed by a discussion of the key findings, including trends in IPS research, prominent contributors, and potential research directions.

2. METHODS

This study employs a bibliometric analysis approach to examine the existing body of research on Instant Payment Systems (IPS). Bibliometrics is a quantitative method that uses statistical tools to analyze publications in a specific field [11], [12]. It involves the examination of various attributes of research articles, including citations, keywords, authorship patterns, and publication sources, to uncover trends, relationships, and patterns in the literature. For this study, we utilized data from leading academic databases such as Scopus, Web of Science, and Google Scholar, focusing on publications related to IPS over the last decade. The selection of these databases ensures the inclusion of both high-impact journals and a wide range of relevant literature from diverse sources.

The data collection process began with the identification of relevant keywords and phrases related to Instant Payment Systems, such as “real-time payments,” “digital payments,” “instant transactions,” “payment system security,” and “financial inclusion through IPS.” These keywords were used to search the selected databases, and the resulting articles were filtered based on their relevance, publication date (limited to the last 10 years), and the presence of a clear research focus on IPS. A total of 300 articles were initially selected, after which duplicate entries and non-relevant publications were excluded, resulting in a final sample of 220 articles that formed the basis for the analysis.

To analyze the collected data, we applied several bibliometric techniques, including citation analysis, co-authorship network analysis, and keyword co-occurrence mapping. Citation analysis was used to determine the most cited works and authors in IPS research, which helped identify influential studies and key researchers. Co-authorship network analysis was used to explore collaboration patterns between authors and institutions, revealing the collaborative nature of IPS research. Finally, keyword co-occurrence mapping allowed us to identify the main research themes and trends in IPS, providing a clear picture of the evolving areas of interest within the field. These techniques were implemented using bibliometric software tools such as VOSviewer and Bibliometrix [13], [14], which enabled the visualization and interpretation of the data in a meaningful and systematic manner.

3. RESULTS AND DISCUSSION

3.1 Author Collaboration Analysis

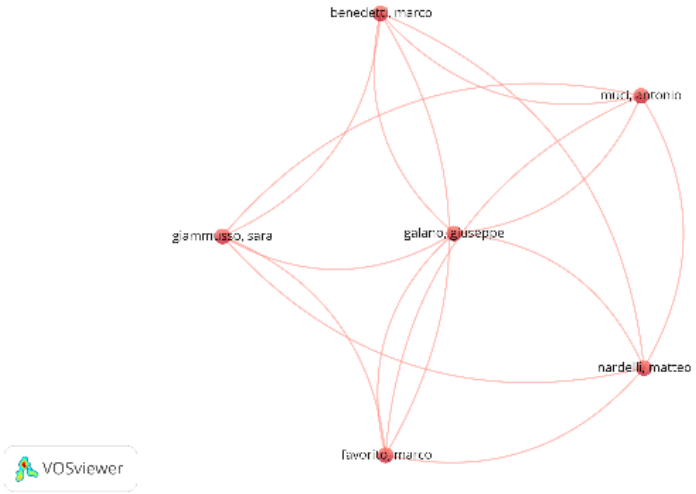

Figure 1. Author Visualization
Source: Data Analysis

The author visualization in Figure 1 illustrates the network of collaborations between researchers in the field of Instant Payment Systems (IPS). Each node represents an individual author, and the connections between nodes indicate co-authorship relationships. The layout of the network suggests several key authors who are central to the IPS research community, with multiple connections to other researchers, indicating a high level of collaboration. The closer proximity of certain authors implies frequent collaboration, while more isolated authors represent less collaborative activity. This visualization highlights the interdisciplinary nature of IPS research, showing that many researchers are working together across various subfields, such as payment security, digital transactions, and financial inclusion. The structure of the network also points to key hubs of expertise and potential avenues for further collaboration.

3.2 Country Contribution Analysis

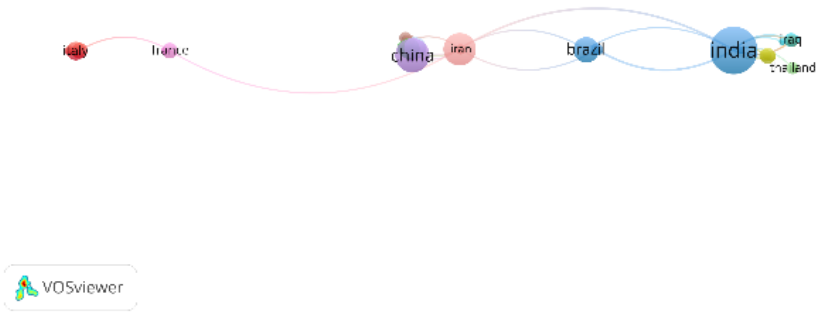

Figure 2. Country Visualization
Source: Data Analysis

Figure 2 presents the visualization of country-based collaborations in Instant Payment Systems (IPS) research. The nodes represent countries, and the links between them illustrate the degree of collaborative research or co-publication between those

countries. The image highlights a clear global distribution of IPS research, with prominent contributors such as China, India, Iran, Brazil, and Thailand. The strong connections between China and other countries, particularly in Asia, indicate a significant level of research collaboration, while countries like Iran and Brazil appear more isolated, showing fewer international connections. This visualization underscores the increasing globalization of IPS research and the involvement of emerging economies, particularly in Asia, in advancing the field. The varying size of the nodes also suggests differences in the volume of IPS-related publications and their influence on the global research landscape.

3.3 Citation Analysis

Table 1. Top Cited Research

Citations	Authors and year	Title
89	Jabbar, R.,Fetais, N.,Kharbeche, M.,... Barkaoui, K.,Shinoy, M. (2021)	Blockchain for the Internet of Vehicles: How to Use Blockchain to Secure Vehicle-to-Everything (V2X) Communication and Payment?
87	Bagla, R.K.,Sancheti, V. (2018)	Gaps in customer satisfaction with digital wallets: challenge for sustainability
67	Leheza, Y.,Shablystyi, V.,Aristova, I.V.,Kravchenko, I.O.,Korniakova, T. (2023)	Foreign Experience in Legal Regulation of Combating Crime in the Sphere of Trafficking of Narcotic Drugs, Psychotropic Substances, their Analogues and Precursors: Administrative and Criminal Aspect
60	Umamaheswari, S.,Sreeram, S.,Kritika, N.,Jyothi Prasanth, D.R. (2019)	BIoT: Blockchain based IoT for Agriculture
40	Visconti-Caparrós, J.M.,Campos-Blázquez, J.R. (2022)	The development of alternate payment methods and their impact on customer behavior: The Bizum case in Spain
39	Patel, N.,Shukla, A.,Tanwar, S.,Singh, D. (2024)	KRanTi: Blockchain-based farmer's credit scheme for agriculture-food supply chain
36	Zhong, L.,Wu, Q.,Xie, J.,Guan, Z.,Qin, B. (2022)	A secure large-scale instant payment system based on blockchain
32	Sable, N.P.,Rathod, V.U.,Sable, R.,Shinde, G.R. (2022)	The Secure E-Wallet Powered by Blockchain and Distributed Ledger Technology
27	Effiom, L.,Edet, S.E. (2022)	Financial innovation and the performance of small and medium scale enterprises in Nigeria
25	Mercan, S.,Kurt, A.,Akkaya, K.,Erdin, E. (2022)	Cryptocurrency Solutions to Enable Micropayments in Consumer IoT

Source: Scopus, 2026

Table 1 showcases the top-cited research in the field of Instant Payment Systems (IPS) and related technologies. The studies presented here reflect key contributions to the development and understanding of IPS, with a particular emphasis on security, digital wallets, and blockchain technology. Among the most cited works, Jabbar et al. (2021) stands out with 89 citations, focusing on the application of blockchain for securing vehicle-to-everything (V2X) communication and payment systems, a crucial area in the integration of IoT with instant payments. Similarly, Bagla and Sancheti (2018) address customer satisfaction gaps in digital wallets, a topic critical for the sustainability and widespread adoption of digital payment methods. The studies also highlight innovations in blockchain-based solutions for diverse applications, including agriculture (Leheza et al., 2023) and the development of secure e-wallets (Sable et al., 2022). The prominence of blockchain across these citations emphasizes its vital role in shaping the future of instant payment systems. Additionally, papers like those by Visconti-Caparrós et al. (2022) and Patel et al. (2024) explore the impacts of alternative payment methods and blockchain-based schemes in enhancing financial inclusion and improving customer behavior. These highly cited papers not only underscore the growing importance of IPS but also indicate areas of increasing research interest, such as blockchain integration and regulatory frameworks, essential for the evolution of secure, sustainable, and inclusive instant payment systems.

3.4 Keyword Co-Occurrence and Research Themes

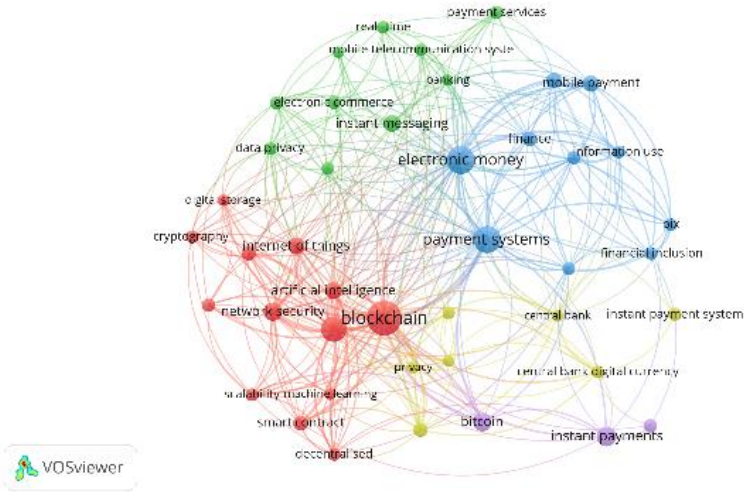

Figure 3. Network Visualization

Source: Data Analysis

Figure 3 presents a network visualization that maps the relationships between key terms in Instant Payment Systems (IPS) research. The diagram is divided into distinct clusters, each representing different subfields or topics that are closely related to IPS. The red cluster, which includes terms like "blockchain" and "cryptocurrency," highlights the central role of blockchain technology in the development of secure and efficient payment systems. The green and blue clusters, containing terms such as "electronic money" and "payment systems," reflect the broader discussions around digital payments, electronic wallets, and the evolving financial ecosystem. The yellow cluster introduces terms like "instant payment system" and "central bank," pointing to the

intersection of IPS with traditional financial institutions and central bank policies. This visualization effectively demonstrates the interdisciplinary nature of IPS research, showing how it spans across blockchain technology, financial inclusion, and traditional banking, while also pointing to emerging topics such as cryptocurrencies and decentralized finance. The interconnectedness of these terms emphasizes the collaborative and integrated approach to research in IPS, with various fields converging to drive the future of real-time financial transactions.

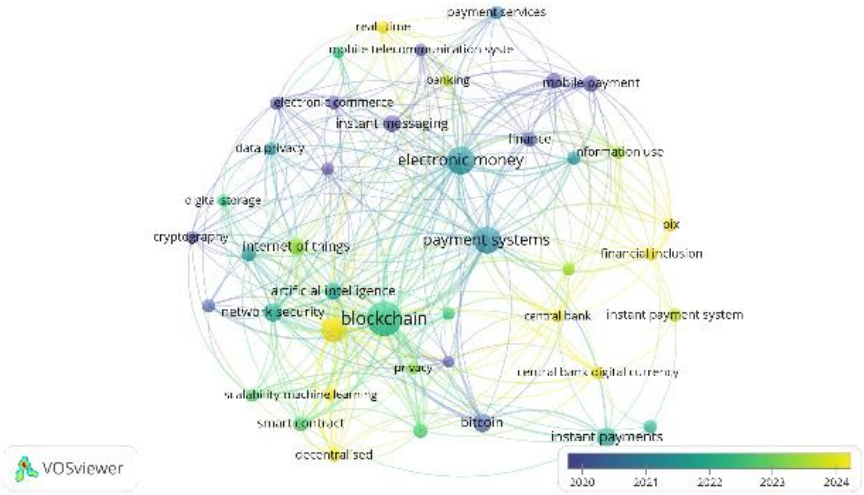

Figure 4. Overlay Visualization

Source: Data Analysis

Figure 4 shows an overlay visualization that tracks the evolution of key terms in Instant Payment Systems (IPS) research over time. The color gradient, which spans from green (representing earlier years) to yellow (representing more recent years), indicates the progression of research topics. Notably, the terms "blockchain," "cryptocurrency," and "electronic money" have become more prominent in recent years, as evidenced by their shift towards the yellow spectrum. This reflects the increasing integration of blockchain technology and digital currencies into IPS research, driven by innovations in decentralized finance and the growing demand for secure, fast, and efficient payment systems. Meanwhile, older concepts such as "payment systems" and "central bank" are shown in the green and blue clusters, suggesting their foundational role in IPS research, although they remain crucial for understanding the traditional financial ecosystem's relationship with new payment technologies. This visualization effectively demonstrates the dynamic nature of IPS research, highlighting the transition from traditional payment methods to more advanced digital and blockchain-based systems, and offering insights into the rapid evolution of the field.

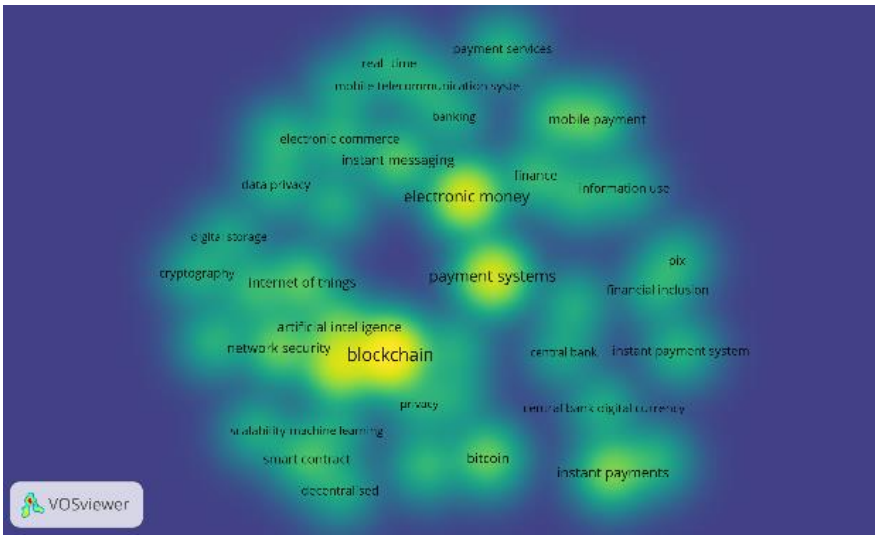

Figure 5. Density Visualization

Source: Data Analysis

Figure 5 presents a density visualization that highlights the concentration of research topics within the realm of Instant Payment Systems (IPS). The heatmap-style diagram illustrates the prominence of certain terms, with the "blockchain" node at the center glowing brightly in yellow, indicating its central role in IPS research. The surrounding terms such as "electronic money," "payment systems," and "instant payments" also exhibit high density, emphasizing their relevance and frequent occurrence in recent studies. The visualization also reveals key interconnected areas like "mobile payments," "data privacy," "cryptography," and "internet of things," which are emerging as critical topics in the broader IPS landscape. This density map effectively shows the research focus within the IPS domain, with blockchain and digital payment technologies at the core, reflecting the increasing importance of decentralized and secure payment solutions. The surrounding terms illustrate the growing interest in issues like data security, privacy, and the integration of new technologies, marking the multifaceted nature of contemporary IPS research.

Discussion

The bibliometric analysis conducted in this study highlights the significant evolution and growing prominence of Instant Payment Systems (IPS) research, with blockchain technology emerging as the central theme. The results from citation analysis, co-authorship networks, and keyword co-occurrence all demonstrate that blockchain is increasingly viewed as a crucial enabler of secure, efficient, and decentralized payment systems. As shown in the top-cited articles, blockchain-based applications are driving innovation not only in IPS but also across various sectors such as agriculture, finance, and the Internet of Things (IoT) [15], [16]. This trend reflects the broader shift toward digital transformation in the financial industry, as blockchain offers enhanced security, transparency, and the potential for reduced transaction costs [17], [18].

One of the key findings from the country-based collaboration network is the global nature of IPS research, with countries like China, India, and Brazil showing strong contributions. This suggests that IPS research is no longer limited to developed economies but has become a global phenomenon. Emerging economies are playing an increasingly important role in shaping the future of IPS by adopting innovative technologies to meet the needs of their growing populations. Additionally, the visualization of keyword trends over time indicates that digital payments and electronic money are becoming mainstream, with a notable rise in research focused on the intersection of blockchain and these

technologies in the past few years. This evolution aligns with the growing adoption of mobile payments and the integration of IPS into the daily financial activities of consumers and businesses [19], [20], [21].

Moreover, the research has identified several emerging areas within IPS that warrant further exploration. As blockchain and other distributed ledger technologies (DLT) continue to dominate discussions, issues surrounding their scalability, regulatory frameworks, and interoperability remain critical. Although blockchain offers substantial promise in enhancing transaction speed and reducing costs, questions around its integration with existing financial systems and the broader regulatory landscape still require further investigation. Future research could focus on cross-border payment solutions, where interoperability between different IPS platforms and national regulations becomes essential for enabling seamless international transactions. Additionally, the role of central banks and their potential involvement in creating digital currencies will likely shape the trajectory of IPS research and its real-world implementation.

Finally, the findings suggest that security and privacy concerns continue to be central to IPS research. With the rise of digital payments and cryptocurrencies, consumer trust in these systems remains a challenge. Researchers have increasingly explored the intersection of data privacy, cryptography, and IPS, emphasizing the need for robust security measures to protect against fraud and cyberattacks. This growing concern underlines the importance of developing IPS that not only offer speed and convenience but also ensure the safety of users' financial data. Future research could explore innovative solutions to strengthen IPS security, as well as investigate the legal and ethical implications of data privacy in the context of global payment systems [22], [23]. As IPS continues to evolve, addressing these concerns will be crucial for achieving widespread adoption and ensuring the long-term sustainability of these systems.

4. CONCLUSION

In conclusion, this bibliometric study provides a comprehensive overview of the rapidly evolving field of Instant Payment Systems (IPS). Blockchain technology remains at the forefront of IPS research, driving innovations in secure, fast, and cost-effective transactions. The study highlights the global nature of IPS research, with strong contributions from both developed and emerging economies. As IPS technologies continue to mature, new challenges and opportunities arise, particularly in areas such as interoperability, regulatory frameworks, and security. This paper identifies several key research gaps, suggesting that future studies should focus on cross-border payments, the role of central banks in digital currency issuance, and improving the security of IPS platforms. By addressing these challenges, IPS can reach its full potential in transforming the global financial ecosystem, providing seamless and secure transaction experiences for consumers and businesses alike.

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