

Bibliometric Analysis of Mobile Payment Technology Innovation in Financial Transaction Transformation

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ABSTRACT

Mobile payment technology has become increasingly prevalent, reshaping the landscape of financial transactions globally. This study conducts a comprehensive bibliometric analysis to explore the trends, patterns, and dynamics surrounding mobile payment technology innovation. Through systematic data collection and analysis, key themes, influential authors, pivotal publications, and emerging topics in the field are identified and examined. The analysis reveals the transformative impact of mobile payment technology on financial systems, consumer behavior, and business models. Moreover, it underscores the significance of understanding the underlying factors influencing innovation in this domain. The findings provide valuable insights for researchers, policymakers, industry practitioners, and consumers, informing strategic decision-making and technological development efforts in the financial and technology sectors.

Keywords: Mobile Payment Technology, Innovation, Bibliometric Analysis, Financial Transactions, VOSViewer

1. INTRODUCTION

Mobile payment technology has emerged as a pivotal driver in the transformative landscape of financial transactions [1], [2]. With the proliferation of smartphones and the Internet, the way individuals conduct financial transactions has undergone significant evolution. From traditional cash transactions to digital payments facilitated by mobile devices, this shift has reshaped the dynamics of commerce globally [3], [4]. Understanding the trajectory of mobile payment technology innovation is essential in comprehending its impact on financial systems, consumer behavior, and business models [5]. Through bibliometric analysis, this research aims to delve into the trends, patterns, and dynamics surrounding mobile payment technology innovation, providing insights into its evolution and implications.

The rapid advancement of mobile payment technology has been fueled by various factors, including technological innovation, changing consumer preferences, and regulatory frameworks [6]. This dynamic environment has led to a proliferation of research and development efforts aimed at enhancing the efficiency, security, and accessibility of mobile payment systems [7]. Additionally, the integration of mobile payment solutions into various sectors, such as retail, finance, and transportation, highlights its versatility and potential to revolutionize conventional payment methods [8], [9]. Despite the considerable attention garnered by mobile payment technology, there remains a need for comprehensive analysis to discern the underlying trends and drivers of innovation in this domain [10].

In the context of this evolving landscape, understanding the research problem becomes paramount. While mobile payment technology has witnessed significant growth and adoption [1], [6], [8], [11], [12], there exist gaps and challenges that warrant exploration. These may include issues related to security, interoperability, user experience, and regulatory compliance. Moreover, identifying the underlying factors influencing the pace and direction of innovation in mobile

payment technology can provide valuable insights for stakeholders, policymakers, and industry players seeking to navigate this complex ecosystem effectively.

The research problem addressed in this study revolves around understanding the trends, patterns, and dynamics of innovation in mobile payment technology, as reflected in scholarly literature. By conducting a bibliometric analysis, this research aims to identify key research themes, influential authors, pivotal publications, and emerging topics in the field of mobile payment technology innovation. This research holds significance in providing valuable insights for various stakeholders, including researchers, policymakers, industry practitioners, and consumers. By elucidating the trends and dynamics of mobile payment technology innovation, the study can inform strategic decision-making, policy formulation, and technological development efforts in the financial and technology sectors. Additionally, the findings of this research can contribute to the existing body of knowledge on mobile payment technology, fostering further research and discourse in this rapidly evolving domain.

2. LITERATURE REVIEW

2.1 *Mobile Payment Technology*

Mobile payment technology is a transformative innovation that offers convenient and efficient financial services [13]. It enhances purchasing convenience, customer satisfaction, and checkout efficiency, contributing to its high perceived value [8]. Despite its global impact, some advanced economies like the U.S. lag in mobile payment adoption due to past success with card payments, hindering their transition [14]. Mobile payment utilizes mobile phones and electronic devices for electronic currency transactions, revolutionizing payment systems and popularizing electronic money [15]. However, barriers to adoption, such as consumer resistance and technological theories, can impede its widespread use [9]. Integrating blockchain technology can address security concerns and enhance trust in mobile payments, especially in the initial stages of industry integration.

2.2 *Financial Transaction Transformation*

Financial transaction transformation involves the evolution of money functions, digital platforms, and the emergence of new intermediaries in financial operations [16]. Economic frictions and technological advances have shaped market structures, leading to disaggregation and rebundling of financial services [17]. The CFO plays a crucial role in balancing transactional optimization with strategic influence during financial transformation [18]. Stock trading has been significantly impacted by the development of e-commerce, simplifying participation, reducing costs, and emphasizing speed, reliability, and security of computer systems [19]. The financial sector's transformation is driven by factors like evolution, complexity, and purposefulness, with a focus on organizational and functional changes in Ukraine's financial sector [20]. These transformations necessitate proactive planning, risk assessment, and modernization to achieve the desired outcomes in financial business development.

3. METHODS

3.1 *Data Collection*

The first step in this research involves the systematic collection of scholarly publications related to mobile payment technology innovation. A comprehensive search strategy will be devised to identify relevant literature from academic databases, such as PubMed, Scopus, Web of Science, and Google Scholar. Keywords and search terms pertaining to mobile payment technology, innovation, financial transactions, and related concepts will be utilized to ensure the inclusion of relevant publications. Additionally, citation chaining and reference list reviews will be employed to augment the dataset.

3.2 Inclusion and Exclusion Criteria

To maintain the relevance and integrity of the dataset, inclusion and exclusion criteria will be established. Included publications must focus on mobile payment technology innovation and its impact on financial transaction transformation. Peer-reviewed articles, conference proceedings, books, and reports published in English will be considered. Publications outside the scope of mobile payment technology or lacking substantial innovation-related content will be excluded.

3.3 Data Extraction

Data extraction will be conducted to capture relevant information from the selected publications. This includes bibliographic details (e.g., authors, publication year, journal), keywords, abstracts, and citation counts. Additionally, metadata such as publication type, research methodology, and thematic focus will be recorded to facilitate subsequent analysis.

3.4 Bibliometric Analysis

Bibliometric analysis will be employed to analyze the collected dataset comprehensively. Various bibliometric indicators and techniques, including citation analysis, co-citation analysis, authorship analysis, and keyword co-occurrence analysis, will be utilized to uncover patterns, trends, and relationships within the literature. Visualization tools such as network graphs and heatmaps will be employed to illustrate the bibliometric data effectively.

3.5 Data Interpretation

The findings from the bibliometric analysis will be interpreted to derive meaningful insights into mobile payment technology innovation. Key themes, research trends, influential authors, seminal publications, and emerging topics will be identified and analyzed. The interpretation will involve synthesizing the quantitative bibliometric data with qualitative analysis to provide a holistic understanding of the research landscape.

4. RESULTS AND DISCUSSION

4.1 Research Data Matriks

Table 1. Research Data Metrics

Publication years	: 1998-2024
Citation years	: 26 (1998-2024)
Paper	: 980
Citations	: 108094
Cites/year	: 4157.46
Cites/paper	: 110.30
Cites/author	: 57136.97
Papers/author	: 535.97
Author/paper	: 2.43
h-index	: 157
g-index	: 308

1. Red Cluster: This cluster seems to focus on the technical aspects of financial technology. Keywords like "blockchain", "big data", "electronic payment", "online banking", and "payment service" suggest a focus on the underlying technologies that enable modern financial services. China is highlighted here, which might suggest a geographic focus or origin of research related to these technologies.
2. Green Cluster: Keywords such as "case", "case study", "Ghana", "India", "Kenya", "mobile money", and "opportunity" indicate that this cluster might be examining case studies or specific instances where mobile money and financial technologies are being used or explored. The presence of country names suggests a geographical or regional analysis of financial technology adoption and its impacts.
3. Blue Cluster: This cluster has keywords such as "commercial bank", "banking industry", and "disruption", which implies a focus on the impact of new financial technologies on traditional banking sectors. The term "disruption" indicates that the research may discuss how traditional banking is being challenged by new fintech developments.
4. Yellow Cluster: With terms like "adoption", "regulation", "e-wallet", and "mobile wallet", this cluster appears to be about the uptake of digital financial services and the regulatory environment surrounding them. It may discuss factors influencing the adoption of these technologies by consumers and businesses.
5. Purple Cluster: This cluster includes "COVID", "pandemic", "Indonesia", "Malaysia", and factors influencing something, possibly the adoption of digital payment forms. This suggests research into how the COVID-19 pandemic has influenced digital financial transactions and payment methods, possibly with a focus on Indonesia and Malaysia.

The overall network shows a complex interplay between technological innovation, regional focuses, practical applications in the form of mobile payments and e-wallets, the response to global challenges such as the pandemic, and the intersection of new technologies with established financial institutions.

4.3 Overlay Visualization

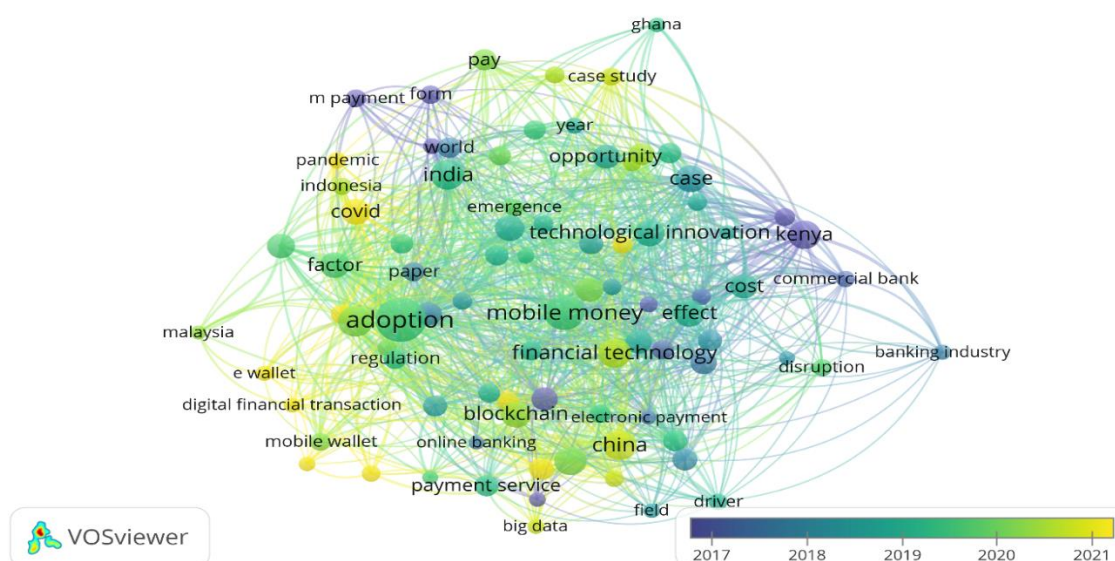


Figure 2. Overlay Visualization

Source: Data Analysis Result, 2024

The figure 2 above is a bibliometric visualization from VOSviewer, which includes a timeline view that reflects the prominence of certain topics over time, indicated by the color gradient from blue to yellow across the years 2017 to 2021. At the beginning of the period, topics represented by blue nodes would have been more prominent. However, without clear blue nodes corresponding to 2017, it is challenging to determine specific topics that dominated in this year. It is possible that this visualization does not have a distinct set of keywords that were exclusively or most prominent in 2017. Slightly lighter blue nodes indicate topics that were significant in 2018. We may be looking for nodes that are not the darkest blue but are not yet into the green hues. These might include topics that are beginning to show the emergence of financial technology as a key area of research.

The green nodes indicate topics that were likely most discussed or published about in 2019. Keywords like "mobile money", "financial technology", and perhaps "adoption" might have been particularly relevant in this year, reflecting a growing focus on the practical application of financial technology. As the color moves into a light green and yellow hue, these topics were likely trending in 2020. It is evident that "COVID", "pandemic", and related terms are in this color range, indicating that research in 2020 was heavily influenced by the global health crisis and its impact on digital financial services and behaviors. The yellow nodes are indicative of the most recent year in the dataset, 2021. Keywords in this color range, which could include terms like "disruption", "banking industry", and possibly "China", suggest a focus on the ongoing effects of financial technology innovations on traditional financial sectors and the continued importance of big data and blockchain in financial services.

Overall, the timeline indicates a shift from foundational technological aspects of fintech, represented by earlier years, to more applied and contextual aspects such as the response to the COVID-19 pandemic and its impact on financial behaviors and the banking industry. The shift towards yellow in the more recent years also suggests an increasing focus on the transformative impact of fintech on traditional banking systems and the growing significance of countries like China in the fintech landscape. The exact transition of topics year by year is slightly more difficult to discern without specific markers for each year, but the general trend follows the color gradient provided in the visualization.

4.4 Citation Analysis

Table 2. The Most Impactful Literatures

Citations	Authors and year	Title
3039	[21]	The truth about blockchain
2402	[22]	Embracing digital technology: A new strategic imperative
2171	[23]	E-government and the transformation of service delivery and citizen attitudes
2150	[24]	Blockchain technology: principles and applications
2100	[25]	The evolution of Fintech: A new post-crisis paradigm
2020	[26]	Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal
1835	[27]	Leading digital: Turning technology into business transformation
1621	[28]	Digital transformation: opportunities to create new business models
1542	[29]	On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services
1470	[20]	Digital Finance and FinTech: current research and future research directions

Source: Publish or Perish Output, 2024

Table 3 presents the most impactful literature within the domain of mobile payment technology innovation, as indicated by their citation counts. Topping the list is the work by [21], titled "The truth about blockchain," which has garnered 3039 citations, underscoring the significant

interest and influence of blockchain technology in the realm of financial transactions. Following closely is the paper by [22] titled "Embracing digital technology: A new strategic imperative," with 2402 citations, highlighting the strategic importance of digital technology adoption in driving business transformation. Other notable contributions include [23] work on e-government transformation, [24] exploration of blockchain principles and applications, and [25] examination of the evolution of fintech post-crisis paradigm. These impactful literatures reflect the diverse facets of digital transformation, fintech innovation, and the integration of technology into business models, emphasizing their relevance and resonance within the scholarly discourse on mobile payment technology innovation.

4.5 Author Visualization

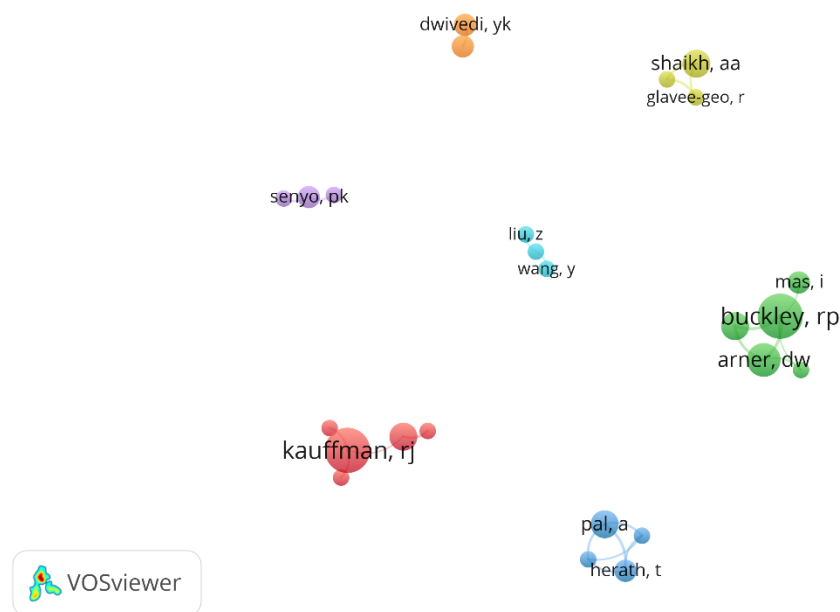


Figure 4. Author Visualization

Source: Data Analysis Result, 2024

This image is a bibliometric visualization of an author collaboration network created by VOSviewer. It shows different clusters of authors who have likely co-authored papers or worked together in some research capacity. Each cluster of nodes (represented by different colors) suggests a group of researchers who frequently collaborate. The clusters are typically determined by co-authorship; authors within the same cluster are likely to have co-authored papers with each other more frequently than with authors in other clusters.

The red cluster centered around "kauffman, rj" suggests a tightly-knit group of collaborators who have likely worked together extensively. The green cluster with "buckley, rp" and "arner, dw" indicates another group of authors who have a strong pattern of collaboration. The blue cluster includes "liu, z" and "wang, y" as prominent members, likely indicating frequent joint research or publications. There are also isolated nodes like "senyo, pk" and "dwivedi, yk" which might be emerging or less frequent collaborators within this network or they have their distinct collaboration networks not shown here. "shaikh, aa" and "glavee-geo, r" seem to be bridging between clusters, which may indicate interdisciplinary collaboration or a pivotal role in connecting various research domains or groups.

4.6 Density Visualization

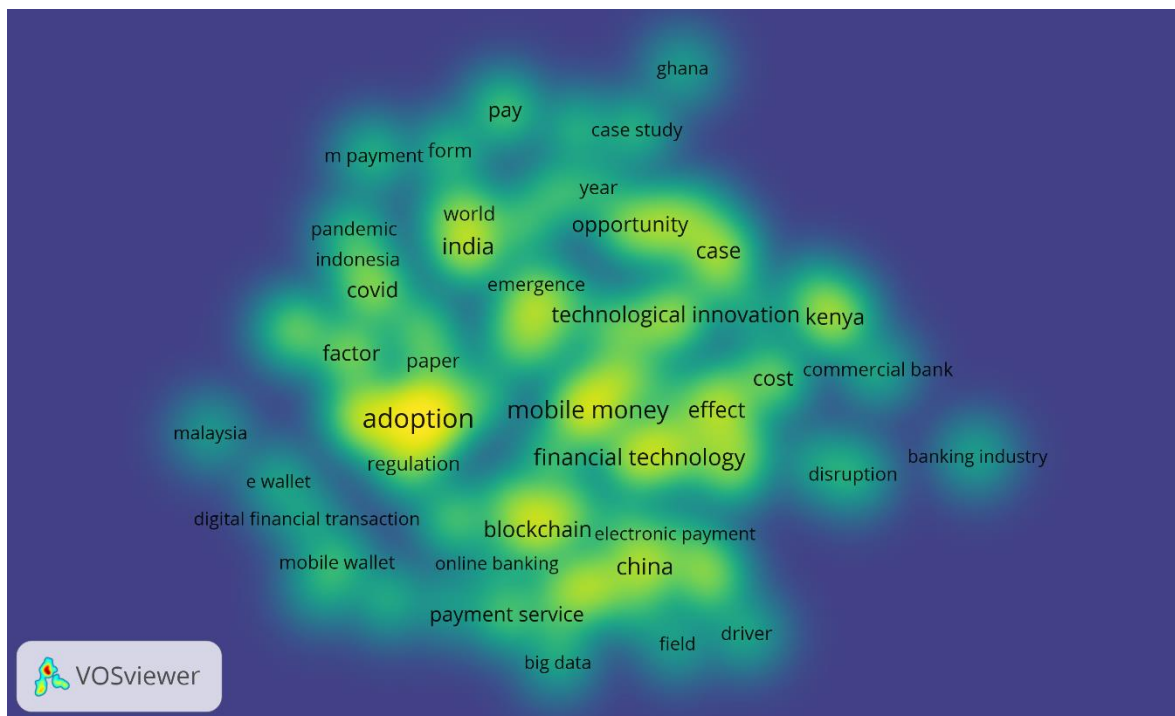


Figure 4. Density Visualization

Source: Data Analysis Result, 2024

The figure is a density visualization of keywords from VOSviewer, reflecting the concentration and distribution of topics within a set of literature. In such visualizations, areas with a higher density of connections between keywords are typically displayed in warmer colors (e.g., reds and yellows), suggesting these are more frequently occurring or discussed topics within the dataset. Conversely, cooler colors (e.g., blues and greens) suggest less density and possibly emerging or niche topics. To interpret potential future research topics from this figure, we need to consider both the dense areas and the peripheries:

1. **Central, Dense Topics (Warm Colors):** Keywords like "adoption", "financial technology", "mobile money", and "blockchain" are central and densely connected, indicating that these are well-established topics in the literature. Future research in these areas might focus on deepening the understanding of how these technologies are integrated into existing systems or their socio-economic impact.
2. **Emerging, Less Dense Topics (Cooler Colors):** Around the edges, we can find keywords like "big data", "china", and "banking industry". These topics, being less dense, might represent newer or less-explored areas in the dataset. Future research might focus on the intersection of big data and financial technology, the specific role of countries like China in the global fintech movement, and the ongoing transformation of the banking industry due to digital disruption.
3. **Intersections and Gaps:** The figure doesn't clearly show the cooler areas because the edges are not well-defined. However, by considering the keywords at the fringes of the warmer colors, one can speculate on potential gaps or intersections that may be ripe for future research. For example, the intersections of "regulation" with "blockchain" and "electronic payment" can be potential research topics as the regulatory framework for these technologies continues to evolve.
4. **Geographical Keywords:** Keywords like "ghana", "indonesia", "malaysia", "india", and "kenya" are spread across the visualization, indicating regional studies related to

financial technology. Future research could further explore how different regions adapt to and are affected by fintech innovations.

5. Pandemic-Related Research: Given the presence of "covid" and "pandemic" in the dataset, one potential future research topic could be the long-term effects of the COVID-19 pandemic on digital payment systems and financial technology adoption.
6. Technology-Driven Changes: With "blockchain", "big data", and "digital financial transaction" in the mix, another potential research avenue could be the examination of how emerging technologies continue to change financial transactions and services.

CONCLUSION

Throughout the series of VOSviewer visualizations, we observe a multifaceted landscape of research within the realm of financial technology. The keyword co-occurrence map indicates a robust dialogue centered on the adoption of financial technology, the influence of blockchain, and the profound impact of the COVID-19 pandemic on digital finance. Trends over the years reveal a narrative that begins with foundational technological aspects and moves towards the practical implications of fintech, including the disruption of traditional banking and the role of big data. In the author collaboration network, we see distinct clusters that hint at rich, collaborative efforts which likely drive the advancement of fintech research. Lastly, the density visualization provides insight into established topics, while also suggesting emerging research frontiers involving regional studies, regulatory challenges, and the evolving interplay of emerging technologies with financial services. Taken together, these visualizations encapsulate a dynamic academic field that is not only reacting to global events and technological advancements but is also characterized by a strong collaborative spirit and a trajectory that points towards continued innovation and integration of technology in financial systems around the world.

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