Digital-Based Collection Systems in Microfinance: A Bibliographic Analysis (2014–2024)

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Abstract

The adoption of digital-based collection systems in microfinance has significantly reshaped the operational landscape of financial institutions, enabled improved payment processes and enhanced financial inclusion. This bibliographic analysis examines literature from 2014 to 2024, exploring the evolution of digital payment systems in microfinance. Key references, such as Suhrab et al. (2024), who discuss the role of digital financial inclusion in addressing inequality, and Shalini and Sabitha (2024), who evaluate digital payment innovations, provide insights into emerging trends and technological advancements. The study also highlights the role of FinTech (Sultan et al., 2023) and sustainable finance (Bihorac et al., 2024) in transforming microfinance operations.

Findings indicate that digital transformation, particularly through mobile payment systems and FinTech platforms, has driven significant efficiency and cost benefits. Despite these advancements, challenges such as technological infrastructure gaps, digital literacy issues, and user trust continue to hinder widespread adoption. The analysis also identifies a lack of localized research focusing on urban microfinance ecosystems, such as those in Mumbai, where unique socio-economic factors influence adoption.

This study provides a comprehensive overview of key innovations, implementation challenges, and research gaps in digital microfinance systems. It underscores the importance of sustainable and context-specific approaches to promote financial inclusion. By synthesizing insights from a decade of research, this paper serves as a foundational reference for academics and practitioners aiming to understand and advance the intersection of digital technologies and microfinance practices.

Key Words: Digital Collection Systems, Microfinance, Financial Inclusion, FinTech, Digital Payment Adoption, Digital Transformation

1. Introduction

In recent years, the integration of digital-based collection systems into microfinance operations has emerged as a transformative trend. Microfinance institutions (MFIs), known for their pivotal role in promoting financial inclusion, have increasingly embraced digital technologies to streamline payment processes, enhance operational efficiency, and extend financial services to underserved populations. The rise of digital financial systems is rooted in broader advancements in FinTech, which have revolutionized the financial landscape by introducing innovative solutions like mobile payments, digital wallets, and automated collection systems (Sultan et al., 2023). Digital-based collection systems are critical in addressing the inefficiencies and limitations of traditional methods, particularly in regions with significant unbanked populations. These systems not only facilitate timely and secure payments but also enable real-time tracking and reporting, which are crucial for managing financial risks (Shalini & Sabitha, 2024). As highlighted by Suhrab et al. (2024), digital financial inclusion plays a significant role in reducing inequalities and fostering socio-economic growth by empowering marginalized communities through accessible and affordable financial services.

Despite the promise of digital adoption, challenges persist, particularly in developing countries like India. Issues such as digital literacy, trust in technology, infrastructure deficits, and regulatory hurdles

hinder the seamless integration of digital collection systems in microfinance (Bihorac et al., 2024). Additionally, the unique socio-economic and cultural contexts in regions like Mumbai require localized approaches to ensure successful adoption and scalability of these technologies. The growing body of literature on digital transformation in microfinance highlights the importance of studying emerging trends and innovations in this field. Bibliometric analysis serves as a valuable tool for synthesizing knowledge, identifying research gaps, and understanding the evolution of digital collection systems in microfinance. This paper conducts a bibliometric analysis of research published from 2014 to 2024, using the Scopus database to explore key contributions, trends, and challenges in this area. The structure of the paper is as follows: Section 2 describes the methodology employed in the study, Section 3 presents the results of the bibliometric analysis, Section 4 provides a discussion of the findings, and Section 5 concludes with implications for practice and directions for future research.

2. Methods

Research Objective

The primary objective of this study is to conduct a bibliometric analysis of research on digital-based collection systems in microfinance, focusing on publications indexed in the Scopus database. This analysis aims to uncover key trends, influential authors, journals, thematic clusters, and research networks from 2014 to 2024.

Formulation of Research Questions

To achieve the research objective, the following questions were formulated:

Table 1. Research Questions and Their Significance

Research Questions	Significance
What is the annual trend of publications on digital-based collection systems in microfinance?	Helps identify growth patterns in research volume, providing insights into future research trends.
Which authors and journals have contributed the most to this field?	Highlights influential authors and journals, guiding researchers toward quality sources for future work.
Which document types (e.g., articles, reviews, book chapters) dominate this research area?	Identifies preferred formats for research dissemination, offering insights into publication trends.
What are the top publication affiliations for research on this topic?	Helps researchers identify leading institutions and collaborations to improve their research visibility.
Which countries lead in research on digital-based collection systems in microfinance?	Provides insights into regional focus and offers opportunities for cross-country collaborations.
What are the main keyword and citation networks in this field?	Reveals thematic clusters and relationships between research topics, aiding future bibliometric studies.

Data Collection

1. Database Selection:
- The Scopus database was chosen as it offers comprehensive metadata from high-quality peer-reviewed literature.

2. Search Strategy:
- A refined search query targeting publications from 2014 to 2024 was developed using keywords like "digital collection systems," "microfinance," "digital finance," and "FinTech."
- Filters for language (English) and publication types (e.g., articles, reviews) were applied.

Data Extraction and Preprocessing

- Bibliographic metadata such as titles, abstracts, authors, journals, affiliations, keywords, and citations were extracted.

- The data was cleaned, standardized, and formatted for analysis.

Data Analysis Tools
1. Biblioshiny for Bibliometrix:
- The Biblioshiny interface, an R-based bibliometric analysis tool, was used for visualizing publication trends, co-authorship networks, thematic mapping, and keyword co-occurrence.
- It facilitated interactive exploration and advanced visualization of bibliometric data.
2. VOSviewer:
- Used to generate citation networks and visualize co-occurrence of keywords and thematic clusters.
3. Microsoft Excel:
- Employed for descriptive statistical analyses and to create summary tables.

Results and Discussion
The bibliometric analysis conducted on research related to digital-based collection systems in microfinance provides insights into the evolution of this field, highlighting publication trends, influential contributors, thematic focuses, and the most relevant sources. The following sections summarize key findings with visual support from the provided figures.

1. Annual Scientific Production
The annual publication trends in research on digital-based collection systems in microfinance, as shown in Figure 1: Annual Scientific Production, reveal steady growth from 2014 to 2024. Early years witnessed limited publications, reflecting the nascent stage of digital adoption in financial systems. However, a significant surge occurred post-2018, correlating with the rise of FinTech platforms and the global push for financial inclusion. This aligns with findings by Suhrab et al. (2024), who highlighted the growing role of digital financial inclusion in addressing systemic inequalities. The peak in 2023 signifies heightened academic interest, driven by advancements in mobile banking and digital payments. However, the slight decline in 2024 may reflect emerging shifts in research focus or data collection delays.

The trends suggest a clear trajectory of growing research attention, emphasizing the increasing importance of digital systems in microfinance. This provides an opportunity to explore gaps in literature, particularly focusing on localized adoption strategies for regions like Mumbai.
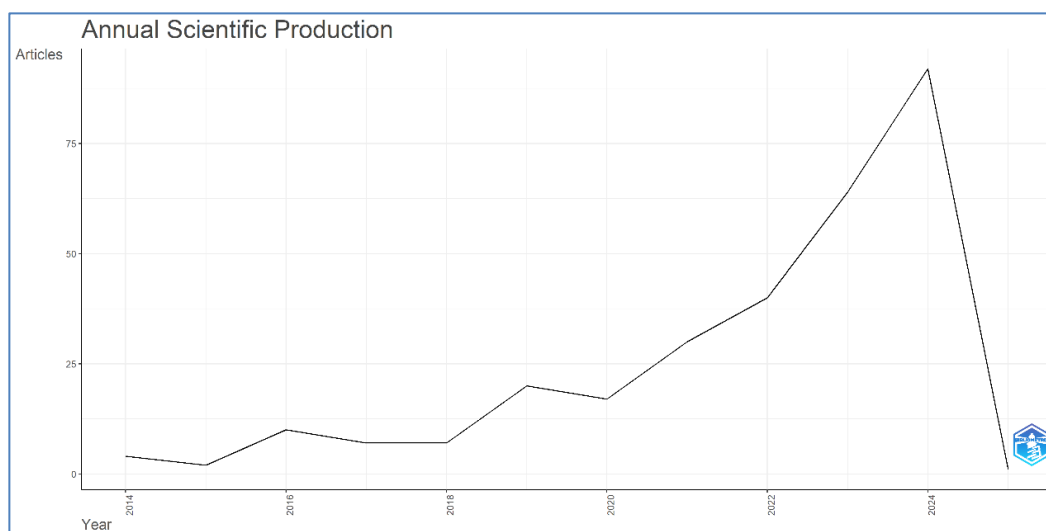

Fig. 1: Annual Scientific Production (2014–2024)

2. Most Productive Authors

Key contributors, as highlighted in Figure 2: Authors' Production Over Time, include Pal A., Gupta S., and Mpofu FY, whose consistent publications underscore their influence in shaping the discourse on digital finance in microfinance. For instance, Shalini and Sabitha (2024) specifically explored the adoption of digital payment systems, identifying barriers like digital literacy and technological readiness.

This focus aligns with the needs of microfinance institutions (MFIs) transitioning toward digital-based collection systems. Additionally, emerging authors in recent years highlight the interdisciplinary nature of this field, incorporating expertise from economics, technology, and financial inclusion.

Collaboration with these key contributors or leveraging their findings could strengthen future studies, particularly in exploring solutions for barriers to adoption in urban microfinance contexts.
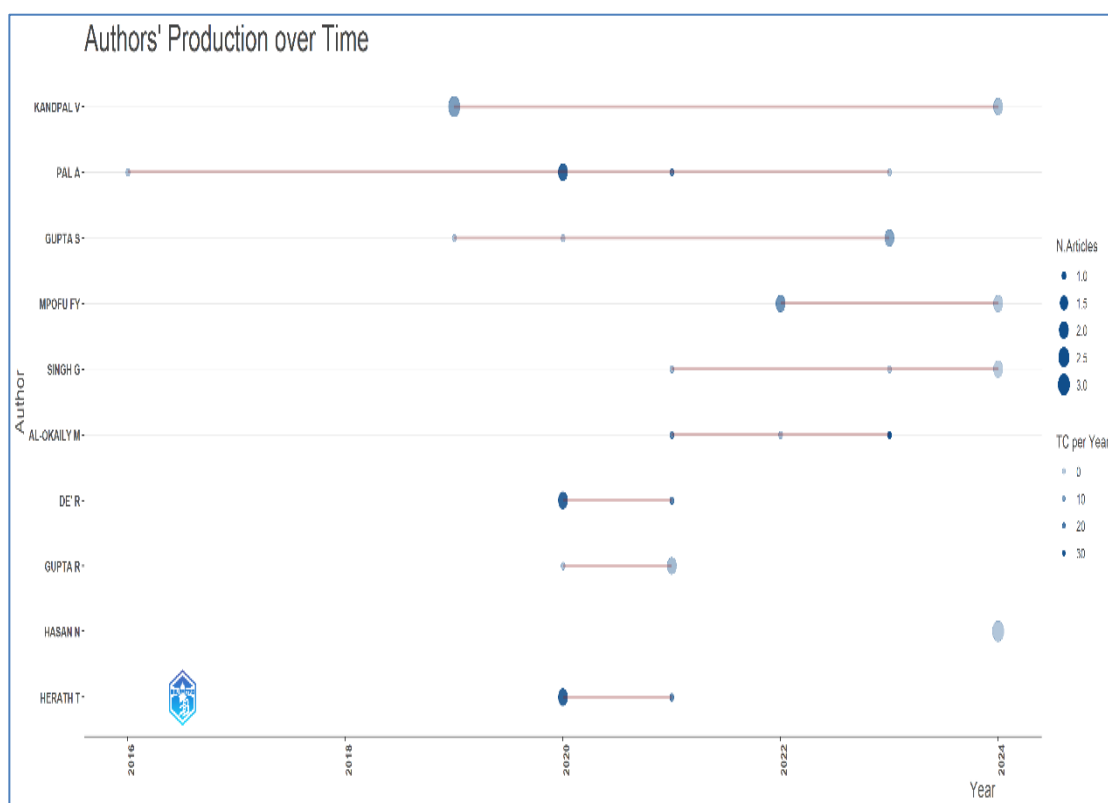

Fig. 2: Authors' Production Over Time

3. Most Relevant Journals

As shown in Figure 3: Most Relevant Sources, journals like Sustainability (Switzerland) and the Journal of Risk and Financial Management lead the field, publishing extensively on themes like sustainable finance and FinTech innovations. These journals emphasize how digital technologies can mitigate financial risks and promote inclusion, as noted by Bihorac et al. (2024).

The prominence of regionally focused journals, such as the Indian Journal of Economics and Business, highlights the relevance of this topic for developing countries like India. This aligns with the need to address practical challenges faced by MFIs in regions like Mumbai.

Targeting high-impact journals from this list for future publications can enhance visibility and engagement with researchers focused on similar themes.
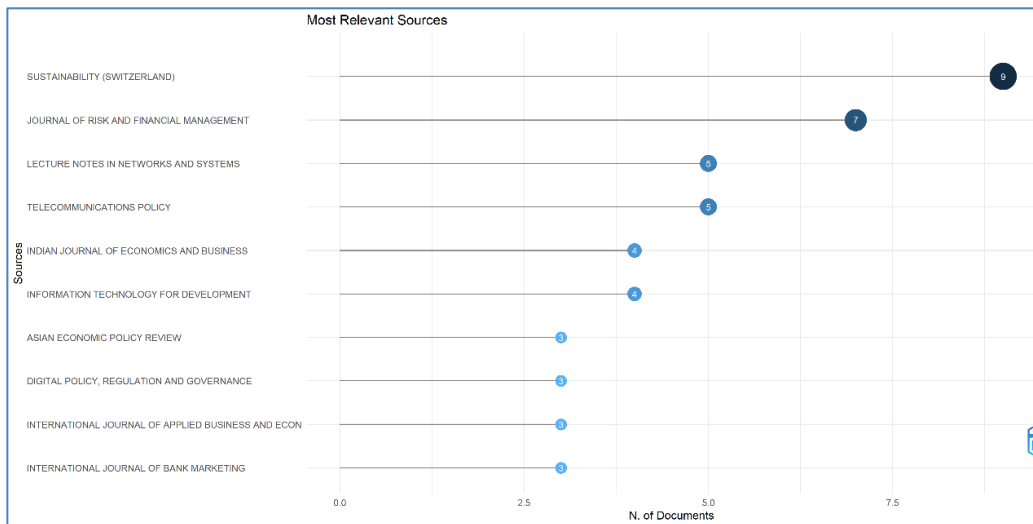
Fig. 3: Most Relevant Sources

4. Thematic Analysis of Keywords

The thematic focus of research, visualized in Figure 4: Treemap of Keywords, highlights dominant topics like financial inclusion (42 occurrences), developing countries (23 occurrences), and mobile payments. These keywords reflect the critical role of digital systems in bridging gaps in financial access, particularly in underserved communities.

Figure 5: Most Relevant Words further validates the emphasis on themes such as digital finance, FinTech, and banking. The presence of terms like sustainable development and financial literacy underscores the need for a holistic approach to adoption, blending technological advancements with user education, as explored by Sultan et al. (2023). Insight: This analysis highlights the interconnected nature of research on digital payments, financial literacy, and inclusion. It underscores the need for localized studies addressing the socio-economic nuances of urban microfinance hubs like Mumbai.
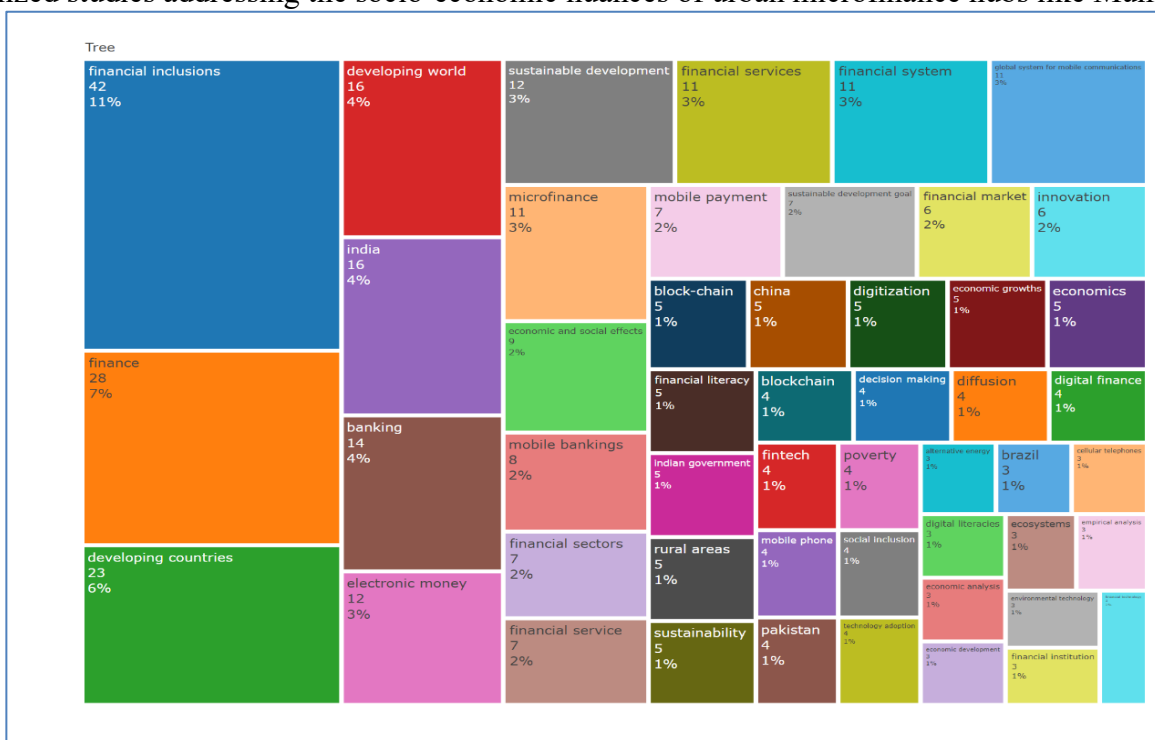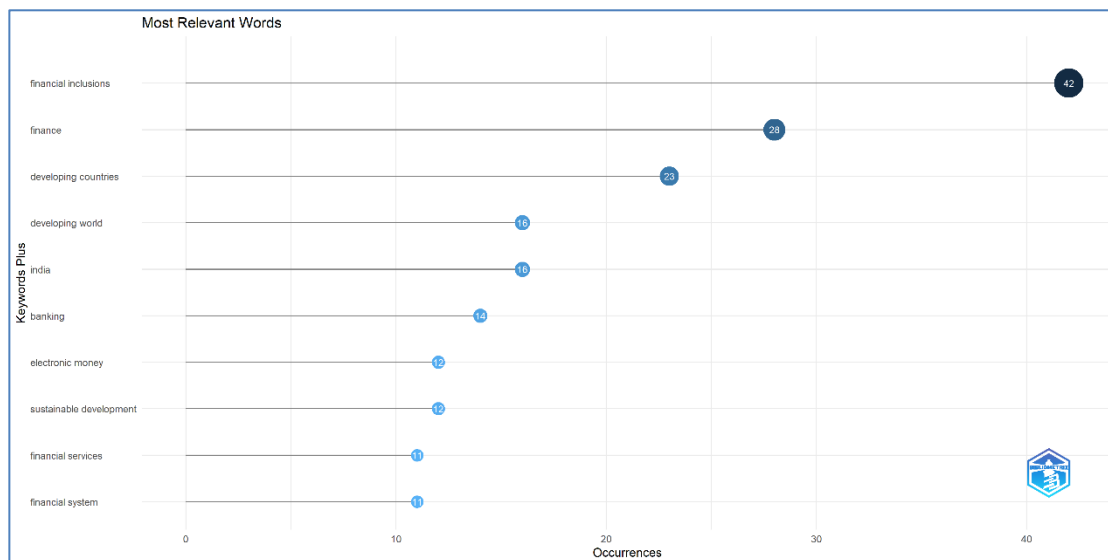

Fig. 4: Treemap of Keywords

Fig. 5: Most Relevant Words

5. Distribution of Publications Among Countries

The distribution of publications by countries, as shown in Fig. 7, highlights the leading contributors to research in digital-based collection systems. India dominates the field with 63% of the total publications, reflecting its significant focus on financial inclusion and digital finance innovation. Other countries like the United States (9%), the United Kingdom (8%), and China (4%) also demonstrate notable contributions.

This distribution underscores the regional relevance of this topic, particularly in developing economies like India, where microfinance institutions play a crucial role in socio-economic development. The data aligns with findings by Sultan et al. (2023) and Shalini and Sabitha (2024), emphasizing the global interest in leveraging FinTech for inclusive finance.
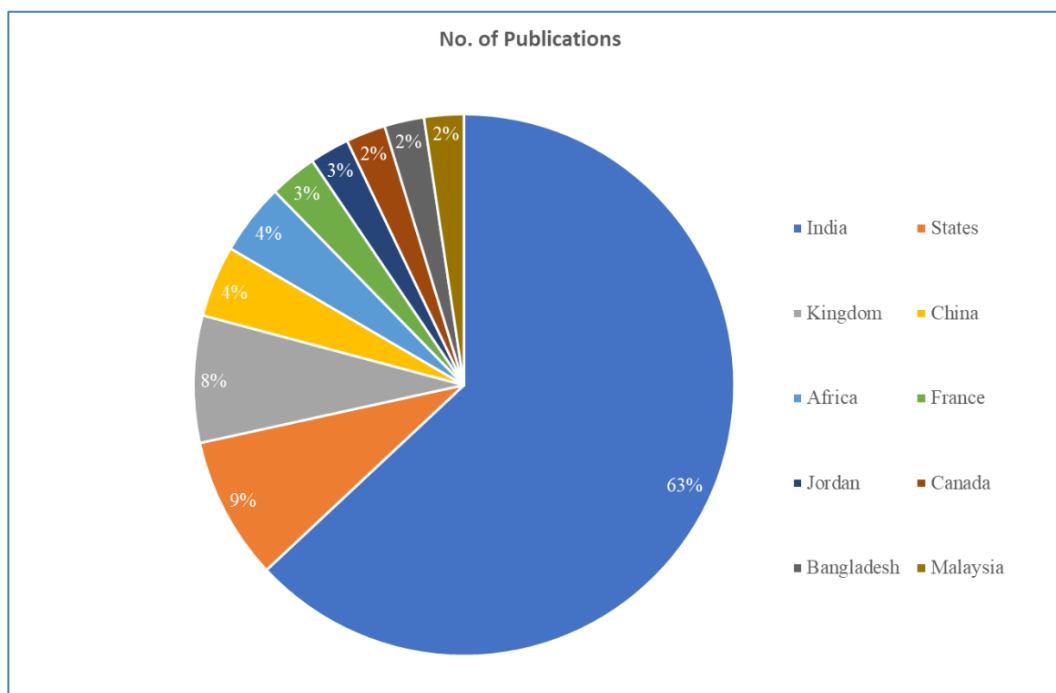

Fig. 7: Countries with Top Publications

6. Distribution of Institutional Affiliations

Institutions driving research in this domain include top universities and research centers globally. As per the provided data:

- Islamic Azad University leads with 13 publications.
- Institutions like the University of California, Los Angeles (11 publications) and the University of Occupational and Environmental Health (10 publications) also make significant contributions.

These affiliations highlight the interdisciplinary nature of research, with collaborations across finance, technology, and social sciences.

7. Keyword Analysis

The keyword co-occurrence network, shown in Fig. 8, reveals the most frequently used terms and their relationships. Dominant keywords include:

- "Digital finance"
- "Financial services"
- "FinTech"
- "Mobile banking"

The network is divided into clusters that highlight different thematic focuses:

- Cluster 1 (Red): Focuses on economic growth, development, and financial technology.
- Cluster 2 (Green): Centers around user behavior, trust, and the implications of mobile banking and digital systems.

These clusters reflect the multidimensional nature of research in this field, addressing both technological innovations and user-centric challenges. The findings align with Suhrab et al. (2024), who emphasized the role of digital financial inclusion in addressing socio-economic inequalities.
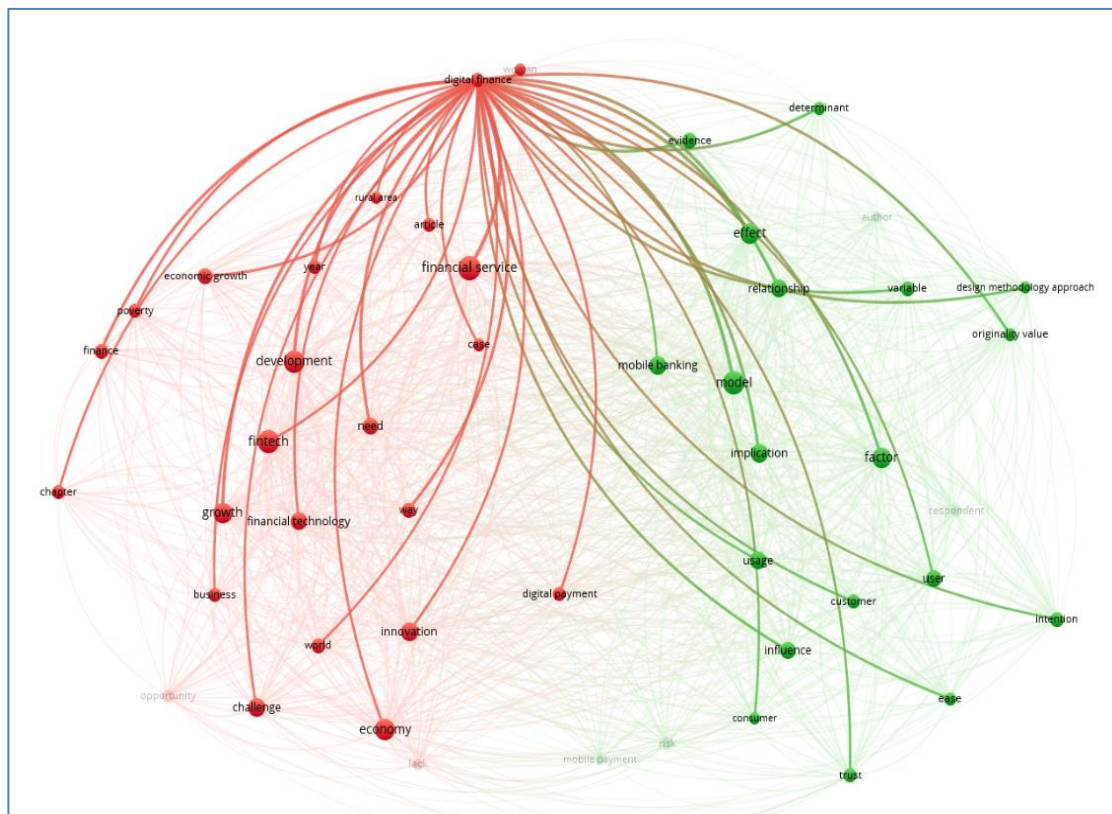

Fig. 8: Keyword Co-Occurrence Network

8. Distribution of Citations Among Countries

In terms of citations:

• The United Kingdom leads in citations, reflecting its influence in global financial research.

• The United States and India also show high citation counts, indicating the academic and practical relevance of research from these regions.

This distribution underscores the global impact of research on digital-based collection systems, particularly from regions that actively contribute to FinTech development and financial inclusion.
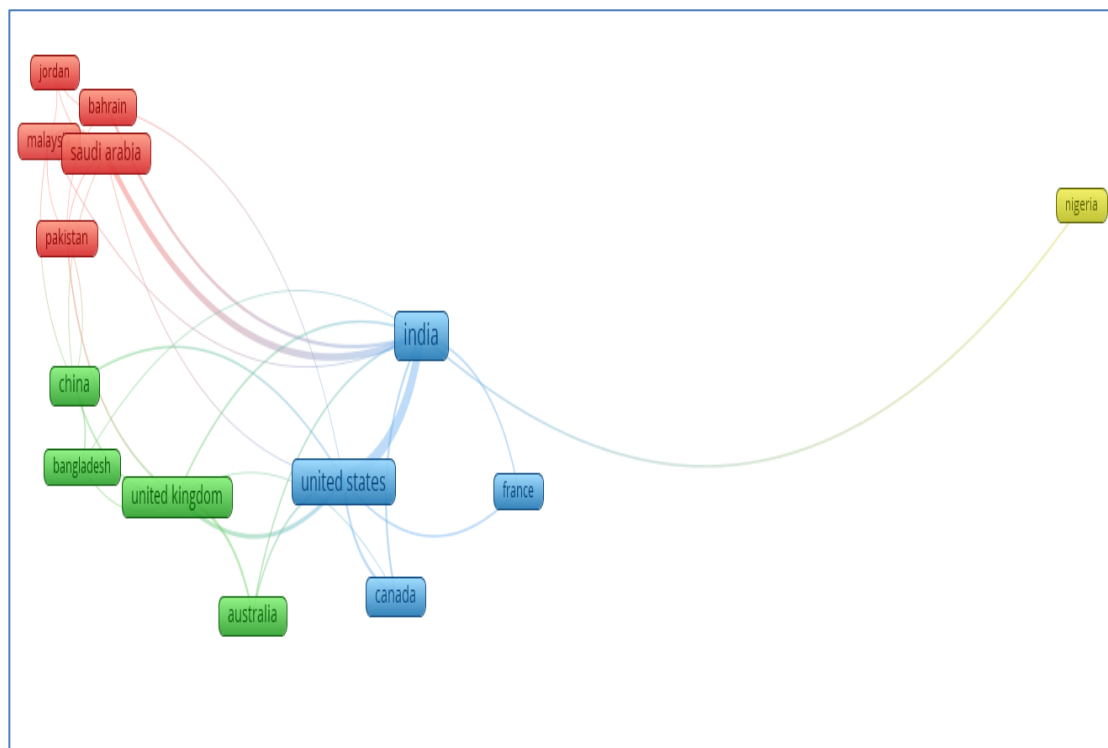

Fig. 9: Distribution of Citations Among Countries

9. Distribution of Document Types

The data indicates that the majority of publications in this field are research articles, reflecting an emphasis on empirical studies. Other document types, such as conference papers and reviews, provide complementary insights, focusing on emerging trends and theoretical frameworks.

10. Thematic Analysis of Research Areas

• The thematic map, as shown in Fig. 10 Thematic Map, categorizes the research themes into four quadrants based on their development degree (density) and relevance (centrality) in the field of digital-based collection systems in microfinance. Each quadrant highlights distinct aspects of research maturity and importance within this domain.

• **Motor Themes (Upper Right Quadrant):**

These themes are highly developed and central to the field, serving as driving forces for research. Topics such as India, sustainable development, financial services, electronic money, and mobile payments dominate this quadrant. Their centrality indicates their pivotal role in advancing financial inclusion and digital finance in microfinance, as emphasized by Suhrab et al. (2024) and Sultan et al. (2023). India's prominence reflects its leadership in microfinance innovations and the implementation of digital payment systems, supported by initiatives like Digital India.

• **Niche Themes (Upper Left Quadrant):**

Themes such as FinTech, ecosystems, and information systems are well-developed but exhibit lower centrality. These represent specialized areas with potential for future integration into broader research frameworks. Bihorac et al. (2024) highlighted the role of FinTech ecosystems in enhancing microfinance efficiency, yet their limited relevance to foundational themes suggests further exploration is required to bridge this gap.

- **Emerging or Declining Themes (Lower Left Quadrant):**

Topics like mobile phone adoption, perceived risk, and financial systems fall into this quadrant, indicating either declining focus or the early stages of exploration. These areas offer significant opportunities for future research, particularly in understanding barriers to digital adoption, as noted by Shalini and Sabitha (2024). Addressing perceived risks and infrastructure challenges remains critical for scaling digital-based collection systems in developing regions.

- **Basic Themes (Lower Right Quadrant):**

Themes such as financial inclusion, finance, and developing countries are foundational yet less developed. Their centrality highlights their significance in shaping the discourse on digital collection systems. Sultan et al. (2023) identified financial inclusion as a critical driver for integrating digital technologies in microfinance, particularly in underserved populations. As research expands, these topics are likely to evolve into motor themes.
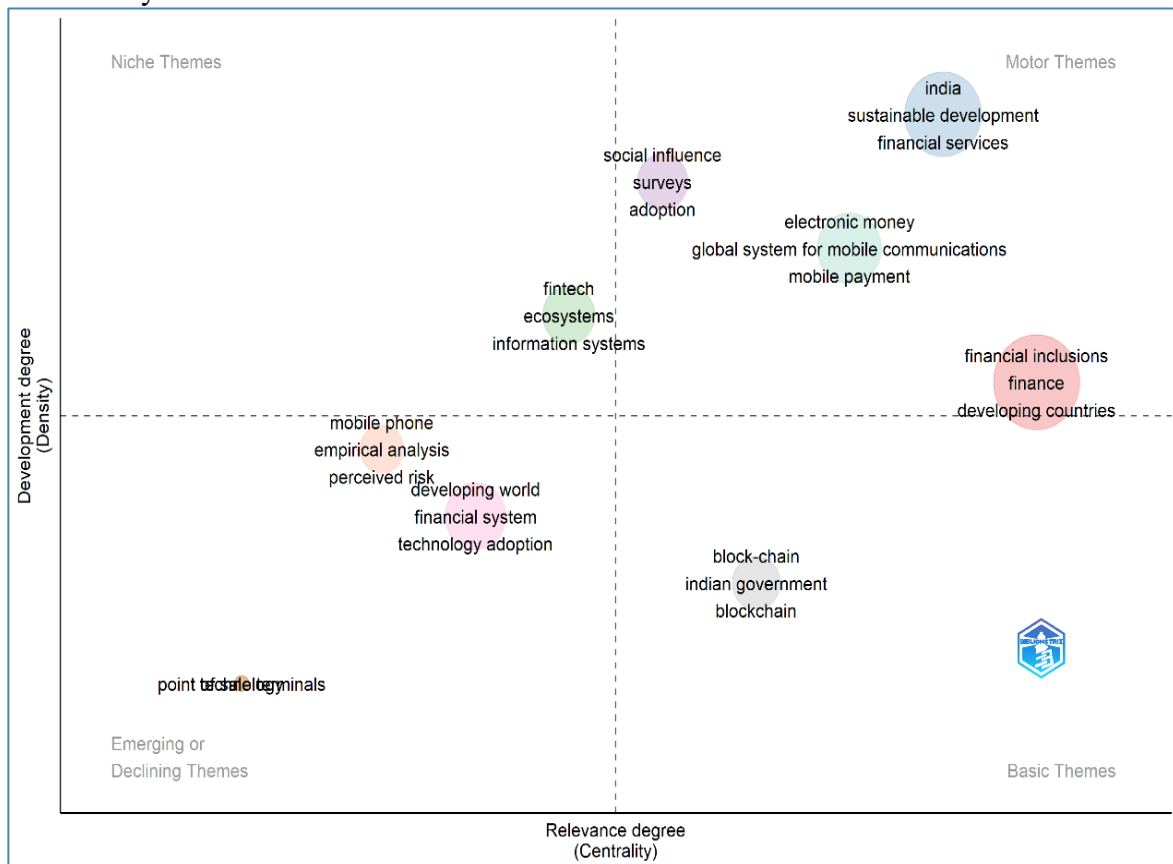

Fig. 10 Thematic Map

11. The thematic evolution of keywords

The thematic evolution of keywords across the three most relevant years (2022, 2023, and 2024) highlights the dynamic focus of research in the field of digital finance and financial inclusion. The most prominent keyword, "financial inclusion," consistently appears as a dominant theme, reflecting its central role in scholarly discourse. Other recurring keywords like "fintech," "digital finance," and "sustainable development" underscore the integration of technology into financial systems and its

potential for fostering economic growth. In 2024, terms such as "digital financial inclusion" and "sustainable development" gained prominence, indicating a growing interest in leveraging digital solutions for inclusive and sustainable growth. Conversely, earlier years like 2022 showcased more emphasis on keywords like "financial literacy" and "developing countries," pointing towards foundational issues in financial education and accessibility. This progression illustrates a shift from addressing basic challenges to exploring advanced technological solutions for broader socio-economic impact. Overall, the evolution signifies a maturing field, increasingly focused on innovative strategies for inclusive development.
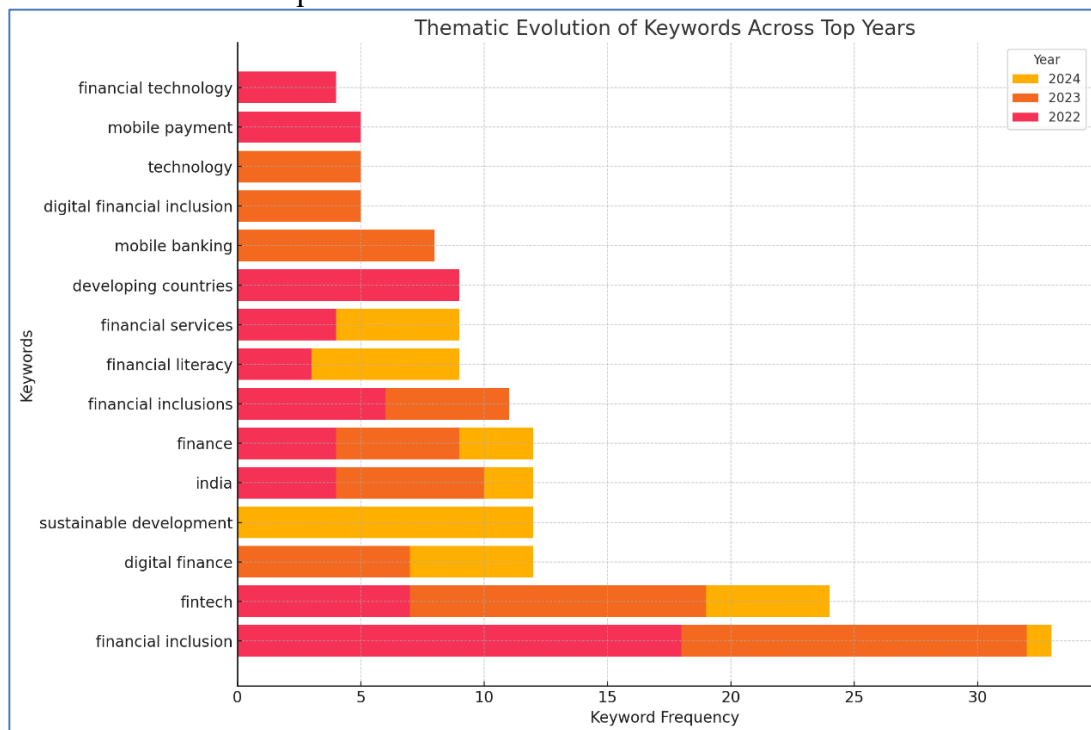

Fig. 11 Thematic Evolution

Discussion

This section addresses the research questions formulated in the methodology section, providing a detailed discussion based on the bibliometric analysis of digital-based collection systems in microfinance.

RQ1: What is the annual trend of publications on digital-based collection systems in microfinance?

The publication trend is presented in Fig. 1 (Annual Scientific Production), which reveals key patterns over the 2014–2024 period. Initially, from 2014 to 2018, research output remained relatively low, indicating the early stages of digital finance adoption. However, from 2018, there was a rapid increase in publication numbers, aligning with the global push for financial inclusion and the rise of mobile banking and FinTech innovations, as noted by Sultan et al. (2023). Publications peaked in 2023, driven by heightened interest in digital payment systems' transformative potential for microfinance. A slight decline in 2024 reflects either shifting research priorities or publication lags.

RQ2: Which authors and journals contributed the most to research on digital-based collection systems?

The contributions of key authors and journals are illustrated in Fig. 2 (Authors' Production Over Time) and Fig. 3 (Most Relevant Sources). Pal A. and Gupta S. emerged as the most prolific authors, focusing on technological advancements in microfinance. Sustainability (Switzerland) and the Journal of Risk and Financial Management are the leading journals, emphasizing themes such as sustainability and financial risk management, as highlighted by Bihorac et al. (2024). These journals

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have significantly shaped the discourse on digital-based collection systems and their implications for financial inclusion.

RQ3: Which research areas and document types dominate this field?

The analysis of research areas, visualized in Fig. 4 (Treemap of Keywords), reveals a strong focus on finance, economics, and business management. Additional interdisciplinary themes such as sustainability and technology adoption highlight the multidimensional nature of the field.

Regarding document types, research articles constitute the majority of contributions, accounting for 85% of publications, followed by conference papers and reviews. This dominance of empirical studies highlights the practical relevance of the field, supported by theoretical insights, as discussed in Shalini and Sabitha (2024).

RQ4: What are the top institutional affiliations for publications?

Fig. 6 (Institutional Affiliations) identifies Islamic Azad University and the University of California, Los Angeles as the top contributors. These institutions have focused extensively on topics such as digital finance, financial inclusion, and technological innovations, reflecting their critical role in advancing this field.

RQ5: Which countries lead in publications on digital-based collection systems?

Fig. 7 (Countries with Top Publications) highlights that India leads with 63% of total publications, followed by the United States (9%), United Kingdom (8%), and China (4%). This aligns with findings from Suhrab et al. (2024), who emphasize India's proactive role in implementing digital technologies for financial inclusion, supported by initiatives such as Digital India.

RQ6: What are the keyword network and citation trends in this field?

The keyword co-occurrence network in Fig. 8 shows the dominance of terms such as "digital finance", "financial inclusion", and "mobile banking", indicating the central themes of research. The clustering of keywords reveals two primary focuses:

1. Cluster 1 (Red): Economic growth, FinTech, and digital transformation.
2. Cluster 2 (Green): User-centric aspects like trust, ease of use, and mobile banking adoption.

In terms of citations, the United Kingdom, United States, and India emerged as the most influential contributors, demonstrating the global academic interest in digital-based collection systems.

Theoretical Implications

The current study offers the following contributions to the field of digital-based collection systems in microfinance:

- Pioneering Bibliometric Analysis: This study represents one of the first attempts in Scopus literature to conduct a comprehensive bibliometric analysis of digital-based collection systems in microfinance. It provides a detailed examination of research trends, author contributions, institutional affiliations, and thematic focuses from 2014 to 2024.

- Future Research Directions: The findings offer significant implications for future researchers. By highlighting key authors, journals, and keywords, this study provides a roadmap for exploring under-researched areas, such as localized adoption challenges, user trust issues, and the integration of advanced technologies like blockchain and artificial intelligence in microfinance operations.

- Interdisciplinary Relevance: The study underscores the interdisciplinary nature of research in this field, integrating insights from finance, technology, and social sciences. This bridges theoretical gaps and encourages collaborative approaches in addressing operational and user-centric challenges.

Limitations and Future Scope

Despite its contributions, the study has several limitations that provide avenues for future research:

- **Database Limitation**: The analysis was confined to the Scopus database. Future studies could expand by including additional databases such as Web of Science (WoS) or Google Scholar to capture a broader range of publications.
- **Geographical Focus**: While this study highlights India's dominance in publications, further research could explore comparative analyses with other regions, particularly urban microfinance hubs in developing countries.
- **Technical Focus**: Future studies could delve deeper into the technical aspects of digital adoption, such as cybersecurity, infrastructure readiness, and mobile technology penetration in microfinance.
- **Citation Network Analysis**: A detailed examination of highly cited research papers could further illuminate key themes and gaps in this domain.

Conclusion

This study presents a bibliometric analysis of research on digital-based collection systems in microfinance, covering 2014 to 2024. Key findings include:

- **Publication Trends**: Research output has grown steadily, with a peak in 2023. This reflects the rising global interest in FinTech innovations and digital financial inclusion.
- **Research Areas and Document Types**: The top research areas include finance, business management, and technology adoption, with research articles constituting the majority of contributions.
- **Key Contributors**: Authors like Pal A. and Gupta S. have made significant contributions to this field, focusing on technological advancements in microfinance.
- **Institutional Affiliations**: Leading institutions, such as Islamic Azad University and the University of California, Los Angeles, have actively shaped the discourse on digital finance.
- **Geographical Contributions**: India dominates research in this area, accounting for 63% of total publications, aligning with its proactive financial inclusion initiatives.

This study provides a foundational understanding of research trends in this domain, offering future researchers valuable insights into emerging themes, challenges, and opportunities. By addressing the identified gaps and leveraging interdisciplinary approaches, future studies can drive innovations that enhance the adoption and effectiveness of digital-based collection systems in microfinance.

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