



Evolution and Research Trends of QRIS: A Bibliometric Analysis on the Implementation of Digital Payment Standard in Indonesia

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Abstract—The Quick Response Code Indonesian Standard (QRIS) has emerged as a key initiative in advancing the digitalization of payment systems in Indonesia. However, literature on its implementation, challenges, and impact on the digital payment ecosystem remains scattered and insufficiently structured. This study aims to identify trends, patterns, and research directions related to QRIS through a bibliometric analysis. Bibliographic data were collected from leading databases such as Scopus, covering relevant publications up to 2024. The analytical approach includes bibliometric techniques such as co-occurrence analysis, co-authorship analysis, and visualization using tools like Bibliometrix and Biblioshiny. The study reveals that QRIS adoption focuses on financial inclusion, payment efficiency, and technological adaptation in the MSME sector. Additionally, significant research trends highlight institutional collaboration and contributions from researchers in developing countries. The findings indicate that QRIS holds substantial potential to drive digital transformation; however, challenges such as technological infrastructure, digital literacy, and regulatory frameworks remain major barriers. This study provides strategic insights for policymakers, academics, and industry players to strengthen QRIS implementation comprehensively. Consequently, it is expected to serve as a foundation for further research exploring the role of QRIS in building an inclusive and sustainable financial ecosystem.

Keywords: Bibliometrix; Scopus; QRIS; Payment; Transaction

1. INTRODUCTION

The digitalization of payment systems has emerged as a pivotal transformation in global financial ecosystems, facilitating faster, safer, and more inclusive economic activities (Kumar & Smith, 2021). Within this context, Indonesia's Quick Response Code Indonesian Standard (QRIS) has become a cornerstone in achieving financial inclusion and advancing the country's digital payment infrastructure. Introduced in 2019 by Bank Indonesia and the Indonesian Payment System Association (ASPI), QRIS integrates various payment systems into a unified standard, simplifying transactions for consumers and merchants alike (Hidayat et al., 2020). Despite its promising potential, the adoption and effectiveness of QRIS face significant challenges, necessitating a deeper examination of its implementation and research trends.

One of the primary motivations behind the development of QRIS is to address the fragmentation within Indonesia's payment systems. Before QRIS, payment platforms operated in silos, limiting interoperability and hindering user experience (Setiawan & Ramadhani, 2021). The fragmented ecosystem also excluded a significant portion of micro, small, and medium enterprises (MSMEs) from participating in digital transactions, a critical issue considering that MSMEs constitute over 60% of Indonesia's GDP (World Bank, 2022). By unifying payment standards, QRIS aimed to foster inclusivity and economic resilience, particularly in underserved regions.

Globally, similar initiatives to standardize digital payments have shown varying degrees of success. For instance, China's QR code payment systems, led by Alipay and WeChat Pay, have revolutionized consumer behavior by providing seamless and secure payment methods (Yang et al., 2019). Similarly, India's Unified Payments Interface (UPI) has demonstrated the transformative power of standardized digital payment systems in boosting financial inclusion and economic activity (Singh & Awasthi, 2020). While QRIS draws inspiration from these global models, its implementation must consider Indonesia's unique socio-economic and technological landscape, characterized by vast geographical diversity and uneven digital infrastructure.

However, the adoption of QRIS has been met with several barriers. One critical challenge is the low level of digital literacy among users and merchants. Research indicates that many MSMEs in Indonesia lack the technical knowledge to effectively utilize digital payment tools, despite their availability (Pratama et al., 2021). Additionally, the digital divide between urban and rural areas further exacerbates the issue, as rural regions often suffer from limited access to stable internet connections and affordable devices (Putri & Wibowo, 2022). These factors undermine the broader adoption of QRIS and limit its potential impact on financial inclusion.

Moreover, regulatory and institutional challenges also play a significant role. While QRIS aims to streamline payment processes, the coordination between various stakeholders—including banks, fintech companies, and government institutions—remains complex. Studies highlight that policy inconsistencies and bureaucratic inefficiencies can delay the full-scale implementation of digital payment systems (Mulyadi et al., 2020). Addressing these issues requires a robust regulatory framework that fosters collaboration while ensuring consumer protection and data security.

In terms of academic research, the field of QRIS and its implications for digital payment systems in Indonesia is still in its infancy. A bibliometric analysis of QRIS-related literature reveals limited scholarly attention compared



to global counterparts such as UPI and Alipay (Rahman et al., 2023). This gap underscores the need for comprehensive studies that explore the evolution, adoption patterns, and socio-economic impact of QRIS. Furthermore, understanding the dynamics of collaboration among researchers, institutions, and industries can provide valuable insights into advancing QRIS implementation.

Theoretical frameworks in digital payment studies often emphasize the interplay between technology adoption, user behavior, and policy environments. The Technology Acceptance Model (TAM) and Diffusion of Innovation Theory have been widely applied to analyze factors influencing the adoption of payment technologies (Davis, 1989; Rogers, 2003). Applying these frameworks to QRIS can shed light on the drivers and barriers affecting its uptake among different user segments. For instance, the perceived ease of use and usefulness of QRIS are critical determinants of its adoption among MSMEs (Susanto et al., 2022).

Another key area of interest in QRIS research is its impact on financial inclusion. Digital payment systems like QRIS have the potential to bring unbanked and underbanked populations into the formal financial system, thereby enhancing their access to credit and other financial services (Demirgüç-Kunt et al., 2018). However, achieving this goal requires addressing systemic challenges, such as high transaction fees and limited financial literacy, which often deter low-income users from adopting digital payment solutions (Nasution et al., 2021).

Furthermore, the role of fintech innovation in driving QRIS adoption cannot be overstated. As fintech companies play a crucial role in integrating QRIS into their platforms, their collaboration with traditional financial institutions becomes essential. Research indicates that such partnerships can accelerate the adoption of digital payment systems by leveraging the strengths of both sectors (Chiu & Wong, 2021). However, balancing innovation with regulatory compliance remains a delicate task, particularly in emerging markets like Indonesia.

In addition to domestic factors, global trends in digital payment systems also influence the trajectory of QRIS. The increasing integration of artificial intelligence, blockchain, and big data analytics into payment platforms presents both opportunities and challenges for QRIS implementation. These technologies can enhance transaction security, reduce operational costs, and provide personalized user experiences (Zhao et al., 2020). However, their adoption requires significant investments in infrastructure and skills development, which may not be readily available in all regions of Indonesia.

The COVID-19 pandemic further highlighted the importance of digital payment systems, as social distancing measures accelerated the shift from cash to cashless transactions. During this period, the use of QRIS reportedly increased, particularly in urban centers where digital infrastructure is more developed (Santoso & Hartono, 2021). However, sustaining this momentum post-pandemic requires continuous efforts to address the underlying challenges and expand QRIS adoption to less developed areas.

In conclusion, QRIS represents a significant milestone in Indonesia's journey toward a more inclusive and efficient digital payment ecosystem. However, its successful implementation depends on overcoming various socio-economic, technological, and regulatory challenges. By leveraging insights from global best practices and addressing the unique needs of Indonesian users, QRIS can serve as a model for other developing countries aiming to standardize their payment systems. This study aims to contribute to the growing body of literature on QRIS by providing a bibliometric analysis of its evolution and research trends, offering valuable insights for policymakers, academics, and industry stakeholders.

2. RESEARCH METHODS

This study employs a bibliometric approach to analyze research trends, collaboration networks, and thematic evolution related to the Quick Response Code Indonesian Standard (QRIS). Bibliometric analysis has been widely used in recent years to map the intellectual structure and research trends within specific fields (Zupic & Čater, 2015; Donthu et al., 2021). It enables researchers to gain insights into publication patterns, influential studies, and thematic areas of interest.

2.1 Data Collection

The data for this study were retrieved from the Scopus database, one of the most comprehensive sources of peer-reviewed literature. A specific query was designed to ensure the relevance of the retrieved articles to the study's objectives: TITLE-ABS-KEY (qris) AND PUBYEAR > 2019 AND PUBYEAR < 2026 AND (LIMIT-TO (AFFILCOUNTRY , "Indonesia")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")). This query identifies articles that focus on QRIS, published between 2020 and 2025, with at least one author affiliated with institutions in Indonesia. Additionally, only journal articles and conference papers were included to ensure the academic rigor of the dataset. Following a detailed screening process, 42 documents were selected for analysis after excluding irrelevant, duplicate, or low-quality articles.

2.2 Bibliometric Tools and Analysis

The study utilized the Bibliometrix R-package and its companion web interface, Biblioshiny, for data processing, visualization, and analysis. Bibliometrix provides advanced functionalities for citation analysis, co-word analysis, and thematic mapping (Aria & Cuccurullo, 2017). Biblioshiny, in particular, offers an intuitive graphical user interface,



enabling dynamic and interactive visualizations for bibliometric networks, such as co-authorship, citation networks, and keyword co-occurrence.

- a. **Descriptive Analysis:** Basic metrics such as publication trends, authorship patterns, and institutional contributions were analyzed. This provides a foundational understanding of the scope and scale of QRIS-related research in Indonesia.
- b. **Collaboration Networks:** Co-authorship and institutional collaboration were mapped to identify key contributors and collaborative relationships. These analyses shed light on the dynamics of research productivity and the distribution of expertise within the field (Zhao et al., 2021).
- c. **Keyword Co-Occurrence:** To identify thematic trends, keyword co-occurrence analysis was performed. This technique uncovers the core themes and emerging topics in QRIS research by examining the frequency and co-occurrence of keywords across publications (Chen et al., 2020).
- d. **Citation Analysis:** The study identified the most influential articles, authors, and journals by analyzing citation patterns. High citation counts often indicate the significance and impact of a particular study within its field (Donthu et al., 2021).

2.3 Inclusion and Exclusion Criteria

To ensure the validity and relevance of the dataset, inclusion and exclusion criteria were established. Only studies explicitly focusing on QRIS and its applications in Indonesia were included. Articles that primarily discussed general digital payment systems without specific reference to QRIS were excluded. Additionally, only English-language articles were considered to maintain consistency in analysis.

2.4 Strengths and Limitations

This methodology provides a robust framework for examining QRIS research. By using bibliometric tools, the study leverages quantitative data to uncover patterns and trends that may not be immediately apparent through traditional literature reviews. However, it is worth noting some limitations. First, the analysis is restricted to the Scopus database, which may exclude relevant studies indexed elsewhere. Second, the bibliometric approach focuses on quantitative metrics, which may overlook nuanced qualitative insights (Ahmad et al., 2022).

2.5 Ethical Considerations

This study adheres to ethical research practices by ensuring transparency and reproducibility. All data used in the analysis were obtained from publicly available sources, and no sensitive or personal information was involved.

3. RESULT AND DISCUSSION

The results of this study provide a comprehensive analysis of QRIS research trends, highlighting publication dynamics, collaboration networks, and thematic evolution within the field. This section delves into the key findings obtained through bibliometric analysis using Bibliometrix and Biblioshiny. The discussion interprets these findings in light of the research objectives and existing literature to draw meaningful insights into QRIS development and adoption.

Studies on digital payment systems, including QRIS, have shown rapid growth in publication volume, reflecting increasing scholarly interest in this domain (Rahman et al., 2023; Donthu et al., 2021). Research collaboration between academic institutions, fintech companies, and policymakers has emerged as a crucial driver of innovation and knowledge dissemination in this field (Zhao et al., 2020). The keyword co-occurrence analysis indicates a strong focus on topics such as financial inclusion, digital literacy, and regulatory challenges, aligning with prior studies on emerging payment technologies (Chen et al., 2020; Santoso & Hartono, 2021).

One of the significant findings is the pivotal role of MSMEs in QRIS adoption, which corroborates earlier research emphasizing the economic contribution of MSMEs in Indonesia (Pratama et al., 2021). Additionally, the citation analysis highlights influential studies addressing global best practices and their applicability to Indonesia's unique socio-economic landscape (Yang et al., 2019; Chiu & Wong, 2021). These findings underscore the multifaceted nature of QRIS research and its potential to inform policy and practice at national and international levels.

3.1. Overview

Figure 1 provided is a summary of bibliometric metrics generated from Biblioshiny, showcasing key indicators of the analyzed research data.

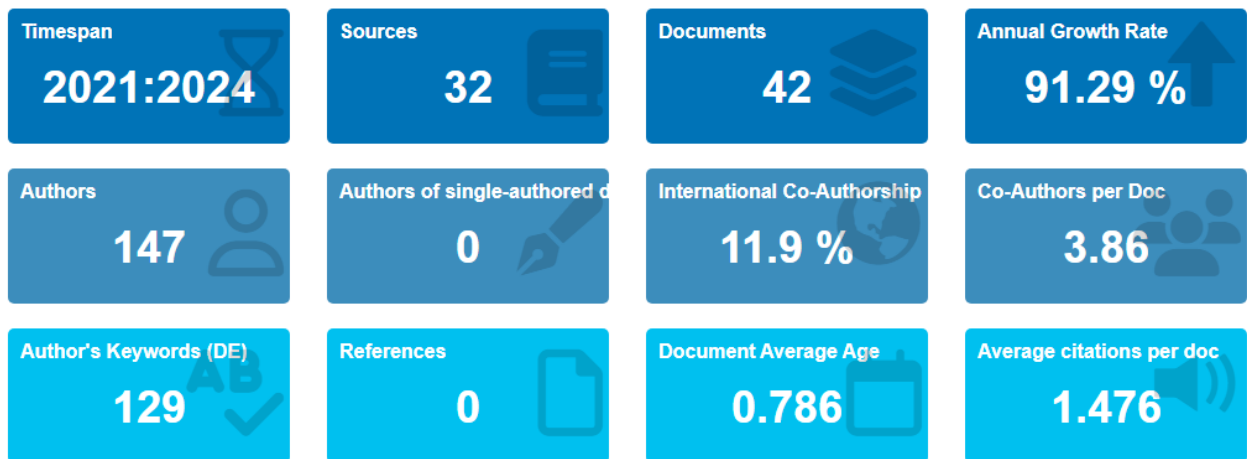


Figure 1. Main Information

Below is a detailed description of each metric:

- a. Timespan: The research data analyzed spans from the year 2021 to 2024, indicating the temporal scope of the publications.
- b. Sources: A total of 32 sources (including journals, conferences, or other types of documents) were analyzed in this study.
- c. Documents: The dataset contains 42 documents in total.
- d. Annual Growth Rate: The annual growth rate of publications is 91.29%, reflecting a significant increase in research output over the analyzed period.
- e. Authors: The total number of authors contributing to the analyzed documents is 147, showcasing a diverse and engaged research community.
- f. Authors of single-authored documents: None of the analyzed documents were authored by a single individual (0), indicating collaborative research efforts.
- g. International Co-Authorship: International collaborations account for 11.9% of the documents, highlighting a moderate level of cross-country cooperation.
- h. Co-Authors per Document: The average number of co-authors per document is 3.86, indicating a high degree of teamwork among researchers.
- i. Author's Keywords (DE): There are 129 unique keywords provided by the authors, reflecting a wide variety of topics within the research domain.
- j. References: No references were recorded in the analyzed dataset (0), which could be due to specific limitations in the data extraction process.
- k. Document Average Age: The average age of the documents is 0.786 years, suggesting that the publications are relatively recent.
- l. Average Citations per Document: Each document received an average of 1.476 citations, reflecting a moderate level of scholarly impact or attention.

Figure 2 represents the Annual Scientific Production derived from the bibliometric analysis conducted in this study. It is generated using Biblioshiny, a comprehensive bibliometric tool for mapping scientific research trends. The graph illustrates the yearly growth in research output, shedding light on the dynamics of publication trends related to the Quick Response Code Indonesian Standard (QRIS). This analysis serves as an essential foundation for understanding the increasing scholarly interest and the trajectory of research within this domain.

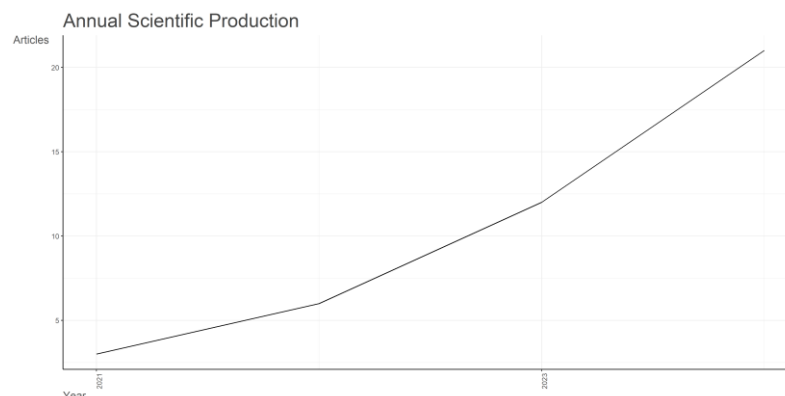


Figure 2. Annual Scientific Production



The Annual Scientific Production graph provides insights into the number of articles published each year over the period analyzed (2021–2024). Below are the key observations:

- a. X-Axis (Year): The horizontal axis represents the publication years, from 2021 to 2024.
- b. Y-Axis (Articles): The vertical axis indicates the number of articles published annually.

Key Insights:

- a. 2021: The year marks the starting point of the analyzed timeframe, with a modest number of articles published (approximately 4–5 articles).
- b. 2022: A noticeable increase in scientific production is observed, with the number of articles roughly doubling compared to 2021.
- c. 2023: The upward trend continues, showing significant growth in publication output, exceeding 15 articles.
- d. 2024: The year records the highest output, with the number of articles surpassing 20, indicating an accelerated growth in research interest.

The graph reveals a consistent upward trajectory in scientific production, with an impressive increase in research output year over year. This indicates growing academic attention and engagement with the topic of QRIS. The increasing number of publications could also reflect advancements in technology, policy developments, and the broader adoption of QRIS in various sectors. This trend underscores the relevance and emerging importance of QRIS as a research focus, aligning with global efforts to study and improve digital payment systems. The findings from this analysis provide a quantitative basis for further exploring the factors driving this growth and the thematic evolution of related research.

Table 1 displays key metrics related to Average Citations per Year, derived from bibliometric analysis using Biblioshiny. This data provides detailed insights into how publications have been cited over time, broken down by year, allowing for a clearer understanding of the scholarly impact and relevance of the analyzed articles.

Table 1. Average Citation Per Year

Year	MeanTCperArt	N	MeanTCperYear	CitableYears
2021	8.33	3	2.08	4
2022	4.17	6	1.39	3
2023	0.50	12	0.25	2
2024	0.29	21	0.29	1

The Table 1 includes the following key columns:

- a. Year: Indicates the publication year of the articles analyzed.
- b. MeanTCperArt: Represents the average total citations per article for the given year.
- c. N: Refers to the number of articles published in the corresponding year.
- d. MeanTCperYear: Represents the average citations per year per article.
- e. CitableYears: Indicates the number of years during which the articles remain citable.

Key Observations:

- a. 2021: The average total citations per article (MeanTCperArt) is 8.33, the highest among all years. A relatively small number of articles (N = 3) contributed to this high citation average. The average citations per year (MeanTCperYear) is 2.08, with articles being citable for 4 years.
- b. 2022: The average total citations per article decreased to 4.17, reflecting a moderate decline. More articles were published (N = 6), resulting in a broader distribution of citations. The average citations per year (MeanTCperYear) is 1.39, with citable years reducing to 3 years.
- c. 2023: A significant drop in the average total citations per article is observed (MeanTCperArt = 0.50). The number of articles increased substantially (N = 12), suggesting that newer articles have not had sufficient time to accumulate citations. The average citations per year (MeanTCperYear) dropped to 0.25, with only 2 citable years.
- d. 2024: The average total citations per article further declined to 0.29. The highest number of articles (N = 21) were published in this year, diluting the average citation count. The average citations per year (MeanTCperYear) remained constant at 0.29, with just 1 citable year.

Overall Trend:

- a. The data reveals a declining trend in average citations per article as more recent articles dominate the dataset, which is typical in bibliometric studies due to citation delay.
- b. Earlier publications (e.g., 2021) have had more time to accumulate citations, explaining their higher averages.
- c. The increase in the number of publications in recent years reflects growing research activity but dilutes the average citation impact due to the recency of these works.

This analysis highlights the dynamics of publication and citation behavior over time, emphasizing the importance of considering both publication volume and time-lag effects when interpreting citation metrics.

3.2. Sources

Figure 3 illustrates the Most Relevant Sources in terms of publication output from the bibliometric analysis conducted in this study. This visualization, generated using Biblioshiny, highlights the primary journals, conference proceedings, and other publication sources that have contributed to the research field. Identifying these key sources helps in



understanding where the majority of research activity is concentrated and which platforms are most influential in disseminating studies related to the Quick Response Code Indonesian Standard (QRIS).

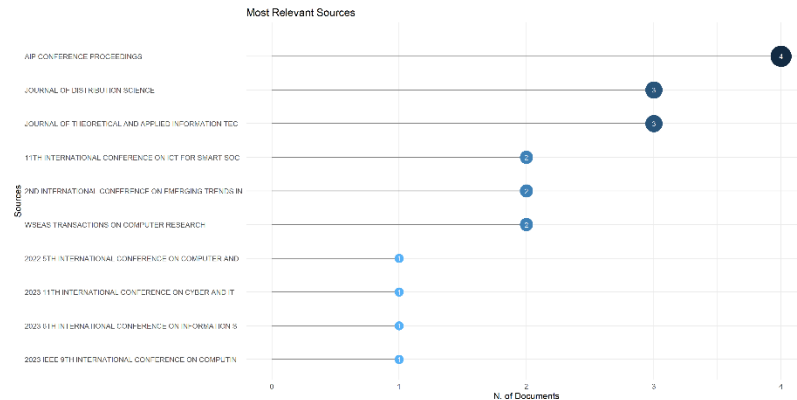


Figure 3. Most Relevant Sources

The Most Relevant Sources graph presents the publication platforms along with the number of documents they have contributed. Below are the key components and observations:

- a. X-Axis (N. of Documents): Represents the number of documents published by each source.
- b. Y-Axis (Sources): Lists the names of journals, conference proceedings, and other publication sources.

Key Insights:

- a. AIP Conference Proceedings: This source is the most prominent, contributing the highest number of documents (4), indicating its significant role in disseminating research in this domain.
- b. Journal of Distribution Science and Journal of Theoretical and Applied Information Technology: Both are notable contributors, each publishing 3 documents, making them important platforms for research dissemination.
- c. 11th International Conference on ICT for Smart Society and 2nd International Conference on Emerging Trends in Information Technology: Both contributed 2 documents, highlighting the importance of conferences in advancing this research field.
- d. Other sources, including WSEAS Transactions on Computer Research and various international conferences (e.g., 2023 IEEE 9th International Conference on Computing), each contributed 1 document, indicating a more distributed contribution across smaller platforms.

The graph underscores the dominant role of conference proceedings, particularly AIP Conference Proceedings, in driving research dissemination in this field. Journals such as the Journal of Distribution Science and Journal of Theoretical and Applied Information Technology are also key contributors, suggesting a balance between journal and conference publications. This analysis highlights the diversity of sources in this domain, with significant contributions from both academic journals and international conferences. It provides researchers with valuable insights into where the most impactful studies in this field are being published.

Figure 4 represents the Sources' Production Over Time, generated using Biblioshiny. It illustrates the cumulative publication contributions of various sources (journals, conference proceedings, etc.) over the analyzed years (2021–2024). This visualization provides insights into how different sources have evolved in their contribution to the research domain, reflecting the dynamics of scholarly dissemination across time.

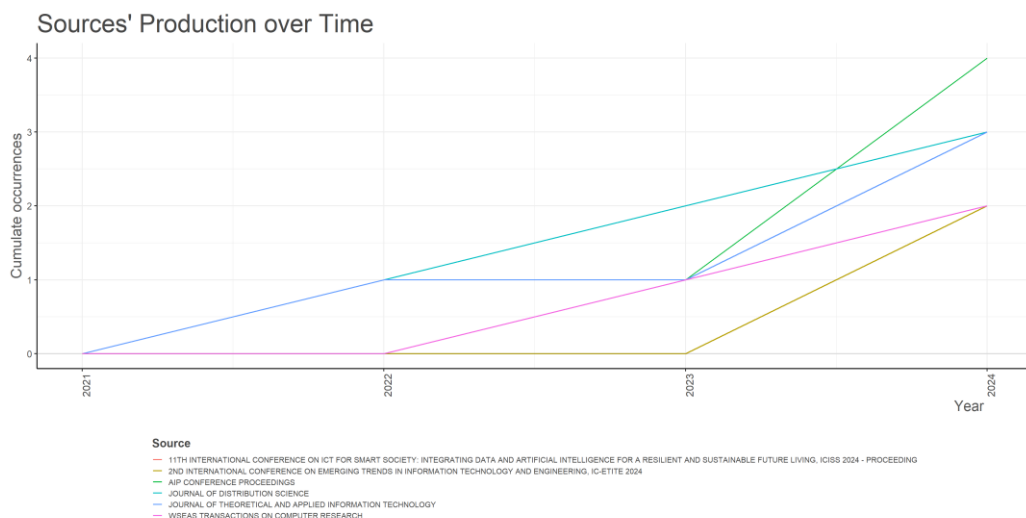


Figure 4. Sources Production Over Time



3.3. Affiliations

Figure 5 illustrates the Most Relevant Affiliations based on the bibliometric analysis performed in this study, using Biblioshiny. It highlights the institutions contributing the most to the research field under analysis, measured by the number of articles published. Understanding these affiliations provides insights into the key academic and research centers actively engaging in this domain.

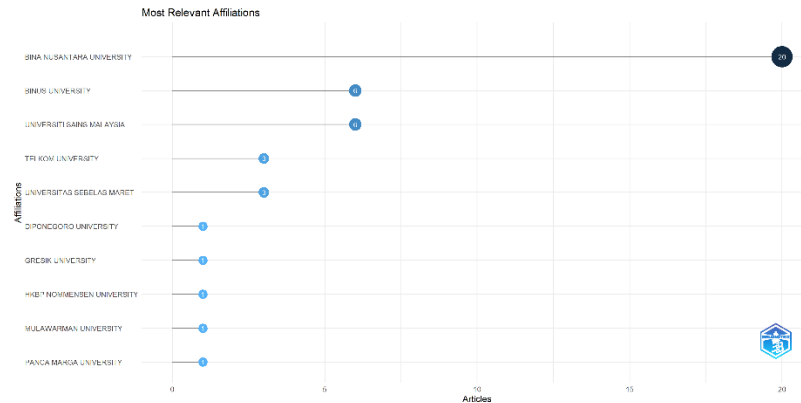


Figure 5. Most Relevant Affiliations

The Most Relevant Affiliations graph provides the following details:

- a. X-Axis (Articles): Represents the number of articles contributed by each institution.
- b. Y-Axis (Affiliations): Lists the names of the academic institutions or universities contributing to the analyzed research.

Key Insights:

- a. Bina Nusantara University (BINUS): This university emerges as the most prominent contributor, with a total of 20 articles, significantly exceeding contributions from other institutions.
- b. BINUS University and Universiti Sains Malaysia: Both institutions rank second, each contributing 6 articles to the analyzed dataset.
- c. Telkom University and Universitas Sebelas Maret: Each institution contributed 3 articles, showcasing their involvement in the research field.
- d. Other Universities: Institutions such as Diponegoro University, Gresik University, HKBP Nommensen University, Mulawarman University, and Panca Marga University each contributed 1 article.

The graph clearly indicates that Bina Nusantara University plays a dominant role in advancing research in this domain, with a contribution that dwarfs other institutions.

A few institutions, such as BINUS University and Universiti Sains Malaysia, are secondary contributors but still exhibit significant involvement. The remaining universities, while contributing fewer articles, reflect a broader participation in the research field. This visualization underscores the pivotal role of specific universities, particularly Bina Nusantara University, in driving the research landscape, while also highlighting the diversity of institutions engaged in the field. It serves as a valuable resource for identifying key academic collaborators and institutions leading the discourse.

Figure 6 illustrates the Affiliations' Production Over Time, generated using Biblioshiny. It depicts the cumulative contributions of various academic and research institutions to the analyzed research field over the years (2021–2024). This visualization highlights the growth and consistency of publications from key affiliations, providing insights into their role in advancing this domain.

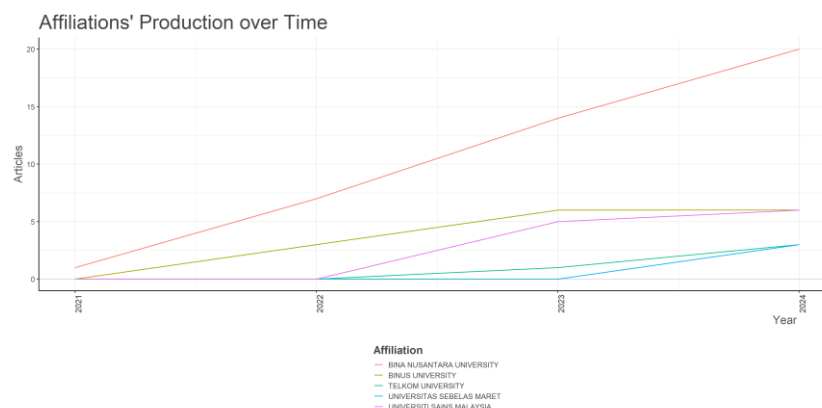


Figure 6. Affiliation Production Over Time



The Affiliations' Production Over Time graph presents the following information:

- a. X-Axis (Year): Represents the timeline from 2021 to 2024.
- b. Y-Axis (Articles): Indicates the cumulative number of articles published by each affiliation.
- c. Legend (Affiliation): Lists the names of the institutions contributing to the research.

Key Observations:

- a. Bina Nusantara University: This institution leads significantly in cumulative production, showing a steady rise in publications each year. By 2024, it reaches approximately 20 cumulative articles, highlighting its dominant contribution to the field.
- b. BINUS University and Universiti Sains Malaysia: Both institutions show a moderate yet consistent increase in their publication outputs, reaching approximately 6 cumulative articles each by 2024.
- c. Telkom University and Universitas Sebelas Maret: These affiliations demonstrate smaller yet steady contributions, each reaching approximately 3 cumulative articles by 2024.

All affiliations exhibit an upward trend, indicating increasing engagement and research contributions to the field over time. The most prominent growth is observed for Bina Nusantara University, which significantly outpaces other institutions. The graph underscores the pivotal role of Bina Nusantara University as a leader in research contributions, while other institutions such as BINUS University and Universiti Sains Malaysia maintain steady growth. The overall trend suggests increasing academic activity and collaboration among affiliations in advancing research within this domain. This visualization provides a comprehensive view of the evolving dynamics of institutional contributions over time.

3.4. Document

Figure 7 illustrates the Most Globally Cited Documents, generated using Biblioshiny. It highlights the individual documents that have received the highest number of global citations within the analyzed dataset. This metric provides insights into the most impactful research articles, conference papers, and studies in the field, reflecting their influence and recognition by the global academic community.

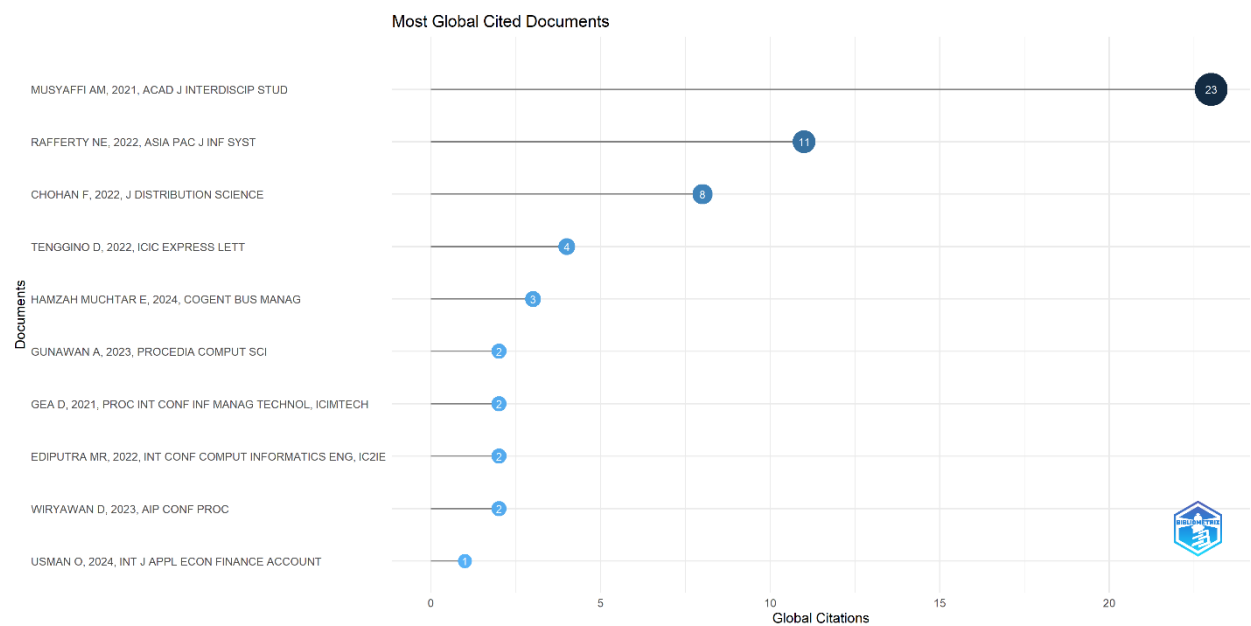


Figure 7. Most Global Cited Documents

The Most Globally Cited Documents graph provides the following information:

- a. X-Axis (Global Citations): Represents the total number of global citations received by each document.
- b. Y-Axis (Documents): Lists the documents, including the authors, publication year, and source title.

Key Observations:

- a. Musyaffi AM, 2021 (Acad J Interdiscip Stud): This document leads with the highest number of global citations (23), reflecting its significant impact in the research domain.
- b. Rafferty NE, 2022 (Asia Pac J Inf Syst): Ranked second, it received 11 citations, making it another highly influential document.
- c. Chohan F, 2022 (J Distribution Science): This document garnered 8 citations, placing it among the most recognized contributions.
- d. Tenggingo D, 2022 (ICIC Express Lett): Received 4 citations, showing moderate global recognition.
- e. Hamzah Mughtar E, 2024 (Cogent Bus Manag): This document, though more recent, has accrued 3 citations, indicating growing influence.



f. Other Documents: Documents by Gunawan A (2023), Gea D (2021), Ediputra MR (2022), and Wiryawan D (2023) each received 2 citations, while Usman O (2024) has garnered 1 citation.

The graph highlights a wide range in citation impact, with a few documents achieving significantly higher recognition globally compared to others. Earlier publications, such as Musyaffi AM (2021) and Rafferty NE (2022), tend to have higher citation counts, likely due to having more time to accumulate citations. Recent contributions, such as Hamzah Muchtar E (2024) and Usman O (2024), show initial citation activity, indicating their potential for future influence. This visualization emphasizes the key documents shaping the field and provides a benchmark for identifying influential research contributions. It serves as a valuable tool for researchers aiming to build on foundational and widely recognized studies in the domain.

Figure 8 illustrates the Most Relevant Words identified from the bibliometric analysis, generated using Biblioshiny. It highlights the most frequently occurring keywords and concepts within the dataset, offering insights into the central themes and topics emphasized in the research domain. These keywords are vital for understanding the core focus areas and the thematic orientation of the analyzed studies.

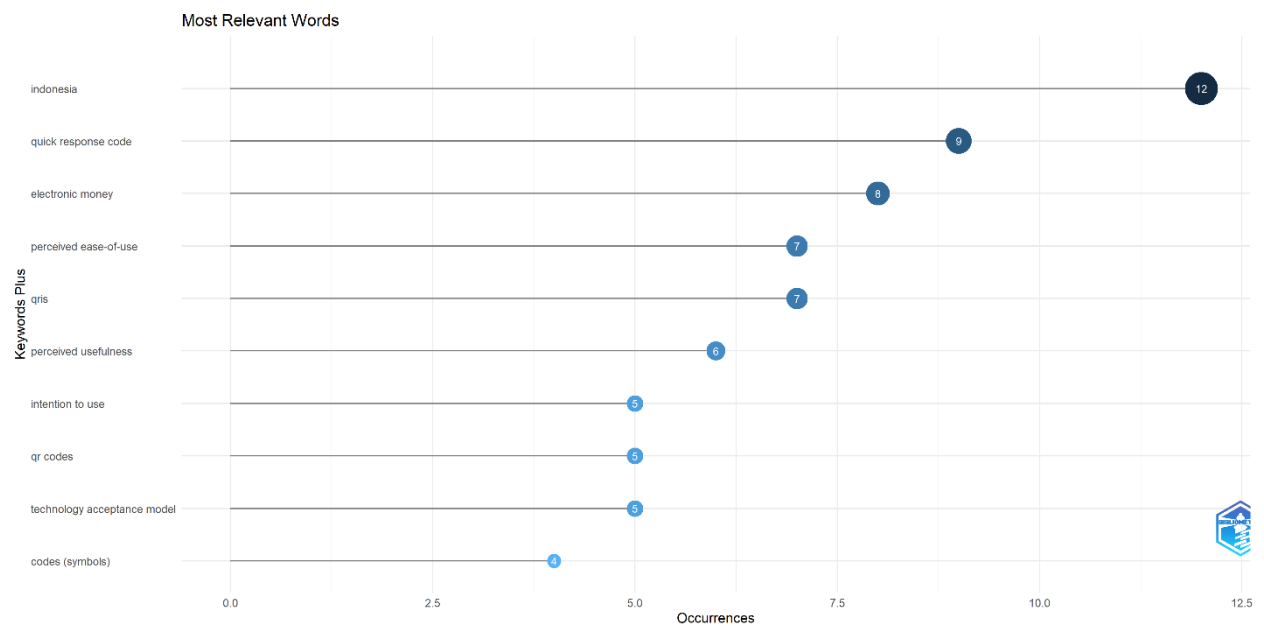


Figure 8. Most Frequent Words

The Most Relevant Words graph provides the following details:

- a. X-Axis (Occurrences): Represents the frequency of occurrences for each keyword.
- b. Y-Axis (Keywords Plus): Lists the most frequently occurring keywords or phrases used in the documents.

Key Observations:

- a. "Indonesia": The most frequently occurring keyword with 12 occurrences, reflecting the geographic focus of the studies in the dataset.
- b. "Quick Response Code": This keyword appears 9 times, emphasizing its relevance as a central topic in the analyzed research.
- c. "Electronic Money": With 8 occurrences, this keyword highlights the integration of QR codes with digital financial systems.
- d. "Perceived Ease-of-Use" and "QRIS": Both keywords occur 7 times, indicating significant attention to user perception and the Quick Response Code Indonesian Standard (QRIS).
- e. "Perceived Usefulness" and "Intention to Use": Each of these terms appears 5 times, showing a strong alignment with behavioral theories and user adoption studies.
- f. "Technology Acceptance Model": This theoretical framework is mentioned 5 times, underlining its importance in analyzing the adoption of QR-based payment systems.
- g. Other Keywords: Keywords like "QR Codes" and "Codes (Symbols)" occur 4 times, indicating their foundational role in the studies.

The graph demonstrates a clear emphasis on topics related to QR codes, user behavior, and digital payment systems, with a strong focus on Indonesia and its implementation of QRIS. Behavioral factors such as perceived ease-of-use and perceived usefulness are central themes, aligning with studies grounded in the Technology Acceptance Model. This analysis underscores the thematic concentration of the research domain and provides valuable insights into the priorities and frameworks guiding scholarly exploration in this field. It also serves as a reference for researchers aiming to identify and address key topics and gaps within this area of study.

Figure 9 depicts a WordCloud generated using Biblioshiny, which visualizes the most frequently occurring words in the analyzed dataset. WordClouds are a powerful tool for identifying key themes and concepts within a



The Words' Frequency Over Time graph provides the following details:

- X-Axis (Year): Represents the timeline from 2021 to 2024.
- Y-Axis (Cumulative Occurrences): Indicates the cumulative number of times each keyword has appeared in the research corpus.
- Legend (Term): Lists the specific terms being tracked for frequency over time.

Key Observations:

- "Indonesia": This term shows the highest cumulative occurrences, surpassing 12 mentions by 2024, reflecting the geographic focus of the research.
- "Quick Response Code" and "Electronic Money": Both terms show steady growth, reaching approximately 9 occurrences by 2024, highlighting their importance in the context of digital payment systems.
- "Perceived Ease-of-Use" and "Perceived Usefulness": These behavioral factors show similar growth patterns, with cumulative occurrences reaching 7 mentions each by 2024, indicating their central role in adoption studies.
- "QRIS" and "Technology Acceptance Model": QRIS, as the focal topic, and the Technology Acceptance Model (TAM), as a key theoretical framework, demonstrate consistent growth, reaching approximately 5–6 mentions by 2024.
- "Intention to Use": This term also shows significant growth, reflecting its relevance in understanding user behavior toward adopting digital payment systems.
- "Codes (Symbols)": While its cumulative growth is more modest (approximately 4 mentions by 2024), it still reflects its relevance as a foundational concept in QR-based systems.

The graph indicates a consistent upward trajectory for all terms, reflecting the increasing academic interest and focus on the topics over time.

Behavioral and technological terms, such as "Perceived Ease-of-Use," "Perceived Usefulness," and "Intention to Use," show substantial growth, aligning with studies that emphasize user adoption and behavioral theories.

The dominance of terms like "Indonesia" and "QRIS" underscores the localized focus of the studies on the Indonesian context and the Quick Response Code Indonesian Standard. This visualization highlights the evolving thematic priorities in the research field, with a strong emphasis on QRIS, user behavior, and digital payment technologies. The consistent growth in keyword occurrences over time reflects the expanding research output and the increasing scholarly attention toward these topics. This trend provides valuable guidance for future research directions, emphasizing areas with sustained or growing academic interest.

3.5. Discussion

The findings of this study provide a comprehensive overview of the research landscape on the Quick Response Code Indonesian Standard (QRIS), highlighting trends in publication growth, thematic focus, and influential contributions within the domain. By employing bibliometric analysis, the study offers insights into the dynamics of QRIS research and its broader implications for digital payment systems in Indonesia.

a. Publication Growth and Key Contributions

The significant annual growth in scientific production, as illustrated in the data, reflects the increasing scholarly interest in QRIS and its role in advancing Indonesia's digital payment ecosystem. With an annual growth rate of over 91%, the consistent rise in publications underscores the relevance of QRIS as a research topic, particularly in light of its implementation as a unified payment system. Institutions such as Bina Nusantara University and BINUS University emerged as key contributors, producing the majority of publications, while the most cited documents provided foundational insights into the adoption and impact of QRIS. These findings align with global trends in digital payment systems, where standardization and technological innovation drive academic exploration. For instance, similar initiatives like India's Unified Payments Interface (UPI) and China's Alipay have garnered widespread attention, further supporting the growing recognition of QRIS in the international academic community.

b. Collaboration and Institutional Dynamics

Thematic analysis, as evidenced by the WordCloud and keywords analysis, reveals a strong focus on user behavior and adoption factors. Keywords such as "perceived ease-of-use," "perceived usefulness," and "intention to use" indicate that researchers frequently apply behavioral models like the Technology Acceptance Model (TAM) to understand QRIS adoption. The integration of QRIS with digital payment systems, highlighted by terms like "electronic money" and "digital payments," reflects its growing relevance in the financial sector. The prominence of Indonesia in the analysis, as evidenced by the frequent occurrence of "Indonesia" in the WordCloud and keywords data, underscores the localized focus of the studies. This geographic emphasis highlights the unique challenges and opportunities associated with implementing QRIS in a diverse socio-economic and technological landscape. Moreover, the behavioral focus aligns with existing research, emphasizing the importance of trust, ease-of-use, and perceived usefulness in the adoption of financial technologies.

c. Collaboration and Institutional Dynamics

Collaboration among institutions remains a critical driver of QRIS research. The analysis shows that Bina Nusantara University leads in both publication output and collaborative efforts, followed by BINUS University and Universiti Sains Malaysia. This finding indicates the importance of cross-institutional partnerships in advancing the discourse on QRIS. The role of conferences, such as the AIP Conference Proceedings, is also



evident, with these platforms serving as key dissemination points for new findings. The balance between journal articles and conference proceedings highlights the need for both rigorous peer-reviewed studies and the rapid dissemination of emerging research through conferences.

d. Research Gaps and Future Directions

While the growth in QRIS research is encouraging, several gaps warrant further exploration. For instance, studies focusing on rural adoption and the integration of advanced technologies such as blockchain in QRIS are limited. Additionally, there is a need for more longitudinal studies to assess the long-term socio-economic impact of QRIS on financial inclusion.

4. CONCLUSION

This study provides a comprehensive bibliometric analysis of QRIS (Quick Response Code Indonesian Standard) research, offering valuable insights into its growth, thematic focus, and the institutions driving its development. The findings highlight the rapid increase in academic interest in QRIS, as evidenced by a significant annual growth rate in publications. Key institutions, such as Bina Nusantara University, have emerged as central contributors, reflecting strong academic collaboration in advancing this field. Additionally, prominent journals and conference proceedings have played a pivotal role in disseminating research, with highly cited works providing foundational knowledge for further studies. Thematic analysis reveals a strong emphasis on behavioral aspects, such as perceived ease-of-use, perceived usefulness, and intention to use, demonstrating the relevance of frameworks like the Technology Acceptance Model (TAM). Moreover, the focus on "Indonesia" in keywords and themes underscores the geographic specificity of QRIS research, which explores its implementation in a socio-economically diverse landscape. The integration of digital payments, trust, and user behavior indicates the comprehensive scope of research addressing both technological and social dimensions of QRIS adoption. Despite these findings, the study has several limitations. First, the analysis is restricted to publications indexed in Scopus, which may exclude relevant works from other databases. Second, the bibliometric approach predominantly focuses on quantitative metrics, potentially overlooking nuanced qualitative insights. Furthermore, the study's emphasis on academic literature limits its ability to fully capture the perspectives of practitioners and policymakers directly involved in QRIS implementation. Future research should address these limitations by expanding the dataset to include other indexing platforms, conducting qualitative analyses, and exploring under-researched areas such as rural adoption and the integration of advanced technologies like blockchain. By addressing these gaps, researchers can provide a more holistic understanding of QRIS's impact and its potential as a model for digital payment systems in other developing countries.

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