LEVERAGING QRIS AS A DIGITAL INNOVATIVENESS FOR BOOSTING MSMES PERFORMANCE

Balqis Syathiri*[1]
Universitas Negeri Yogyakarta
Email: balqissyathiri.2023@student.uny.ac.id

Abstract

This study aims to analyze the use of QR Code as a digital innovation in transactions through a bibliometric approach. QR Codes have become an easy, secure, and popular payment method in the community, especially in Indonesia. Through a bibliometric analysis of the literature from 2014 to 2024, this study evaluates publication trends, prominent authors, and key themes related to QR Codes. The results of the analysis show that convenience and security are important factors in the adoption of QR Codes, while their use is increasingly widespread in the banking and e-commerce sectors, especially after the pandemic. The study provides insights for academics, practitioners, and policymakers to understand the role of QR Codes in future transactions.

Keywords: QRIS, Digital Innovativeness, Bibliometrics

A. INTRODUCTION

In the rapidly evolving digital era, technological innovations have driven significant changes in various aspects of life, including financial and business transactions. One of the important innovations that continues to grow and receive widespread attention is the use of Quick Response Code (QR-Code) in digital transactions (Aktaş, 2017; Canadi et al., 2010). QR codes (Quick Response), which used to be a way to access information or websites in the past, are now an important form of remote payment and are a convenient and secure payment method that consumers are increasingly using, especially in restaurants, cafes, bars, and other hospitality establishments (Sorensen, 2021).

QR Code is a form of digital payment that can make payments by scanning a QR code (Musyaffi et al., 2021). Whereas according to QR Codes are more efficient because they can store more information and are more flexible in terms of storage [10]. To use a mobile payment service with QR codes, users need to have a mobile app that has QR code scanning and generation functionality on their mobile devices. Then, users can open the app to scan the QR code displayed by the merchant, enter the amount to be paid, and complete the payment (Gao et al., 2018).

QR codes have transformed business transactions in the banking sector, online purchases, and in-store shopping (Jiang et al., 2021). QR code payments, which started in China and also has a wide user base in India, are a popular payment method used in Southeast Asia, Europe, and

* *Corresponding author*

America, especially with the impact of the pandemic (Moran 2021). In 2020, QR code payments accounted for about half of the total point of sales (POS) payments in China, the birthplace of the product (Worldpay 2021).

Although statistics from around the world do not reflect information on the number of mobile payment users with QR codes, the number of transactions with this payment method reached $2.21 trillion worldwide in 2020 (Bunmark 2017). Juniper Research shows QR code payment users will reach 2.2 billion globally by 2025 (Zhou et al., 2021). When the literature is researched, it is seen that the history of experimental studies on QR code mobile payments dates back to 2015. These studies are based on the Technology Acceptance Model (TAM) (De Luna et al., 2019; Liébana-Cabanillas et al., 2015; Tew et al., 2022; Yan et al., 2021) and they investigated the intention to use QR code mobile payments in the future.

QR-Code payments are increasingly in demand by the public because they are an easy-to-use data exchange method, integrated with various features, and unlimited near field communication technology (NFC) functions (De Luna et al., 2019). QR – Code payment services are faster, easier, and more secure than other mobile payment options, so they have been widely used today, especially in societies with high technology sensitivity (Eren, 2021; Liu et al., 2022; Sun et al., 2021). In addition, QR Codes have also become popular due to their fast readability and greater storage capacity compared to standard barcodes (Alhafi et al., 2019). Users think that the QR Code mobile payment app they download is compatible with the technology they have such as a mobile phone or tablet (Nur Fathin et al., 2020).

Furthermore, since users find that QR Code mobile payments are easy to use, this might be the reason they don't need support from anyone if they find it difficult to use it because they know how to do it and are able to do it themselves. However, while the use of QR-Codes shows great potential in supporting digital innovation, there are still limitations in understanding its impact on transactions and consumer behavior. Therefore, this study aims to conduct a bibliometric analysis of the existing literature regarding QR-Code as a form of digital innovation in transactions.

Through this approach, it is hoped that research trends, strengths, and weaknesses in QR-Code studies can be identified, as well as their contribution to the development of knowledge in this field. Bibliometric analysis will include a review of relevant scientific articles, which is expected to provide a more comprehensive picture of the current state of research. This research is expected to provide insights for academics, practitioners, and policymakers in understanding the dynamics of QR-Code as an innovative tool in transactions and its implications in the future.

B. RESEARCH METHOD

This study adopts a literature review method with bibliometric analysis, which allows the analysis of literature patterns in a specific domain using statistical and mathematical approaches (Aria & Cuccurullo, 2017). Data was collected from journal articles that had been published in the Scopus database by searching using keywords that focused on Quick Response Code in the context of Indonesian standards and their application to digital payments. The specific search string used is: 'TITLE-ABS-KEY ("Quick Response Code") AND TITLE-ABS-KEY ("Quick Response Code Indonesian Standard") OR TITLE-ABS-KEY ("payment") OR TITLE-ABS-KEY (fintech)' The initial search results found 85 documents, which after the screening process left 39 relevant documents for further analysis. Information from Scopus is downloaded in BibTeX (.bib) format to get complete details including citation information, bibliographic data, abstracts, keywords, and other additional

information. Data analysis was carried out using the Biblioshiny package in the R application version 4.3.1.

C. FINDINGS AND DISCUSSION

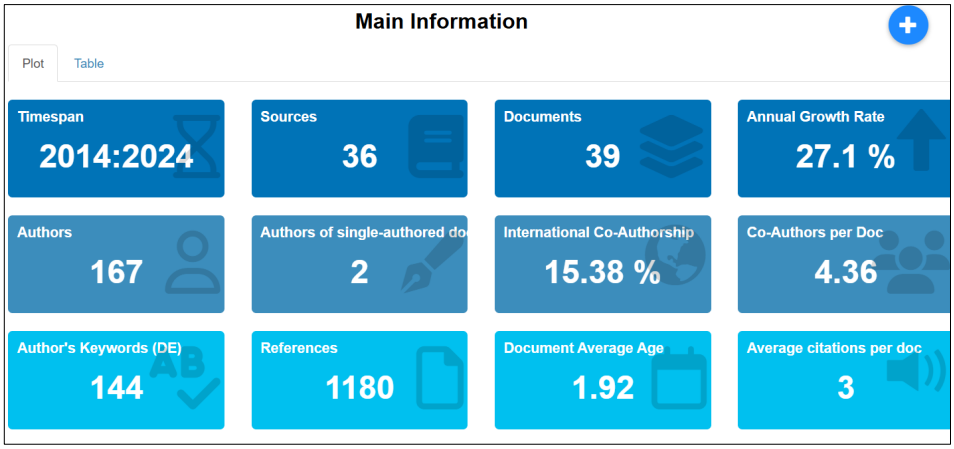

Figure 1. Main Information

Table 1. Annual Scientific Production

Year	Articles
2014	1
2015	1
2016	0
2017	1
2018	1
2019	2
2020	0
2021	3
2022	5
2023	14
2024	11

Figure 1 provides an overview of the key information used in the bibliometric analysis of this article. It was confirmed that there were 39 documents from 167 authors conducting research from 2014 to 2024, with an annual growth rate of 27.1%. Based on Figure 1 and Table 1, there were 39 research articles published during the period. In Table 1, data from annual scientific production shows a significant increase in the number of articles, especially in 2023 with 14 articles and 2024 with 11 articles. Research production was relatively low before 2021, with most years having only 1 or 2 articles, with the exception of 2020 which did not show publications. However, production has increased sharply in recent years, indicating an increase in research interest.

Three-Field Plot

The Three-Field Plot depicts the allocation by Citation Reference (CR) on the left, the Author (AU) in the middle, and the Descriptor (DE) on the right. This graph was created to reflect the interconnectedness between the main references, authors, and topics raised by previous researchers, especially those focused on QR code-related Fintech research. It can be seen that the most influential works (CR) include "A primer on partial least squares structural equation modeling (PLS-SEM)" as well as studies related to mobile payments and trust (trust). Authors (AU) who stand out in this study include Salsa Imbartika Budiarti, Aldi Akbar, and others, whose work discusses many topics such as QRIS, trust, perception of ease of use, and intention to use. Descriptors (DEs) that are often used in this study include QR codes, trust, and security.

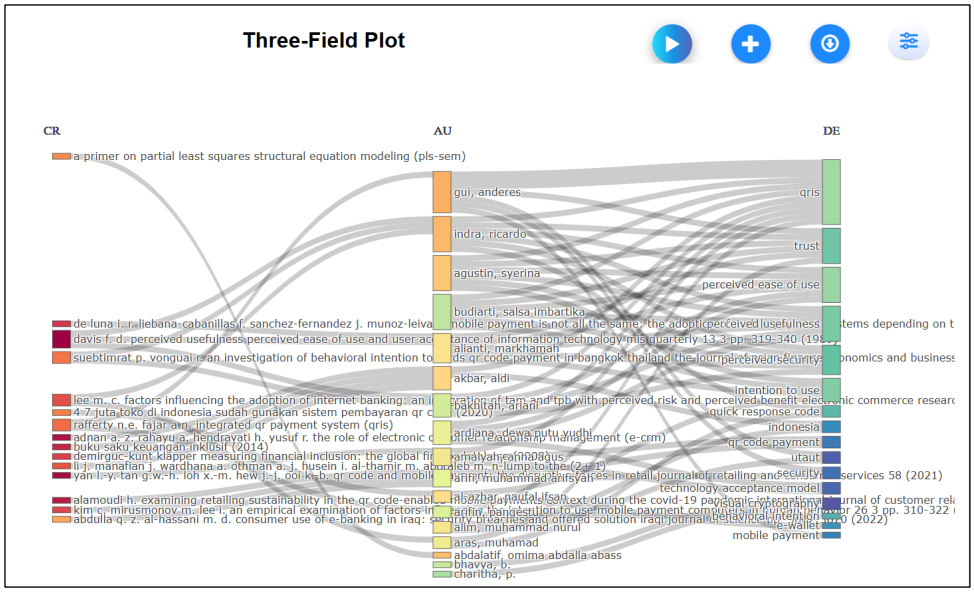

Figure 2. Three-Field Plot

Most Relevant Sources

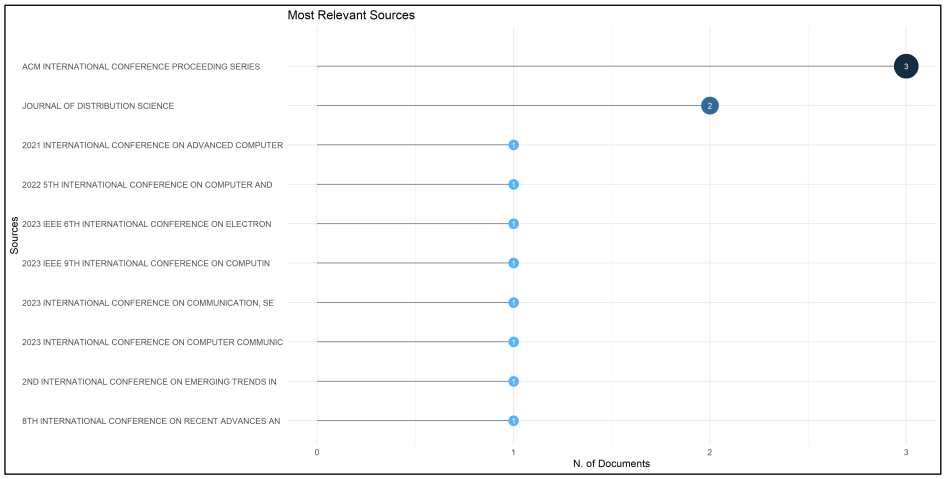

Figure 3. Most Relevant Sources

Figure 3 shows 10 sources or journals that have contributed to research in the specific area under review. Based on the figure, the source with the highest number of publications is the Administrative Conference Processing Series with 3 documents published. Other journals, such as the Journal of Distribution Science and various conference publications (including the 2021 International Conference on Advanced Computer, the 2022 IEEE International Conference on Blockchain, and the 2021 International Conference on Computers) each contributed 1 or 2 documents related to the topic. Most of the sources come from conference proceedings, which suggests that research in this area is more often presented at international conferences than published in traditional academic journals. The diversity of these conferences shows a wide interest in the topic across various technology and business disciplines. The results and discussion are presented at a length of 60-70% of the length of the article. Results are the main part of a scientific article that contains: the results of data analysis, the results of hypothesis testing, can be equipped with tables or graphs, to clarify the results verbally.

Countrie's Scientific

Tabel 1. Countrie's Scientific Production

Year	Articles
Indonesia	91
China	31
India	17
Malaysia	8
Philipines	5
USA	4
Saudi Arabia	3
Netherlands	2
Australia	2
South Korea	2

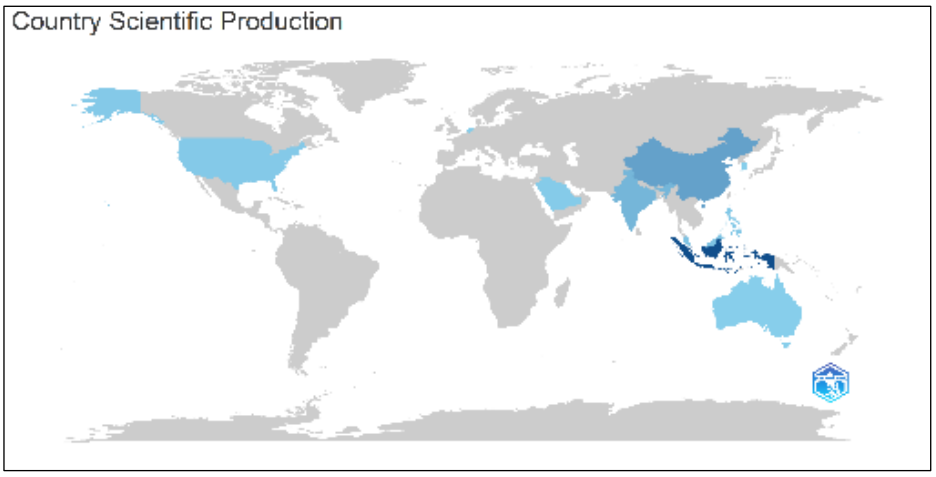

Figure 4. Countrie's Scientific

Table 2 shows the countries that have published articles related to production research. Based on this data, Indonesia ranks first with the highest number of contributions, namely 91 articles. It was followed by China with 31 articles and India with 17 articles. Malaysia and the Philippines contributed 8 and 5 articles respectively. Other countries with a smaller number of publications include the United States (4), Saudi Arabia (3), as well as the Netherlands, Australia, and South Korea, each with 2 articles. This data reflects diverse international contributions to production research, with Indonesia leading significantly in the number of publications.

Word Cloud & Tree Map

Figure 5. Word Cloud

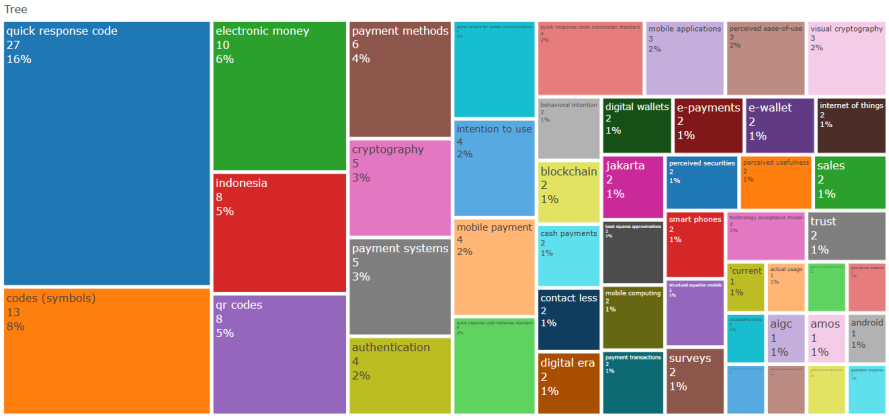

Figure 6. Tree Map

Figures 5 and 6 show a visualization of data based on the most frequently used keywords in the keyword graph settings that the author has used previously. The advantage of this keyword selection is that it provides insight into the most important research topics and trends. Figure 5 is a word cloud that shows that the most prominent keywords are "quick response code," "electronic money," and "codes (symbols)." Figure 6 discusses keywords based on a treemap that illustrates the frequency of keyword use, where the most frequently used word is "quick response code" with 27 frequencies or 16%, followed by "electronic money" at 6%, and "Indonesia" at 5%.

Countrie's Scientific Production

Of the 39 documents obtained based on Scopus search data, Figure 7 can provide an overview of the Co-occurrence network that displays words in color by considering whether there is a relationship between one word and another. The same round color indicates the weight of the relationship between words. The darker the colors produced in the images, the longer the study addressed the topic.

The size of the circle in Figure 7 shows the number of publications related to the word both in the title of the article, abstract, and keywords. The larger the circle, the more articles related to the term. It can be said in Figure 7 that each connected word means that the word has an influence and is significant, both the research on the word is positive and negative.

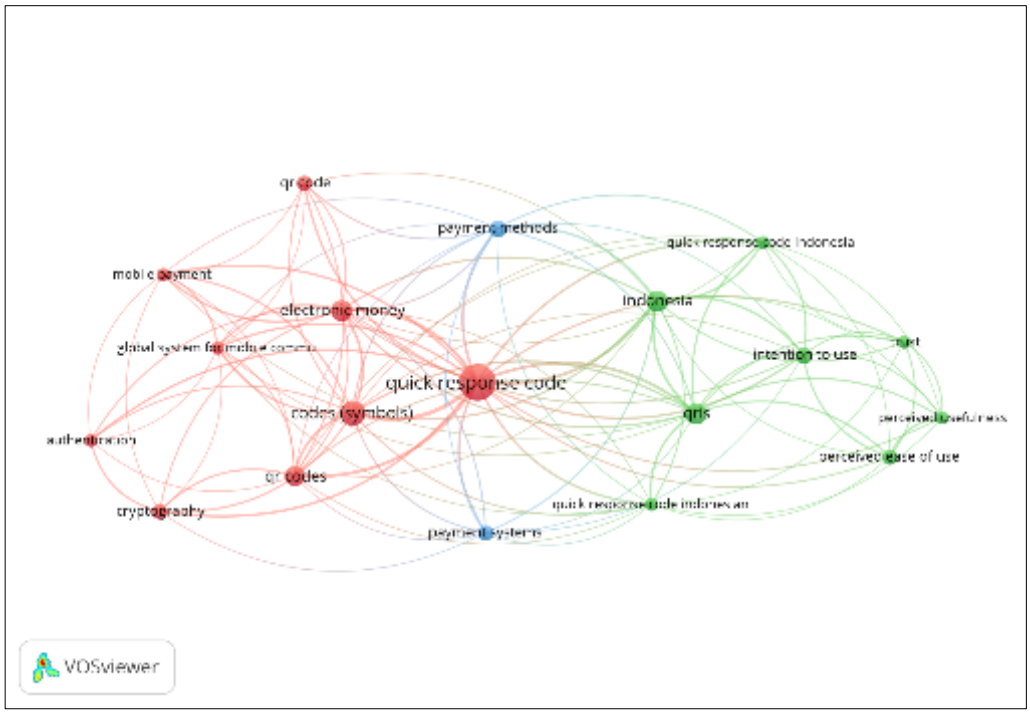

Figure 7. Countrie's Scientific Production

This visualization illustrates the network of interconnectedness (co-occurrence) of terms related to research on quick response codes in Indonesia. The words in the picture are grouped with different colors, indicating the relationship between the terms. The size of each circle represents the frequency with which the term appears in the dataset, such as in article titles, abstracts, or keywords, where a larger circle indicates a greater number of publications related to the term. The darker the color, the longer or more prominent the topic is discussed in the research literature. In the image, the "quick response code" is in a central position and is connected to several terms, such as "Indonesia," "payment methods," "perceived ease of use," and "mobile payment." This connectivity shows that quick response codes have significance in research discussions in Indonesia, especially in areas such as mobile payments, security, and user perception. Closer, connected terms with thicker lines indicate stronger associations and more frequent occurrences in studies.

This image is divided into clusters, each of which is represented by a different color. Each cluster reflects related research themes. For example, the green cluster appears to focus on user experience, with terms such as "perceived usefulness" and "ease of use," highlighting studies that address how quick response codes are perceived in terms of ease of use in Indonesia. The red

cluster may place more emphasis on technical aspects such as "mobile payments," "electronic money," and "cryptography," indicating a focus on security and the implementation of quick response codes in mobile payment systems. The blue cluster is likely to focus on a variety of payment methods, linking it to the use of quick response codes in Indonesia. Overall, this connected network shows the central role that quick response codes play in the Indonesian context, especially in digital payments and mobile technology. This visualization shows that research in this area covers a wide range of interrelated themes, from technical security measures to adoption and user perception.

D. CONCLUSION

In the conclusion of this study, it can be concluded that the use of QR Codes as a tool for digital innovation in transactions has had a significant impact on the development of financial and business transactions, especially in digital payments. Through bibliometric analysis of existing literature, it can be seen that QR Codes are an efficient, easy-to-use, and safe solution for consumers. Research trends show an increase in academic and practical attention to this topic, especially in the context of developing countries such as Indonesia, which is one of the largest users of QR Code technology in payments. The main findings in this study highlight the importance of ease of use and security factors as a driver of QR Code adoption, where consumers feel comfortable using this technology for various transaction purposes. The results of the analysis also show that QR Code innovation has contributed to digital transformation in the financial sector, especially with the increasing use of digital payments in the pandemic era. In the future, the potential for the development and adoption of QR Codes in the field of transactions is expected to be even greater, in line with the needs of people who want a fast, easy, and secure payment system. Thus, this research not only enriches the theoretical understanding of digital payment technology through QR Codes, but also provides practical implications for practitioners and policymakers in developing infrastructure and regulations that support the widespread and sustainable application of this technology.

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