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JOURNAL of BUSINESS ECONOMICS & MANAGEMENT

BIBLIOMETRIC ANALYSIS OF DIGITAL FINANCIAL REPORTING: A COMPREHENSIVE REVIEW OF RESEARCH TRENDS AND EMERGING TOPICS

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Abstract. Digital Financial Reporting (DFR) has gained significant research attention amid the digital transformation. This study comprehensively reviews DFR research, identifies trends, and highlights emerging topics. Key trends include advancements in sustainability reporting and improved financial reporting quality while emerging topics like XBRL and International Financial Reporting Standards (IFRS) reflect evolving research interests. Utilizing bibliometric methods, the study quantitatively analyzes DFR literature from Scopus, Emerald, Google Scholar, OpenAlex, Crossref, and SAGE. The research involved data sourcing, screening, eligibility selection, and bibliometric analysis. Findings show a dynamic increase in annual publications in DFR, with noticeable peaks and shifts in research focus over time. A notable rise post-2016 culminated in a peak in 2023, indicating sustained scholarly interest and field evolution. This study contributed into how digitalization enhances financial reporting quality, addressing gaps from previous bibliometric analyses. It emphasizes systematic trend analysis, identifying research gaps, and exploring factors driving the digital transformation of financial reporting. These insights guide researchers in developing new variables and strategies to advance DFR solutions, enhancing the accuracy, transparency, and accessibility of financial information through digital innovation.

1. Introduction

Digital financial reporting is a revolution in accounting and financial reporting practices that has gained significant momentum in recent decades. With the rapid advancement of information technology, primarily through developing and implementing eXtensible Business Reporting Language (XBRL), the financial reporting process has undergone a profound transformation (Hoque, 2023; Putsai & Mkhize, 2021). Digitalization allows companies to present their financial data more efficiently and transparently, providing faster and more accessible information for stakeholders (Anh et al., 2019; Rivero et al., 2022). In this connected landscape, the ability to collect, analyze, and disseminate real-time financial information is critical to improving corporate decision-making and oversight (Chao et al., 2023).

Along with this transition, new challenges and opportunities emerge, sparking intense discussions among academics, regulators, and practitioners. Financial reporting quality, global standardization under IFRS (International Financial Reporting Standards), and integrating sustainability reporting are taking center stage (Adedokun et al., 2022; Parashar et al., 2023). This topic covers the technical aspects of digital reporting and considers the broader implications of corporate social responsibility and transparency. Digital financial assets and currencies introduce complexity and a new dimension to financial reporting, evolving it into a dynamic, interdisciplinary field that innovates with technological shifts and global financial regulations (Liu, 2022). Digitization of financial reporting poses data security risks, such as cyber-attacks that could threaten the integrity of financial information. In addition, over-reliance on technology presents operational risks in the event of system failure or data processing errors. Moreover, implementing standards such as eXtensible Business Reporting Language (XBRL) requires complex adaptations from practitioners and regulators to ensure consistency and proper compliance. Therefore, research and developments in this area should carefully consider these challenges and limitations to maximize the benefits of digitization while minimizing security risks and over-reliance on technology.

The research aims to explore literature performance metrics, the origin of literature, key trends, and emerging topics of digital financial reporting. It details the uncharted literature on research topics on digital financial reporting. The contribution of this study lies in its focused examination of the enhancement of financial reporting quality through digitalization, an area that has not been extensively explored in previous bibliometric analyses. By systematically analyzing trends and identifying gaps in the existing literature, this research elucidates the critical factors influencing the digital transformation of financial reporting. It highlights the advancements in technologies such as blockchain, artificial intelligence, and cloud computing, and their impact on the accuracy, transparency, and accessibility of financial information. This study not only provides a comprehensive overview of the current state of digital financial reporting but also offers practical insights for stakeholders, including policymakers, regulators, and financial institutions, on how to leverage digital technologies to improve the quality and reliability of financial reports. Thus, it significantly enhances our understanding of the interplay between digital technologies and financial reporting practices, setting a new direction for future research and practical applications in the field.

Bibliometric studies on digital financial reporting have been conducted by several researchers (Aziz et al., 2021; Bosi et al., 2021; Brika, 2022; B. Li & Xu, 2021; Yadav & Banerji, 2023), among others: the theme of digital finance has changed over time. Initially, researchers focused on socio-economic and demographic variables, but over time, the topic evolved to include factors that influence, promote, and affect digital financial literacy (Yadav & Banerji, 2023). FinTech literature has expanded significantly, focusing on critical technologies like the Internet and Web of Things, big data, artificial intelligence, distributed systems (including blockchain and cloud computing), and security technologies (B. Li & Xu, 2021). Another study found that most previous studies discussed economic and social developments positively affected by digital banking and financial inclusion (Aziz et al., 2021). Research revealed that content analysis of 343 articles based on clusters found research gaps and suggested areas for further research (Brika, 2022). Most articles discuss business, management, and accounting (Bosi et al., 2021). The gap that can be identified based on the information above is the need for more research focusing on aspects of digital financial literacy in bibliometric studies of digital financial reporting. The current research needs to explore the impact of digital financial literacy on economic and social development in the context of digital banking and financial inclusion.

This study offers significant insights into Digital Financial Reporting (DFR), highlighting key trends, emerging research areas, and the evolution of collaborative research in DFR literature. It is a vital resource for practitioners, academics, and policymakers by elucidating recent advancements in digital financial reporting and guiding future research. The findings support practitioners in adopting technological best practices and assist decision-makers in shaping policies for the digital financial industry, thereby driving innovation in reporting practices. Overall, this research fills existing knowledge gaps, enhances understanding of DFR, and fosters further advancements in the field. The role of bibliometrics in analyzing papers taken in the context of digital financial reporting will help reveal recent research trends, citation patterns towards technologies such as XBRL, and developments in related themes such as data security and operational efficiency. It provides an in-depth understanding of how digitalization affects the evolution of financial reporting and provides guidance for researchers to explore future challenges and opportunities.

This article starts with a literature review on digital financial reporting, emphasizing information technologies that enhance financial transparency. The bibliometric research methodology is then described, including selecting data sources and analysis tools. The results reveal publication trends, key journals, country contributions, and visualizations of collaborations and keywords. The discussion interprets the findings, exploring the dynamics of digital financial reporting. The conclusions section summarizes the main findings and suggests future research directions, focusing on the impact of technology on financial reporting.

2. Literature review

Digital financial reporting significantly improves efficiency in financial reporting by integrating advanced information technology. Sophisticated accounting software automates routine tasks and database management systems for efficient data storage. It speeds up the reporting process and reduces human error (Choung et al., 2023; Gao, 2023; Tao et al., 2023; Uthaileang & Kiattisin, 2023). For example, a study of 2,114 listed companies in Shanghai and Shenzhen showed that digital transformation played an essential role in improving the efficiency of corporate innovation from 2010 to 2022 (Y. Wang & He, 2024). Adopting electronic reporting standards such as XBRL, faster information exchange processes, and automated data analysis enable companies to produce financial reports more efficiently and responsively to market changes (J. Li et al., 2023; Neves et al., 2023; F. Wang et al., 2023). While digital financial reporting increases efficiency, technology dependency leads to system failures and cyber-attacks. In addition, the adoption of electronic reporting standards such as XBRL requires training and organizational culture changes that are not easy to implement. XBRL is an international standard for the exchange of financial data in an electronic, computer-readable format, enabling more structured, accurate and easily comparable financial reporting. Its important role is to provide consistency in financial reporting, improve efficiency in data analysis, and enable better comparison and analysis between financial entities. Corporate financialization refers to the process by which companies focus more on financial and investment activities than on the production of goods and services. Its important role in the digitization of financial reporting is to influence the profit-seeking behavior and financial risk dynamics of companies, which can be monitored and analyzed more effectively through digital technologies such as blockchain and data analytics.

In addition to efficiency, digital financial reporting is a beacon of trust, improving the accuracy of financial reporting. Technologies such as blockchain and artificial intelligence (AI)

ensure that reported financial data is not only accurate but easily verified and audited. The implementation of AI and data analytics enables the identification of patterns and anomalies in financial data, thereby reducing the risk of errors and fraud (Pashkevich et al., 2023, p. 1). Blockchain technology enhances the security and reliability of transactions, providing a transparent and immutable record of transactions (Gietzmann & Grossetti, 2021, p. 1). Thus, the accuracy of financial reports is not just improved, but fortified, giving stakeholders a sense of security and confidence in making decisions based on reported financial data, and reinforcing the trust in the digital financial reporting system (Darmawati et al., 2024; K. Wu & Lu, 2023; Xi & Wang, 2023; Zhang et al., 2023, 2024, p. 69). While technologies such as blockchain and AI improve data accuracy and security, their adoption requires significant investments and technical skills that not all companies possess, creating a reporting quality gap. In addition, a less skilled workforce can resist the use of technology, hindering the implementation and full benefits of digital financial reporting.

In addition, the accuracy of financial reporting can be improved through technology adoption. Adopting technology in financial reporting is influenced by the perceived benefits and trust in the technology (Qiu et al., 2023; Yasmin et al., 2024; Zhang et al., 2023). In a money-oriented environment, as observed in a study of firms in Pakistan, digital innovation has a positive impact on firm performance (Abbas et al., 2024, p. 1). Reporting standards such as XBRL facilitate efficient information exchange and automated analysis, allowing firms to adapt quickly to regulations and market needs (Begkos et al., 2023, p. 1; Han et al., 2023). The trust factor and perceived benefits of these technologies are critical in driving technology adoption, with companies that see direct benefits from the technology tending to implement it more quickly in their operations (Abbas et al., 2024; K. Wu & Lu, 2023). Adopting technology in financial reporting can improve accuracy by facilitating efficient information exchange and automated analysis. However, implementation costs and technical training are significant barriers for companies, especially those with limited resources. In addition, technology reliance faces risks related to data security and the need for organizational culture change to adopt new technologies effectively.

However, using financial reporting technology requires oversight regarding cybersecurity. Cybersecurity is a critical aspect of digital financial reporting due to the sensitive nature of financial data (Bessho & Hirota, 2023). Cybersecurity threats, measures such as data encryption, and continuous monitoring are essential to protect accounting systems from cyberattacks (Bui et al., 2023; C. Li et al., 2023; Ştefănescu et al., 2020). Strong security protects the integrity and confidentiality of data and ensures that the financial reporting process is uninterrupted (Ciubotariu et al., 2021; Gao, 2023; Kuo & Lee, 2023). As recommended by various studies, implementing advanced security technologies ensures that the stored and processed financial data remains safe from threats, thereby increasing trust in the digital financial reporting system. The importance of cybersecurity in digital financial reporting technology is undeniable, as sensitive financial data is vulnerable to cyber-attacks. Security threats such as data encryption and continuous monitoring are crucial to protect accounting systems from cyber-attacks. Implementing advanced security technology is critical to maintaining data integrity, confidentiality, and a smooth financial reporting process. Thus, trust in digital financial reporting systems can be enhanced by protecting stored and processed data.

Based on the above, digital financial reporting supported by advanced information technology is a transformative force that improves accounting transparency and financial efficiency. Electronic reporting standards such as XBRL facilitate seamless information exchange and automated analysis, improving corporate innovation efficiency and influencing profit-seeking

behavior. The integration of technologies such as AI, data analytics, and blockchain not only improves transaction security and financial data insights but also emphasizes the critical role of cyber security in safeguarding accounting systems. Digital financial reporting simplifies data processing, improves financial communication, and enhances decision-making capabilities, marking a significant evolution in accounting practices worldwide.

The novelty of this study is its comprehensive approach to analyzing the evolution of digital financial reporting literature from 2013 to 2023, which integrates sophisticated bibliometric methods and focuses on the influence of digital technology, unlike previous studies that mainly examine the impact of technology or regulatory changes separately. This research synthesizes both aspects to provide a holistic view of how digital technologies such as blockchain, artificial intelligence, and big data analytics are changing financial reporting practices. Moreover, this research not only explores the quantitative growth of the literature but qualitatively assesses thematic shifts and research gaps. Datasets from multiple authoritative sources beyond conventional databases ensure a thorough analysis that uncovers a broad spectrum of scholarly contributions. This approach enables a deeper understanding of the field's current state and future directions and provides insights that previous researchers have missed or under-explored.

3. Methods

3.1. Research design and procedure

The bibliometric analysis focused on Digital Financial Reporting (DFR) literature across international journals indexed in various databases from 2013 to 2023. It aimed to capture growth trends, citation patterns, and geographical distribution, using visualization techniques to map collaboration networks and identify key thematic areas. The study methodically selected articles using "Digital Financial Reporting" as the main keyword and applied rigorous filters across multiple databases like Scopus, Emerald, Google Scholar, OpenAlex, Crossref, and SAGE to ensure comprehensive coverage. Data was uniformly exported for consistent analysis, culminating in a detailed discussion that interprets the findings and contributes substantively to the scholarly understanding of DFR.

3.2. Data source and collection

The data collection process began with article identification using the PRISMA protocol. The keywords string *"digital financial reporting" OR "Electronic financial reporting" OR "automated financial reporting" OR "digitalized financial reporting"* were searched in various databases, including Scopus, Emerald, Google Scholar, OpenAlex, Crossref, and SAGE. The literature collection used the Publish or Perish (PoP) program. A total of 1184 documents were retrieved from 2013–2023. The data collection approach in this study included various platforms and databases to ensure comprehensive coverage of the literature. While Scopus and OpenAlex were primary sources, data from other databases were important. This strategy was to overcome the limitations of single-source data coverage and ensure a thorough and representative bibliometric analysis.

The period 2013 to 2023 was selected because, since 2013, various digital technology innovations have significantly impacted financial reporting practices, such as adopting blockchain technology, artificial intelligence, and big data analytics. The past decade has seen new regulations related to digital financial reporting in various jurisdictions, including adopting

XBRL (eXtensible Business Reporting Language) to improve transparency and efficiency. The ten-year period provides sufficient data coverage to identify long-term trends and significant changes in the academic literature, enabling analysis of the evolution of research and emerging topics in digital financial reporting. This study focuses on recent developments in digital financial reporting-related technologies relevant to contemporary practice and policy. Before 2013, technologies such as blockchain, artificial intelligence, and big data analytics had not developed significantly. In addition, many international standards and regulations related to digital financial reporting were introduced after this period. The data collection process is explained further in Figure 1 below.
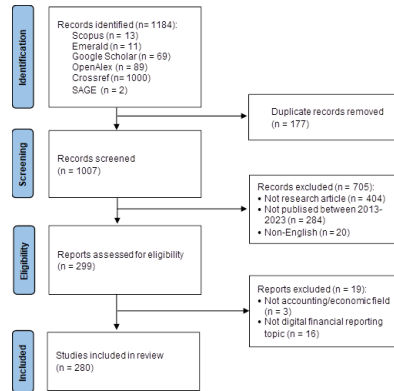

Figure 1. PRISMA protocol

3.3. Data analysis

The study analyzed 280 scientific articles on digital financial reporting (DFR) using Biblioshiny in R-Studio and VOSviewer. The objective was to assess key metrics such as publication year distribution, citation frequencies, author collaborations, and thematic mapping. The Biblioshiny platform facilitated the examination of publication trends and citation impacts across the digital financial reporting (DFR) literature, allowing for identifying influential works and their evolution over time. In parallel, VOSviewer visualized collaboration networks among researchers and thematic clusters within the DFR field, demonstrating the interconnections between various research themes. Integrating findings from both tools provided a comprehensive overview of DFR research development, offering insights into evolving trends and fostering a deeper understanding of the field's scholarly contributions.

4. Results

4.1. Metrics and annual scientific production

Bibliometric data analysis from 2013 to 2023 reveals significant research activity in digital financial reporting, with 280 papers cited 1,014 times. According to Table 1, this strong influence in academic circles is evidenced by an average of 101.40 citations per year and 3.62 citations per paper. High collaboration and productivity are indicated by each author contributing an average of 166.90 papers and receiving 553.96 citations. The average number of authors per paper was 2.09, with a median of 2 and a mode of 1, suggesting diverse research

collaborations. The Hirsch h-index of 17 shows that 17 papers were cited at least 17 times, confirming the presence of influential works in this field. Further, the Egghe g-index of 22, with 503 citations accounting for 49.6% of total citations, emphasizes the impact of highly cited works.

Egghe's g-index, in the context of this study, is relevant and significant as a bibliometric indicator measuring the impact and influence of highly cited publications in this field. Specifically, the g-index was 22 with 503 citations, contributing 49.6% of the total citations. The critical role of selected research shapes the discourse and understanding of digital financial reporting. This metric is critical in identifying key contributions that have gained substantial academic attention and recognition in the literature. For studies focusing on digital financial reporting, where rapid technological advances and regulatory changes continue to reshape practice, Egghe's g-index highlights important works that received extensive citations and influenced subsequent research directions, theoretical frameworks, and practical applications. In essence, high g-index values emphasize the importance of influential publications in defining the intellectual landscape and dissemination of knowledge in the digital financial reporting domain, which thus has a significant impact on advancing scholarly discourse and practical implementation in this area.

Figure 2 illustrates the dynamic trend in the number of articles published yearly in digital financial reporting from 2013 to 2023. The publication trends display a generally upward trajectory, despite some fluctuations. An initial period of variability was followed by a dip in 2020, likely due to the COVID-19 pandemic, and then a consistent increase in research output, especially after 2016. The number of articles grew from 11 in 2013 to a peak of 38 in 2023, reflecting rising interest and development in the field, influenced by technological progress, regulatory changes, and increased recognition of its significance. The rebound and sustained growth post-2020 demonstrate the resilience and ongoing expansion in digital financial reporting research, providing valuable insights for researchers, practitioners, and policymakers engaged in the field.

Table 1. Metric data

Reference date	2023-11-25 20:07:00 (GMT+8)
Publication years	2013–2023
Citation years	10 (2013–2023)
Papers	280
Citations	1014
Citations/year	101.40 (acc1 = 75, acc2 = 44, acc5 = 11, acc10 = 4, acc20 = 0)
Citations/paper	3.62
Citations/author	553.96
Papers/author	166.90
Authors/paper	2.09/2.0/1 (mean/median/mode)
Age-weighted citation rate	266.82 (sqrt = 16.33), 138.41/author
Hirsch h-index	17 (a = 3.51, m = 1.70, 423 cites = 41.7% coverage)
Egghe g-index	22 (g/h = 1.29, 503 cites = 49.6% coverage)
PoP hI, norm	11
PoP hI, annual	1.10
Fassin hA-index	7

Articles
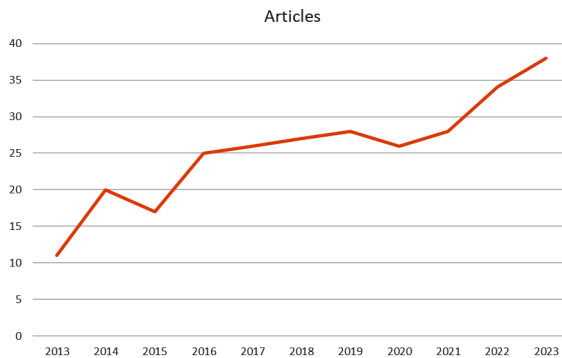
Figure 2. Publication per year

4.2. Source of literature origin

Table 2 highlights the distribution of published documents by various journals related to digital financial reporting. The "Journal of Financial Reporting and Accounting" tops the list with 30 articles, making it a central hub for researchers in this field. It is followed by the "SSRN Electronic Journal" and the "International Journal of Accounting and Financial Reporting," with 25 and 24 articles, respectively, indicating their significant contributions. Other important journals include "Financial Reporting" with 22 articles and the "Journal of Financial Reporting" with 10. Although journals like "Economics," "Investment Management and Financial Innovations", and "The International Journal of Digital Accounting Research" have fewer articles, each contributes uniquely to the field's diversity. Figure 3 illustrates the yearly publication trends, showing that the "Journal of Financial Reporting and Accounting" and the "SSRN Electronic Journal" have the most consistent and significant growth. In contrast, others show varying levels of engagement over time.

Table 2. Top 10 most relevant sources

Sources	Articles
Journal of Financial Reporting and Accounting	30
SSRN Electronic Journal	25
International Journal of Accounting and Financial Reporting	24
Financial Reporting	22
Journal of Financial Reporting	10
Economics	5
Investment Management and Financial Innovations	5
Research Journal of Finance and Accounting	4
The International Journal of Digital Accounting Research	4
International Journal of Psychosocial Rehabilitation	3

In mapping the global contribution to research in digital financial reporting, the publishing frequency data by region provides a clear picture of the countries that are most active in advancing the field. Country distribution is based on the country of origin of the author's

affiliation. The data reflects the dynamics of global research and how it is spread across regions, highlighting key knowledge centers and geographic diversity in academic contributions. It is presented in Figure 4 below.
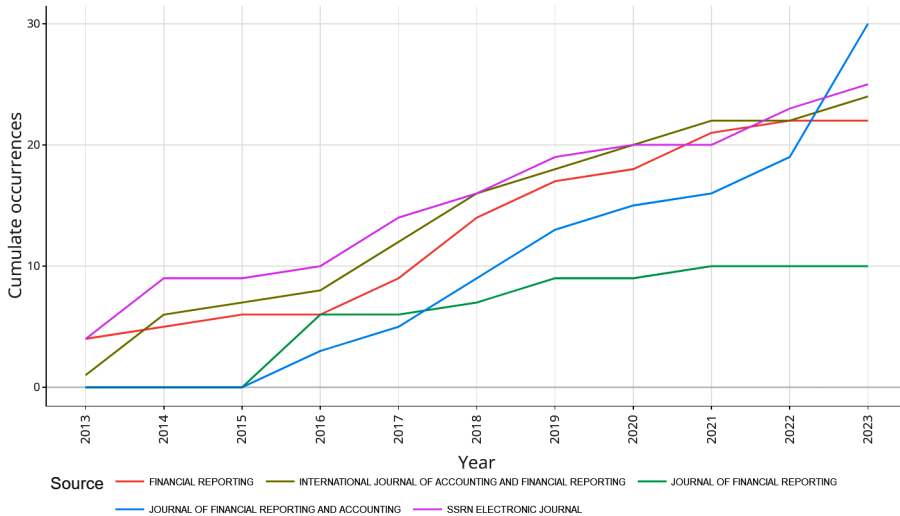

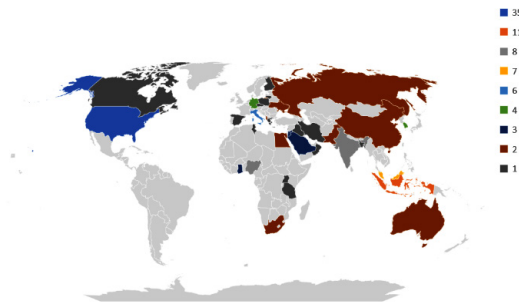**Figure 3.** Sources' production over time

Figure 4. Countries' scientific production

The USA leads digital financial reporting research with 35 publications, reflecting substantial investments in research and development, robust academic infrastructure, and influential universities. Indonesia follows with 11 publications, showing regional research growth. India and Nigeria each contributed eight publications, indicating the research's importance in emerging markets. Malaysia and Italy were actively involved with 7 and 6 publications supported by national policies. Germany and South Korea, with four publications each, highlight their commitment to financial and technological innovation. Additionally, nations like Ghana, Jordan, and Saudi Arabia contribute to the global landscape with multiple publications, showcasing diverse perspectives across economic and cultural contexts. Figure 5 illustrates the extensive global collaboration network, with the USA central to partnerships with countries like South Korea, Germany, Italy, and Albania, emphasizing its pivotal role and the varied engagement levels in digital financial reporting research globally.
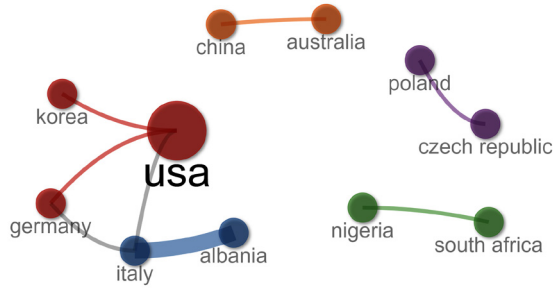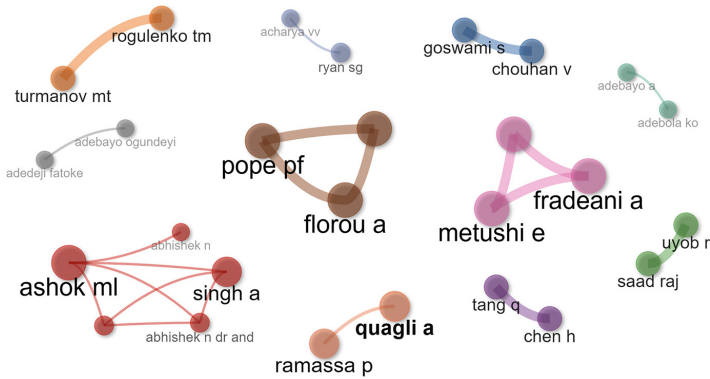
Figure 5. Countries collaboration network

According to Table 3, the data reveals the authors' productivity and collaborative roles in digital financial reporting research. QUAGLI A and RAMASSA P stand out with three publications each, with QUAGLI A showing a higher fractional score (2.33) than RAMASSA P (1.17), indicating more outstanding individual contributions. ALEXANDER D, with two publications and a fractional score of 1.5, also contributes significantly. Conversely, authors like ASHOK ML, CHEN H, FLOROU A, and FRADEANI A, each with two publications, have lower fractional scores, suggesting frequent collaboration. HRIBAR P's score of 1.25 suggests leadership in one of their two publications. Figure 6 illustrates author collaboration networks, highlighting clusters such as QUAGLI A and RAMASSA P, indicating strong collaborations with others like FLOUROU A and METUSHI E. ASHOK ML forms another cluster with SINGH A, demonstrating focused research efforts. Node sizes signify collaboration frequency, showcasing authors' contributions to the research landscape in digital financial reporting.

Table 3. Top 10 most relevant affiliations

Authors	Articles	Articles Fractionalized
Quagli A	3	2.33
Ramassa P	3	1.17
Alexander D	2	1.50
Ashok ML	2	0.70
Chen H	2	0.67
Chouhan V	2	1.00
Florou A	2	0.67
Fradeani A	2	0.67
Goswami S	2	1.00
Hribar P	2	1.25

Table 4 presents the list of affiliates or institutions and the number of articles published in the digital financial reporting domain. From the available data, the University of Mysore and Srinivas University lead with two published articles each. These two universities have significant research activity in digital financial reporting and may be centers of excellence in this topic. Many other institutions, such as Bentley University, Blackbit Limited, and various others, contributed one article each, signifying the geographical and institutional diversity of the research. The presence of private companies such as Blackbit Limited also shows that

Figure 6. Author collaboration network

industry interest in this topic is high, confirming the importance of digital financial reporting research for practitioners and academics.

Table 4. Top 10 most relevant affiliations

| Authors	Articles
University of Mysore	2
Srivinas University	2
Bentley University	1
Blackbit Limited	1
California State Polytechnic University	1
Catolica Lisbon School	1
Covenant University	1
Damanhour University	1
Ekiti State University	1
Florida Atlantic University	1

4.3. Key trends and emerging topic

Table 5, Figures 7, Figure 8, and Figure 9 collectively illustrate key digital financial reporting research trends. The most frequently occurring keyword is "financial reporting," with 45 instances indicating its central focus in the literature. Keywords such as "IFRS" and "XBRL" are closely followed, underscoring the significance of international financial reporting standards and the eXtensible Business Reporting Language. Other notable terms include "financial reporting quality," "accounting," and "earnings management," highlighting their relevance to corporate governance and reporting quality. The keyword network visualizes "financial reporting" as a central node, closely linked with terms like "accounting," "IFRS," "financial statements," and "internet financial reporting," reflecting the field's emphasis on reporting standards and technological impacts. Emerging keywords like "sustainability reporting" and "digital financial assets" point to growing interest in sustainability and the digital economy. The keyword overlay reveals newer research trends in "digital economy" and "digital financial

assets," whereas established topics like "financial reporting" and "accounting" continue to dominate. The density visualization confirms the prominence of "financial reporting," with dense clusters around "IFRS" and "accounting," while emerging topics show increasing interest. Overall, the bibliometric analysis highlights the central themes, evolving trends, and emerging digital financial reporting research areas.

Table 5. Top 10 most frequent keywords

Words	Occurrences
Financial Reporting	45
IFRS	27
XBRL	26
Financial Reporting Quality	18
Accounting	16
Earnings Management	11
Integrated Reporting	8
Financial Performance	7
Financial Statements	7
Internet Financial Reporting	7
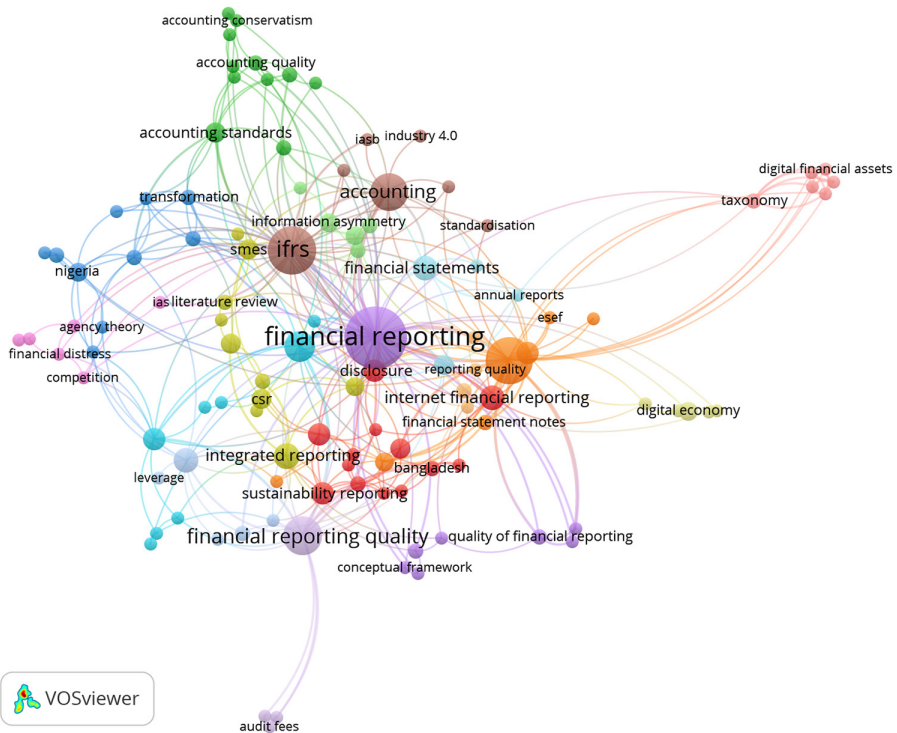
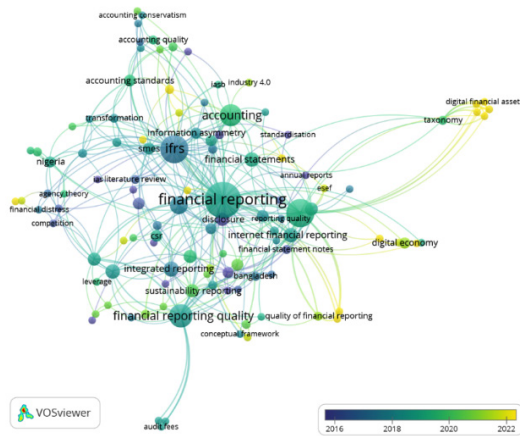**Figure 7.** Network visualization

Figure 8. Keywords overlay

Figure 9. Keywords Density

Figure 10 shows the evolving trends in digital financial reporting research from 2013 to 2023, with the size of the dots representing term frequency. "Sustainability reporting" has seen significant growth, indicating increasing interest in integrating sustainability into financial reporting. Terms like "digital reporting" and "XBRL" have also risen in frequency, reflecting the focus on technological advancements in reporting processes. Meanwhile, "IFRS" and "disclosure" have remained stable or slightly declined, suggesting they are established topics. Core areas such as "financial reporting," "financial reporting quality," and "financial performance" continue to dominate. Figure 11 outlines the thematic evolution in four periods: 2013–2015 focused on "financial reporting," "IFRS," "XBRL," and "earnings management"; 2016–2018 saw the rise of "integrated reporting" and "convergence"; 2019–2021 introduced "digital reporting," "sustainability reporting," and "bibliometric analysis"; and 2022–2023 emphasized "financial reporting," "sustainability reporting," and "CSR," highlighting the growing integration of social responsibility in financial reporting.

Bibliometric analysis from 2013 to 2023 highlights the consistent evolution of digital financial reporting research, with "financial reporting," "IFRS," and "XBRL" as foundational
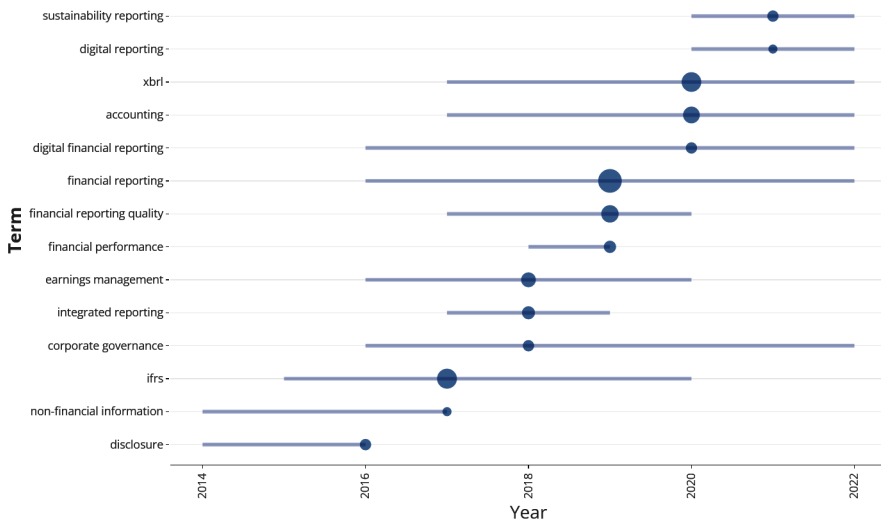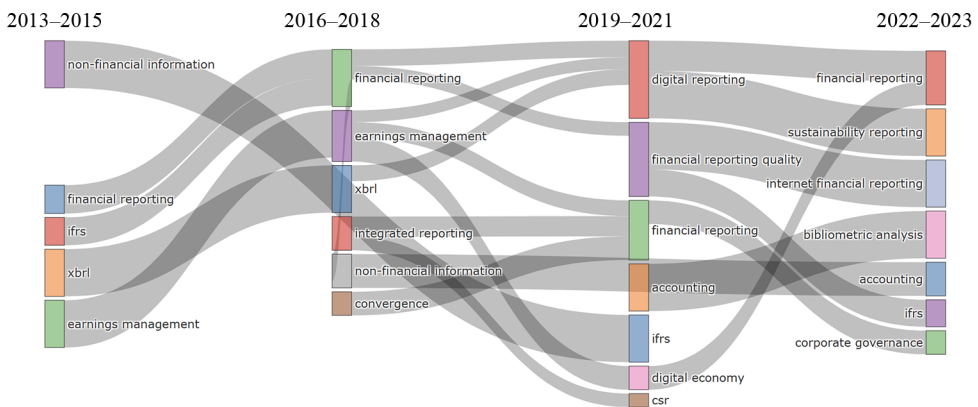
Figure 10. Trend topics on 2013–2023

Figure 11. Overall thematic evolution in three cutting-points

topics. From 2013–2015, core themes like "financial reporting," "annual reports," and "financial statements" dominated, while "XBRL" and "non-financial information" began to emerge. Between 2016–2018, "XBRL" and "voluntary disclosure" gained attention as niche themes and "integrated reporting" started evolving. From 2019–2021, the focus expanded to include "CSR," "tax avoidance," and the "digital economy." By 2022–2023, the emergence of "digital currency" and "digital financial assets" reflected the influence of technological advancements. Throughout the decade, increasing interest in "sustainability reporting" and "digital reporting" indicated a shift towards integrating technology and sustainability into financial reporting practices.

5. Discussion

5.1. Literature performance and the origin

This research provides an in-depth insight into the evolution and trends in digital financial reporting from 2013 to 2023. The analysis shows significant research activity, with 280 papers cited 1014 times. The average per year of 101.40 and 3.62 citations per paper reflect strong influence in academic circles. In particular, the Hirsch h-index of 17 confirms the presence of influential works in the field. In addition, the high level of collaboration and productivity among researchers is evident from the average author writing 166.90 papers and receiving 553.96 citations. The variation in research collaboration is indicated by the average of 2.09 authors per paper. The Egghe g-index, which reached 22 with 503 citations, highlights highly cited and influential works. The age-weighted citation rate highlights the importance of recent work and its relevance to recent developments in the field. This analysis confirms that digital financial reporting is an active and influential research area.

Specifically, the findings reveal a dynamic trend in the number of articles published yearly in the digital financial reporting domain. The annual scientific production graph shows the fluctuations and growth in the number of publications, highlighting years where research interest peaks and crucial moments where there may be a shift in research priorities or the impact of external factors on the academic community. The increase in annual publications indicates significant developments in the field, which may trigger technological advancements, regulatory changes, or increased awareness of the importance of digital financial reporting. Notably, the consistent and significant increase after 2016, with a peak in 2023, signifies increased interest and research in the field, illustrating its continued evolution and growth.

This finding is in line with other researchers who have found that the theme of digital finance has changed over time. Initially, researchers focused on socio-economic and demographic variables, but over time, the topic evolved to include factors that influence, promote, and affect digital financial literacy (Yadav & Banerji, 2023). The research found that FinTech literature has grown significantly over the past 20 years. The research also showed that crucial FinTech technologies include Internet technologies (including the Internet and Web of Things), big data, artificial intelligence, distributed technologies (blockchain and cloud computing), and security technologies (B. Li & Xu, 2021). Furthermore, another study found that most previous studies discussed economic and social developments positively affected by digital banking and financial inclusion (Aziz et al., 2021). Research revealed that a content analysis of 343 articles based on the clusters found research gaps and suggested areas where action could be taken for further research (Brika, 2022). Furthermore, the research showed that most articles were written in English and published in journals and conferences. Most of these articles are on business, management, and accounting (Bosi et al., 2021).

5.2. Key trends

Digital financial reporting is a recent development in accounting involving information technology to present and disseminate corporate financial information. Recent studies in China reveal that the development of information and communication technologies, as well as related policies, contribute significantly to improving accounting and financial transparency, although the impact is more significant in the long term than in the short term (Gao, 2023; Tao et al., 2023). In addition, digital financial literacy in Korea not only improves financial

well-being through better financial knowledge and protection against digital fraud but also has a more significant impact on financial well-being than financial knowledge alone, with important implications for financial education (Choung et al., 2023; Uthaileang & Kiattisin, 2023).

With digital technology, financial statements are generated more efficiently and accurately. Analysis of data from 2,114 companies listed on the Shanghai and Shenzhen A-share markets from 2010 to 2022 reveals that digital transformation improves the efficiency of corporate innovation. Financial information disclosure acts as an essential intermediary factor, especially in the context of high industrial competition and low levels of regional marketing (Y. Wang & He, 2024). The application of accounting technology includes using database management systems to store and manage financial data more efficiently (Gietzmann & Grossetti, 2021). This technology allows companies to access real-time financial information, facilitating faster and more accurate decision-making. In addition, blockchain technology is applied in accounting to improve the security and reliability of financial transactions (Zhang et al., 2024).

5.3. Emerging topics of digital financial reporting

One of the significant trends in accounting technology is the adoption of artificial intelligence (AI) and big data analytics. AI software assists in the analysis of financial data, identifying patterns or trends that may not be visible to humans and providing valuable insights for strategic decision-making (Abbas et al., 2024; K. Wu & Lu, 2023). Integrating AI and machine learning into accounting practices allows for predictive analysis, helping companies forecast future financial trends and adjust strategies accordingly. The use of big data analytics enables companies to process large volumes of financial data, improving the accuracy of financial reporting and identifying areas for cost optimization.

Moreover, digital financial reporting is critical in enhancing corporate social responsibility (CSR) transparency and environmental, social, and governance (ESG) reporting. As companies increasingly need to disclose non-financial information, digital reporting platforms enable more efficient and accurate reporting of CSR and ESG metrics, which are crucial for sustainability assessments and meeting regulatory requirements. Emerging research emphasizes that adopting digital tools for ESG reporting improves data accuracy and facilitates real-time monitoring of sustainability targets (S. Wu & Li, 2023). Furthermore, regulatory frameworks such as the EU's Corporate Sustainability Reporting Directive (CSRD) are pushing companies to adopt digital reporting systems that integrate financial and non-financial information, reinforcing the importance of digitalization in meeting sustainability and governance goals (Fasan, 2024).

The intersection of technology and regulation highlights another evolving trend. Digital financial reporting systems must be agile enough to comply with evolving regulatory requirements, including sustainability and ESG reporting. Regulations such as the Task Force on Climate-related Financial Disclosures (TCFD) and the Global Reporting Initiative (GRI) require companies to disclose both financial and ESG data, which necessitates integrated digital reporting systems that ensure compliance while enhancing transparency and accountability (Malinić & Vučković-Milutinović, 2024). The rise of digital financial reporting thus not only transforms how financial data is disclosed but aligns financial practices with broader social and environmental accountability.

6. Conclusions

The topic of digital financial reporting has experienced significant growth and development over the past decade, with a substantial increase in the number of publications and citations signaling its widespread influence. Key performance indicators such as the Hirsch h-index and Egghe g-index point to influential works that have shaped the foundation and direction of research in this area. These findings reflect dynamic trends in scientific production, highlight crucial moments in the evolution of research, and show global technological events and developments influencing the focus and intensity of research. Digital financial reporting has evolved into a highly dynamic and essential research area with an ever-increasing impact in academic and practical sectors.

The implications of the results of this bibliometric study on digital financial reporting are significant for academics, practitioners, and policymakers. For academics, the findings highlight unexplored areas and opportunities for in-depth research, encouraging further investigation into the impact of current technologies and regulations on financial reporting practices. For practitioners, the increased focus on digitization in financial reporting underscores the need for adaptation and capacity building in managing financial data digitally. Meanwhile, the trends identified for policymakers indicate the importance of formulating and refining regulations that support transparency, efficiency, and security in digital financial reporting. Overall, this research provides strategic guidance in directing resources and attention to critical aspects of evolving digital financial reporting from theoretical and practical perspectives. A concrete example for academics is the development of new variables on data quality and security aspects in digital financial reporting to deepen understanding of the impact of the latest technology and existing regulations. For practitioners, strategies to strengthen digital financial data management capacity to increase reporting efficiency and reliability. As for policymakers, this discovery is for developing innovation and regulation of transparency, efficiency, and security of digital financial reporting.

The bibliometric study faces limitations due to its reliance on publicly available data from selected databases, potentially leading to publication bias by excluding less-cited studies, thus narrowing the analysis. Focused on literature in specific languages and timeframes, it may miss broader or more recent trends. This approach emphasizes research quantity over quality, potentially overlooking important content nuances. Additionally, it must examine the broader social, economic, and technological impacts of digital financial reporting, limiting a comprehensive understanding of the subject. The limitations of this study affect the validity of the findings by limiting the generalizability of the results due to the reliance on publicly available data and the exclusion of studies that could potentially result in publication bias. The literature's narrow focus on a specific language and time period has resulted in the omission of more recent and broader trends with significant impact. Additional analysis of alternative data sources expanded time and language coverage, and in-depth analysis techniques to capture essential nuances of identified content can be employed to address these limitations. These enhancements reinforce the empirical basis and relevance of the research conclusions about the evolution of digital financial reporting.

Future research in digital financial reporting should diversify its sources, including unpublished or lesser-known studies and literature in non-English languages, to offer broader perspectives. It is essential to incorporate qualitative methods like content analysis to delve into the socio-economic aspects and nuances of the field. Emphasizing the impact of emerging technologies like AI and blockchain will shed light on the evolution and future challenges

in digital financial reporting. Additionally, exploring the effects of new regulations and policy changes will provide crucial guidance for policymakers and practitioners adapting to rapidly evolving market dynamics.

Funding

Author contributions

All authors contributed equally to the conception and design of the study.

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