West Science Interdisciplinary Studies
Vol. 03, No. 04, April and 2025: pp. 640-652

Competitive Advantage of Banking Industry in the Digital Age: A Bibliometric Approach

Loso Judijanto[1], Salwa Aulia Novitasari[2], Rani Eka Arini[3]
[1] IPOSS Jakarta, Indonesia and losojudijantobumn@gmail.com
[2] Nusa Putra University and salwa.auln12@gmail.com
[3] Nusa Putra University and raniekaarini1009@gmail.com

ABSTRACT

The digital age has fundamentally transformed the competitive dynamics of the global banking industry, necessitating the integration of advanced technologies, customer-centric strategies, and agile business models. This study conducts a comprehensive bibliometric analysis to explore the evolution, intellectual structure, and thematic trends in scholarly literature on competitive advantage in the banking sector from 2000 to 2024. Drawing data from the Scopus database and utilizing VOSviewer for visualization, the study identifies key research clusters centered around digital banking, fintech, artificial intelligence, customer experience, and financial inclusion. The findings reveal a shift from early infrastructural concerns to more strategic and behavioral focuses, underscoring the growing importance of personalization, trust, and innovation in achieving sustainable competitiveness. Co-citation and country collaboration analyses highlight the interdisciplinary nature of the field and the global distribution of research efforts, with India, the United States, and the United Kingdom emerging as central contributors. This study offers valuable insights for academics, practitioners, and policymakers, while also identifying gaps for future exploration in areas such as ESG integration, digital leadership, and organizational transformation.

Keywords: *Competitive Advantage, Digital Banking, Fintech, Digital Transformation, Bibliometric Analysis.*

1. INTRODUCTION

The rapid evolution of digital technologies has profoundly reshaped the competitive landscape of the global banking industry. In the digital age, banks are no longer merely financial intermediaries but have evolved into complex, technology-driven organizations that offer a wide array of services via digital channels. Innovations such as mobile banking, artificial intelligence (AI), blockchain, cloud computing, and big data analytics are transforming traditional banking operations, customer engagement, and risk management. These advancements allow banks to streamline operations, reduce costs, enhance customer experiences, and ultimately gain a sustainable competitive advantage [1]. Consequently, digital transformation is not just a strategic option—it is a critical requirement for banks seeking relevance and resilience in an increasingly volatile financial ecosystem.

The proliferation of fintech firms has further intensified competition in the financial services sector. These agile, tech-savvy players are leveraging innovative digital platforms to deliver personalized, low-cost, and highly convenient services, often outperforming traditional banks in customer satisfaction and user experience [2]. As a response, incumbent banks have accelerated their digital transformation agendas to maintain market relevance and protect their customer base. This competitive pressure has spurred an influx of research aimed at understanding the determinants of competitive advantage in banking, especially in relation to technology adoption, innovation capacity, strategic agility, and digital capability [3]. These dimensions are central to banks' efforts to realign their business models to match digital-era demands.

Regulatory developments have also shaped the competitive dynamics within the digital banking ecosystem. Regulators across the globe are enforcing new frameworks to accommodate digital innovation while ensuring data security, consumer protection, and financial stability. Policies such as PSD2 in the European Union and open banking initiatives in several countries are facilitating a more level playing field by enabling third-party access to customer financial data [4]. While these reforms promote innovation and competition, they also challenge traditional banks to rethink their competitive strategies and develop more collaborative, transparent, and customer-centric approaches. Thus, compliance and innovation have become dual imperatives that influence banks' competitive positioning in the digital economy.

Amidst this transformation, customer behavior has also undergone a significant shift. Digital-native generations now expect real-time, personalized, and omnichannel financial services. The traditional parameters of competitive advantage—such as physical branch networks and relationship-based banking—are being replaced by digital experience, user interface design, personalization, and data-driven decision-making [5]. In this context, competitive advantage increasingly hinges on a bank's ability to collect, analyze, and act on customer data while ensuring seamless digital interactions. Banks that are unable to meet these expectations risk losing market share to more adaptive and technologically sophisticated competitors.

Given these multifaceted changes, the academic and professional discourse surrounding competitive advantage in the banking sector has expanded considerably in recent years. Studies have examined the impact of digital transformation, IT capability, organizational agility, and innovation strategy on bank competitiveness [6], [7]. However, despite the growing body of research, there has been limited effort to systematically map the intellectual landscape of this topic using bibliometric techniques. Bibliometric analysis enables researchers to quantify patterns in scientific literature, identify influential works and authors, discover thematic trends, and explore emerging areas of inquiry. In doing so, it offers a comprehensive overview of the structure and evolution of scholarly output related to competitive advantage in the banking industry during the digital age.

Despite the increasing volume of literature addressing the impact of digital transformation on banking competitiveness, the field remains fragmented, with diverse theoretical approaches, empirical methodologies, and conceptual frameworks. There is a lack of consensus on the critical determinants of competitive advantage in a digital banking context, and no unified view exists regarding the interplay between technological adoption, regulatory adaptation, and strategic transformation. Moreover, previous reviews have largely relied on narrative or qualitative methods, which may overlook significant bibliometric patterns and underrepresented themes. Hence, there is a pressing need for a systematic, data-driven analysis to map the knowledge structure, research trends, and intellectual roots of this domain. The objective of this study is to conduct a bibliometric analysis to explore the evolution, thematic focus, and scholarly structure of research on competitive advantage in the banking industry within the context of the digital age

2. LITERATURE REVIEW

The concept of competitive advantage has long been a central theme in strategic management literature. In the context of the banking industry, competitive advantage refers to the capability of a bank to deliver greater value to customers than its competitors, which in turn results in superior financial performance, market position, or customer loyalty [8]. Traditionally, sources of

competitive advantage in banking included elements such as branch networks, capital adequacy, customer relationships, and service differentiation. However, with the advent of the digital era, these traditional advantages are being redefined and often displaced by digital capabilities, technological innovation, and strategic agility.

2.1 Digital Transformation and Banking Competitiveness

Digital transformation has emerged as a vital driver of competitiveness in the financial sector. It encompasses the integration of digital technologies into all areas of a business, fundamentally altering how banks operate and deliver value to customers. Scholars such as [9] argue that digital transformation is not merely a technological upgrade but involves a cultural and structural shift toward data-driven decision-making, customer-centricity, and innovation. Banks that succeed in leveraging digital technologies are able to enhance operational efficiency, reduce transaction costs, personalize services, and improve customer experience—factors that significantly influence competitive positioning.

According to [10], digital transformation strategies must align with business models to yield competitive returns. In banking, this implies investing in customer experience platforms, advanced analytics, and cybersecurity infrastructure. Studies by [11] emphasize the role of fintech in disrupting banking value chains, forcing incumbents to innovate rapidly to maintain their market share. As a result, traditional banks increasingly collaborate with fintech startups or develop in-house digital capabilities to remain competitive. These partnerships facilitate co-creation of digital services, faster product development, and access to alternative customer segments.

2.2 Innovation Capability and Dynamic Capabilities

Innovation capability plays a crucial role in sustaining competitive advantage. In the context of the banking industry, this includes product innovation (e.g., mobile wallets, robo-advisors), process innovation (e.g., AI-based underwriting), and business model innovation (e.g., platform banking). Dynamic capabilities theory, introduced by [12], is frequently applied to explain how firms adapt and thrive in rapidly changing environments. For banks, dynamic capabilities such as sensing market trends, seizing new digital opportunities, and transforming internal structures are essential to maintain long-term competitiveness.

[13] argue that digital capabilities—defined as an organization's ability to mobilize and deploy IT-based resources in combination with other organizational resources—are positively associated with competitive performance. In a digital environment, banks need to continuously renew their capabilities through learning, experimentation, and agile governance. The integration of IT with strategic decision-making processes enables banks to identify emerging trends, develop responsive strategies, and execute transformation initiatives with speed and precision.

2.3 Customer-Centric Strategies and Personalization

The digital age has shifted the locus of competitive advantage from operational scale to customer-centric innovation. Customers now expect seamless digital interactions, instant service delivery, and personalized offerings across all financial touchpoints. Studies by [14] highlight the importance of customer relationship management (CRM)

systems and data analytics in gaining insights into consumer behavior. The ability to tailor products and experiences based on real-time data is a key source of differentiation for digital banks.

Furthermore, the integration of artificial intelligence (AI) and machine learning (ML) allows banks to deliver hyper-personalized services, anticipate customer needs, and manage risks more effectively [15]. Personalization not only enhances user satisfaction but also contributes to higher retention rates and increased cross-selling opportunities, thus reinforcing competitive advantage. The challenge, however, lies in balancing personalization with data privacy, as customers become more concerned about how their data is collected and used.

2.4 Strategic Agility and Organizational Change

Strategic agility—the ability to rapidly adapt strategy and operations in response to environmental changes—is another important factor influencing banking competitiveness. Digital disruption demands that banks operate with flexible organizational structures and responsive leadership. [16] define strategic agility as a meta-capability that encompasses strategic sensitivity, leadership unity, and resource fluidity. These elements enable banks to pivot quickly, launch new initiatives, and reallocate resources without bureaucratic delays.

Organizational change is often required to foster agility. This includes breaking down silos, adopting agile methodologies, fostering a culture of innovation, and retraining the workforce in digital competencies [17]. Many banks have begun to restructure into cross-functional digital teams and innovation labs to accelerate product development and foster collaboration across departments. The success of such transformation efforts largely depends on leadership commitment and change management capabilities.

2.5 Regulatory Environment and Open Banking

The evolving regulatory environment has also become a determinant of competitive advantage. Regulatory frameworks such as the Revised Payment Services Directive (PSD2) in Europe have introduced the concept of open banking, which mandates banks to open their APIs to third-party providers. This has enabled new forms of competition and cooperation, such as banking-as-a-service (BaaS) platforms and embedded finance models [18]. Banks that embrace open innovation and develop API-driven architectures are better positioned to compete in the platform economy. However, increased digitalization also brings challenges related to cybersecurity, data governance, and compliance. Regulatory technology (RegTech) has emerged as a solution to manage these complexities efficiently. Banks that integrate RegTech tools into their operations can reduce compliance costs, enhance risk monitoring, and build trust with regulators and customers—factors that further solidify their competitive edge.

3. METHODS

This study employs a bibliometric analysis approach to systematically explore the intellectual structure and research trends related to competitive advantage in the banking industry during the digital age. Data were extracted exclusively from the Scopus database, which is recognized for its comprehensive coverage of high-quality peer-reviewed literature. A search query

was constructed using a combination of relevant keywords such as "competitive advantage," "banking," "digital transformation," "fintech," and "digital banking," covering the publication period from 2000 to 2024. The retrieved metadata, including titles, abstracts, author names, affiliations, keywords, sources, and citations, were exported in RIS and CSV formats for analysis. The data were then analyzed using VOSviewer software to generate visual maps of co-authorship networks, co-occurring keywords, citation patterns, and thematic clusters.

4. RESULTS AND DISCUSSION

4.1 Network Visualization

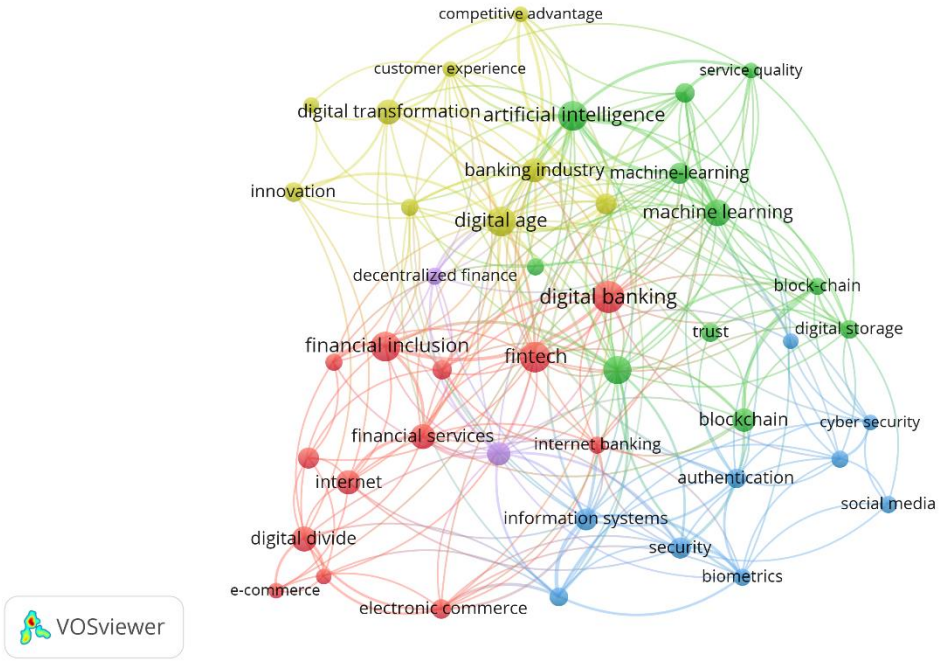

Figure 1. Network Visualization
Source: Data Analysis Result, 2025

The bibliometric visualization illustrates the co-occurrence of keywords related to competitive advantage in the banking industry during the digital age. The network is composed of multiple clusters, each represented by a distinct color, reflecting thematic groupings in the literature. The central positioning of "digital banking" signifies its critical role as a thematic hub, closely linked to other major concepts such as fintech, artificial intelligence, blockchain, and financial inclusion. The size of the nodes corresponds to the frequency of keyword occurrences, while the proximity and links indicate co-occurrence strength, thus highlighting the most interconnected research themes in this field.

The red cluster, which includes keywords such as fintech, financial inclusion, internet, financial services, and digital divide, centers around issues of accessibility and transformation driven by financial technology. This suggests that a significant stream of research focuses on how fintech innovations contribute to bridging or widening digital and financial divides, especially in underserved populations. The close association with internet and electronic commerce further indicates an interest in digital financial services as enablers of inclusion and economic participation, reflecting the growing relevance of inclusive digital finance strategies. The green cluster emphasizes technological enablers of digital banking, including machine learning, cybersecurity, blockchain, authentication, and trust. This theme points to a technologically intensive perspective on banking competitiveness, where security, reliability, and technological trustworthiness play a vital role. The

recurrence of terms such as biometrics, digital storage, and social media suggests a strong concern with both security infrastructure and the integration of consumer-facing digital tools, marking a convergence of back-end innovation and front-end customer experience.

The yellow cluster groups terms like digital transformation, artificial intelligence, innovation, customer experience, and competitive advantage, indicating a conceptual linkage between strategic transformation efforts and outcomes. This cluster appears to frame the banking industry's transition in terms of its impact on firm-level capabilities and value delivery. The presence of banking industry, digital age, and service quality alongside AI and customer experience points to a strategic management perspective that investigates how digital technologies reshape competitiveness through enhanced service design, operational agility, and customer-centric innovation. Lastly, the blue and purple clusters represent foundational and infrastructural elements. Keywords such as information systems, security, and internet banking (purple), along with authentication and digital storage (blue), highlight the technical backbone required for digital competitiveness. These clusters underscore the importance of robust digital infrastructure and risk mitigation practices, which serve as enablers for higher-level innovations discussed in the green and yellow clusters. Together, they reinforce the idea that competitive advantage in the digital age is multifaceted.

4.2 Overlay Visualization

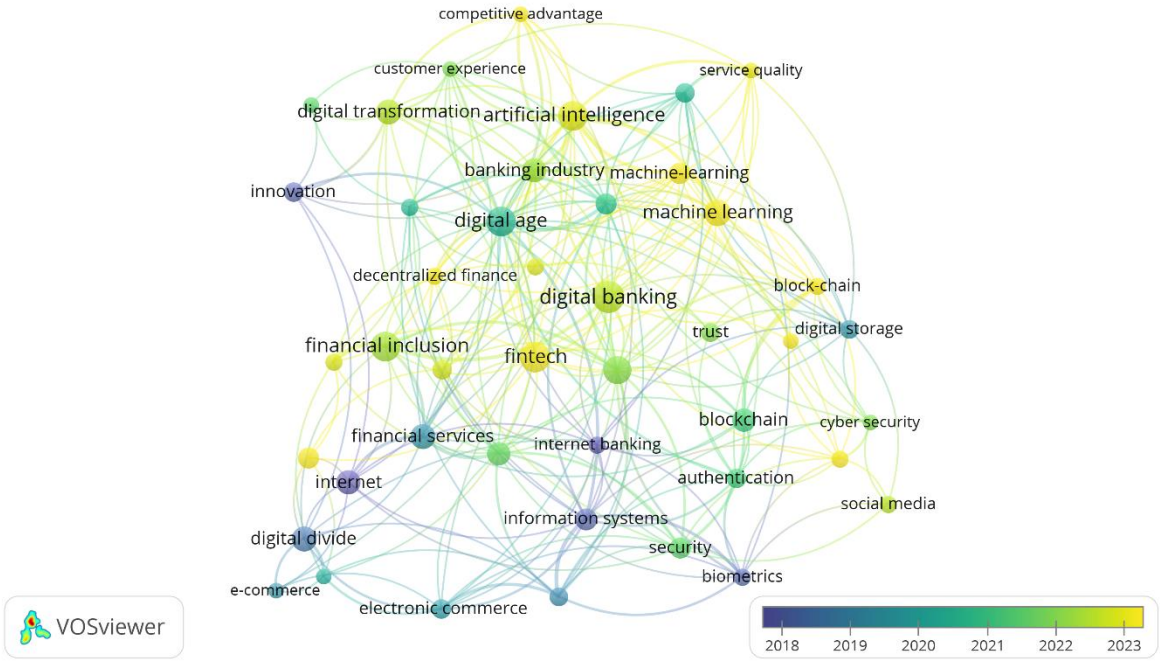

Figure 2. Overlay Visualization

Source: Data Analysis Result, 2025

The overlay visualization provides a temporal analysis of keyword evolution in the literature on competitive advantage in the banking industry during the digital age. Colors represent the average publication year associated with each keyword, ranging from blue (older, ~2018) to yellow (recent, ~2023). Central terms such as "digital banking," "fintech," and "digital transformation" are colored in greenish-yellow tones, indicating their prominence in both early and more recent studies. This suggests these topics have maintained consistent relevance throughout the years and continue to attract scholarly attention as foundational themes in discussions of digital competitiveness in banking. Keywords appearing in darker blue tones, such as "information

systems," "security," "biometrics," and "electronic commerce," reflect earlier research focuses, mostly around 2018–2019. These topics were likely foundational as the banking sector began its transition into digital frameworks. The emphasis at that time was on system infrastructure, cybersecurity, and the technical implementation of digital services. While still relevant, the shift in color toward yellow in other keywords shows that scholarly discourse has since progressed toward broader, more strategic and consumer-focused topics. Conversely, the newest research frontiers are signaled by the yellow-highlighted terms like "blockchain," "cyber security," "social media," "service quality," and "customer experience." These indicate a recent surge in interest, especially in understanding the interplay between emerging technologies, user expectations, and regulatory adaptation. Notably, the positioning of "competitive advantage" near the top right implies that the strategic implications of digital innovation are gaining momentum as a fresh and critical research focus.

4.3 Citation Analysis

Table 1. The Most Impactful Literatures

Citations	Authors and year	Title
245	[19]	"Untact": a new customer service strategy in the digital age
201	[20]	Acceptance and use of mobile banking: an application of UTAUT2
156	[21]	Training older adults to use tablet computers: Does it enhance cognitive function?
155	[22]	Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms
150	[23]	The Global Findex Database 2017: Measuring Financial Inclusion and Opportunities to Expand Access to and Use of Financial Services
127	[24]	Digitalization in the financial industry: A contingency approach of entrepreneurial orientation and strategic vision on digitalization
94	[25]	Mobile banking and AI-enabled mobile banking: The differential effects of technological and non-technological factors on digital natives' perceptions and behavior
78	[26]	Poverty and Migration in the Digital Age: Experimental Evidence on Mobile Banking in Bangladesh
77	[27]	The relationship between csr communication on social media, purchase intention, and e-wom in the banking sector of an emerging economy
69	[28]	Csr communication through social media: A litmus test for banking consumers' loyalty

Source: Scopus, 2025

4.4 Density Visualization

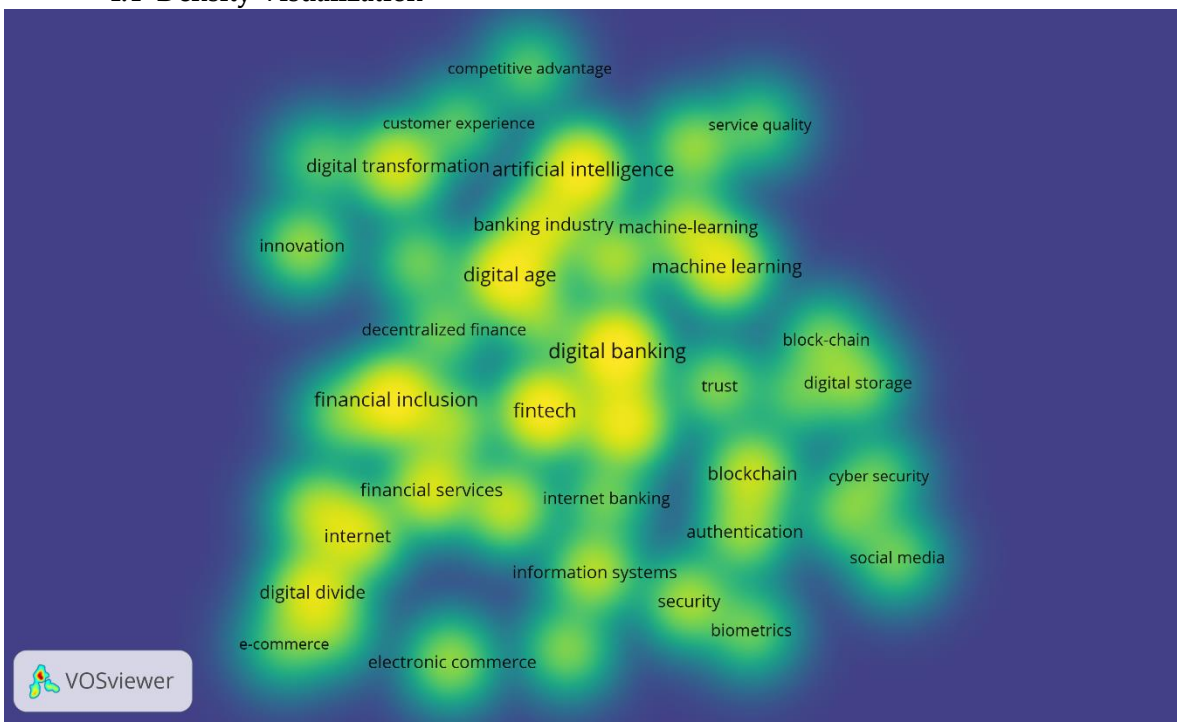

Figure 3. Density Visualization

Source: Data Analysis Result, 2025

The heatmap visualization provides a density-based perspective of the most frequently occurring keywords in the literature concerning competitive advantage in the digital banking sector. Brighter yellow areas indicate higher keyword occurrence and co-occurrence density, signifying core topics that dominate scholarly discourse. The most intense concentrations appear around "digital banking," "fintech," "digital transformation," "artificial intelligence," and "financial inclusion." These terms form the thematic nucleus of recent studies, highlighting a strong research interest in how digital innovation and inclusion strategies are shaping the competitive dynamics within the banking industry. Surrounding this core, slightly cooler (green and blue) regions feature terms like "cybersecurity," "blockchain," "authentication," "service quality," and "customer experience." While these are still prominent, their lower density suggests that they are either emerging topics or more narrowly focused themes within the broader field. This distribution indicates that current research is heavily concentrated on strategic transformation and technology integration, while issues like security, trust, and user-centric design, though gaining traction, may still offer considerable room for further exploration.

4.5 Co-Authorship Network

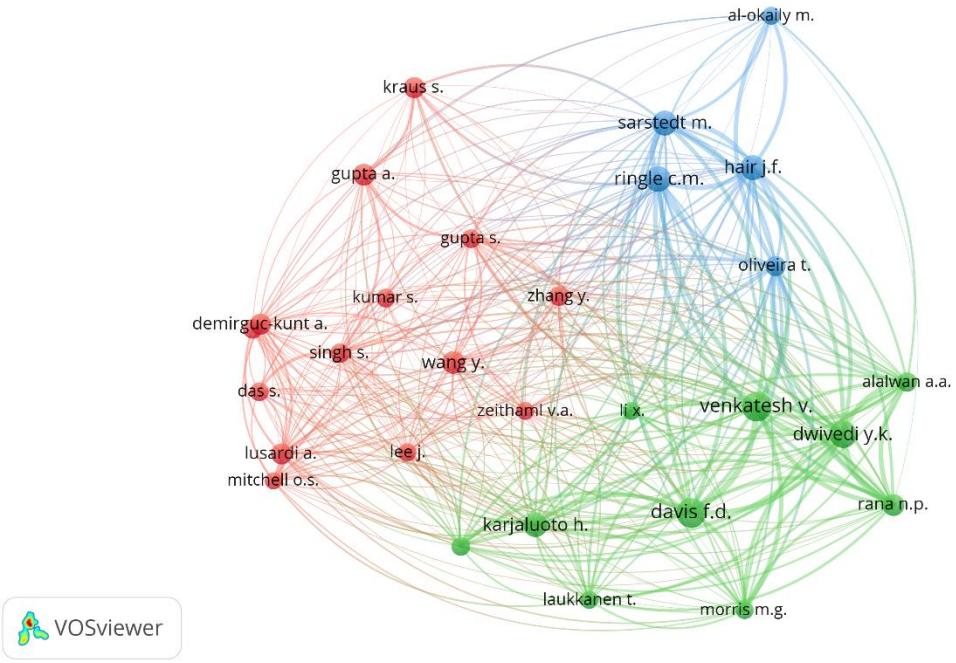

Figure 4. Author Visualization
Source: Data Analysis Result, 2025

The author co-citation network visualized in this VOSviewer map highlights the intellectual structure of the research field related to digital banking and competitive advantage. The network reveals three prominent clusters of frequently co-cited authors. The green cluster, led by scholars like Venkatesh V., Davis F.D., Dwivedi Y.K., and Alalwan A.A., represents foundational works on technology acceptance models (TAM, UTAUT) and digital adoption behavior, often used to understand user interaction with digital banking technologies. The red cluster, featuring authors such as Kraus S., Demirgüç-Kunt A., and Gupta A., appears to focus more on innovation management, financial inclusion, and strategic frameworks in the fintech and banking transformation context. Meanwhile, the blue cluster, centered around Hair J.F., Ringle C.M., and Sarstedt M., comprises methodological experts known for structural equation modeling (SEM), especially Partial Least Squares (PLS-SEM), which has become increasingly popular in digital banking research. The interconnectedness among clusters indicates strong interdisciplinary collaboration, suggesting that studies on digital banking competitiveness draw from technology adoption theories, strategic innovation literature, and advanced quantitative methods.

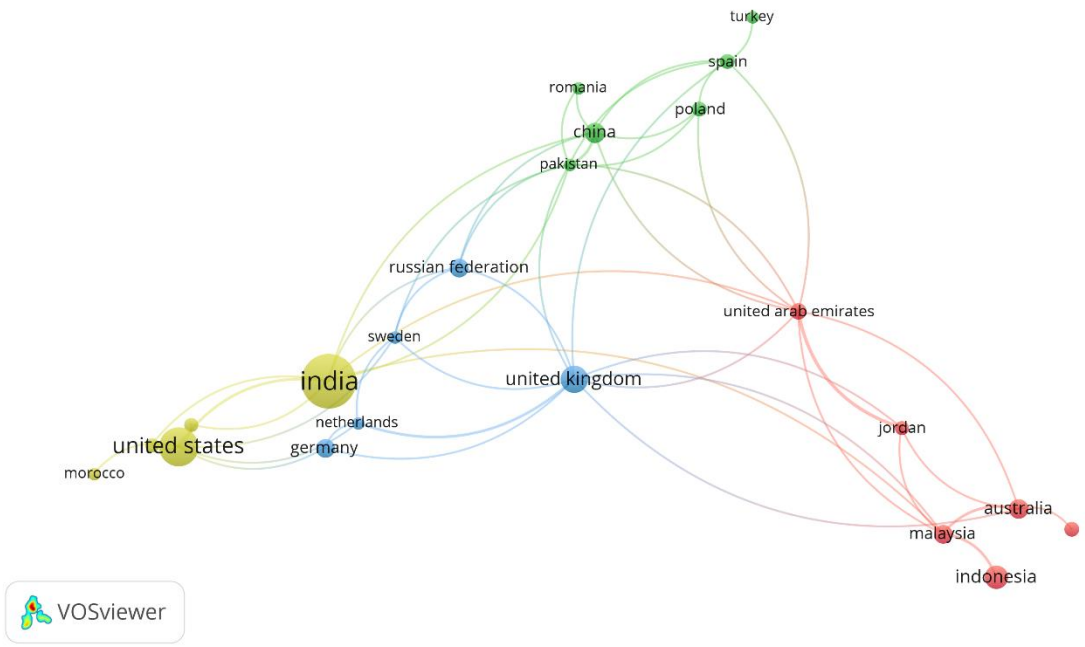

Figure 5. Country Visualization
Source: Data Analysis Result, 2025

The country collaboration network map visualizes international research partnerships in the domain of digital banking and competitive advantage. The larger nodes, such as India, United States, and United Kingdom, indicate countries with high publication output and extensive collaboration networks. India emerges as a central hub, actively collaborating with both Western nations like the United States, Germany, and the Netherlands, and Asian counterparts such as China and Pakistan. The red cluster including Malaysia, Indonesia, Jordan, and Australia reflects strong regional partnerships in Southeast Asia and the Middle East, often linked through shared fintech and digital finance interests. The green and blue clusters represent European and Eurasian collaborations, with countries like Poland, Romania, Turkey, and Russia forming bridges across different academic spheres.

Discussion

The findings of this bibliometric analysis provide valuable insights into the evolving landscape of research concerning competitive advantage in the banking industry during the digital age. The visualizations reveal a multidimensional and increasingly sophisticated body of literature, characterized by strong interdisciplinary foundations and expanding thematic diversity. By examining the co-occurrence of keywords, co-citation of influential authors, and international collaboration networks, this study highlights how digital transformation, technological innovation, and customer-centric strategies are reshaping competitiveness in banking.

At the core of the thematic mapping lies "digital banking," a central and consistently recurring keyword across all clusters. Its close proximity to other dominant terms such as "fintech," "digital transformation," "artificial intelligence," and "financial inclusion" reflects its position as the conceptual nucleus of the field. This confirms that digital banking is no longer a niche innovation but the mainstream foundation upon which modern banking operations and strategic differentiation are built. The tight clustering around fintech suggests that scholars view financial technology not as a disruptive force in isolation, but as a critical component embedded within banks' competitive

architectures. As banks compete not only with each other but also with agile fintech entrants, the integration of digital capabilities becomes a prerequisite for survival and success [29].

The overlay visualization further enriches this perspective by illustrating the temporal evolution of research interests. Earlier studies (2018–2019) emphasized foundational topics such as information systems, security, and internet banking, indicating an initial focus on the technical infrastructure of digital banking. As the field matured, attention shifted toward more strategic and behavioral themes such as artificial intelligence, customer experience, service quality, and eventually competitive advantage—highlighted in brighter yellow tones representing publications from 2021 onwards. This progression reflects a paradigmatic shift in the literature: from technology implementation to the strategic outcomes and market implications of digital transformation. Banks are no longer evaluated solely on their ability to digitize services, but on how these services enhance customer value, market agility, and long-term differentiation [30].

A critical area of growth identified in the keyword mapping is the increasing prominence of customer-centric themes, such as service quality, customer experience, and trust. This trend aligns with contemporary views in strategic marketing and digital business literature, where competitive advantage is seen as increasingly reliant on superior customer engagement and personalized experiences. Technologies such as machine learning and artificial intelligence are being harnessed not only for operational efficiency but also to understand customer behavior, predict needs, and deliver tailored services in real time [31]. This shift from product-centric to customer-centric banking reinforces the importance of data-driven personalization as a source of sustainable competitive advantage.

The heatmap analysis validates these thematic clusters by illustrating research density. Core topics—such as digital banking, fintech, and artificial intelligence—are not only frequent but also central to the knowledge network, with high co-occurrence intensity. Peripheral yet emerging themes such as blockchain, cybersecurity, and biometrics also appear in the heatmap, suggesting growing scholarly interest but less conceptual maturity. These areas represent nascent frontiers of research with potential for expansion, particularly in exploring their strategic role in enhancing transparency, security, and identity management in banking. Given the rising concerns about digital fraud and data privacy, further investigation into these topics could yield critical insights for banks aiming to build trust and regulatory compliance into their digital strategies [32].

The author co-citation network further illuminates the interdisciplinary nature of the field. Three dominant clusters emerged: one centered on digital adoption and behavior theory (e.g., Venkatesh, Davis), another on strategic and financial innovation (e.g., Kraus, Demirgüç-Kunt), and a third on quantitative methodology (e.g., Hair, Ringle, Sarstedt). This structure indicates that the study of competitive advantage in digital banking is informed by both theoretical and methodological pillars. Technology Acceptance Models (TAM, UTAUT) and innovation diffusion theories provide the conceptual scaffolding for understanding user behavior, while Structural Equation Modeling (PLS-SEM) has become the preferred analytical technique for validating these frameworks. This integration of behavioral theory and empirical rigor strengthens the scientific robustness of the field and facilitates cross-disciplinary collaboration.

International collaboration patterns reveal a highly globalized research ecosystem, with India, the United States, and the United Kingdom emerging as central hubs. India's prominence in both productivity and connectivity reflects its active role in fintech innovation and financial inclusion research. Countries such as Malaysia, Indonesia, and the United Arab Emirates also demonstrate growing contributions, particularly within the red cluster of regional partnerships in Asia and the Middle East. This geographic spread underscore the contextual diversity of digital banking research, shaped by varying regulatory regimes, infrastructure maturity, and financial behaviors. Such diversity presents an opportunity for comparative studies that examine how banks across different economies adapt digital strategies to gain competitive advantage.

While the field has expanded rapidly, the bibliometric evidence also exposes certain gaps. First, although digital banking and fintech are well-covered, there is relatively limited integration of environmental and social dimensions, such as ESG (Environmental, Social, Governance) concerns, into the discourse on banking competitiveness. With sustainability gaining importance in global finance, future studies could explore how digital strategies align with green banking and social impact. Second, while customer experience is increasingly recognized, there is still room to investigate how specific technologies (e.g., AI chatbots, digital identity systems, blockchain-based contracts) directly influence perceived value and customer retention. Third, although methodology is a strength of the field, a dependence on PLS-SEM may limit the exploration of complex causal relationships or longitudinal dynamics, which could be addressed through mixed methods or machine learning models.

Another potential avenue for future research lies in organizational transformation and change management. Digital transformation is not just about adopting new technologies but requires banks to reconfigure structures, processes, and culture. Yet, terms like "agility," "organizational change," or "digital leadership" are underrepresented in the current bibliometric landscape. Understanding how banks internally orchestrate change, manage resistance, and build digital capabilities can yield deeper insights into the mechanisms of sustained advantage. Similarly, the role of digital talent development, internal innovation labs, and cross-functional teams in driving transformation could be more systematically studied.

CONCLUSION

This study provides a comprehensive bibliometric analysis of the scholarly discourse on competitive advantage in the banking industry within the context of the digital age. The findings reveal that research in this field is strongly shaped by themes such as digital transformation, fintech integration, artificial intelligence, customer experience, and financial inclusion, which collectively serve as pillars of modern banking competitiveness. The evolution of keywords over time reflects a shift from foundational technological concerns toward strategic and customer-centric considerations. Influential authors and methodologies highlight the interdisciplinary nature of the field, combining behavioral theories with advanced quantitative techniques. Moreover, international collaboration patterns demonstrate the global relevance of digital banking transformation, with contributions spanning both developed and emerging economies. Despite its growth, the field presents opportunities for further exploration, particularly in areas like sustainability, digital trust, organizational change, and technological-human value alignment. As digital disruption continues to redefine the financial landscape, ongoing research must address these gaps to better inform strategic decision-making and policy development in the banking sector.

REFERENCES

[1] P. Priyanto, E. Murwaningsari, and Y. Augustine, "Impact digital business strategy on competitive advantage in the banking sector," *Eur. J. Bus. Manag. Res.*, vol. 8, no. 2, pp. 65–70, 2023.

[2] P. K. Omari, "Digital Technology and Competitive Advantage of Commercial Banks in Kenya." University of Nairobi, 2019.

[3] D. Vander, "How do firms build and sustain strategic competitive advantage in the digital economy?: A case study in digital banking." Macquarie University, 2019.

[4] P. Priyanto, E. Murwaningsari, and Y. Augustine, "Exploring the relationship between robotic process automation, digital business strategy and competitive advantage in banking industry," *J. Syst. Manag. Sci.*, vol. 13, no. 3, pp. 290–305, 2023.

[5] V. Stojkovski and B. Nenovski, "Digital services as a tool for creating competitive advantage in the banking sector in north Macedonia," *J. Lib. Int. Aff.*, vol. 7, no. 1, pp. 79–93, 2021.

[6] A. R. Asa, D. Tsanga, C. Januarie, and M. Kamati, "Technological innovation as a strategy for competitive advantage within the Namibian banking industry," *Int. J. Manag. Sci. Bus. Adm.*, vol. 8, no. 1, pp. 68–72, 2021.

[7] W. Probojakti, H. N. Utami, A. Prasetya, and M. F. Riza, "Driving sustainable competitive advantage in banking: The role of transformational leadership and digital transformation in organizational agility and corporate resiliency," *Bus.*

Strateg. Environ., 2025.
[8] M. E. Porter, "Technology and competitive advantage," *J. Bus. Strategy*, vol. 5, no. 3, pp. 60–78, 1985.
[9] T. A. L. Afaishat, M. Al-Maadhedee, and I. Yamin, "The impact of adopting the digital strategy on the competitive advantage: A moderating role of employee satisfaction in the Jordanian banking sector," *Probl. Perspect. Manag.*, vol. 22, no. 1, p. 193, 2024.
[10] T. C. Melewar and A. Navalekar, "Leveraging corporate identity in the digital age," *Mark. Intell. Plan.*, vol. 20, no. 2, pp. 96–103, 2002.
[11] A. R. Al-Owaidi, "Understanding the Effect of Digital Marketing in Achieving Competitive Advantage through the Quality of Banking Service: An Exploratory Study from the Point of View of a Sample of Rafidain Bank Customers in Iraq," *Open J. Bus. Manag.*, vol. 12, no. 6, pp. 3894–3920, 2024.
[12] P. Pristiyono, J. Juliana, and Y. Prayoga, "Measuring customer trust through digital transformation of banking as a competitive advantage," *J. Ekon. Bisnis Dan Kewirausahaan*, vol. 11, no. 2, p. 214, 2022.
[13] F. W. Maina, "Implementing Digital Strategy for Attaining Competitive Advantage During Covid–19 Pandemic by International Tier 1 Banks in Kenya." University of Nairobi, 2021.
[14] Q. A. Porter, "Internet and Competitive advantage: an empirical study of UK retail banking sector." University of Warwick, 2005.
[15] W. Probojakti, H. N. Utami, A. Prasetya, and M. F. Riza, "Building Sustainable Competitive Advantage in Banking through Organizational Agility," *Sustainability*, vol. 16, no. 19, p. 8327, 2024.
[16] C. R. Parahiyanti, S. H. W. Prabowo, Y. R. Dewi, N. Abd Aziz, and E. Yunitasari, "Creating Satisfaction, Loyalty, and Competitive Advantage for Banking Industry: The Roles of Customer Relationship Management (CRM) in the Digital Era," in *BISTIC Business Innovation Sustainability and Technology International Conference (BISTIC 2022)*, Atlantis Press, 2023, pp. 380–392.
[17] G. M. Makau, "Influence of digital marketing strategies on the competitive advantage of commercial banks in Kenya." Strathmore University, 2021.
[18] E. W. Githinji, "Digital Lending Strategies and Competitive Advantage of Commercial Banks in Kenya." University of Nairobi, 2024.
[19] S. M. Lee and D. Lee, "'Untact': a new customer service strategy in the digital age," *Serv. Bus.*, vol. 14, no. 1, pp. 1–22, 2020.
[20] K. Owusu Kwateng, K. A. Osei Atiemo, and C. Appiah, "Acceptance and use of mobile banking: an application of UTAUT2," *J. Enterp. Inf. Manag.*, vol. 32, no. 1, pp. 118–151, 2019.
[21] M. Y. Chan, S. Haber, L. M. Drew, and D. C. Park, "Training older adults to use tablet computers: Does it enhance cognitive function?," *Gerontologist*, vol. 56, no. 3, pp. 475–484, 2016.
[22] E. H. Manser Payne, J. Peltier, and V. A. Barger, "Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms," *J. Res. Interact. Mark.*, vol. 15, no. 1, pp. 68–85, 2021.
[23] A. Demirgüç-Kunt, L. Klapper, D. Singer, S. Ansar, and J. Hess, "The Global Findex Database 2017: Measuring financial inclusion and opportunities to expand access to and use of financial services," *World Bank Econ. Rev.*, vol. 34, no. Supplement_1, pp. S2–S8, 2020.
[24] T. Niemand, J. P. C. Rigtering, A. Kallmünzer, S. Kraus, and A. Maalaoui, "Digitalization in the financial industry: A contingency approach of entrepreneurial orientation and strategic vision on digitalization," *Eur. Manag. J.*, vol. 39, no. 3, pp. 317–326, 2021.
[25] E. M. Payne, J. W. Peltier, and V. A. Barger, "Mobile banking and AI-enabled mobile banking: The differential effects of technological and non-technological factors on digital natives' perceptions and behavior," *J. Res. Interact. Mark.*, vol. 12, no. 3, pp. 328–346, 2018.
[26] J. N. Lee, J. Morduch, S. Ravindran, A. Shonchoy, and H. Zaman, "Poverty and migration in the digital age: Experimental evidence on mobile banking in Bangladesh," *Am. Econ. J. Appl. Econ.*, vol. 13, no. 1, pp. 38–71, 2021.
[27] G. Cheng *et al.*, "The relationship between csr communication on social media, purchase intention, and e-wom in the banking sector of an emerging economy," *J. Theor. Appl. Electron. Commer. Res.*, vol. 16, no. 4, pp. 1025–1041, 2021.
[28] N. Ahmad, R. T. Naveed, M. Scholz, M. Irfan, M. Usman, and I. Ahmad, "CSR communication through social media: A litmus test for banking consumers' loyalty," *Sustainability*, vol. 13, no. 4, p. 2319, 2021.
[29] A. I. Wati, "ANALYSIS OF DIGITAL-BASED BANKING SERVICES TOWARDS COMPETITIVE ADVANTAGE IN INDONESIAN SYARIAH BANK," in *PROCEEDING INTERNATIONAL BUSINESS AND ECONOMICS CONFERENCE (IBEC)*, 2024, pp. 463–480.
[30] W. Sardjono and W. G. Perdana, "Artificial Intelligence as a New Competitive Advantage in Digital Marketing in the Banking Industry," in *Conference on Innovative Technologies in Intelligent Systems and Industrial Applications*, Springer, 2022, pp. 561–573.
[31] M. E. Porter and V. E. Millar, "How information gives you competitive advantage: The information revolution is transforming the nature of competition," in *Knowledge and special libraries*, Routledge, 2009, pp. 85–103.
[32] A. Malkawi, Z. M. Alhawamdeh, T. Banihani, O. A. M. Ali, M. F. Alzyoud, and M. Alghizzawi, "The Impact of Digital Entrepreneurship on Competitive Advantage through Business Intelligence in Jordanian Commercial Banks," *Migr. Lett.*, vol. 21, no. 4, pp. 254–269, 2024