

Charting The Ai Revolution in Banking: A Bibliometric Study of Emerging Themes and Future Directions (2026–2027)

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Abstract

This paper brings together a changing research landscape of artificial intelligence (AI), Internet of things (IoT) and big data within banking industry from the year 2018 to 2025 through a bibliometric analysis. The study utilized Biblioshiny for the research output from Scopus, analysing the body's document type, metrics, author names, contributions to themes, cites and suggests future research gaps (particularly fraud detection, risk modelling and customer engagements). AI is still a strong theme, but networks of sectors will begin growing and ethics is still a sub-theme. The geographic analysis shows that India leads in research work but still there is limited impact of citations. The study offers conceptual research possibilities for futures research around cross-border AI research, ethical applications of AI applications in banking, integration with IoT, associated regulation

1. INTRODUCTION

The global financial ecosystem is in an unprecedented state of change now more than ever, supported by faster acceleration and fusion of emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), Blockchain and Big Data Analytics. Recent FinTech scholarship increasingly frames this transformation as a convergence-driven phenomenon, where Artificial Intelligence, Big Data Analytics, and digital platform architectures jointly redefine banking value creation, competition, and regulatory oversight (Gomber et al., 2022; Vives & Ye, 2025). The emerging technologies play an indispensable role as accelerators of decisions, operational efficiencies, cost reductions, enhanced customer value, innovation and even sustainability in banking and financials in general (Zhang & Tao, 2020; Vives & Ye, 2025). This convergence of technological

1.1 NEED & SIGNIFICANCE OF THE STUDY

The convergence of Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Analytics is transforming the global banking industry. As stated in a McKinsey report, AI technologies were expected to create up to \$1 trillion of annual incremental value to global banking by improving risk management, customer engagement, and automating repetitive tasks (Bughin et al., 2018).

The International Data Corporation (IDC) anticipates that global spending on AI in banking will grow to \$97.9 billion by 2027, reflecting a compound annual growth rate of 29.8% (IDC, 2023). Consequently, there is substantial need to know how research in this area is evolving, given the scale of the economic and strategic significance for banks.

1.2 WHY THE BANKING SECTOR?

This study specifically emphasizes the banking industry due to its oppositional position and because it is one of the earliest and most utilized adoptors of Artificial Intelligence, Internet of Things, and Big Data Analytics. While global banking daily captures and generates a massive amount of structured (e.g. transaction histories) and unstructured data (e.g. customer behavioral patterns), the intelligent technologies with extensive experience using it are ready in quite possibly one of the best ground to deploy and effectively utilize the intelligent technologies (Jakšič & Marinč, 2019). The World Bank states that the financial services sector worldwide processes more than \$5.4 trillion dollars of transactions every day. Given that billion-dollar transactions occur every minute, operational capacity, efficiency, customer relations, accuracy,

and security are critical in every aspect of the modern world (World Bank, 2022).

2. RESEARCH GAPS & QUESTIONS

While the number of studies that document the promising opportunities that AI, IoT and Big Data present is continuing to grow while the gaps in the literature remain the intact. The literature that examines limited dimensions of technology (fraud detection, customer service automation) is ubiquitous; however, literature that examines the interaction of technology is limited. The understanding of the extent to which technology is changing the operating model of traditional banks, as well as the operating model of an AI first neobank is not yet explored by academicians and researchers. There is little comparative literature on operational efficiency and ways of innovation with legacy banks and neobanks (Banerjee et al, 2022; Dehnert, 2020).

Additionally, bibliometric analysis as a research methodology has the potential to be highly effective at mapping up an intellectual structure, the evolution of themes and knowledge gaps in AI-finance research (Goyal & Kumar, 2021; Hua et al, 2019). Most studies are either based on a case study approach or qualitative review without documenting longitudinal changes in research trends and knowledge gaps.

2.1 PROCEDURE FOR BIBLIOMETRIC ANALYSIS

This research utilized a systematic bibliometric approach based on the frameworks designed by Donthu et al. (2021), Zupic and Čater (2015), Ramos-Rodríguez and Ruiz-Navarro (2004), and Cobo et al. (2011). The procedure for data extraction from the Scopus database followed the best practices outlined in the report by Appio et al., 2014 and was developed in accordance with three relevant keywords in the title, abstract and author keywords. To perform performance analysis, science mapping and to visualize networks, this research utilized the Bibliometrix R Package to process the data, as well as its interface Biblioshiny (Aria & Cuccurullo, 2017).

2.2 BIBLIOMETRIC ANALYSIS & VISUALISATION

The data collection was performed in a structured manner, with the search phrase ("fintech*") AND

("artificial*") AND ("intelligence*") AND ("banks*" OR "neobanks*"), resulting in an initial article count of 172. Narrowing the articles involved a few inclusion criteria – publication years (2018-2025), document type (articles, secured books, book chapters, conference papers, reviews), subject areas (Computer Science, Business, Economics), if published in English and the status of final publication. These approaches narrowed the article countdown to 139 articles. Then, the remaining 139 articles' abstracts were screened for themes related to AI, fintech and banks and also excluded an additional 27 articles. The bibliometric analysis was ultimately based on 112 articles, to follow the trend and thematic mapping approach. Therefore, this was a rigorous process, but ultimately an appropriate corpus for this study, in both relevance and methodological rigor.

3. ANALYSIS & KEY FINDINGS



Figure 1. Keyword Cloud (Source: Biblioshiny using data from Scopus)

The word cloud in Figure 1 generated from Biblioshiny clearly presents the most prominent terms in the data set, providing an overview of the most substantial terms with "artificial intelligence" taking the largest area and font size relating to its spatial and typological position on the cloud thereby reaffirming its conceptual importance. Other terms relative to the saliency of "artificial intelligence" included terms such as "fintech", "banking", "finance" and "machine-learning", which are provided meaning through their lexical prominence in relation to "artificial intelligence" and their relationship to each other as themes in the growing conversation in the literature. This visualization also showcases the underlying co-word structure by highlighting terms occurring together frequently, while simultaneously providing an intuitive snapshot of the intellectual geography of the field related to the science mapping rationale articulated by Cobo et al. (2011)

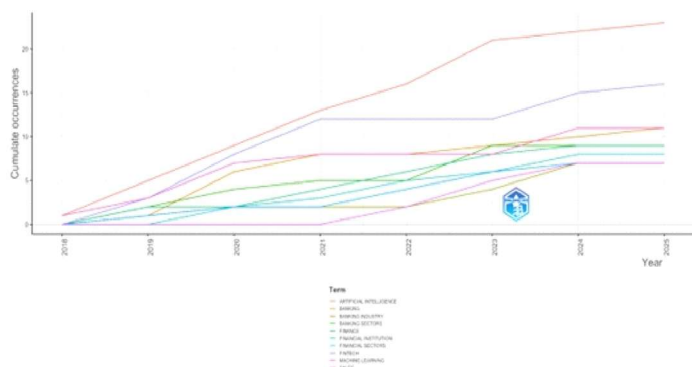


Figure 2. Keyword growth over time from 2018 - 2025. Each line represents a keyword such as Artificial Intelligence, Banking, Finance, Machine Learning, Sales etc. (Source: Biblioshiny using data from Scopus)

The chronological emergence of the keyword frequencies, provided in the Figure 2 illustrates an evolving pattern of growth in the areas of focus in the AI-fintech research corpus over the period from the year 2018 to 2025. "Artificial intelligence" shows the most pronounced and consistent upward growth, increasing from a single reference in 2018 to 23 by 2025, indicating the strengthening and orienting centrality of the field as the conceptual anchor. The rapid increase indicates an intensifying consolidation and trend of incorporation of AI across various aspects of both financial innovation and academic research.

"Fintech," likewise, showcases a similarly positive and upwardly sloped growth trajectory. Increasing from 3 references in 2019 to 16 by 2025 indicates an ongoing relevance of the domain to which various applications of AI are being understood. "Banking," "sales" and "finance" exhibit and increased frequency of mentions characterized by stable and moderate growth. Increased frequency suggests an increased refinement of research focus as scholars moved from conceptual discussions to the applied area of inquiry; and explorations of actual customer engagement and organizational finance and institutional vectors of finance. The noteworthy is the increase and emergence of "machine-learning" which did not emerge in the literature until 2022 and rapidly moved toward a frequency of 7 references by 2025. This may suggest an emerging growth trajectory toward interest in specific artificial intelligence tools as operational and analytical devices.

4. FINDINGS

The combination of AI, IoT and Big Data has clearly altered the research landscape in banking, with AI taking the leading role as the thematic core. Bibliometric trends indicate a progressive shift from early-stage discussions about fintech and banking (2018–2020) to an exploration of applications in the sector and the particularities of AI tools (2021–2025). Research themes have progressed from general emergent operational integration of AI and digital invention to more specific themes of sectoral integrations, regulation and policy implications and ethics. While institutional involvement is robust and dominated by located institutions in India and emerging economies, citation impact and research activity still present en bloc, territorial effect, which suggests that there may be a gap between research activity, output and the capacity to have global academic impact.

5. LIMITATIONS OF THE STUDY

Despite promising future avenues, the present systematic bibliometric review of AI, IoT, and Big Data applications in banking has limitations. This study confined itself to the Scopus database as the data source, any English-language related published articles, and articles published in their final stage. Consequently, relevant studies, if exist, published in languages other than English could have been excluded as well as relevant publications in non-Scopus indexed databases, which may present an alternative view of literature on AI, IoT and Big Data in banking. Bibliometric tools like Biblioshiny provide respectively good quantitative perspective on the literature as identified, without opportunity to evaluate the qualitative depth of the articles in the review, and further the citation-based approach taken does not consider the height of impact that newly published materials may have, considering the time horizon we cited. Next, the manual screening process used in this review is based on a thorough "thread/open process", which has sizing limitations, and while this is true, these thematic relevance assessments get subjective.

6. CONCLUSION

This research aimed to explore the influence of Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Analytics on research trajectories, thematic pathways and institutional

impacts in banking research from 2018 to 2025. The bibliometric analysis strongly evidenced how AI has emerged as the central thematic delimiting in the domain of banking research, with research slowly evolving through early explorations of fintech and operational integration (2018–2020) through to more advanced categorizations of sectorial implications, ethical governance and regulatory perspectives (2021–20225).

Thematic mapping revealed three paradigmatic shifts: (i) initiation - AI was mainly couched within fintech and transactional systems; (ii) embedding - major themes such as fraud detection, customer engagement, and credit scoring emerged as specific application areas; and (iii) maturation--the discourse began to shift towards structural and systemic issues such as techniques in machine learning, ethical AI, and industry adoption. The growth of AI, IoT and Big Data progressively redefined not just the technological approach to banking research, but the institutional and regulatory dimension too.

7. FUTURE IMPLICATIONS

Implications of this research provide substantial details for academia, industry and regulators. As AI technologies shape how banking functions, future research should be focused on the ethics of AI, regulation and accountability in algorithmic purposes. There should also be a reinvigoration regarding the study of IoT, especially in the use of analytics in real-time and as security improvements. There should be cooperation and information exchange through cross-border initiatives to circumvent problems of regional silos. For practitioners, following the path for the banks in layman's terms would require aligning AI strategies with changing customer expectations, data governance principles and sectoral regulations. Finally, there should continue to be bibliometric tracking to identify emerging technologies including generative AI as evolving a role within new financial ecosystems.

REFERENCES

1. Appio, F. P., Cesaroni, F., & Di Minin, A. (2014). Visualizing the structure and bridges of the intellectual property management and strategy literature: A document co-citation analysis. *Scientometrics*, 101(1), 623–661. <https://doi.org/10.1007/s11192-014-1324-1>.
2. Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>.
3. Banerjee, R., Majumdar, S., & Albastaki, M. (2022). Ideal self-congruence: Neobanking by traditional banks and the impact on market share—A case of UAE banks. *International Journal of Professional Business Review*, 7(1), 1–21. <https://doi.org/10.26668/businessreview/2022.v7i1.292>
4. Begenau, J., Farboodi, M., & Veldkamp, L. (2023). Big data in finance and the growth of large firms. *Journal of Finance*, 78(1), 223–271. <https://doi.org/10.1111/jofi.13127>.
5. Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., & Subramaniam, A. (2018). *Notes from the AI frontier: Applications and value of deep learning*. McKinsey Global Institute. <https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-applications-and-value-of-deep-learning>.