The Role of Artificial Intelligence and ChatGPT in Fintech: Prospects, Challenges, and Research Agendas

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Abstract

This study reviews the role of artificial intelligence (AI) and Chat Generative Pre-trained Transformer (ChatGPT) or Chatbot in the financial technology (fintech) industry, and highlights opportunities, challenges, and research agendas. A bibliometric analysis of 154 articles shows that research on AI and chatbots in the fintech sector is lacking. AI and chatbots have the potential to enhance fraud detection, customer loyalty, financial inclusion, data analysis, back-office process automation, and customer service. However, challenges such as job loss, data security, transparency, skill shortages, behavioral biases, and regulatory monitoring must be addressed. The empirical findings suggest future research agendas to advance AI and ChatGPT/Chatbot in fintech and to create value for stakeholders.

Keywords: Artificial intelligence, Chatbot, ChatGPT, Fintech, Banking, Bibliometric.

Classification codes:

1. Introduction

Over the past few years, the financial sector has undergone a dramatic transformation fueled by technological advancements(Tan et al., 2023). Recent technological advancements, including artificial intelligence (AI) and Chat Generative Pre-trained Transformer (ChatGPT) have emerged as cutting-edge technologies that offer tremendous potential for the financial technology (Fintech) and banking industries (Dowling & Lucey, 2023; Dwivedi et al., 2023). These technologies have the potential to reshape the delivery and consumption of banking and financial services, thus, creating value for customers, financial institutions, and regulators. Fintech is one of the fastest-growing areas in the banking industry (Sunitha & Madhav, 2020). Fintech has revolutionized the banking industry by making it easier and more efficient for customers to access financial services (Okuda & Shoda, 2018; Raudha & Saeedi, 2019). Therefore, it is crucial to examine how these new technologies can be adopted in the fintech industry.

Several factors drive the adoption of AI and Chatbots in the fintech industry. First, these technologies can enhance the efficiency and accuracy of financial processes and reduce the cost and time required to complete them (Farida S. Rasiwala & Bindya Kohli, 2021; Sirenko et al., 2020; Varma et al., 2022). Second, AI and Chatbots can improve

customer experience by providing personalized and real-time services and enhance customer satisfaction and loyalty (Dwivedi et al., 2023; Eren, 2021; Varma et al., 2022). Third, these technologies enable financial institutions to detect fraud more effectively and improve the security and integrity of financial systems(Dwivedi et al., 2023; Raudha & Saeedi, 2019). Despite the potential benefits of AI and Chatbot adoption in fintech, several challenges must be addressed before their widespread implementation. One significant concern is data privacy and security, as the use of AI and Chatbots involves the collection and processing of sensitive customer data (H. M. Dawood et al., 2022; Dwivedi et al., 2023; Su et al., 2021; Vučinić & Luburić, 2022). Other concerns include a lack of transparency in AI decision-making processes, regulatory and legal challenges, and ethical issues related to the use of AI in financial services (Bhatia et al., 2020; Farida S. Rasiwala & Bindya Kohli, 2021; Micheler & Whaley, 2020).

Several studies have investigated the role of AI and chatbots in fintech. For example, AI can be used to develop personalized financial products and services that meet customer needs (Cao & Zhai, 2022; Kumar et al., 2022). Furthermore, AI-based chatbots can be used to improve customer satisfaction and experience through a conversational interface that enables natural language interactions between financial institutions and customers (Dwivedi et al., 2023; Eren, 2021). Owing to the rapid pace of technological innovation and the importance of fintech in the global economy, more research is needed on the role of AI and ChatGPT/Chatbots in the finance and banking sectors (Dowling & Lucey, 2023; Dwivedi et al., 2023). Therefore, a comprehensive review of the existing literature is required. Despite the large number of literature reviews on AI and machine learning, few are dedicated to fintech and banking. For instance, Doumpos et al., (2023) reviewed the AI and operational research in fintech and banking (H. Dawood et al., 2022) analyzed business trends and challenges in Islamic fintech, (Raudha & Saeedi, 2019) examined the use of AI and machine learning in fraud detection, and (Bhatt et al., 2022) explored the connection between fintech, digitalization, and financial services. However, there is a lack of comprehensive literature reviews that analyze AI and Chatbot applications in fintech.

Through a comprehensive literature review, this study aims to fill this gap by answering the following research questions: 1) What is the status of AI and chatbot applications in fintech? 2) What are the prospects and challenges associated with AI and ChatGPT/Chatbot applications in the fintech industry? This study identifies current trends, prospects, challenges, and future research agendas related to AI-based ChatGPT/chatbot applications in fintech. Furthermore, we used bibliometric techniques, specifically co-word analysis, to evaluate 154 studies published

between 2016 and 2022 in journals indexed in the Elsevier Scopus database. Our study offers multiple perspectives on AI-based chatbots in fintech and banking literature by examining the following:1) the status of AI and chatbot applications in fintech and banking (e.g., sources, top-keywords, top-authors, and top-cited documents); 2) prospects, challenges, and future research directions.

The remainder of this paper is organized as follows: Section 2 discusses the research methodology, Section 3 discusses the results and interpretations, and Section 4 summarizes the research.

2. Methods

Peer-reviewed articles were collected from Scopus, a bibliometric database frequently used in the social sciences (Aracil et al., 2021; Austmann, 2021). In addition to providing comprehensive abstracts and citations, Scopus includes enriched data and links scholarly literature across various scholarly fields. We selected 154 publications (84 articles and 70 conference papers) based on AI or chatbots in fintech and banking research from the Scopus database using search strings[1]. Broad search terms were used to reduce the likelihood of excluding relevant studies. As there are few studies, we only considered studies that started in 2016. Subsequently, we read the individual abstracts as well as the entire article to ensure that each was pertinent. The final sample of 154 articles yielded 495 different keywords written by 434 authors with an average of 8.135 citations. Furthermore, we used a bibliometric approach and R Studio software to provide an updated review of AI and chatbot adoption literature in fintech (Jimenez et al., 2022). Finally, to examine the prospects and challenges related to AI and ChatGPT/Chatbot applications in fintech, we reviewed various articles and recent publications.

3. Results and Interpretations

3.1. AI and Chatbot research trends in fintech: sources, documents, authors, keywords, nations, and institutions.

Figure 1 shows the number of publications on AI and Chatbot applications in the fintech industry during the study period from 2016-2022, and the average number of citations per article. We observed a spike in publications from 2015 onward, while the average number of citations dropped slightly. The most relevant sources of publications are listed in Table 1. Based on the h-index, the top three publications on AI and fintech studies are Finance Research Letters, ICRITO 2020, and IJSTR. As for the most-cited articles (see table 2), the three top ranking studies are Belanche et al., (2019), Jakšič & Marinč, (2019), and Demertzis et al., (2018).

[1] We applied the following search query to build the database in this study: ("chatbot" OR "conversational agent" OR "artificial* intelligence" OR "AI" OR "chatbot adoption" AND "Fintech" OR "financial technology" AND “Banks" OR "banking" OR "financial industry") and pubyear: (2016-2022) and language: (English) and document types: (articles or conference papers).

Table 3 presents the most active countries and their affiliations in AI and Chatbot applications for fintech research during the study period. Spain led the way with 203 citations, followed by the UK and China with 101 and 54 citations, respectively. The most relevant affiliations in AI and fintech research include the University of Salamanca, University of Luxembourg, and Amity University, all of which have more than five documents. Furthermore, table 4 summarizes the leading authors of AI and fintech research. In terms of the h-index, Mehrotra, Aitken, and Belanche rank highest. Finally, figures 2-3 present the most relevant keywords and three-field plots linking publication sources, keywords, and countries. There are some key observations here, such as fintech, AI, and machine learning, which are themes in most publications and in most countries contributing to this research area. The results of this study prove that more research is needed in artificial intelligence and Chatbots in the fintech sector. This highlights the importance of further investigating the potential of AI and Chatbots to revolutionize the fintech industry.

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Moreover, four key observations have been identified based on extensive literature reviews of AI and chatbot applications in the fintech and banking industries. These key observations suggest that leveraging AI and chatbot applications in fintech can improve customer experience and access to financial services.

Key-observation 1.1: The number of publications on AI and chatbot applications in the fintech industry has increased since 2015, with a spike in publications from 2015 onwards.

Key-observation 1.2: Spain was the most active country in AI and chatbot applications in fintech research during the study period, followed by the UK and China.

Key-observation 1.3: Most publications in AI and fintech research focus on themes such as fintech, AI, and machine learning, and most countries contribute to this research area.

Key-observation 1.4: More research is needed to investigate the potential of AI and chatbots to revolutionize the fintech industry.

3.2. Prospects, challenges, and Future Research Agendas

Table 5-6 present key prospects and challenges for AI-based ChatGPT/Chabot in the fintech industry. Our extensive literature review revealed several benefits for fintech companies to adopt AI-based ChatGPT/Chatbots, such as improving fraud detection (Dwivedi et al., 2023; Raudha & Saeedi, 2019), customer loyalty and satisfaction (Dwivedi et al., 2023; Eren, 2021; Varma et al., 2022), financial inclusion (How et al., 2020; Ravikumar, 2019), optimizing data-analysis (Sirenko et al., 2020; Varma et al., 2022), automating back-office processes (Sirenko et al., 2020; Varma et al., 2022), and automating customer-service (Patil & Kulkarni, 2019; Raudha & Saeedi, 2019).

Despite these benefits, there are certain drawbacks, such as job loss (Ghandour, 2021), data-security risks (H. M. Dawood et al., 2022; Su et al., 2021; Vučinić & Luburić, 2022), lack of transparency(Farida S. Rasiwala & Bindya Kohli, 2021; Sirenko et al., 2020), skill shortages (Karkkainen et al., 2018; Rahman et al., 2022), behavioral biases (Ashta & Herrmann, 2021; Jakšič & Marinč, 2019), and regulatory monitoring concerns (Micheler & Whaley, 2020; Rahman et al., 2022; Sirenko et al., 2020). Furthermore, we identified several future research directions for AI and ChatGPT/Chatbot applications in the fintech industry, as shown in Table 7.

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Moreover, our empirical results indicate that AI-driven ChatGPT and Chatbots are transforming the fintech and banking industries. This enables improved customer service, reduced data analysis costs, and better risk assessment. However, these technologies also have challenges, such as bias and cyber threats. Therefore, the potential of AI and ChatGPT in Fintech and banking is significant. To remain competitive, banks must continue to invest in these technologies. Based on these findings, three key observations were made.

Key-observation 2.1: AI-based ChatGPT/Chatbots offer several benefits for fintech companies, such as improving fraud detection, customer loyalty and satisfaction, financial inclusion, optimizing data-analysis, and automating back-office processes.

Key-observation 2.2: There are several challenges associated with AI-based ChatGPT/Chatbots in the fintech

industry, such as job loss, data-security risks, lack of transparency and accountability, skill shortages, and regulatory monitoring concerns.

Key-observation 2.3: Future research directions in the fintech industry for AI and ChatGPT/Chatbot applications can help address these challenges and maximize the benefits of AI-based ChatGPT/Chatbots.

4. Conclusion

The fintech industry has undergone significant transformations with the emergence of AI and its various applications. AI-powered Chatbots, such as ChatGPT, have played a crucial role in this transformation by enabling personalized interactions with customers, improving efficiency, and reducing operational costs (Dwivedi et al., 2023). Consequently, the combination of AI and language models such as ChatGPT have revolutionized the fintech industry, and their continued development and adoption will likely shape the future of finance (Dowling & Lucey, 2023; Dwivedi et al., 2023). Our study identified research trends, prospects, challenges, and future research directions in AI and Chatbot applications in the fintech sector by evaluating peer-reviewed publications from the period 2016-2022. Our empirical findings suggest that most previous studies were published as conference papers, which allowed academics to focus on and publish articles in top academic journals on AI-based Chatbot applications in the fintech sector. AI-based ChatGPT is currently one of the most transformative tools available. Despite its significant opportunities, it also presents significant challenges for the fintech and banking industries. A thorough literature review shows that that AI-powered Chatbots can help fintech companies improve fraud detection, customer loyalty, financial inclusion, data analysis, back-office process automation, and customer service automation. However, drawbacks include job losses, data security risks, lack of transparency, skill shortages, behavioral biases, and regulatory monitoring concerns. Future research should focus on addressing the challenges identified and exploring new applications of AI-based Chatbots in Fintech industry. Moreover, our study provides various research directions for future studies on AI and ChatGPT/Chatbot applications in the fintech and banking industries. AI and ChatGPT/Chatbot have enormous potential in fintech and banking. Further research is required to fully explore the potential of AI-based Chatbots and ensure their responsible and ethical use in the financial industry.

Acknowledgements: The researchers would like to express their gratitude to the anonymous re-viewers for their efforts to improve the quality of this paper.

Funding Sources: This study has not received any funding.

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