

Generative Artificial Intelligence in Fintech: Opportunities, Challenges, Digital Transformation and Future Research Directions

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Citation: Sawarna, S. & Kumar, M. (2026). *Generative Artificial Intelligence in Fintech: Opportunities, Challenges, Digital Transformation and Future Research Directions*. *Journal of Commerce, Economics & Computer Science*, 12(03), 22–26.

Abstract

Generative Artificial Intelligence (AI) is changing the FinTech industry, by making the financial services faster, smarter, and more efficient. AI- tools such as ChatGPT, Gemini, Microsoft Copilot, and other large language models are helping financial institutions improve customer service, automate routine work, detect fraud, manage risks, and support better decision-making. These technologies are also helping banks and financial companies provide better digital services to their customers. At the same time, the increasing use of generative AI has created several challenges. These include data privacy, cyber security risk, AI bias, misinformation, ethical concerns, legal issues. These challenges need proper attention to ensure the safe and responsible use of AI in financial services. The main purpose of this study is to examine the role of Generative AI in the FinTech industry, identify its opportunities and challenges and understands its contribution to digital transformation. The study is based on entirely secondary data only. The data collected from research articles, e-journals, books, government publications, industry reports, case studies, reports of international organization, and various websites. The findings of the research show that generative AI is becoming an important technology in the FinTech sector. It improves customer experience, increases work efficiency, supports innovations and help reduce operating costs. However, financial institutions must also address issues related to data security, privacy, transparency, and ethical use of AI. The study suggests that financial institutions should adopt responsible AI- practices strengthen cyber security system, improve employee skills through regular training and follow government regulations and ethical guidelines. These measures can help in building trust and support the safe and sustainable use of Generative AI in the future of FinTech.

Keywords: Artificial Intelligence, FinTech, Digital transformation, ChatGPT, Financial Innovation.

Introduction

The financial sector has experienced significant changes over the past few years, because of rapid technology development. Traditional banking methods are usually being replaced by digital financial services that allow customers to perform banking activities anytime and from anywhere. This rapid growth of digital financial services has led to the development of the FinTech industry.

FinTech refers to the use of technology to improve the financial products and services. It combines finance with modern technologies such as AI, Cloud computing, Blockchain, Big data, Machine learning, Mobile applications and digital payment systems. Such technologies have made financial services faster, more efficient, and easily accessible to individual and businesses. FinTech has changed

the way banks, financial institutions and customers interact with each other's by providing secure convenient and user friendly digital solutions.

Among the latest technological development generative AI has become one of the most important innovations. Unlike traditional AI which mainly analyses existing data and perform pre-defined task, generative AI can create new content such as text, images, computer code, reports, financial summaries, and business recommendation. Popular generative AI platforms such as ChatGPT, Gemini, Microsoft Copilot, Perplexity AI are now widely used by individuals and organizations to improve productivity, communications, decision making, and customer services.

The FinTech industry is increasingly adopting generative AI to improves it operations and provide better financial services. Banks and financial companies use AI-powered Chabot to answer customer queries, provide personalized financial advice, detect suspicious transactions, prepare financial reports, analyses customer behavior and support faster decision making. It also helps organizations automate routine tasks, reduce manual work, improve operational efficiency, and lower business costs. These benefits have encouraged many financial institutions to invest in AI-based technology as part of their digital transformation strategies.

Although Generative AI offers many advantages, it also creates several challenges. The increasing use of AI in financial services has raised concerns about data privacy, cybersecurity, misinformation, AI bias, transparency, and legal responsibility. Such information is not properly protected it may lead to cyberattacks, data breaches, financial fraud and identity theft. Ai systems may sometime generate incorrect or misleading information which can affect business decisions and customer trust.

Ethical issues have also become an important concern. AI models are trained using large data sets and the quality of their output depends on the quality of the information used during training. Government and regulatory authorities are also developing policies and guidelines to promote the safe and ethical use of AI in financial services. Digital transformation has become one of the major goals of the finTech industry. Generative AI is expected to play a key role in this transformation by supporting innovations, improving financial decisions making, and creating more personalized financial services. However, successful implementation of AI requires proper planning, skilled employees, strong cyber security measure, and ethical standard. The rapid growth of AI has created new opportunities as well as new challenges for the FinTech sector. Therefore, there is a need to understand how generative AI is transforming financial services and what factors influence its successful adoptions.

The present study aims to examine the role of generative AI in the FinTech industry. IT focuses on the major opportunities, challenges and contribution of Generative AI to digital transformation. The findings of this study are expected to help researchers, students, financial institutions, policy makers, and technology professionals understand the growing importance of generative AI in FinTech. It is expected to contribute to the existing literature and support the future development of a secure, innovative, and sustainable digitals financial ecosystem.

Review of Literature

Previous studies show that AI has become an important technology for digital transformation across different industries. Recent research highlights that Generative AI improves business efficiency, customer service, financial decision-making and innovation. The previous studies discuss these issues separately, while limited review studies examine the overall role of Generative AI in FinTech and digital transformation. David Krause (2024) examined the role of Generative AI in FinTech. The study explains that AI technologies improve credit scoring, financial advice, fraud detection, and operational efficiency while creating opportunities for innovation in financial services. Kalyani and Gupta (2023) reviewed AI and Machine learning in banking. Their study reported that AI has improved banking efficiency, customer satisfaction, and digital trust while encouraging further technological innovations. David Kuo Chuen Lee et al. (2024) conducted a comprehensive review of Generative AI in finance. The study found that AI has improved customer service, fraud detection, financial reporting, and decision making. The researchers also highlighted challenges related to regulation, privacy and responsible AI adoption. Dwivedi (2021) discussed the opportunities and challenges of AI across different industries. Their study highlighted ethical issues, governance, transparency, and the need for responsible AI practices. Weber et al. (2024) reviewed explainable AI in finance. They found that transparent AI models improve trust, accountability, and financial decision making. Shabsigh and Boukherouaa(2023) examine the impact of Generative AI

on the financial sector. The study concluded that Generative AI can improve financial services but may also increase cyber risks, privacy concerns, and systematic financial risk if not properly managed. Gowda (2024) discussed the benefits and risks of Generative AI in FinTech. The study found that AI improves automation, customer experience, and forecasting but raise concerns regarding ethics, privacy, and algorithmic bias. Dubey et al.(2025) explained that Generative AI empowers financial firms by improving operational efficiency, customer engagement, and business performance while also identifying important future research areas. Raju (2025) studied the emerging role of Generative AI in Indian financial services. The study explains that Generative AI supports digital transformation through multilingual customer services, compliance management, credit assessment, and financial innovation. It also discuss ethical issues, AI bias, privacy, and responsible AI adoption in India. Mukherji (2026) reviewed the impact of Generative AI on the Indian banking sector. The study found that Generative AI supports fraud detection, regulatory complaints, customer relationship management, credit scoring, and digital transformation. The author recommended responsible AI governance and stronger cyber security frame works. Chaudhary and Kumar (2026) analyzed AI in banking India. The study concluded that AI has improved customer support, digital banking, fraud prevention and operational efficiency. However, it also emphasized the need for employee training, ethical AI practices and stronger cyber security measures. Prajapat et al. (2026) studied digital transformation in India's financial sector. The researchers reported that AI, UPI, Blockchain, and Digital banking are improving financial inclusion, and service delivery. They also highlighted policy and cyber security challenges.

Research Gap

Previous studies have explained AI, FinTech, and Digital transformation separately. Many studies discuss the benefits of Generation AI in improving financial services, customer experience and business efficiency. Other studies have focused on challenges such as, Data privacy, Cybersecurity, and AI ethics. However, very few studies have provided a comprehensive review of both the opportunities and challenges of Generative AI in the FinTech sector. In addition limited studies have combined evidence from research articles, government reports, industry reports, and international publications. Therefore, the present study attempts to fill this gap by examining the role of Generative AI in FinTech, its contribution to digital transformation and future research direction using secondary data.

Purpose of the Study

The purpose of this study is to understand the role of Generative AI in the FinTech industry. The study also aims to identify the major opportunities and challenges of Generative AI, examine its contribution to digital transformation, and suggest future research directions based on secondary data.

Objectives of the Study

The present study has the following objectives:

- To study the role of Generative AI in the FinTech industry.
- To identify the major opportunities of Generative AI in financial services.
- To examine the challenges of adopting Generative AI in the FinTech sector.
- To understand the contribution of Generative AI to digital transformation.
- To suggest future research directions for the effective use of Generative AI in FinTech.

Research Methodology

The present study is based entirely on secondary data only. The collected data from research articles, books, journals, websites, government reports, industry reports, international publication, and published case studies related to Generative AI and FinTech. The collected data were carefully reviewed and analyzed the opportunities, challenges, and role of generative AI in digital transformation. The study is descriptive in nature and does not include primary data, surveys, interviews, or questionnaires.

Opportunities of Generative AI in FinTech

- **Improves Customer Service and Customer Experience:** Generative AI provides quick, accurate, and 24/7 customer support through AI-powered chatbots and virtual assistants.
- **Enhances Fraud Detection and Risk Management:** It analyses financial transactions in real time to detect fraud, reduce risks, and improve security.

- **Supports Faster Financial Decision-Making:** It processes large amounts of financial data quickly to help businesses make better and faster decisions.
- **Increases Operational Efficiency and Reduces Costs:** It automates routine financial tasks, saving time, reducing manual work, and lowering operating costs.
- **Provides Personalized Financial Services:** It recommends suitable financial products and services based on customers need and financial behavior.
- **Promotes Innovation and Digital Transformation:** It helps financial institutions develop new digital services, improve business processes, and remain competitive.

Challenges of Generative AI in FinTech

- **Data Privacy Concerns:** Generative AI processes large amounts of personal and financial data, increasing the risk if data misuse or privacy breaches.
- **Cybersecurity Threats:** AI systems may become targets of cyberattacks fraud, hacking, and unauthorized access to sensitive financial information.
- **Ethical Issues:** The use of Generative AI raises ethical concerns related to fairness, accountability, transparency and responsible use of technology.
- **Lack of Transparency:** Many AI models works as “black boxes” making it difficult to understand how they generate decisions or recommendations.
- **Shortage of Skilled Professional:** Many organizations face difficulties in finding trained professional who can develop, manage, and monitor AI systems.

Findings of the Study

- Generative AI is changing the FinTech industry by improving customer service, fraud detection, and financial decision-making.
- AI tools such as ChatGPT, Gamin, and Microsoft Copilot help financial institutions automate routine work and improve efficiency.
- Generative AI supports digital transformation by providing faster, smarter, and more personalized financial services.
- Despite its benefits, Generative AI also crates challenges such as data privacy, cybersecurity risk, AI bias and ethical issues.
- The review shows that responsible AI use, proper regulations, and strong cyber security are necessary for the safe adoption of Generative AI in the FinTech sector.

Suggestions

- Financial institutions should adopt Generative AI responsibly while ensuring customer data privacy and security.
- Strong cybersecurity systems should be implemented to protect against cyber threats and financial fraud.
- Banks and FinTech companies should provide regular AI training to employees to improve their knowledge and skills.
- Government should develop clear policies and ethical guidelines for the responsible use of Generative AI.
- Future researches should conduct primary research to examine the real impact of Generative AI on customers, banks, and financial institutions.

Conclusion

Generative AI is becoming an important technology in the in the industry. It helps improve customer service, increase efficiency, support innovations, and reduce operational cost. However, it also creates challenges related to privacy, cyber security, ethics and regulations. Financial institutions should use generative AI responsibly by following proper security measures and ethical practices, with effective

policies, skilled professional, and continuous technological development, Generative AI can play a major role in the future growth of the FinTech industry.

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