**Generative AI in Banking:** Empirical Insights on Integration, Challenges, and Opportunities in a Regulated Industry

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**Generative AI in Banking:** Empirical Insights on Integration, Challenges, and Opportunities in a Regulated Industry

**Abstract**

**Purpose:** This study aims to fill critical research gaps by providing empirical evidence on the practical application of Generative AI in the banking sector. It explores managerial preparedness, regulatory compliance, and data privacy challenges in implementing this technology, offering insights into its operational effectiveness and potential in financial services.

**Methodology:** The research employs a qualitative approach, conducting in-depth interviews with bank managers and industry experts. These interviews are analysed to identify key factors influencing the successful integration of Generative AI in financial institutions, focusing on Recognition, Requirement, Reliability, Regulatory, and Responsiveness.

**Findings:** The study identifies five critical factors—Recognition, Requirement, Reliability, Regulatory, and Responsiveness—that collectively impact the adoption and operational effectiveness of Generative AI in banking. These factors highlight the challenges and opportunities of integrating this technology within the highly regulated financial industry.

**Implications:** The findings have significant theoretical and managerial implications. Theoretically, the research contributes to understanding AI integration in regulated industries, particularly financial services. Managerially, it provides a roadmap for financial institutions to adopt Generative AI responsibly, balancing innovation with regulatory compliance and ethical considerations.

**Originality:** This study is among the first to provide empirical data on Generative AI's practical application in the banking sector, addressing the lack of real-world evidence and offering a comprehensive analysis of the factors influencing its successful implementation in a highly regulated environment.

**Keywords:** Generative AI; Banking Innovation; Managerial Preparedness; Regulatory Compliance; Data Privacy

# Introduction

Generative AI, exemplified by models such as ChatGPT, has profoundly impacted various industries by automating complex tasks, enhancing productivity, and creating new interaction paradigms (Amankwah-Amoah, et al., 2024; Dwivedi, et al., 2023; Ooi, et al., 2023a). In sectors ranging from healthcare to entertainment, these AI models generate human-like text, design, and even decision-making support, revolutionizing traditional workflows (Amankwah-Amoah, et al., 2024; Mogaji & Jain, 2024). In financial services, potential applications include automating customer service, generating personalized financial advice, fraud detection, and risk management (Huang, et al., 2023; Desiraju & Khan, 2024). The transformative power of Generative AI lies in its ability to learn from vast amounts of data and generate outputs that mimic human intelligence, thereby driving innovation and efficiency (Dwivedi, et al., 2023; Mogaji & Jain, 2024).

Despite the promising capabilities of Generative AI, its application in financial services remains underexplored and speculative. This study addresses three key research gaps in the integration of AI in financial services. First, there is a lack of empirical research on Generative AI in banking, with existing studies being largely speculative and lacking real-world data on implementation and outcomes (Dwivedi et al., 2023; Desiraju & Khan, 2024; Huang et al., 2023). Second, managerial preparedness and interest in adopting AI technologies have been underexplored, despite their critical role in technology integration (Mogaji & Nguyen, 2022). Understanding how managers perceive and prepare for Generative AI is essential. Third, the relevance and challenges of implementing Generative AI in the highly regulated financial sector, where trust and data privacy are paramount, have not been adequately examined (Abdulquadri et al., 2021; Ooi et al., 2023). Key questions regarding the practical implementation, regulatory compliance, data security, and ethical implications of Generative AI in this sector remain unanswered. The lack of empirical studies and practical insights leaves a gap in understanding how these technologies can be effectively and safely integrated into financial services.

The need to explore Generative AI in financial services is driven by the industry's constant pursuit of innovation, efficiency, and competitive advantage (Abdulquadri, et al., 2021; Mogaji, et al., 2018). Financial institutions are under pressure to enhance customer experiences, streamline operations, and reduce costs. Generative AI promises solutions to these challenges but also raises concerns about data privacy, regulatory compliance, and the potential for unintended biases. Understanding how to navigate these issues is crucial for the responsible adoption of AI technologies. Therefore, a detailed examination of the practical applications, benefits, and risks of Generative AI in financial services is imperative. This study aims to fill these gaps by providing empirical evidence on Generative AI's practical applications, assessing managerial readiness, and exploring the ethical and regulatory challenges specific to the financial industry.

To achieve this, we conduct qualitative interviews with bank managers and industry experts to gain insights into the practical challenges and opportunities associated with implementing Generative AI. This aligns with previous approach adopted by Mogaji & Nguyen (2023) in their research exploring managers' understanding of artificial intelligence in relation to marketing financial services. Theoretically, this research builds on Mogaji & Nguyen’s (2022) framework, which examines AI in financial services marketing, focusing on the roles of regulators, developers, and banks in enhancing service delivery. We expand this by incorporating Ooi et al.’s (2023) exploration of Generative AI in banking, including data sources, use-case scenarios, and stakeholder implications. Additionally, we extend Huang et al.’s (2023) GenAI Adoption Maturity Framework, which outlines the stages of Generative AI adoption in financial institutions. Together, these frameworks highlight the transformative potential of Generative AI in improving banking products, services, and decision-making.

The findings of this study have significant theoretical and managerial implications. Theoretically, this research contributes to the understanding of AI integration in highly regulated industries, highlighting the unique challenges and considerations specific to financial services. Managerially, our insights can guide financial institutions and key stakeholders in developing strategies for adopting Generative AI, ensuring compliance with regulatory requirements, and addressing ethical concerns. By providing a roadmap for the practical implementation of Generative AI, this paper aims to help financial managers make informed decisions that balance innovation with responsibility, ultimately driving the industry forward.

# Literature review

## Digital Technology in Banking

The banking and financial services industry has been a pioneer in adopting digital technologies to streamline operations and enhance service delivery, with the impact of these advancements well-documented (Abdulquadri et al., 2021; Chan et al., 2022; Sampat et al., 2023). This journey began with the introduction of Automated Teller Machines (ATMs), a transformative innovation that revolutionized cash withdrawals and basic banking functions by providing customers with 24/7 access to their accounts (Mulu Zelie, 2023; Rugimbana & Iversen, 1994).

Following the success of ATMs, the industry expanded its digital offerings to include online and mobile banking, enabling customers to conduct a wide range of financial transactions remotely. Online banking, which gained prominence in the late 1990s and early 2000s, allowed consumers to manage their finances via websites, significantly enhancing convenience and accessibility (Sakas et al., 2024; Park et al., 2024). Mobile banking further advanced this trend by allowing users to monitor account activity, conduct transactions, and apply for loans directly from their smartphones (Bapat, 2022). These innovations have not only improved customer satisfaction but have also played a critical role in increasing financial inclusion, particularly in regions with limited access to traditional banking services (Soetan et al., 2021; Mulu Zelie, 2023).

## The Growth of FinTech and Neo-Banking

The rise of financial technology (FinTech) companies has introduced new dynamics into the banking industry, evolving alongside traditional banking technologies. The literature highlights FinTech's disruptive potential, with neo-banks like Revolut and Monzo offering innovative services such as fee-free currency exchange and instant international transfers, particularly appealing to younger, tech-savvy customers (Kwon et al., 2023). These institutions have effectively leveraged big data, machine learning, and artificial intelligence (AI) to analyse customer behaviour and deliver personalized financial products and services—areas where traditional banks have often struggled (Nguyen et al., 2022).

Mogaji (2023) argues that the advent of these technologies necessitates a redefinition of banking in the digital era. Understanding the evolving landscape and the impact of technological advancements is crucial for banks to navigate the challenges and opportunities presented by FinTech and digital transformation. FinTech companies, including app-only banks and fully digital neo-banks, have harnessed technology to provide streamlined, user-centric banking services that often surpass those of traditional banks. Nguyen and Mogaji (2022) note that COVID-19 accelerated the adoption of app-only banks, which effectively integrated FinTech to accommodate customers banking from home. Additionally, Park et al. (2024) highlights that low satisfaction and discomfort with traditional banks drive customers to switch to app-only banks, which use FinTech to enhance their relative advantage, compatibility, observability, and trialability.

Despite their innovative strides, FinTech companies still face challenges, particularly in areas such as regulatory compliance and customer trust (Mogaji & Nguyen, 2024). In response, traditional banks, with their established customer bases and regulatory expertise, have begun adopting FinTech-like innovations to remain competitive. This convergence marks a significant shift in the financial services landscape, where technology increasingly plays a central role in service delivery (Stefanelli & Manta, 2023; Mogaji, 2023).

## Artificial Intelligence in Financial Services

The rapid growth of fintech, driven by access to vast amounts of data and sustained consumer interest, has accelerated the adoption of artificial intelligence (AI) in financial services (Soetan et al., 2021; Mogaji & Nguyen, 2022). AI has emerged as a transformative force in the industry, with technologies like machine learning algorithms and natural language processing being employed to automate processes, enhance customer service, and improve decision-making in areas such as credit scoring, fraud detection, and investment management (Omoge et al., 2022; Abdulquadri et al., 2021; Mogaji et al., 2022).

One of the most prominent applications of AI in banking is the deployment of chatbots and virtual assistants (Abdulquadri et al., 2021; Balakrishnan et al., 2021). These AI-driven tools provide customer service by answering queries, processing transactions, and offering financial advice. AI-powered chatbots, for instance, have been shown to improve efficiency and customer satisfaction by providing instant, 24/7 support (Mogaji & Danbury, 2017; Sheth et al., 2022). Beyond customer service, AI is also used in more complex functions such as fraud detection and risk management. Machine learning algorithms can analyze vast amounts of transaction data in real-time to identify suspicious activity, thereby reducing fraud risk and enhancing transaction security (Mogaji et al., 2020). Additionally, AI-driven analytics are improving credit scoring and lending decisions, offering more accurate assessments of creditworthiness than traditional methods (Sheth et al., 2022).

However, while AI applications have brought significant benefits to the banking industry, they have also raised concerns about data privacy, algorithmic bias, and potential job displacement. Mogaji et al. (2020) explored the implications of AI on the digital marketing of financial services to vulnerable customers, highlighting issues related to data misuse and inappropriate targeting. Mogaji and Nguyen (2022) also noted that managers struggle with integrating AI into their business practices, and Sampat et al. (2023) discussed FinTech developers’ concerns about the dark sides of AI, such as embedded biases in algorithms and lack of control over outcomes. As AI continues to evolve, addressing these challenges will be crucial to ensure that the technology is used effectively and ethically (Omoge et al., 2022).

## The Emergence of Generative AI

As technology advances, tools like Generative AI are beginning to significantly impact the banking industry. Generative AI refers to a class of AI capable of creating new content—such as text, images, or even code—based on the data it has been trained on (Dwivedi et al., 2023; Ooi et al., 2023a). Unlike traditional AI, which typically operates on predefined rules, generative AI models can generate original content that mimics human creativity and understanding (Amankwah-Amoah et al., 2024).

In banking, Generative AI has the potential to revolutionize various aspects of operations, including customer service, fraud detection, and product development (Ooi et al., 2023a). For instance, it could be employed to create personalized financial reports for customers, generate realistic synthetic data for testing new financial products, or simulate market scenarios to assist in investment decisions (Graham, 2023; Yusof & Roslan, 2023). There is an increasing body of work exploring how Generative AI is transforming business operations across various industries, including banking, healthcare, and marketing (Dwivedi et al., 2023; Amankwah-Amoah et al., 2024). These studies underscore the potential of Generative AI to drive innovation and efficiency in business processes. In marketing, for example, Generative AI is used to create personalized content and advertising strategies that resonate more deeply with target audiences (Ooi et al., 2023).

However, despite growing interest in Generative AI, most existing studies are conceptual papers, opinion pieces, or systematic reviews that lack empirical data on its practical application in banking. For example, Dwivedi et al. (2023) offered multidisciplinary perspectives on the opportunities, challenges, and implications of generative conversational AI. Ooi et al. (2023) presented the potential of Generative Artificial Intelligence across disciplines. Desiraju and Khan (2024) used scenario-based insights to explore how Generative AI could enhance customer support services in banking but acknowledged the limited understanding of this technology's specific capabilities and its potential to transform customer service in the banking sector. Huang et al. (2023) conceptualized a four-level Adoption Maturity Framework for Financial Institutions using GenAI, ranging from Level 1 – Pilot Exploration, where banks begin to explore GenAI’s potential, to Level 4 – Scaled Integration, where GenAI is fully integrated across all business aspects to enhance products, services, and decision-making.

While these studies have laid the groundwork for theoretical exploration of Generative AI in banking, it is important to note that they often speculate on its potential uses and benefits. Except for Wu et al. (2023), who introduced BloombergGPT—a large language model specifically designed for the finance industry with 50 billion parameters—there is a noticeable gap in our understanding of the practical integration of Generative AI in financial services. This highlights the need for research that provides concrete evidence of how Generative AI is being implemented and what outcomes are being achieved (Sampat et al., 2023).

## Theoretical underpinning

This research is theoretically anchored on several established frameworks that examine the intersection of AI and financial services, providing a structured approach to understanding Generative AI's role in this sector. The foundation of our study builds on the framework developed by Mogaji & Nguyen (2022), which explores managers' understanding of AI in financial services marketing. Their framework underscores the critical roles of various stakeholders, including regulators, developers, and banks, in the collection and aggregation of data to enhance financial service provision. By recognizing the interplay between these entities, Mogaji & Nguyen’s framework provides a valuable lens through which to examine how AI technologies are currently being utilized in financial services. It highlights the importance of managerial awareness and preparedness, particularly in the context of marketing and consumer engagement. This research will extend their framework by applying it specifically to Generative AI, investigating how this advanced technology can be harnessed to further enhance financial services.

Building on the work of Ooi et al. (2023), this study also explores the broader potential of Generative AI across various disciplines, with a focus on its application in banking. Ooi et al.'s framework is crucial in understanding the data sources used for training Generative AI models, which is essential for ensuring the accuracy and reliability of AI-generated outputs. Additionally, their framework discusses various use-case scenarios, offering insights into how Generative AI can be implemented in practical settings, such as creating personalized financial reports or simulating market scenarios. This study expands on Ooi et al.'s work by not only exploring these scenarios but also examining the practical implications for stakeholders, including the challenges and opportunities that arise when integrating Generative AI into existing banking systems. By doing so, this research aims to provide a comprehensive understanding of the practical applications of Generative AI in financial services, moving beyond theoretical exploration to real-world implementation.

Furthermore, this study draws on the GenAI Adoption Maturity Framework for Financial Institutions developed by Huang et al. (2023), which outlines the stages that financial institutions undergo as they integrate Generative AI into their operations. The framework details a progression from Level 1 – Pilot Exploration, where institutions begin to explore GenAI’s potential, to Level 4 – Scaled Integration, where GenAI is fully embedded across all aspects of the business. This research will expand on Huang et al.'s framework by investigating how financial institutions can navigate this journey, particularly in the highly regulated banking sector, where trust and privacy are paramount. The study will explore the specific challenges that banks face at each stage of GenAI adoption and provide insights into how these institutions can achieve a successful integration that enhances their products, services, and decision-making processes. By combining these theoretical frameworks, this research aims to provide a holistic understanding of Generative AI's role in transforming the future of banking.

## Addressing the Research Gap

The integration of digital technology into banking has been a transformative force, driving innovation and improving service delivery across the industry. However, there are still significant gap that needs to be explored in context of AI in financial service. First. The lack of empirical research on generative ai in banking. As earlier discussed, previous studies on Generative AI in the banking sector have largely been speculative, consisting of opinion articles and commentary rather than rigorous empirical research (Dwivedi, et al., 2023; Desiraju & Khan, 2024; Huang, et al., 2023). These studies often present theoretical frameworks and potential benefits without providing concrete data or real-world examples of how Generative AI is being applied in banking. This lack of empirical evidence leaves a significant gap in understanding how these technologies perform in practice, how they are integrated into existing systems, and what specific impacts they have on operational efficiency and customer service. The present study aims to address this gap by providing empirical data on the implementation of Generative AI in banking and evaluating its practical outcomes and effectiveness.

Secondly, there is limited insight on managerial preparedness and interest in ai technologies. As Mogaji & Nguyen (2022) alluded in their study on managers' understanding of artificial intelligence in relation to marketing financial services, managers play a crucial role in the adoption and integration of new technologies, there is a need to understand their level of preparedness, interest, and challenges in adopting Generative AI. Previous research often overlooks the managerial perspective, focusing more on technological possibilities rather than on how these technologies are perceived and adopted by decision-makers. The present study seeks to fill this gap by examining how managers in the banking industry are preparing for and responding to the adoption of Generative AI, including their readiness to implement these technologies, the training required, and their concerns about potential obstacles.

Thirdly, the relevance and implementation challenges of Generative AI in a regulated sector is often overlooked. Generative AI is a growing trend, with adoption ranging from the interest ranging from tourism to creative industries (Amankwah-Amoah, et al., 2024; Dwivedi, et al., 2023) but its relevance and practical application in highly regulated sectors like financial services require careful examination (Farquhar & Meidan, 2017; Mogaji & Danbury, 2017; Soetan, et al., 2021). The financial industry is characterized by stringent regulatory requirements and a strong emphasis on trust and data privacy (Abdulquadri, et al., 2021). Generative AI technologies must navigate these regulatory landscapes while addressing issues such as data security, accuracy, and transparency. One significant concern is the potential for "hallucination," where AI models produce inaccurate or misleading information (Dwivedi, et al., 2023)Ooi, et al., 2023). Such errors could undermine trust and pose risks in a sector where accuracy and reliability are paramount. The present study aims to explore how Generative AI can be effectively and ethically integrated into financial services, considering the sector’s unique regulatory and trust requirements, and identifying the barriers to successful implementation.

By addressing these gaps, the study aims to offer a comprehensive understanding of Generative AI’s practical applications, managerial perspectives, and implementation challenges within the highly regulated financial services sector. Specifically, it will engage directly with bank managers to explore how Generative AI is being utilized, the challenges it presents, and its potential to drive innovation in financial services. This approach will provide a clearer picture of Generative AI's role and its future impact on the banking industry.

# Methodology

## Qualitative Insight and Exploratory Study

This study employs a qualitative approach, aiming to gain deep insights into bank managers' experiences and perceptions of Generative AI in financial services. Following the framework established by Mogaji and Nguyen (2022) in their exploration of managers' interactions with AI, this research is designed as an exploratory study. The objective is to uncover nuanced understandings and practical implications from the perspectives of those directly involved in the implementation and oversight of AI technologies within financial institutions. Through in-depth interviews, we seek to capture the complexities and challenges associated with integrating Generative AI in a highly regulated and sensitive industry.

## Sampling and Participants

Participants for this study were selected from a pool of bank managers across different regions of the world. Recruitment was conducted via LinkedIn, targeting individuals with job titles related to banking, corporate banking, and managerial roles. To ensure the authenticity and relevance of participants, we verified their affiliations by requesting contact through their official work email addresses. Meetings were scheduled over Zoom to facilitate a convenient and accessible platform for interviews. Efforts were made to achieve a globally representative sample, resulting in 36 participants. This number was determined to be sufficient as we reached saturation, with no new information emerging from subsequent interviews. Table 1 presents the demographics information of the participants.

Table 1: Demographic Information of Participants

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Participant Code | Geographical Region | Bank Type | Job Title | Years of Experience | Educational Background | Current AI and Technology Usage | Gender | Age |
| P01 | UK | Microfinance Bank | Branch Manager | 5-10 | Bachelor’s | 0-5 | Male | 31-40 |
| P02 | Spain | Commercial Bank | Corporate Banking Manager | 10-15 | Master’s | 5-10 | Female | 41-50 |
| P03 | Brazil | Investment Bank | Risk Manager | 15+ | PhD | 10-15 | Male | 51-60 |
| P04 | China | Commercial Bank | IT Manager | 5-10 | Master’s | 0-5 | Male | 31-40 |
| P05 | Saudi Arabia | Non-Interest Bank | Corporate Communications | 0-5 | Bachelor’s | 5-10 | Male | 18-30 |
| P06 | Nigeria | Microfinance Bank | Branch Manager | 10-15 | Master’s | 10-15 | Female | 31-40 |
| P07 | South Africa | Investment Bank | Corporate Banking Manager | 15+ | Bachelor’s | 5-10 | Male | 41-50 |
| P08 | India | Commercial Bank | Risk Manager | 0-5 | Bachelor’s | 0-5 | Male | 31-40 |
| P09 | USA | Investment Bank | IT Manager | 10-15 | Master’s | 10-15 | Male | 41-50 |
| P10 | Vietnam | Commercial Bank | Branch Manager | 5-10 | Bachelor’s | 5-10 | Male | 31-40 |
| P11 | Australia | Commercial Bank | Corporate Communications | 15+ | Master’s | 0-5 | Female | 41-50 |
| P12 | UK | Commercial Bank | IT Manager | 10-15 | Bachelor’s | 10-15 | Male | 41-50 |
| P13 | Spain | Investment Bank | Risk Manager | 5-10 | Master’s | 5-10 | Male | 31-40 |
| P14 | Brazil | Commercial Bank | Corporate Banking Manager | 0-5 | Bachelor’s | 0-5 | Female | 18-30 |
| P15 | Saudi | Non-Interest Bank | Branch Manager | 15+ | Bachelor’s | 10-15 | Male | 51-60 |
| P16 | Saudi Arabia | Non-Interest Bank | IT Manager | 5-10 | Master’s | 0-5 | Male | 31-40 |
| P17 | Nigeria | Commercial Bank | Risk Manager | 10-15 | Bachelor’s | 5-10 | Male | 41-50 |
| P18 | South Africa | Commercial Bank | Corporate Communications | 15+ | Bachelor’s | 10-15 | Female | 51-60 |
| P19 | India | Investment Bank | Branch Manager | 5-10 | Master’s | 0-5 | Male | 31-40 |
| P20 | USA | Microfinance Bank | Corporate Banking Manager | 10-15 | Bachelor’s | 5-10 | Female | 41-50 |
| P21 | Vietnam | Commercial Bank | Risk Manager | 15+ | Master’s | 10-15 | Male | 51-60 |
| P22 | Australia | Commercial Bank | IT Manager | 0-5 | Bachelor’s | 0-5 | Female | 31-40 |
| P23 | UK | Investment Bank | Corporate Communications | 10-15 | PhD | 5-10 | Non-Binary | 41-50 |
| P24 | Spain | Commercial Bank | Branch Manager | 15+ | Master’s | 10-15 | Female | 31-40 |
| P25 | Brazil | Commercial Bank | Corporate Banking Manager | 0-5 | Bachelor’s | 10-15 | Male | 41-50 |
| P26 | China | Commercial Bank | Risk Manager | 5-10 | Master’s | 5-10 | Female | 31-40 |
| P27 | Saudi Arabia | Commercial Bank | Branch Manager | 10-15 | PhD | 0-5 | Male | 51-60 |
| P28 | Nigeria | Commercial Bank | Corporate Communications | 15+ | Bachelor’s | 5-10 | Male | 41-50 |
| P29 | South Africa | Commercial Bank | IT Manager | 0-5 | Master’s | 10-15 | Female | 31-40 |
| P30 | India | Microfinance Bank | Corporate Banking Manager | 5-10 | PhD | 0-5 | Male | 31-40 |
| P31 | USA | Commercial Bank | Risk Manager | 10-15 | Bachelor’s | 5-10 | Male | 41-50 |
| P32 | Vietnam | Investment Bank | Branch Manager | 15+ | Master’s | 10-15 | Female | 51-60 |
| P33 | Australia | Commercial Bank | Corporate Communications | 0-5 | Bachelor’s | 0-5 | Male | 18-30 |
| P34 | UK | Commercial Bank | Risk Manager | 5-10 | Bachelor’s | 5-10 | Male | 41-50 |
| P35 | Spain | Investment Bank | IT Manager | 10-15 | Master’s | 0-5 | Female | 31-40 |
| P36 | Brazil | Commercial Bank | Corporate Banking Manager | 15+ | Bachelor’s | 10-15 | Male | 41-50 |

## Data Collection

Data collection was carried out through semi-structured interviews conducted over Zoom, enabling participation from a diverse geographical spread. Each interview lasted between 36 and 56 minutes, averaging 49 minutes. The third author, who was responsible for conducting the interviews, used a guide developed collaboratively by the research team. This guide ensured consistency across interviews while allowing flexibility for participants to elaborate on their experiences and insights. All interviews were recorded with the explicit permission and consent of the participants, who were assured of their anonymity and informed that the findings would be used solely for research purposes. The interviews were conducted in English to maintain uniformity in data collection.

## Data Analysis

The qualitative data obtained from the interviews were analysed using NVivo software, adhering to the six-phase thematic analysis approach outlined by Braun and Clarke (2006). This method involves familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. The process was also aligned with the approach adopted by Mogaji and Nguyen (2022), ensuring a rigorous and systematic analysis. This thematic analysis allowed us to identify and interpret patterns within the data, providing a comprehensive understanding of the participants' experiences and perceptions regarding Generative AI in financial services. The second author conducted the thematic analysis and initial coding, while the first author independently analysed the transcripts to ensure reliability. Coding disagreements were addressed through a structured process involving regular team meetings to discuss and reconcile discrepancies. Unresolved issues were referred to a senior colleague for impartial resolution. To enhance transparency, Appendix 1 includes a sample coding table illustrating the analytical process.

## Credibility

To ensure the validity and credibility of the research, several measures were implemented. Ethical procedures were strictly followed, including obtaining informed consent and guaranteeing participant anonymity. Member checking was employed, wherein preliminary findings were shared with participants to confirm the accuracy and authenticity of the data. Additionally, the research team engaged in regular debriefing sessions to discuss and refine the analysis, ensuring that the interpretations remained grounded in the data. These efforts collectively enhanced the trustworthiness of the study, providing robust and reliable insights into the integration of Generative AI in the financial sector.

In addition, we actively worked to enhance reflexivity by reflecting on our personal beliefs, values, biases, and experiences, and how these might influence the research process and its outcomes. We acknowledged that, as academic researchers, we are not experts in the design and development of Generative AI technology. Therefore, we made a conscious effort to critically engage with the literature and key stakeholders, including our participants. Throughout the research process, we regularly posed critical reflexive questions, prompting ongoing self-reflection and awareness. Regular peer debriefing sessions further allowed the team to reflect on their experiences and challenges, gaining external perspectives that helped mitigate personal biases.

# Findings

The study identifies five key themes in the adoption of Generative AI in banking: Recognition, Requirement, Reliability, Regulatory Compliance, and Responsiveness. These themes explore various facets of Generative AI integration and its impact, incorporating relevant participant quotes for deeper insight. Table 2 offers a detailed summary of these themes and their sub-themes, providing a clear and comprehensive overview of the study's findings.

## Requirement

Managers expressed significant concerns regarding the prerequisites for effectively deploying Generative AI in banking. A major issue highlighted was the availability and quality of data required for the algorithms. Unlike generic AI applications that draw on vast amounts of publicly available text data from the internet, Generative AI for financial services demands specialized, high-quality financial data to make informed decisions. Managers emphasized the need for access to comprehensive and accurate datasets, such as transaction histories, market data, and customer profiles. These datasets are often proprietary, meaning they are owned by the organization, collected internally, and not publicly available, giving the organization a competitive advantage. Additionally, the sensitive nature of this data—containing personal, confidential, or critical financial information like customer account details—requires strict protection to prevent misuse and ensure compliance with privacy regulations.

One Manager said:

*The financial sector operates on data that is not only highly specific but also critically important for maintaining regulatory compliance and ensuring accurate financial decision-making. We can’t just be creating and offering banking services like we are generating images or text. The stakes are very high here -* **P09, USA, Investment Bank, IT Manager**

Managers reiterated that transaction histories, market data, encompassing everything from stock prices to economic indicators are required to enable AI systems to forecast trends and make investment recommendations. Customer profiles, containing sensitive information about individuals' financial behaviours and preferences, are crucial for personalized financial services but require stringent data privacy measures.

Another critical requirement discussed was the need for specialized human resources. P05, from Saudi Arabia, who works in the Corporate Communications department of a Non-Interest Bank, noted: *"While tools like ChatGPT are versatile and publicly accessible, developing a Generative AI specifically tailored for financial services requires a different set of skills and expertise."*  This concern was further echoed by P13, a Risk Manager from an Investment Bank in Spain, who added:

*This* [idea of Generative AI] *is a very complex matter, data scientists with deep knowledge of financial systems, compliance experts to navigate regulatory landscapes, and technologists capable of integrating AI with existing banking infrastructure are needed to make this Generative AI practical for banking services.*

The complexity of financial data necessitates a workforce proficient not only in AI and machine learning but also in the nuances of financial operations and regulatory requirements.

Managers agreed that data scientists in this context must understand financial models and instruments to effectively train AI systems on relevant datasets. In addition, they noted that Compliance experts are essential to ensure that AI implementations adhere to the stringent regulations governing the financial sector, which vary across jurisdictions and involve complex legal and ethical considerations. Technologists, on the other hand, need to focus on developing and maintaining robust, scalable, and secure AI frameworks that can handle the vast amounts of data and computational power required for Generative AI.

Additionally, the technical capabilities of current AI systems were scrutinized, with managers emphasizing the necessity for robust, scalable, and secure AI frameworks that can handle the complexities of financial data and operations. P20, a Corporate Banking Manager at a Microfinance Bank in the USA, stated that: *The current state of AI technology, while advanced in many respects, still faces challenges in terms of scalability and security when applied to the financial sector.* From our engagement with the managers, we established that robustness in this context refers to the AI system's ability to provide accurate and reliable outputs even when faced with varying data quality and unexpected inputs. Likewise. scalability involves ensuring that the AI systems can process large volumes of data and transactions in real-time, a critical requirement for applications like high-frequency trading and real-time fraud detection. Security is a paramount concern due to the sensitive nature of financial data. P29, an IT Manager at a Commercial Bank in South Africa, emphasized:

"*AI systems must be protected against cyber threats and unauthorized access to safeguard the integrity and confidentiality of financial information.*" Managers also stressed the importance of continuous monitoring and updating AI systems to address emerging security vulnerabilities and ensure compliance with evolving regulatory standards.

## Reliability

Reliability emerged as a paramount concern among managers when considering Generative AI for financial decision-making. Managers acknowledged that while the capabilities of Generative AI are widely recognized, there is a growing demand for customized solutions that go beyond generic functionalities. The financial sector, with its high stakes and stringent accuracy requirements, necessitates AI tools that are not only reliable but also precise and trustworthy. An Australian IT manager shared her concern saying:

*In financial services, the accuracy and reliability of AI tools are critical because even minor errors can have significant repercussions, including financial loss, regulatory penalties, and damage to reputation, which no company wants to experience -* **P22, Australia, Commercial Bank , IT Manager**

Managers emphasized that financial institutions operate in a zero-tolerance environment for inaccuracies, meaning that AI systems must be meticulously tested and validated before deployment. Customized AI solutions tailored to the specific needs of financial services are essential to ensure that the AI's outputs align with the sector's exacting standards.

The fear of AI providing misleading or incorrect advice was a recurring theme throughout the discussions. P25, a Corporate Banking Manager at a Commercial Bank in Brazil, highlighted the significant risks of relying on AI for critical financial decisions, such as investment strategies, risk assessments, and customer advisory services. She explained:  
*"Incorrect AI-generated insights in these areas can lead to poor investment choices, increased exposure to financial risks, and suboptimal customer service, all of which can undermine trust in AI systems and the institutions that deploy them.".* Managers also expressed concerns about AI's potential failure to account for nuanced factors or rare but significant events, commonly referred to as "black swan" events, which could have a profound impact on financial outcomes. These unpredictable events pose substantial risks in financial decision-making, as AI systems might overlook or inadequately prepare for them, resulting in incorrect predictions or misguided strategies. The financial industry’s reliance on accuracy and the need to anticipate rare occurrences makes this a critical challenge for AI integration.

In addition to these concerns, the use of Generative AI in customer service adds another layer of complexity. Desiraju & Khan (2024) highlight the potential of Generative AI to create unique, personalized, and context-aware interactions, significantly enhancing customer experiences. However, while this capability for tailored content offers opportunities for deeper engagement, Chen et al (2023) raise concerns about the reliability of AI in replicating the nuance and understanding that human agents provide, particularly in high-stakes situations where precision and empathy are critical.

The combination of these factors underscores the dual challenge of leveraging Generative AI in banking—on one hand, offering more personalized and efficient customer service, and on the other, managing the risks associated with AI's limitations in predicting rare, critical financial events. This underscored the need for rigorous testing and validation of AI outputs, with many managers advocating for comprehensive quality assurance processes to ensure the reliability of AI-generated insights. P35, an IT Manager at an Investment Bank in Spain, shared her experience regarding issues with historical data in their AI program, saying:

*When moving to Generative AI in banking, it is imperative to involve extensive back-testing of AI models against historical data to verify their accuracy and robustness under various market conditions. Additionally, continuous monitoring and periodic recalibration of AI systems are necessary to maintain their reliability over time as market conditions and financial regulations evolve.*

Managers also stressed the importance of explainability in AI systems to maintain the integrity and accuracy of financial recommendations. Explainability refers to the AI system's ability to provide clear, understandable reasons for its decisions and predictions (Dwivedi, et al., 2021). In a sector where transparency and accountability are paramount, being able to explain how an AI reached a particular decision is crucial for gaining stakeholder trust and meeting regulatory requirements (Farquhar & Meidan, 2017; Mogaji & Nguyen, 2022). Managers called for AI models that are not only accurate but also interpretable, allowing financial professionals to understand and verify the AI's reasoning.

Moreover, managers emphasized the need for robust governance frameworks around the use of Generative AI in financial services. P31, a Risk Manager at a Commercial Bank in the USA, advised: *There is need to establish clear protocols for AI deployment, setting up oversight committees to review AI performance, and developing incident response plans to address any AI-related failures swiftly.* Such governance structures are essential to ensure that AI systems operate within defined ethical and operational boundaries, thereby enhancing their reliability and safeguarding against potential adverse outcomes.

## Regulatory

The regulatory environment in which financial services operate was identified as a significant barrier to the adoption of Generative AI. This aligns with previous findings around the technology adoption for financial services provision (Abdulquadri, et al., 2021; Stefanelli & Manta, 2023; Adeola, et al., 2021). Managers noted that financial institutions are inherently conservative in their approach to new technologies, primarily due to the need to protect customers and comply with strict regulatory standards. The complexity and rigidity of financial regulations pose a challenge for integrating AI technologies that are still evolving and may not yet fully meet regulatory requirements.

Regulatory compliance in the financial sector is crucial, encompassing numerous laws and guidelines designed to protect customer interests, maintain market integrity, and prevent financial crimes such as money laundering and fraud. Aldasoro et al. (2024) acknowledge the valid concerns surrounding the risks of AI in a heavily regulated industry. However, their survey of cybersecurity experts at major central banks reveals that most central banks have either already adopted or plan to adopt Generative AI tools for cybersecurity. This is largely because the perceived benefits of these tools, such as enhanced threat detection and response, outweigh the associated risks.

Managers interviewed in this study agreed that the benefits of Generative AI outweigh the risks. They noted that its ability to analyse vast amounts of data and generate valuable insights holds the potential to revolutionize many aspects of financial services, from decision-making to risk management and customer service. However, the evolving nature of AI technologies means that they often outpace the existing regulatory frameworks, creating uncertainty and risk for institutions looking to adopt them. P32, a Branch Manager at an Investment Bank in Vietnam, emphasized the tension between the innovative potential of Generative AI and the cautious stance of regulators. She explained:

*"While banks are eager to explore and exploit the capabilities of AI to improve efficiency, customer service, and decision-making processes, regulators require time to understand the implications of these technologies and establish appropriate frameworks to ensure their safe and responsible use."*

We found that this regulatory lag can hinder the pace of AI adoption in financial services, as institutions must wait for clear guidelines and approvals before fully implementing AI-driven solutions. This tension is exacerbated by the rapid pace of technological advancement compared to the slower, more deliberate process of regulatory change. Managers pointed out that regulators are tasked with a significant responsibility. P10, Branch Manager of a Commercial Bank in Vietnam said: *they [the regulators] must balance the need to foster innovation with the imperative to protect consumers and maintain the stability and integrity of the financial system.* This submission suggests that any new technology, including Generative AI, should undergo rigorous scrutiny to assess its impact on various aspects of financial operations and customer interactions. Managers emphasized the need for a balanced approach that fosters innovation while ensuring rigorous oversight and customer protection. P12, an IT Manager at a Commercial Bank in the UK, suggested:

*Regulators could adopt more adaptive and flexible regulatory frameworks that can evolve in tandem with technological advancements. For example, regulatory sandboxes—controlled environments where new technologies can be tested under the supervision of regulators—were mentioned as a potential solution. These sandboxes allow financial institutions to experiment with AI applications while ensuring compliance with essential regulatory standards -*

Furthermore, managers highlighted the importance of proactive engagement between financial institutions and regulators. P17 reflecting on the intricacies in regulating financial services in developing country, called for open dialogue and collaboration, saying:

*There should be open dialogue between the stakeholder to help bridge the gap between innovation and regulation, enabling a mutual understanding of the benefits and risks associated with Generative AI. By working together, banks and regulators can develop guidelines that support the responsible deployment of AI technologies, addressing concerns related to data privacy, security, and ethical considerations -* **P17, Nigeria, Commercial Bank, Risk Manager.**

Additionally, managers highlighted the necessity of continuous education and training for both regulators and financial professionals. P23, a Corporate Communications professional from an Investment Bank in the UK, stated: "*Despite the developed nature of financial services regulation in the UK, AI technologies are evolving, and it is important to stay informed about the latest developments and understand their implications for our business operations*." P27, a Branch Manager at a Commercial Bank in Saudi Arabia, echoed this sentiment, adding: "*Regulators need to be equipped with the knowledge and tools to assess AI systems effectively, while financial institutions must ensure that their staff can manage and oversee AI applications in compliance with regulatory standards*." These vignettes underscores the crucial importance of continuous education and training as AI technologies, particularly Generative AI, evolve rapidly in financial services. As AI becomes more integrated into critical areas like decision-making and customer service, staying updated is essential for both regulators and financial professionals to ensure ethical use, compliance, and effective risk management.

## Responsibilities

A critical issue raised by managers was the question of responsibility for the outputs and decisions generated by Generative AI. This concern touches on several layers of accountability, from the developers who create the AI systems to the banks that deploy them and the customers who ultimately use the AI-driven services. The complexity of assigning responsibility becomes evident when considering the multifaceted nature of AI's role in financial decision-making, where errors or biases in AI outputs can have significant financial and reputational consequences.

The ambiguity surrounding responsibility has made some organizations hesitant to fully embrace Generative AI. Managers expressed that without clear guidelines on accountability, institutions may be reluctant to deploy AI systems, fearing potential legal and financial repercussions from erroneous or harmful outputs. For instance, P26, a Risk Manager at a Commercial Bank in China, shared their thoughts, stating: *If an AI system provides incorrect investment advice leading to substantial financial losses, it is unclear whether the liability falls on the developers who designed the system, the banks that implemented it, or the regulatory bodies that oversaw its deployment.*

From our engagement with the managers, there is the notion that developers are responsible for ensuring the integrity and performance of their AI models. The managers agree that the developers must design and test algorithms rigorously to minimize errors and biases. However, their responsibility may be limited once the AI system is in use, and they [the developers] may not have control over how the system is implemented or interpreted in real-world scenarios. This creates a grey area regarding their liability for decisions made by the AI once it is operational.

It is important to note that managers recognize their financial institutions are responsible for overseeing the deployment and operation of AI systems. Banks must establish strong oversight mechanisms to monitor AI performance and intervene when necessary, including setting procedures for handling disputes and errors, while ensuring AI is used appropriately by staff. P28, a Corporate Communications professional at a Commercial Bank in Nigeria, noted:

*"It is expected that my organization must ensure these systems are integrated into our existing processes in a way that aligns with regulatory standards and ethical practices. I must feel safe and reassured in using the system to enhance my work."*

Managers also highlighted the critical role of regulators in providing comprehensive frameworks for accountability. P24, a Branch Manager at a Commercial Bank in Spain, stressed: *"Regulators also need to address ethical concerns related to AI, such as fairness, transparency, and the prevention of discrimination."* This concern was further echoed by P30, a Corporate Banking Manager at a Microfinance Bank in India, who added:

*"Regulators must develop clear guidelines that define the roles and responsibilities of developers, financial institutions, and other stakeholders. This includes creating standards for the development, deployment, and oversight of AI technologies to ensure all parties understand their obligations and liabilities."*

Our analysis shows that without clear guidelines regarding the responsibilities related to Generative AI, the potential legal and ethical ramifications of AI errors could stifle innovation and adoption within the industry. The fear of litigation and reputational damage may discourage financial institutions from fully embracing Generative AI, despite its significant potential benefits. These concerns align with Bhattacharya & Aoun (2024), who emphasize the ethical challenges of using Generative AI in banking, noting that issues like algorithmic bias, fairness, and accountability become critical when AI systems are used to influence important financial decisions. To mitigate these concerns, it is essential for the industry to establish well-defined accountability structures that address the responsibilities of all parties involved. This includes developing legal frameworks that clearly outline liability in cases of AI-related failures and providing mechanisms for dispute resolution.

Moreover, managers highlighted the need for ongoing dialogue between developers, financial institutions, and regulators to continually refine and update accountability frameworks as AI technology evolves. P36, a Corporate Banking Manager at a Commercial Bank in Brazil, stated: *This collaborative approach can help ensure that accountability structures remain relevant and effective, addressing new challenges and risks as they arise.* By establishing robust frameworks for accountability and engaging in continuous dialogue, the financial sector can better manage the risks associated with AI and harness its potential for innovation and efficiency.

## Responsiveness

In response to the challenges associated with adopting Generative AI in financial services, managers discussed a range of proactive measures and strategic considerations that their companies are undertaking. They emphasized that, given the significant concerns related to responsibility, data quality, and regulatory compliance, financial institutions are exploring various approaches to integrate AI technologies in a way that balances innovation with caution.

One notable initiative highlighted by managers is the exploration of the Bloomberg GPT approach, which involves developing specialized AI tools tailored specifically for financial contexts (Wu et al , 2023). 19 of the 36 participants mentioned this Bloomberg GPT as a practical example of how Generative Ai can be used for financial service provision, albeit on an investment scale and not retail or for commercial banking. These managers noted that the Bloomberg GPT approach address several concerns at once: by creating proprietary AI systems, banks gain full control over the development and implementation of these tools. This customization allows institutions to ensure that the AI models are closely aligned with their specific operational needs and regulatory requirements. Furthermore, proprietary systems can be designed to handle the unique data sets of financial institutions, ensuring higher data quality and relevance, which are crucial for accurate and reliable AI outputs.

Managers are also considering a variety of strategies to integrate Generative AI into their operations. One approach involves developing in-house AI capabilities. This aligns with the GenAI Adoption Maturity Framework for Financial Institutions as developed by (Huang, et al., 2023) where this strategy allows financial institutions to build AI systems from the ground up, tailored specifically to their requirements and controlled entirely within their organizational framework. Developing in-house capabilities provides greater flexibility and control over the AI tools, enabling institutions to fine-tune the technology to meet their unique needs and regulatory standards.

Alternatively, some managers are exploring collaborations with established AI providers to leverage existing AI infrastructure. P33, a Corporate Communications professional at a Commercial Bank in Australia, explained:

*"We are partnering with AI experts to access advanced technologies and expertise that may not be available internally. We hope this collaboration will enable faster and more efficient deployment of AI tools, as they can build on our experience and technology stack."*

However, P18, a Corporate Communications professional at a Commercial Bank in South Africa, expressed concerns about such partnerships, noting:

*"I must highlight that these partnerships [with AI companies] require careful management to ensure the AI systems align with our company’s specific needs and comply with regulatory requirements."*

Managers acknowledged the necessity of ongoing evaluation and adjustment of AI strategies to keep pace with evolving technological capabilities, regulatory landscapes, and customer expectations. The dynamic nature of AI technology and the financial sector means that strategies must be flexible and adaptable. Regular assessments of AI systems, along with updates to address new technological advancements, regulatory changes, and shifts in customer preferences, are essential to maintaining the effectiveness and relevance of AI tools.

By sharing these insights, managers underscored the importance of adopting a measured and informed approach to AI adoption in financial services. P16, an IT Manager at a Non-Interest Bank in Saudi Arabia, emphasized the importance of continuous learning, collaboration, and adaptation in navigating the complex interplay of technology, regulation, and customer trust. He noted: *"This is crucial not just for Generative AI, but also for addressing the broader concerns surrounding technology adoption in banking."* We can therefore deduce from our analysis that financial institutions must remain proactive in addressing emerging challenges and opportunities, ensuring that their AI strategies are both innovative and responsible. By focusing on continuous evaluation and adaptation, institutions can effectively manage the risks and harness the potential benefits of AI, ultimately leading to more informed and responsible AI adoption in the financial sector.

Table 2 consolidates the key themes and their sub-themes, offering a structured overview of how each aspect influences the integration and impact of Generative AI in banking. It serves as a comprehensive reference for understanding the intricate dynamics and insights drawn from the qualitative data.

Table 2: Comprehensive Overview of Key Themes, Sub-Themes, and Considerations in Generative AI Deployment for Banking.

|  |  |  |
| --- | --- | --- |
| **Main Theme** | **Description** | **Sub Themes** |
| Requirement | *The successful deployment of generative AI in banking demands high-quality financial data, specialized human resources like data scientists and compliance experts, and robust technical systems. Institutions must also ensure compliance with regulations and adopt strategic approaches such as in-house development and continuous evaluation.* | Data Availability and Quality |
| Need for Specialized Human Resources |
| Technical Capabilities of AI Systems |
| Challenges in Regulatory Compliance |
| Strategic Responses and Adaptation |
| Reliability | *AI solutions in banking must be highly reliable, providing precise, customized outputs validated for accuracy. Continuous monitoring and governance are essential to build trust and ensure regulatory compliance. There is a focus on explainability and the transparency of AI outputs*. | Customization and Precision |
| Accuracy and Validation |
| Risk of Misleading Advice |
| Explainability and Transparency |
| Governance and Oversight |
| Regulatory | *Banks face significant challenges in balancing innovation with regulatory requirements. Regulatory sandboxes and proactive engagement with regulators are suggested strategies to ensure compliance while fostering innovation.* | Regulatory Barriers and Compliance |
| Tension Between Innovation and Regulation |
| Adaptive and Flexible Regulatory Approaches |
| Proactive Engagement and Collaboration |
| Education and Training |
| Responsibilities | *Responsibility for Generative AI outputs is divided among developers, financial institutions, and regulators. Each has specific duties to ensure fairness, mitigate risks, and uphold legal and ethical standards. Clear accountability and collaboration are necessary for effective governance.* | Accountability for AI Outputs |
| Developer responsibilities |
| Financial institution responsibilities |
| Regulatory responsibilities |
| Mitigating Risks and Promoting Innovation |
| Legal and Ethical Frameworks |
| Responsiveness | *To ensure flexibility and continual improvement, banks should invest in both in-house AI development and collaboration with external providers. Ongoing evaluation and a balanced, informed approach are vital to maintain responsiveness to emerging trends and challenges in AI deployment.* | Development of Specialized AI Tools |
| In-house ai development |
| Collaboration with External AI Providers |
| Ongoing Evaluation and Adjustment |
| Measured and Informed Approach to AI Adoption |

# Discussion

The findings from this study underscore a pivotal shift in banking technology, aligning with the evolving landscape outlined in the literature. The adoption of Generative AI in banking, as demonstrated by the results, builds on the industry’s historical trend towards digitalization—starting from the introduction of ATMs to the rise of online and mobile banking (Sakas et al., 2024; Mulu Zelie, 2023). This progression illustrates a continual drive for technological advancements aimed at enhancing service delivery and customer engagement. The current study’s observations that Generative AI is beginning to play a transformative role in operations such as personalized financial reporting and market scenario simulation resonate with the broader trends highlighted by previous research (Graham, 2023; Yusof & Roslan, 2023).

However, while the potential benefits of Generative AI are substantial, the empirical evidence from this study also exposes critical gaps that echo the issues identified in the literature. The lack of concrete data on the practical integration of Generative AI in banking reflects a broader deficiency in empirical research within this domain (Dwivedi et al., 2023; Huang et al., 2023). This finding highlights the need for more rigorous investigations into how Generative AI technologies are implemented and their real-world impacts. The study’s results align with the literature’s call for further exploration into the effectiveness of these technologies, moving beyond theoretical discussions to provide actionable insights and data-driven evaluations.

Moreover, the challenges observed in managing and integrating Generative AI, particularly in a highly regulated sector like banking, emphasize the complexities noted in prior studies (Farquhar & Meidan, 2017; Abdulquadri et al., 2021). Issues related to data privacy, algorithmic biases, and regulatory compliance continue to pose significant hurdles, as outlined by the literature. The findings reflect these concerns, suggesting that while Generative AI holds promise for innovation, its integration must be handled with careful consideration of regulatory requirements and ethical implications. This critical reflection not only aligns with existing research but also underscores the importance of addressing these challenges to effectively harness the benefits of Generative AI in the banking industry.

## Theoretical Contribution

This study makes significant theoretical contribution by directly addressing the critical gaps in the literature regarding the integration of Generative AI in financial services.

First, it confronts the pressing need for empirical research in this area, moving beyond the speculative nature of existing studies. Previous research has largely been theoretical or opinion-based, lacking the rigorous empirical data necessary to understand the real-world applications and outcomes of Generative AI in banking (Dwivedi et al., 2023; Desiraju & Khan, 2024; Huang et al., 2023). By providing concrete evidence from managers working on implementations of Generative AI in the banking sector, this study fills a crucial void. It offers insights into how these technologies are being integrated into existing systems, their impact on operational efficiency, and their effect on customer service. This empirical approach not only enriches the academic discourse but also provides practical guidance for financial institutions considering the adoption of Generative AI.

Second, the study addresses the underexplored area of managerial preparedness and interest in adopting AI technologies. Managers are pivotal in the successful integration of new technologies, yet their perspectives have been largely overlooked in the context of Generative AI (Mogaji & Nguyen, 2022). By examining how banking managers perceive, prepare for, and respond to the challenges and opportunities presented by Generative AI, this study highlights the critical human factors that influence technology adoption. It provides a nuanced understanding of managerial readiness, identifying gaps in knowledge, training needs, and potential obstacles that could hinder the effective deployment of AI. This focus on the managerial perspective bridges the gap between technological potential and practical implementation, offering valuable insights for both researchers and practitioners.

Third, the study delves into the often-overlooked challenges of implementing Generative AI in a highly regulated sector. While Generative AI has seen interest and adoption in less regulated industries, such as tourism and the creative arts (Amankwah-Amoah et al., 2024; Dwivedi et al., 2023), its application in the financial sector presents unique challenges. Financial services are governed by stringent regulatory requirements and a strong emphasis on trust, data privacy, and accuracy (Abdulquadri et al., 2021; Ooi et al., 2023). This study critically examines how Generative AI can be integrated into this regulatory environment, addressing potential issues such as data security, transparency, and the risk of AI-generated inaccuracies or "hallucinations." By doing so, it offers a comprehensive framework for understanding the regulatory and ethical challenges associated with Generative AI in banking and provides strategies for mitigating these risks.

## Managerial implications

This study benefits financial managers, data scientists, compliance professionals, regulators, and AI providers. It offers insights into effective AI integration, data management, regulatory compliance, and risk mitigation, helping these stakeholders navigate Generative AI’s complexities and optimize its use in the financial sector.

Bank managers and executives must prioritize optimizing data management and technical infrastructure to effectively deploy Generative AI. This requires investing in high-quality specialized financial data, which includes detailed records of customer transactions, market data, and customer profiles. Transaction histories help analyse financial behaviour, detect fraud, and predict trends, while market data informs investment decisions. Customer profiles, which contain sensitive financial information, enable personalized services. To ensure accuracy and privacy, robust data governance frameworks are essential for the secure and effective use of AI in the financial industry. Managers should also prioritize building or acquiring specialized human resources, including data scientists and compliance experts, to navigate the complexities of AI integration. Additionally, fostering a culture of continuous evaluation and adaptation is crucial, as it allows institutions to stay ahead of technological advancements and regulatory changes. By addressing these areas, managers can enhance operational efficiency, mitigate risks, and drive innovation in their banking operations.

Data scientists and AI specialists should concentrate on developing and maintaining advanced AI models tailored specifically for the financial sector. This involves focusing on creating algorithms that can handle the intricacies of financial data, ensuring both reliability and security. They need to collaborate closely with compliance experts to integrate regulatory requirements into AI systems, ensuring that models are both effective and compliant. Continuous learning and adaptation are essential, as evolving financial landscapes and technological advancements require ongoing refinement of AI tools. By aligning their expertise with industry-specific needs and regulatory standards, data scientists can contribute to the successful deployment and operation of Generative AI in financial services.

Compliance and risk management professionals should establish comprehensive frameworks to ensure that Generative AI systems adhere to regulatory requirements and ethical standards. This includes developing protocols for monitoring AI performance, addressing potential biases, and ensuring transparency in AI decision-making processes. They must work closely with AI developers and financial managers to create robust governance structures that delineate responsibilities and manage risks effectively. Proactive engagement with regulators and ongoing training in AI technology are also crucial to staying informed about evolving regulations and best practices. By implementing these measures, compliance professionals can help mitigate legal and operational risks associated with AI deployment in financial services.

Regulatory bodies and policymakers should develop adaptive and flexible regulatory frameworks that can keep pace with the rapid advancements in AI technology. This involves creating clear guidelines for the development, deployment, and oversight of Generative AI systems, while balancing innovation with consumer protection. Implementing regulatory sandboxes can facilitate safe experimentation with AI technologies, allowing financial institutions to test new solutions under regulatory supervision. Continuous dialogue with financial institutions and AI developers is essential to understand emerging risks and benefits, ensuring that regulations are both effective and practical. By fostering collaboration and staying abreast of technological developments, regulators can support responsible AI adoption while safeguarding the financial system's integrity.

Financial institutions and banks should explore various strategies for integrating Generative AI, including developing proprietary systems or partnering with AI technology providers. They need to ensure that AI tools are customized to their specific operational needs and regulatory requirements, which may involve investing in in-house development or leveraging external expertise. Establishing clear oversight mechanisms and governance structures is critical for managing AI systems' performance and addressing any issues that arise. Additionally, institutions should maintain flexibility in their AI strategies, continuously evaluating and adjusting them to adapt to technological advancements and regulatory changes. By adopting these practices, banks can effectively harness the benefits of AI while managing associated risks and challenges.

AI technology providers should focus on developing solutions that are specifically tailored to the needs of the financial sector, incorporating features that address industry-specific challenges such as data quality, regulatory compliance, and security. They must work closely with financial institutions to understand their requirements and ensure that their AI systems align with regulatory standards and operational needs. Investing in secure and scalable technologies is essential to meet the demands of large-scale financial applications. Additionally, AI providers should engage in proactive communication with regulators to contribute to the development of relevant guidelines and standards. By aligning their offerings with the unique needs of the financial sector and collaborating with stakeholders, AI technology providers can drive successful adoption and integration of Generative AI in financial services.

# Conclusion

The integration of Generative AI in financial services holds tremendous potential for transforming the industry through automation, personalized services, and enhanced decision-making capabilities. This study provides a nuanced understanding of the challenges and opportunities associated with implementing Generative AI in a highly regulated and sensitive sector. By exploring the experiences and insights of bank managers from around the world, we have uncovered key considerations that financial institutions must address to successfully adopt and leverage AI technologies. Our findings contribute to the broader discourse on AI integration, offering valuable insights for both theoretical development and practical application.

While this research offers significant insights, it is not without limitations. Although we aimed for a globally representative sample, the qualitative nature of the study and the specific cohort of bank managers interviewed may limit the generalizability of the findings. The opinions and perspectives gathered reflect the personal experiences and understandings of the managers rather than the official stances of their respective institutions. This subjective element means that while the study provides in-depth insights, it may not capture the full spectrum of organizational viewpoints or account for all contextual factors influencing AI adoption in different regions and institutions.

Future research should build on the insights provided by this study through more extensive, quantitative investigations. A global quantitative survey could offer a broader understanding of the adoption and impact of Generative AI in financial services, capturing a wider range of perspectives and experiences across different types of financial institutions and geographical regions. Additionally, exploring consumer awareness and perceptions of Generative AI in financial services is crucial. Understanding how customers view AI-driven services, their concerns about data privacy and security, and their overall acceptance of AI solutions can provide financial institutions with the information needed to tailor their strategies effectively. This dual focus on organizational and consumer perspectives will be essential for comprehensively assessing the potential and limitations of Generative AI in the financial sector.

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# References

Abdulquadri, A., Mogaji, E., Kieu, T. & Nguyen, P., 2021. Digital transformation in financial services provision: a Nigerian perspective to the adoption of chatbot. *Journal of Enterprising Communities: People and Places in the Global Economy,* 15(2), pp. 258-281.

Adeola, O., Hinson, R., Nguyen, N. & Soetan, T., 2021. Marketing bank services to financially vulnerable customers: evidence from an emerging economy. *International Journal of Bank Marketing,* 39(3), pp. 402-428.

Aldasoro, I., Doerr, S., Gambacorta, L., Notra, S., Oliviero, T., & Whyte, D. (2024). Generative artificial intelligence and cyber security in central banking. *Journal of Financial Regulation*, fjae008.

Amankwah-Amoah, J. et al., 2024. The impending disruption of creative industries by generative AI: Opportunities, challenges, and research agenda. *International Journal of Information Management,* Volume 102759.

Balakrishnan, J., Nwoba, A. & Nguyen, N., 2021. Emerging-market consumers’ interactions with banking chatbots. *Telematics and Informatics,* Volume 65, p. 101711.

Bapat, D., 2022. Exploring the relationship between lifestyle, digital financial element and digital financial services experience. *International Journal of Bank Marketing,* 40(2), pp. 297-320.

Chang, V. et al., 2020. How Blockchain can impact financial services–The overview, challenges and recommendations from expert interviewees. *Technological forecasting and social change,* Volume 158, p. 120166.

Chan, R., Troshani, I., Rao Hill, S. & Hoffmann, A., 2022. Towards an understanding of consumers’ FinTech adoption: the case of Open Banking. *International Journal of Bank Marketing,* 40(4), pp. 886-917.

Chen, B., Wu, Z., & Zhao, R. (2023). From fiction to fact: the growing role of generative AI in business and finance. *Journal of Chinese Economic and Business Studies*, 21(4), 471-496.

David-West, O., Iheanachor, N. & Umukoro, I., 2020. Sustainable business models for the creation of mobile financial services in Nigeria. *Journal of Innovation & Knowledge,* 5(2), pp. 105-116.

Dwivedi, Y. et al., 2023. So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management,* Volume 71, p. 102642..

Fanning, K. & Centers, D., 2016. Blockchain and its coming impact on financial services. *Journal of Corporate Accounting & Finance,* 27(5), pp. 53-57.

Farinloye, T., Wayne, T., Mogaji, E. & Soetan, T., 2020. Nigerian Banking Services: a systematic literature review and research agenda. *Research Agenda Working Papers,* 2020(9), pp. 92-107.

Farquhar, J. & Meidan, A., 2017. *Marketing financial services.* London: Bloomsbury Publishing.

Graham, S., 2023. Majority of European financial services leaders expect Generative AI to significantly affect productivity and change roles – but many firms still lack plans to upskill their workforce. [Online]   
Available at: https://www.ey.com/en\_gl/news/2023/10/majority-of-european-financial-services-leaders-expect-generative-ai-to-significantly-affect-productivity-and-change-roles-but-many-firms-still-lack-plans-to-upskill-their-workforce

Kwon, K., Molyneux, P., Pancotto, L. & Reghezza, A., 2023. Banks and FinTech acquisitions. *Journal of Financial Services Research,* Volume https://doi.org/10.1007/s10693-022-00396-x, pp. 1-35.

Lee, C. & Pan, L., 2023. Smile to pay: predicting continuous usage intention toward contactless payment services in the post-COVID-19 era. *International Journal of Bank Marketing,* 41(2), pp. 312-332.

Levy, S., 2022. Brand bank attachment to loyalty in digital banking services: mediated by psychological engagement with service platforms and moderated by platform types. *International Journal of Bank Marketing,* 40(4), pp. 679-700.

Lyu, V., Chin, W., Zhang, H. & Liu, V., 2022. Value added or overload? A study of the countervailing effects of non‐core features on mobile banking apps. *Journal of Consumer Behaviour,* 21(3), pp. 602-613.

Mogaji, E., 2023. Redefining banks in the digital era: a typology of banks and their research, managerial and policy implications. *International Journal of Bank Marketing,* 41(7), pp. 1899-1918.

Mogaji, E., Czarnecka, B. & Danbury, A., 2018. Emotional appeals in UK business-to-business financial services advertisements. *International Journal of Bank Marketing,* 36(1), pp. 208-227.

Mogaji, E. & Danbury, A., 2017. Making the brand appealing: advertising strategies and consumers’ attitude towards UK retail bank brands. *Journal of Product & Brand Management,,* 26(6), pp. 531-544.

Mogaji, E. et al., 2022. Guest editorial: Artificial intelligence in financial services marketing. *International Journal of Bank Marketing,* 40(6), pp. 1097-1101.

Mogaji, E. & Jain, V., 2024. How Generative AI is (will) change Consumer Behaviour: Postulating the potential impact and implications for research, practice, and policy. *Journal of Consumer Behaviour.* *23* (5), pp 2379-2389

Mogaji, E. & Nguyen, N., 2022. Managers' understanding of artificial intelligence in relation to marketing financial services: insights from a cross-country study. *International Journal of Bank Marketing,* 40(6), pp. 1272-1298.

Mogaji, E. & Nguyen, P., 2024. High street banking on the app: branding strategies of traditionally-driven neobanks. *International Journal of Bank Marketing,* pp. https://doi.org/10.1108/IJBM-12-2022-0529.

Mogaji, E., Soetan, T. & Kieu, T., 2020. The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers. *Australasian Marketing Journal,* 29(3), pp. 235 - 242.

Mulu Zelie, E., 2023. Factors determining bank selection by micro- and small-sized enterprises: evidence from Ethiopia. *International Journal of Bank Marketing,* 41(6), pp. 1239-1260.

Murinde, V., Rizopoulos, E. & Zachariadis, M., 2022. The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis,* Volume 81, p. 102103.

Nguyen, N. & Mogaji, E., 2022. #BankFromHome: Using Advertisement Campaigns to Change Banking Behaviour During the COVID-19 Pandemic in an Emerging Economy. In: O. Adeola, R. Hinson & A. Sakkthivel, eds. *Marketing Communications and Brand Development in Emerging Markets Volume II.* Cham: Springers, p. 83–108.

Nguyen, N. & Mogaji, E., 2022. Redefining banking service delivery: Information technology adoption by UK banks amid the COVID-19 pandemic. In: *Management and Information Technology in the Digital Era: Challenges and Perspectives.* Bradford: Emerald, pp. 95-110.

Nguyen, Y., Tapanainen, T. & Nguyen, H., 2022. Reputation and its consequences in Fintech services: the case of mobile banking. *International Journal of Bank Marketing,* 40(7), pp. 1364-1397.

Omoge,, A., Gala, P. & Horky, A., 2022. Disruptive technology and AI in the banking industry of an emerging market. *International Journal of Bank Marketing,* 40(6), pp. 1217-1247.

Ooi, K. et al., 2023a. The Potential of Generative Artificial Intelligence Across Disciplines: Perspectives and Future Directions. *Journal of Computer Information Systems,* Volume https://doi.org/10.1080/08874417.2023.2261010, pp. 1-32.

Ooi, K. et al., 2023. Banking in the metaverse: a new frontier for financial institutions. *International Journal of Bank Marketing,* pp. https://doi.org/10.1108/IJBM-03-2023-0168.

Pal, A., Tiwari, C. & Behl, A., 2021. Blockchain technology in financial services: a comprehensive review of the literature. *Journal of Global Operations and Strategic Sourcing,* 14(1), pp. 61-80.

Park, J., Yoo, J., Cho, Y. & Park, H., 2024. Understanding switching intentions between traditional banks and Internet-only banks among Generation X and Generation Z. *International Journal of Bank Marketing,* 42(5), pp. 1114-1141.

Rugimbana, R. & Iversen, P., 1994. Perceived Attributes of ATMs and Their Marketing Implications. *International Journal of Bank Marketing,* 12(2), pp. 30-35.

Sakas, D., Giannakopoulos, N. & Trivellas, P., 2024. Exploring affiliate marketing's impact on customers' brand engagement and vulnerability in the online banking service sector. *International Journal of Bank Marketing,* 42(6), pp. 1282-1312.

Sampat, B., Mogaji, E. & Nguyen, N., 2023. The dark side of FinTech in financial services: a qualitative enquiry into FinTech developers’ perspective. *International Journal of Bank Marketing,,* pp. https://doi.org/10.1108/IJBM-07-2022-0328.

Sheth, J., Jain, V., Roy, G. & Chakraborty, A., 2022. AI-driven banking services: the next frontier for a personalised experience in the emerging market. *International Journal of Bank Marketing,* 40(6), pp. 1248-1271.

Soetan, T., Mogaji, E. & Nguyen, N., 2021. Financial services experience and consumption in Nigeria. *Journal of Services Marketing,* 35(7), pp. 947-961.

Stefanelli, V. & Manta, F., 2023. Digital Financial Services and Open Banking Innovation: Are Banks Becoming ‘invisible’?. *Global Business Review,* pp. 1-18.

Appendix 1: Coding table illustrating the analytical process from raw interview quotes to initial codes and final themes.

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| --- | --- | --- |
| **Raw Quote** | **Initial Code** | **Final Theme** |
| "The financial sector operates on data that is not only highly specific but also critically important for maintaining regulatory compliance." | "Importance of specialized data" | "Requirement: Data Availability and Quality" |
| "Incorrect AI-generated insights in these areas can lead to poor investment choices and increased financial risks." | "AI risk in decision-making" | "Reliability: Impact of AI Accuracy on Trust" |
| "AI systems must be robust, scalable, and secure to manage financial operations effectively." | "AI operational requirements" | "Requirement: Technical Capabilities" |
| "Regulators require time to understand these technologies before approving widespread adoption." | "Regulatory lag" | "Regulatory: Barriers to AI Adoption" |
| "AI systems must be protected against cyber threats and unauthorized access to safeguard financial information." | "Need for AI security measures" | "Requirement: Technical Capabilities" |
| "Banks must establish oversight committees to monitor AI performance and handle failures swiftly." | "AI governance mechanisms" | "Reliability: Governance Frameworks" |
| "Managers need extensive training to understand AI systems and ensure compliance with regulatory requirements." | "Managerial training needs" | "Requirement: Specialized Human Resources" |
| "Collaboration between financial institutions and regulators is necessary to develop clear guidelines for AI use." | "Stakeholder collaboration" | "Regulatory: Proactive Engagement with Regulators" |
| "Generative AI can enhance customer experiences but must be explainable to maintain trust and meet regulatory standards." | "Need for AI explainability" | "Reliability: Trust in AI Systems" |
| "The sensitive nature of customer profiles demands strict privacy protections in AI applications." | "Data privacy concerns" | "Requirement: Data Availability and Quality" |

**Explanation of the Table**

* **Raw Quote**: Verbatim excerpts from interview transcripts that form the foundation of the analysis.
* **Initial Code**: A concise label summarizing the central idea of the quote, capturing its essence for later thematic grouping.
* **Final Theme**: Broader thematic categories that emerge from grouping related codes and provide meaningful insight into the research findings.

This table demonstrates a clear progression from raw data to thematic insight, showcasing the depth and rigor of the analysis.