Proceedings of the 3rd International Conference on Software Engineering and Machine Learning
DOI: 10.54254/2755-2721/138/2025.21371

From Brick-and-Mortar to Digital-First Banking: Assessing the Impact of Generative AI on Legacy Banks' Service Paradigm Shift

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Abstract: The banking industry is transitioning from traditional brick-and-mortar models to a digital-first approach, driven by advancements in generative AI. This transformation enhances customer experience, streamlines operations, and improves decision-making. This paper examines the impact of generative AI on legacy banks, focusing on its applications in customer service, process automation, and personalized financial services. Additionally, it explores the challenges and opportunities of this transition, emphasizing the need to balance digital and physical channels while fostering a digital culture to drive innovation and agility. The findings suggest that generative AI is essential for improving operational efficiency and customer satisfaction, positioning legacy banks for sustainable growth and competitiveness in the digital era.

Keywords: Generative AI, Digital-First Banking, Legacy Banks, Customer Experience

1. Introduction

1.1. Background

With the rapid development of digital technologies, the traditional banking industry faces unprecedented pressure to transform. In particular, advancements in generative artificial intelligence (Generative AI) are driving a profound shift in banks' service paradigms. Digital transformation is not only reshaping banks' operational models but also redefining their relationships with customers.

Huang and Wen Yuechun [1] highlighted that the rapid expansion of digital finance is providing new momentum for industrial digitalization. The integration of emerging digital financial tools with traditional banking is restructuring the financial ecosystem. Similarly, Yang and Qiang [2], through an empirical analysis of A-share listed manufacturing companies in China, found that digital transformation in banking enhances corporate innovation capabilities and improves business quality by optimizing resource allocation.

In this transformation, technologies such as artificial intelligence and blockchain have become central drivers of banking digitalization. George [3] analyzed how AI, blockchain, and machine learning enhance security in emerging digital banking technologies, ensuring the safe operation of banks in the digital era. The application of these technologies, particularly generative AI, has significantly improved banks' operational efficiency and customer service quality. Furthermore,

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Brigas [4], in a case study of the real estate sector, emphasized the key market drivers of digital service development. Similarly, in banking, financial institutions are increasingly aligning digital innovation with customer needs, accelerating the shift from traditional brick-and-mortar services to digital-first service models.

As digital finance continues to penetrate the industry, banks face growing challenges in credit supply and risk management. Fang and Wang [5] examined the impact of digital finance on commercial banks' credit supply and risk exposure, finding that while digitalization enhances credit efficiency, it also introduces potential systemic risks. Therefore, banks must carefully manage various risk factors during digital transformation to ensure sustainable development. Lastly, Qu and Dou [6], in their empirical study on the effects of commercial banks' digital transformation, demonstrated that banking digitalization significantly enhances service efficiency, particularly in terms of service quality and response speed. This enables banks to better adapt to evolving market demands and provide more precise services to customers.

In conclusion, as generative AI and other digital technologies continue to integrate into the banking industry, service models are undergoing significant transformations. This paper explores how traditional banks can leverage generative AI to transition from brick-and-mortar to digital-first service models and assesses the profound impact of this transformation on banking service quality, efficiency, and risk management.

1.2. Why Traditional Banks Must Undertake Digital Transformation: Challenges and Opportunities

1.2.1. The Disadvantages of Traditional Banks in the Digital Era

In an era of rapid technological advancement, traditional brick-and-mortar banks face significant challenges in maintaining their competitive edge. One of the most pressing disadvantages is their limited ability to offer personalized, real-time services compared to digital-native financial institutions. Zhang [7] highlights that the digital transformation of rural commercial banks is essential for overcoming traditional service limitations. In rural areas, where access to banking services has historically been constrained, the adoption of digital tools allows banks to reach a broader customer base. Without such transformation, traditional banks risk being left behind, unable to meet the rising expectations of digitally savvy customers.

Moreover, traditional banks often operate with legacy systems that are inefficient and costly to maintain, limiting their ability to respond swiftly to market changes and customer needs. Fasnacht [8] emphasizes that open ecosystems, enabled by digital transformation, provide banks with opportunities to break free from the constraints of these outdated systems. By adopting open platforms, banks can innovate and integrate new technologies that drive efficiency and enhance customer engagement.

Another major challenge for traditional banks is the management of vast amounts of data while ensuring security and regulatory compliance. Rustambekov et al. [9] note that, in the digital age, effectively handling intellectual property and customer data is crucial for maintaining trust. As banks adopt advanced technologies such as AI, they must implement robust frameworks to safeguard sensitive information. Traditional banks, particularly those lacking digital expertise, face substantial risks in this regard.

1.2.2. The Impact of Transformational Change on Banking Services

The shift to digital-first banking services brings several critical changes in how banks interact with customers and operate internally. Technologies like generative AI are proving to be game-changers in this transformation. Ponnusamy and Spanner [10] discuss how cloud and edge computing have

DOI: 10.54254/2755-2721/138/2025.21371

become integral to the banking industry's digital operations. These technologies enable banks to deliver services more quickly, securely, and at a greater scale, creating a more agile and customer-centric service model. The transition to digital-first models allows banks to provide services 24/7, cater to remote customers, and significantly reduce operational costs.

Furthermore, the integration of digital finance into banking services fosters a more collaborative approach to innovation. Cai et al. [12] explore the role of digital finance in fostering independent innovation among small and micro-enterprises. Similarly, in the banking sector, digital transformation facilitates collaboration between banks and fintech companies, creating a fertile environment for innovative financial products and services. This approach is particularly important as customer expectations shift toward more personalized financial solutions—something traditional service models struggle to provide.

Additionally, digital transformation enables the development of an "open ecosystem," as described by Fasnacht [8]. By connecting various financial service providers, banks can leverage a broader range of tools and technologies to enhance their offerings. This not only improves customer satisfaction but also ensures banks remain competitive in an increasingly digital financial landscape.

In conclusion, digital transformation is not merely an opportunity for traditional banks to enhance service delivery—it is an imperative for survival in the digital age. The integration of generative AI and other digital technologies offers transformative potential, allowing banks to provide more efficient, secure, and personalized services. If traditional banks fail to embrace these changes, they risk becoming obsolete in a rapidly evolving industry.

1.2.3. The Changing Customer Demands in the Digital Age

As digital banking becomes more ubiquitous, customer expectations have evolved significantly. Modern consumers seek not only convenience and accessibility but also personalization and immediacy. Traditional banks, with their rigid service structures and reliance on physical branches, are ill-equipped to meet these shifting demands without undergoing fundamental transformation.

One of the most critical shifts in customer expectations is the demand for seamless, omnichannel experiences. Today’s banking customers expect to access their accounts and complete transactions through multiple platforms, including mobile apps, websites, and voice assistants. Traditional banks that fail to provide such integrated experiences risk losing customers to more agile competitors that prioritize ease of use and accessibility [13].

Another key factor is the increasing demand for personalization. Customers no longer want generic financial products; they expect tailored services that align with their individual needs. Digital-first banks leverage AI and big data analytics to offer highly personalized financial solutions based on customer behaviors, preferences, and financial histories. In contrast, legacy banks are often constrained by siloed data systems that limit their ability to provide such customized services.

Additionally, security and privacy have become top priorities for modern customers. As digital banking channels continue to expand, concerns over cybersecurity are paramount. While digital-first banks are often designed with security as a core feature, traditional banks must invest significantly in upgrading their systems to provide the same level of protection. The use of AI and blockchain technologies for securing transactions, detecting fraud, and protecting sensitive customer data has become essential in maintaining trust in digital banking services.

2. Generative AI: Driving Fundamental Transformation in Banking Services

Generative artificial intelligence (AI) has rapidly emerged as a transformative tool in the financial services sector, particularly for traditional banking institutions navigating the shift toward a digital-first model. With its ability to process vast amounts of data, generate human-like responses, and

DOI: 10.54254/2755-2721/138/2025.21371

automate complex processes, generative AI is reshaping not only how banks operate but also how they interact with their customers. The application of AI in banking services extends beyond efficiency improvements—it enhances the overall customer experience and enables banks to remain competitive in a rapidly evolving landscape.

2.1. Potential Applications of Generative AI in Banking Services

Generative AI can be applied across various banking functions, including customer support, data analysis, fraud detection, and personalized financial services. By leveraging generative AI technologies, banks can automate repetitive tasks, deliver more tailored services, and enhance decision-making processes. Several key areas where AI is being effectively deployed include:

2.1.1. Customer Support and Engagement

Generative AI-powered chatbots and virtual assistants are revolutionizing customer support in banking. These systems can handle complex inquiries, provide instant responses, and offer tailored solutions without human intervention. Unlike traditional customer service models, which rely on scripted responses and manual processing, AI-driven assistants engage with customers in natural language, creating a more conversational and personalized experience. Moreover, these AI systems continuously learn from customer interactions, refining their responses over time to enhance customer satisfaction and reduce response times.

2.1.2. Personalized Financial Services

Generative AI has the capability to analyze vast amounts of customer data, including transaction history, spending patterns, and financial goals, to generate customized financial advice and product recommendations. By leveraging advanced machine learning algorithms, AI can suggest specific financial products—such as loans, investment opportunities, or savings plans—that align with individual customer needs. This personalization goes beyond simple cross-selling or upselling; AI can proactively adjust financial recommendations, such as modifying savings plans based on changes in spending behavior or suggesting tailored budgeting strategies.

2.1.3. Loan Underwriting and Credit Risk Assessment

AI models are increasingly being used to assess the creditworthiness of individuals and businesses. Traditionally, loan underwriting relied heavily on manual processes and rigid credit scoring models. However, AI enhances these systems by incorporating alternative data sources, such as payment history and even behavioral analytics, to assess risk more accurately. Generative AI can develop predictive models that help banks make more informed lending decisions, improving the accuracy of loan approvals and reducing default risks. Additionally, AI-driven underwriting significantly accelerates processing times, a critical advantage in today's competitive banking environment.

2.2. Improving the Customer Service Experience with Generative AI

The integration of generative AI in banking services has the potential to significantly enhance the customer experience, transforming how customers interact with banks and how banks address customer needs. Traditional banks, often constrained by rigid and slow systems, face increasing challenges in competing with the more agile, technology-driven service models offered by fintech companies and neobanks. Generative AI helps level the playing field by enabling banks to provide seamless, round-the-clock customer service while reducing wait times and improving service quality.

DOI: 10.54254/2755-2721/138/2025.21371

Whether customers need assistance with checking their account balances, making transfers, or understanding financial products, AI can provide immediate and accurate responses. This constant availability enhances customer satisfaction and supports a more efficient service model. Generative AI can also understand the context of customer queries and tailor responses accordingly. For instance, AI-powered assistants can retain information from previous customer interactions, ensuring continuity in service. If a customer previously inquired about mortgage options, the AI can follow up with relevant information or updates in future conversations, creating a more personalized and coherent experience. By maintaining contextual awareness over time, AI-powered systems deliver a more human-like experience, making customers feel valued and understood.

Furthermore, generative AI empowers customers to handle routine banking tasks autonomously. Actions such as checking account balances, making transfers, or even applying for loans can be completed via AI-driven interfaces without requiring human intervention. This automation not only streamlines the customer experience but also frees human agents to focus on more complex inquiries, improving overall operational efficiency.

2.3. Optimizing Bank Processes: From AI Assistants to Automation

Traditional banks can leverage generative AI technologies to optimize a wide range of processes, from customer interactions to internal workflows. AI-powered assistants can automate customer queries and routine banking tasks, while AI-driven models enhance back-office functions such as loan underwriting and fraud detection. The combination of automation and AI assistants leads to greater efficiency, improved service delivery, and reduced operational costs.

Generative AI equips legacy banks with the tools to transition from outdated, resource-intensive service models to more streamlined, customer-centric approaches. As the banking sector increasingly adopts automation and AI-driven solutions, the traditional banking model will continue to evolve, becoming more responsive to customer needs and operationally efficient.

In conclusion, the potential applications of generative AI in banking are vast, ranging from enhancing customer service experiences to streamlining back-office operations. By embracing these technologies, traditional banks can not only improve their operational efficiency but also provide more personalized and effective services to their customers. As the banking sector moves toward a digital-first model, generative AI will undoubtedly play a crucial role in helping legacy institutions remain competitive in an increasingly dynamic financial landscape.

3. From Counter to Screen: How Traditional Banks Adapt to the "Digital-First" New Normal

The banking sector has undergone a profound transformation in recent years, driven by the rapid rise of digital technologies. Legacy banks, once reliant on brick-and-mortar branches, are now navigating the challenges and opportunities presented by a digital-first approach to banking. This shift has been accelerated by evolving customer expectations, technological advancements, and the growing demand for more convenient, seamless, and personalized banking services. As a result, traditional banks face a critical question: How can they adapt their business processes and service models to thrive in this digital-first environment while maintaining customer trust and loyalty?

3.1. How Digital Services Reshape Banking Business Processes and Customer Interaction

The transition to digital-first banking is fundamentally reshaping how banks operate and engage with customers. Digital banking services, powered by online platforms, mobile applications, and AI technologies, enable banks to deliver faster and more efficient services. Digital platforms facilitate

DOI: 10.54254/2755-2721/138/2025.21371

the automation of routine tasks, accelerate transaction processing, and provide 24/7 service availability, significantly enhancing customer convenience [11].

3.1.1. Automation of Business Processes

Digitalization allows banks to automate various business processes that were previously manual and time-consuming. From customer onboarding to loan underwriting and risk assessment, automated workflows help banks accelerate processes, reduce errors, and lower operational costs. For instance, AI and machine learning enable banks to streamline loan applications, allowing customers to apply and receive approvals more quickly. Additionally, automated systems can manage routine inquiries and service requests, freeing customer service representatives to focus on more complex tasks.

3.1.2. Personalized Customer Experience

Digital services provide banks with the tools to offer more personalized and tailored banking experiences. By leveraging data analytics and artificial intelligence, banks can analyze customer behavior, preferences, and financial needs to provide customized product recommendations, financial advice, and targeted promotions. This level of personalization was not possible with traditional in-branch services.

Digital platforms enable banks to engage customers on a deeper level by offering solutions aligned with their financial goals. Whether assisting customers in saving for retirement, making smarter investment choices, or managing daily expenses more effectively, AI-powered services enhance the overall banking experience.

3.2. Balancing Online and Offline Service Channels

Although digital tools can automate many aspects of banking, certain situations still require human interaction. Complex financial decisions, such as retirement planning or mortgage consultations, often necessitate personalized guidance that AI or chatbots cannot fully replicate. To address this, traditional banks must integrate digital tools with in-person services, ensuring a hybrid service model that caters to diverse customer preferences.

For instance, customers may begin a loan application process online but still prefer to meet with a bank representative to discuss the terms in greater detail. Offering a seamless blend of digital and human interaction ensures that customers have the flexibility to choose the service model that best suits their needs.

While the role of physical branches is diminishing in the digital-first era, they remain relevant. Rather than closing branches entirely, banks should focus on transforming them into customer-centric, value-added spaces. Digital-first branches can provide in-person support for complex financial inquiries and advisory services, while self-service kiosks and digital terminals handle routine transactions. Additionally, branches can serve as educational hubs where customers receive guidance on using digital banking services or assistance with digital tools.

The key is to redefine the role of physical branches to complement digital offerings rather than replicate traditional models. By embracing a hybrid service approach, banks can maintain strong customer relationships while enhancing efficiency and accessibility in the digital-first landscape.

3.3. Internal Structural Adjustments for a Smooth Transition

For traditional banks to successfully navigate the shift to a digital-first model, significant internal adjustments are required. Digital transformation is not solely about adopting new technologies; it also necessitates rethinking internal structures, workflows, and organizational culture to fully integrate

DOI: 10.54254/2755-2721/138/2025.21371

digital capabilities across the institution. Below are key areas where banks must implement changes to ensure a smooth transition:

3.3.1. Leadership Commitment and Organizational Culture

A successful digital transformation requires strong leadership committed to driving change and fostering a digital-first culture within the bank. Senior management must fully invest in the transition, leading by example and championing the adoption of digital technologies while encouraging innovation at all levels of the organization. Establishing a culture that embraces change, experimentation, and continuous learning is essential for overcoming resistance and ensuring that digital transformation becomes ingrained in the organization's core values.

3.3.2. Technology Infrastructure Modernization

To support digital banking services, banks must invest in modernizing their technology infrastructure. This includes upgrading legacy systems, adopting cloud computing, enhancing cybersecurity measures, and implementing advanced data analytics tools. These upgrades enable banks to deliver faster, more secure, and scalable services that align with the demands of a digital-first environment. Additionally, a flexible and agile IT infrastructure allows banks to quickly adapt to new digital trends and emerging technologies, ensuring long-term competitiveness.

3.3.3. Workforce Transformation and Digital Skills Development

Digital transformation also necessitates a shift in the bank's workforce. Employees must be equipped with the skills required to operate new technologies and integrate digital tools into their workflows. Banks must invest in training and development programs to upskill their staff in areas such as data analysis, cybersecurity, and customer experience management. Furthermore, attracting and retaining top talent with expertise in digital banking, AI, and fintech is critical to ensuring the bank's continued success in an evolving financial landscape.

3.3.4. Agile Decision-Making and Innovation

To remain competitive in the digital-first banking sector, traditional banks must adopt a more agile approach to decision-making and product development. Historically, banks have been slow to innovate due to hierarchical structures and rigid processes. However, in the digital age, agility is key to responding swiftly to market changes and customer demands. By adopting agile methodologies, banks can streamline development processes, accelerate product launches, and experiment with innovative solutions that better meet customer needs.

3.3.5. Data-Driven Strategies for Enhanced Decision-Making

Data is at the core of digital transformation. Banks must implement advanced data analytics capabilities to derive actionable insights from the vast amounts of customer data they collect. A data-driven approach enables banks to make more informed decisions regarding product development, marketing strategies, and customer service improvements. Additionally, effective use of data analytics can help banks identify emerging trends, detect fraudulent activities, and enhance overall operational efficiency.

DOI: 10.54254/2755-2721/138/2025.21371

4. AI-Driven Customer Experience: From Personalization to Emotional Connection

The financial services industry is undergoing a significant transformation as technological advancements, particularly in artificial intelligence (AI), continue to reshape how banks interact with their customers. One of the most profound changes is the shift toward hyper-personalized banking experiences, enabled by AI in unprecedented ways. AI's role in enhancing customer service, building stronger emotional connections, and improving customer loyalty has become a cornerstone of modern banking.

With the rise of generative AI, traditional banking models are evolving from one-size-fits-all approaches to highly customized and emotionally engaging services designed to meet each customer's unique needs and preferences. AI plays a critical role in delivering personalized banking services by analyzing vast amounts of data to understand customer preferences, behaviors, and financial habits. This data-driven approach enables banks to tailor their products, services, and interactions to each customer in a way that is both relevant and timely. By leveraging AI, banks can offer customized recommendations, solutions, and financial advice based on individual profiles, thereby enhancing the customer experience and increasing the likelihood of customer satisfaction and loyalty.

Generative AI, in particular, holds great potential for advancing personalization by utilizing complex algorithms and machine learning models to predict customer behavior and needs with remarkable accuracy. This predictive capability allows banks to anticipate a customer's financial needs before they even arise, offering proactive solutions that save time and effort. For instance, AI can automatically suggest appropriate savings plans, investment opportunities, or loan products based on a customer's financial situation and goals. Additionally, AI can provide personalized insights into spending habits, offering actionable advice on how to optimize personal finances. With generative AI, banks can go beyond simple service delivery to create an experience that feels uniquely tailored to each customer.

Furthermore, AI empowers banks to streamline the customer journey by automating mundane tasks and simplifying complex processes. For example, AI-powered chatbots and virtual assistants can handle routine inquiries, transactions, and troubleshooting, allowing customers to resolve issues or access services instantly without human intervention. This increases operational efficiency and frees up bank staff to focus on more complex customer needs. As a result, customers enjoy faster service and a smoother overall experience, contributing to higher satisfaction levels.

AI also enables banks to deliver services around the clock, eliminating the need for customers to adhere to traditional banking hours. This round-the-clock accessibility further strengthens the convenience and personalization that customers value.

5. Digital Culture in Banking: The Fusion of Talent, Technology, and Innovation

As the banking industry transitions from traditional brick-and-mortar models to a more digitally driven paradigm, the need for a strong digital culture has become essential. This culture, built on the integration of talent, technology, and innovation, forms the backbone of the ongoing transformation in the financial sector. Banks must evolve their organizational mindset to foster an environment that embraces digital change, ensuring their continued competitiveness and relevance in an increasingly tech-savvy marketplace. This shift requires not only the adoption of cutting-edge technologies such as artificial intelligence (AI) and blockchain but also a deep investment in talent development and innovation management to integrate these tools effectively.

Collaboration fosters creativity and ensures that banks remain agile in adapting to new trends and challenges in the fast-paced digital economy. Additionally, collaboration enables banks to leverage external technologies and solutions that may otherwise be beyond their internal capabilities. Furthermore, building a digital culture requires strong leadership committed to driving change and

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inspiring the workforce to embrace new ways of working. Leaders must create a vision for the bank's future—one anchored in digital transformation and guided by innovation. This involves not only championing technological adoption but also cultivating an organizational mindset that prioritizes customer-centricity, agility, and data-driven decision-making.

To ensure a successful transition, leaders must effectively communicate the benefits of digital transformation to their teams, helping employees understand how digital tools will enhance their daily operations and improve customer service. Encouraging a culture of continuous learning and innovation will further empower employees to adapt to emerging technologies and contribute to the bank's long-term digital success.

6. Conclusion

The shift from traditional brick-and-mortar banking to a digital-first model represents a fundamental transformation in the financial services industry. As legacy banks navigate this change, the adoption of generative AI has proven to be a pivotal driver of innovation and operational efficiency. By harnessing the power of AI, banks can deliver personalized services, streamline operations, and enhance customer experiences, all while maintaining a competitive edge in an increasingly digital marketplace.

The impact of generative AI on legacy banking is profound. It facilitates the automation of routine tasks, freeing human resources to focus on more complex customer needs. Additionally, AI-powered chatbots, virtual assistants, and predictive analytics enable banks to offer highly personalized services, improving customer satisfaction and loyalty. These advancements not only reshape the banking service paradigm but also empower banks to adapt quickly to changing market conditions and evolving customer expectations.

However, this transformation is not without its challenges. Traditional banks must balance the integration of new digital channels with the maintenance of their existing infrastructure, ensuring a seamless customer experience across both online and offline touchpoints. A well-executed digital transformation strategy—one that prioritizes technological adoption, talent development, and customer-centric innovation—will be essential in ensuring that legacy banks remain resilient and competitive in the digital age.

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