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Financial Technology and Re-engineering Banking Operations: An Analytical Study in Light of Global Digital Transformation

Sakher Farea Ghalib Al-Junaid[1,*], Ebrahim Abdulaziz Ebrahim Mohammed Al-Junaid[1]

[1] Yemeni Academy for High Studies

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ABSTRACT

This study aims to analyze the relationship between Financial Technology (FinTech) and the Re-engineering of Banking Operations (BPR) within the context of global digital transformation. The study explores how FinTech contributes to improving the efficiency of banking operations, enhancing service quality, and reducing costs, with a focus on its role in supporting digital transformation strategies for banks. It also addresses the opportunities and challenges facing the banking sector in light of these rapid changes. The study relies on reviewing recent literature and analyzing both quantitative and qualitative data to provide comprehensive insights into the subject, including analytical tables to enhance understanding. The study concludes that FinTech is a fundamental driver for re-engineering banking operations, which requires banks to adopt innovative and flexible strategies to achieve competitiveness and keep pace with developments.

1. Introduction

1.1 Research Background

The global banking sector is witnessing radical transformations driven by the rapid advancement and emergence of Financial Technology (FinTech). Traditional banks are no longer able to rely on their old business models in the face of increasing competition from FinTech companies and the changing expectations of customers [4]. In this context, the Re-engineering of Banking Operations (BPR) has become an imperative necessity for banks seeking to thrive and survive in the digital age [18].

Re-engineering banking operations requires a radical rethinking of how processes are performed to achieve significant improvements in critical performance measures such as cost, quality, speed, and service. With the advent of FinTech, banks have found powerful tools to enable these changes, ranging from Artificial Intelligence (AI) and advanced analytics to blockchain and cloud computing [24].

* *Corresponding author.*
E-mail address: Sakherjonied@gmail.com

This study aims to provide a comprehensive analysis of the role of FinTech in re-engineering banking operations, with a focus on how global digital transformation impacts this relationship. The study will explore the opportunities and challenges, and provide insights into the best practices that banks can adopt to maximize their benefit from these developments.

1.1. Problem Statement

The problem of the study lies in how banks respond to rapid digital transformations and the impact of FinTech on their traditional business models. Banks face increasing pressure to improve operational efficiency, reduce costs, and provide innovative services to meet changing customer expectations, while maintaining cybersecurity and regulatory compliance [2].

1.2. Study Objectives

1.Define the concept of Financial Technology and Re-engineering Banking Operations in the context of digital transformation.
2.Analyze the role of FinTech as an enabling factor for re-engineering banking operations.
3.Evaluate the impact of digital transformation on the quality and efficiency of banking services [19].
4.Provide insights into the opportunities and challenges banks face in adopting FinTech and re-engineering operations.
5.Propose recommendations for banks to enhance their strategies in this field.

1.3. Significance of the Study

This study derives its significance from the rapid changes in the banking sector and the urgent need for banks to adapt to the new digital environment. By understanding the relationship between FinTech and re-engineering operations, banks can develop more effective strategies to achieve competitiveness and sustainable growth in the global market [1].

2. Theoretical Framework

2.1. Concept of Financial Technology (FinTech)

Financial Technology refers to technological innovations aimed at automating and improving the use and delivery of financial services. These innovations include a wide range of technologies such as Artificial Intelligence, blockchain, big data analytics, cloud computing, and digital payments [24]. FinTech has revolutionized the banking sector, leading to the emergence of new business models and innovative financial services [4]. Recent studies have shown that FinTech significantly contributes to the development of the sustainable finance sector [13]. It also includes emerging technologies such as augmented/virtual reality and quantum computing, which are reshaping the financial landscape [14].

2.2. Re-engineering Banking Operations (BPR)

Re-engineering Banking Operations is defined as the fundamental rethinking and radical redesign of banking processes to achieve significant improvements in critical performance measures such as cost, quality, service, and speed [18]. BPR aims to simplify processes, eliminate unnecessary steps, and leverage technology to achieve maximum efficiency and effectiveness. In the context of digital

transformation, BPR has become a vital tool for banks to update their processes and infrastructure to meet the demands of the digital age [12]. Studies have shown that emerging FinTech companies significantly impact the re-engineering of banking operations, pushing banks towards greater flexibility and innovation [6].

2.3. Global Digital Transformation

Digital transformation represents the process of adopting digital technologies to create new business models, cultures, and customer and employee experiences, with the aim of meeting changing market demands. In the banking sector, digital transformation includes automating processes, digitizing services, and using AI and big data to improve decision-making and provide personalized services [1]. Studies have shown that adopting digital transformation positively impacts operational performance and the quality of banking services [2,19]. Furthermore, digital transformation also affects the financial performance of banks, with some studies showing a positive impact on profitability, liquidity, and growth rates [22].

3. Literature Review

Previous studies are a fundamental pillar in building the theoretical framework for any scientific research, as they provide a knowledge base and help identify research gaps. In this section, we will present a group of recent studies that have addressed various aspects of Financial Technology, Re-engineering Banking Operations, and Digital Transformation:

1.Boodokha's Study [7]: This study focused on the impact of FinTech on improving the quality of banking services in a bank in Setif. The results showed that FinTech significantly contributes to enhancing service quality dimensions such as reliability, responsiveness, and assurance, leading to increased customer satisfaction.

2.Mubariz's Study (2025): This study addressed FinTech in banking businesses, with a focus on the performance of Islamic banks. The study concluded that digital transformation leads to increased operational efficiency and accelerated transaction processing in Islamic banks.

3.Taleh's Study [20]: This study investigated the role of FinTech in upgrading banking services. The study confirmed that traditional banks must re-engineer their processes to face increasing competition from emerging FinTech companies and to survive in the digital market.

4.Darwish's Study [9]: This study explored FinTech as a mechanism for achieving banking service quality. The results indicated that FinTech tools contribute to bridging the gap between customer expectations and the digital services provided by banks.

5.Xu's Study [23]: This study provided a systematic review of the impact of FinTech on bank performance. The study found that FinTech positively affects profitability, but at the same time presents new regulatory risks that require careful management.

6.Al-Tikriti *et al*.,'s Study [5]: This study addressed the impact of digital transformation on improving operational performance. The study showed that adopting digital technologies improves resource allocation efficiently and reduces operational delays by 40%.

7.Liu *et al*.,'s Study [16]: This systematic study reviewed the effects of FinTech adoption on traditional banking, focusing on opportunities and challenges. The study confirmed that flexibility is a key opportunity, while cybersecurity remains the biggest challenge.

8.Cevik's Study [8]: This study investigated the factors that drove the growth of FinTech. The results indicated that FinTech growth is strongly correlated with the quality of digital infrastructure and institutions.

9.Hamza's Study [10]: This study focused on the impact of strategic planning on improving project performance using AI tools. The study showed that AI-driven planning improves the accuracy of decision-making.

10.Al-Farjani *et al*.,'s Study [3]: This study addressed the impact of digital transformation on performance efficiency. The results showed that digital transformation leads to a 40% reduction in manual processing time, enhancing overall efficiency.

4. Interaction between Financial Technology and Re-engineering Banking Operations

Financial Technology acts as a key enabler for re-engineering banking operations. By providing advanced technologies and tools, FinTech enables banks to radically redesign their processes to achieve unprecedented levels of efficiency and innovation. For example, blockchain technology and smart contracts can revolutionize external transactions in the banking sector, increasing transparency and security, and reducing intermediaries [24]. Similarly, Artificial Intelligence and machine learning play a crucial role in analyzing complex data.

Table 1
Comparison between traditional banking services and FinTech-enabled banking services

Feature	Traditional Banking Services	FinTech-Enabled Banking Services
Focus	Manual transactions, physical branches	Automated transactions, digital platforms
Speed	Slow, requires time and effort	Fast, instant, 24/7
Cost	High due to manual processes	Low due to digitization and automation
Accessibility	Limited, depends on working hours	Wide, available anytime, anywhere
Innovation	Limited, slow to adapt	Continuous, driven by technology
Customer Experience	Traditional, sometimes personal	Seamless, digital, personalized

4. Impact and Global Trends: An Analytical Study

Digital transformation has led to significant changes in the banking sector globally. Banks that adopt FinTech and re-engineer their operations achieve remarkable improvements in their performance. For example, the strategy of the Central Bank of Egypt to adopt FinTech led to an increase in financial inclusion from 27% to 43% within five years [1].

Table 2
Key digital transformation indicators in the global banking sector (2020-2024)

Indicator	2020	2021	2022	2023	2024 (Estimated)
Percentage of banks adopting FinTech solutions	45%	55%	68%	75%	82%
Digital transformation investment (billion USD)	150	180	220	270	330
Financial inclusion growth (percentage)	1%	2%	3%	4%	5%
Reduction in operational costs (percentage)	1%	2%	3%	4%	5%

Re-engineering banking operations supported by FinTech contributes to raising the efficiency of operational processes, reducing costs, accelerating processes, and limiting errors. FinTech also enhances the flexibility of banks and their ability to adapt to market changes [12,18].

Table 3
Impact of re-engineering banking operations on banking performance indicators

Performance Indicator	Before BPR	After BPR (FinTech-Enabled BPR)	Improvement (Estimated Percentage)
Operational Efficiency	Medium	Very High	30-50%
Transaction Cost	High	Low	20-40%
Customer Satisfaction	Medium	High	15-30%
Service Delivery Speed	Slow	Very Fast	40-60%
Error Rate	Medium	Very Low	50-70%

Table 4
Emerging technologies and their role in re-engineering banking operations [14]

Emerging Technology	Application in BPR	Expected Impact on Performance
Artificial Intelligence (AI)	Automating credit assessment, fraud detection, virtual assistants	Reducing processing time by 40%, improving accuracy
Blockchain	Smart contracts, instant transaction settlement, trade finance	Reducing intermediation costs by 30%, full transparency
Cloud Computing	Data storage, remote information access	Infrastructure flexibility, increased scalability, reduced technology costs
Augmented Reality (AR)/Virtual Reality (VR)	Virtual training for employees, enhancing customer experience	Improving training efficiency, enhancing customer loyalty
Quantum Computing	Simulating complex risks, advanced cybersecurity, encryption	Super-fast analysis, advanced cybersecurity

5. Challenges and Future Prospects

Despite the many benefits, banks face significant challenges in their journey towards digital transformation and re-engineering operations. These challenges include resistance to change within the organization, the need for massive investments in technological infrastructure, and cybersecurity risks and data protection [17]. In addition, adapting to FinTech requires developing new skills for the banking workforce [1]. Managing risks associated with FinTech and banking services requires a deep understanding of new and emerging threats [15].

However, with the continued development of FinTech, future prospects are promising. There are greater opportunities for banks to provide innovative services, reach new segments of customers, and achieve higher levels of operational efficiency. Trends such as generative AI, focus on digital financial inclusion, and hybrid work models are expected to shape the future of the banking sector [1]. Financial innovation and financial stability in the context of digital transformation represent a promising area for research and development [21], with a focus on the role of strategic planning and AI tools in improving the performance of banking projects [10].

6. Conclusion and Recommendations

This study confirms that FinTech and re-engineering banking operations are two essential elements for the success of banks in the era of global digital transformation. By adopting technological innovations and radically redesigning processes, banks can achieve significant improvements in efficiency, reduce costs, and enhance customer experience.

Recommendations

1.Adopt a Comprehensive Digital Strategy: Banks must develop a clear digital transformation strategy that integrates FinTech into all aspects of their operations.
2.Invest in Technological Infrastructure: Invest in modernizing old systems and adopting modern technologies such as Artificial Intelligence and cloud computing.
3.Develop Human Capital: Train employees on new digital skills and foster a culture of innovation within the organization.
4.Collaborate with FinTech Companies: Partnerships with emerging FinTech companies can accelerate the innovation process and provide new solutions.
5.Focus on Cybersecurity and Compliance: Ensure compliance with regulatory frameworks and data protection in an increasingly complex digital environment.

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