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Research on the Necessity and Countermeasures of Digital Transformation in Commercial Banks

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ABSTRACT
The emergence of fintech marks a significant milestone in the history of financial development. It has not only impacted people's lives but also reshaped the landscape of the financial industry. Leveraging innovative advantages, fintech companies have encroached on commercial banks' market share while simultaneously motivating banks to embrace emerging technologies and embark on digital transformation. The digital transformation of commercial banks is not only an inevitable choice to address market competition and technological iterations but also a core pathway to enhance service efficiency, optimize risk management, and fulfill social responsibilities. This paper analyzes the necessity of digital transformation for commercial banks, identifies challenges during the transformation process, and proposes countermeasures focusing on strategic planning, organizational restructuring, technological investment, and ecosystem collaboration. These recommendations aim to provide references for the sustainable development of the banking industry amid the digital wave.

KEYWORDS
Commercial Bank; Digital Transformation; Necessity; Countermeasures

1 Introduction

Fintech, as a product of the deep integration of emerging technologies and the financial industry, is driving global financial service innovation through its disruptive capabilities and comparative advantages. With the rapid development of fintech, the new era of digital revolution presents unprecedented opportunities and challenges for China's economic growth. The traditional operational models of commercial banks are no longer compatible with the development trends of the digital economy. China's 14th Five-Year Plan emphasizes the deep integration of fintech and the real economy, while the《Fintech Development Plan (2022-2025)》requires banks to increase technological investments. As China accelerates the construction of a digital financial ecosystem, commercial banks, serving as critical pillars of national economic and social development, must expedite their transformation to adapt to the new economic paradigm. How commercial banks can advance digital transformation and strengthen digital capabilities will be a key research topic for financial institutions.

2 Necessity of Digital Transformation for Commercial Banks

2.1 External Competitive Pressure Forces Transformation

The rise of internet finance has enabled fintech companies to revolutionize the delivery of financial products and services through technological innovations such as big data, cloud computing, blockchain, and artificial intelligence (AI). Digital technologies have blurred the boundaries between traditional finance and the tech industry. E-commerce and social platforms, for instance, embed financial services into scenario-based models, facilitating cross-border entry into the financial sector. Fintech companies such as Ant Group and WeBank have rapidly captured market share in payments, credit, and intelligent investment advisory services by leveraging big data and AI, partially displacing traditional banking services. The efficiency and innovation brought by fintech have compelled commercial banks to enhance competitiveness through digital transformation.

2.2 Changes in Customer Demands and Behaviors

The rise of younger customer segments has generated increased demand for online and personalized financial services. Traditional banks' reliance on offline branch networks struggles to meet customers' real-time needs. Surveys indicate that 80% of younger customers (aged 18–35) prefer mobile banking, while only 20% actively visit physical branches [1]. The new generation of consumers favors digital interaction, rendering traditional offline services inadequate in meeting their demands for immediacy and flexibility.

With changes in behavioral habits, customer acceptance of digitization has undergone a qualitative shift. Dependence on convenient and efficient online services has significantly increased. Digital tools such as mobile banking and intelligent investment advisory have become key factors in bank selection. Customers expect financial services to be seamlessly embedded into life scenarios such as shopping, education, and healthcare. The convenience of digital financial services accelerates the shift toward online transactions, intensifying the loss of market share for commercial banks. To avoid marginalization, commercial banks must integrate digital transformation into diverse scenarios, including supply chain finance and cross-border payments.

2.3 Digital Technologies Enhance Operational Efficiency

The application of digital technologies can significantly improve operational efficiency and reduce costs. Automated processes such as Robotic Process Automation (RPA) streamline repetitive tasks like reconciliation and report generation, saving hundreds of thousands of labor hours annually. For instance, Bank of China reduced cross-border payment processing time from 30 minutes to 5 minutes using RPA, achieving annual cost savings exceeding RMB 1 billion[2]. Machine learning-based intelligent approval systems can compress loan approval processes from 3–5 days to 5 minutes, with error rates below 0.1%[3]. Cloud computing reduces IT infrastructure costs and accelerates deployment. The "Nanjing Bank Xinyun" platform, supported by Alibaba Cloud, handles 100, 000 transactions per second with 99.99% system stability. Cloud adoption lowers IT operational costs by 40%–60% compared to traditional IDCs[4].

Digital technologies also extend financial inclusion to rural and SME markets. MYbank (under Ant Group) uses satellite remote sensing to evaluate farmland areas, providing unsecured loans to 100,000 farmers with a non-performing loan (NPL) ratio of only 0.8%. WeBank's "Micro Loan" has disbursed over RMB 2 trillion to 2.2 million SMEs based on tax data[5]. Digital tools further enable green finance by tracking carbon emissions data. SPD Bank uses blockchain to record corporate carbon data, offering preferential rates to low-carbon enterprises. Digital transformation also supports global expansion; Industrial and Commercial Bank of China (ICBC) leverages a unified digital platform to serve international clients, reducing cross-border transaction costs.

2.4 Risk Management and Regulatory Compliance

Digital transformation strengthens commercial banks' risk management frameworks. Real-time monitoring of transaction data and anomaly detection enhance risk warning capabilities. By integrating multi-dimensional data (e.g., social, consumption, location), commercial banks can build precise customer profiles using big data, optimizing credit risk models and reducing NPL ratios. Agricultural Bank of China's "Risk Control Brain" intercepted 1.2 million suspicious transactions in 2023, involving RMB 80 billion[6]. Internet of things monitor collateral status (e.g., vehicle GPS tracking), mitigating moral hazard, while blockchain ensures transaction immutability. Machine learning models predict default probabilities using unstructured data (e.g., e-commerce records), significantly lowering NPL ratios. Digital transformation reduced rural commercial banks' NPL ratios by approximately 0.8%[2].

Digital tools also enhance compliance in a stringent regulatory environment. Automated compliance reporting reduces manual errors. HSBC, for example, employs a unified data platform to align with EU GDPR and Hong Kong Monetary Authority requirements.

3 Challenges in Digital Transformation for Commercial Banks

3.1 Inadequate Top-Level Design and Organizational Rigidity

Some commercial banks lack holistic digital transformation strategies, resulting in fragmented efforts across departments. Branch-level digital initiatives overly depend on headquarters' technology platforms, limiting local innovation and responsiveness. Ambiguous strategic positioning—viewing digitization as mere technological upgrades rather than systemic reforms—leads to misalignment between business and technology. Commercial banks also fail to integrate digital transformation with financial inclusion and ecosystem scenarios, undermining long-term competitiveness.

Vertical management models and hierarchical structures hinder cross-department collaboration. Data fragmentation across systems complicates process integration and customer profiling. Separated business and technology teams further exacerbate inefficiencies.

3.2 Security Risks and Insufficient Technological Innovation

Digitization introduces vulnerabilities such as mobile payment interfaces and open banking APIs, increasing risks of data breaches and fraud. Traditional risk controls struggle to address emerging threats, while applications of blockchain and AI in anti-money laundering (AML) remain immature.

High transformation costs pressure small and medium-sized commercial banks, which lag in R&D due to limited resources. Over-reliance on external vendors weakens innovation capabilities. For example, commercial banks' intelligent investment advisory services often depend on third-party technologies, slowing product iteration compared to internet firms.

3.3 Shortage of Interdisciplinary Talent

Commercial banks face a talent mismatch, particularly in "finance + technology" interdisciplinary roles such as data scientists and AI engineers. Technical departments at branches focus on maintenance, while R&D relies on outsourcing. Commercial banks struggle to attract tech talent due to uncompetitive salaries compared to internet firms.

Weak internal training mechanisms and insufficient digital skill development further hinder transformation. Limited cross-departmental collaboration between business and technology teams results in misaligned product designs.

3.4 Insufficient Data Integration

Data silos and inconsistent standards impede comprehensive customer profiling. For example, deposit data discrepancies across regulatory and internal systems amount to billions of yuan. Cross-departmental data sharing remains challenging, limiting the use of transaction and credit data for holistic insights.

Most commercial banks underutilize data, relying on traditional credit scoring models instead of machine learning. Data-driven innovation, such as personalized wealth management products based on consumer behavior, remains underdeveloped.

3.5 Competitive Threats and Ecosystem Disadvantages

Fintech companies and third-party platforms erode banks' market share through ecosystem advantages. Commercial banks' product homogeneity and reliance on price competition compress profit margins. Platforms like Alipay's "Yu'e Bao" and WeChat's "Lingqiantong" attract customers with superior user experience, diverting payment and wealth management businesses.

Elderly customers struggle with complex mobile banking interfaces, while platforms like WeChat Pay and Alipay dominate in user-friendliness. Commercial banks lag in ecosystem collaboration with sectors such as government, education, and healthcare. Open banking initiatives progress slowly, limiting embedded financial services.

4 Countermeasures for Digital Transformation of Commercial Banks

4.1 Strategic Realignment and Organizational Restructuring

Commercial banks must clarify top-level design and establish dynamic adjustment mechanisms. By formulating comprehensive digital transformation strategies, banks should integrate digital transformation into their overarching strategic frameworks, defining its role in areas such as inclusive finance, ecosystem development, and customer experience enhancement. Small and medium-sized banks can adopt a phased approach to transformation, prioritizing the digitization of core businesses (e.g., online banking) before gradually embedding advanced technologies like AI and blockchain. Commercial banks should establish dynamic evaluation systems to quantify transformation outcomes, incorporating KPIs such as online transaction rates and product iteration speed. Regular assessments and responsive adjustments to market changes—guided by customer feedback and data analysis—are essential.

Commercial banks should promote flat management structures and cross-departmental collaboration to dismantle organizational silos. Agile teams comprising business, technology, and risk management departments should be formed to focus on key projects, such as intelligent risk control systems. Streamlining decision-making processes and empowering frontline teams with greater autonomy—for example, allowing branches to rapidly launch region-specific financial products based on local demands—will enhance responsiveness.

4.2 Strengthening Security and Enhancing Independent Innovation

To mitigate security risks associated with digital transformation, commercial banks should establish multi-layered security frameworks. Technologies such as biometric authentication and quantum encryption can safeguard customer privacy, while AI-powered real-time anti-fraud systems can monitor abnormal transactions. Blockchain applications in credit processes—such as contract archiving and fund flow tracking—can reduce operational risks.

Commercial banks must prioritize independent R&D in core technologies. Establishing fintech labs focused on AI, blockchain, and big data can reduce reliance on external vendors. Large banks should develop proprietary algorithms for intelligent investment advisory services and apply these technologies to cross-border payments and supply chain finance. For example, blockchain can enable real-time settlement in cross-border trade finance. Small and medium-sized commercial banks with limited resources can form alliances or joint ventures to share technology platforms and R&D costs.

4.3 Building Interdisciplinary Talent Teams

Digital transformation requires interdisciplinary talent proficient in both finance and technology. Commercial banks should enhance recruitment strategies by offering competitive salaries, equity incentives, and specialized roles such as "Fintech Experts." Partnerships with universities can establish fintech programs to cultivate talent. Internal training programs should promote cross-departmental rotations—for example, allowing relationship managers to collaborate with engineers on product design—to bridge the gap between business and technical teams.

4.4 Enhancing Data Governance and Value Realization

Commercial banks must unify data standards and integrate fragmented data through centralized repositories. APIs can facilitate real-time data exchange between core systems and external platforms. Advanced analysis, such as machine learning, should be leveraged to analyze customer behavior and design personalized financial products. Dynamic credit scoring models based on historical transaction data can improve SME loan approval efficiency.

4.5 Accelerating Product Innovation and Ecosystem Collaboration

Commercial banks should embed financial services into high-frequency scenarios such as education, healthcare, and e-commerce. For instance, launching "Study Abroad Financial Hubs" that integrate foreign exchange, loans, and insurance. User experience must be optimized: simplified mobile banking interfaces for elderly customers and social features (e.g., investment communities) for younger users. Hybrid models combining online approval and offline instant processing can enhance efficiency.

Open banking APIs and partnerships with governments, tech firms, and industry leaders are critical. Collaborations with core enterprises can build supply chain finance platforms for small and medium-sized enterprises. Joint ventures with fintech companies can drive innovation.

5 Conclusions

Digital transformation is imperative for Chinese commercial banks to achieve high-quality development in the fintech era. By adopting a strategy of "strategic leadership, technology-driven innovation, and ecosystem collaboration," commercial banks can transition from passive defense to proactive leadership. Key priorities include breaking down internal silos, fostering external partnerships, and maintaining customer focus. Only through holistic planning, resource integration, and continuous innovation can banks reshape their competitiveness in the digital age.

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