

Digital transformation in the banking industry: Empirical lessons from leading Vietnamese banks

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Abstract: In the context of the digital era reshaping the global economy, this study aims to clarify the nature and trajectory of digital transformation in four major Vietnamese banks, Techcombank, Vietcombank, VPBank, and BIDV, as microcosms of an emerging economy. The research pursues three objectives: (i) to analyze digital transformation strategies and implementation approaches; (ii) to evaluate the impact of digital technologies on operational efficiency, competitive capability, and customer experience; and (iii) to draw lessons for developing countries transitioning toward a digital economy. The study is grounded in Vial's [1] digital transformation framework, complemented by Chesbrough's [2] open innovation perspective, together with digital maturity models and Rogers' [3] innovation diffusion theory. A qualitative research design combining multiple case studies is employed, using data from secondary sources and semi-structured interviews. The collected data are analyzed through thematic analysis to examine strategic, organizational, and technological dimensions of digital transformation. The findings reveal that digital transformation in Vietnamese banks extends beyond technology adoption to include organizational restructuring, process reconfiguration, and customer-centric innovation. Banks that effectively align technological investments with organizational capabilities demonstrate stronger improvements in operational performance and customer experience, providing practical insights for financial institutions and policymakers in emerging economies.

Keywords: Commercial banks, Digital financial policy, Digital transformation, FinTech, Open banking, Vietnam.

1. Introduction

Over the past decade, digital transformation has become a far-reaching force reshaping the global banking industry. Beyond technological adoption, it reflects a comprehensive redefinition of value creation, service delivery, and risk management [1]. The Fourth Industrial Revolution, with AI, big data, cloud computing, and blockchain, has turned traditional banks into dynamic digital ecosystems, where data has become a new source of competitive capital [4]. As the COVID-19 pandemic disrupted in-person transactions and physical banking services, banks were compelled to accelerate the migration of their operations to digital and online platforms [5]. Within this shift, Asia, especially Singapore, India, and Vietnam, has emerged as a focal point of innovation, where the speed of adaptation has exceeded expectations.

Digital transformation is considered an inevitable strategic direction for Vietnam's banking sector, offering opportunities to realign the role of banks with the country's socialist-oriented market economy and broader national development objectives [6]. The government has identified banking and finance as priority sectors in the National Digital Transformation Program to 2025, with a vision extending to 2030. With 76% of adults using smartphones and over 70% of the population connected to the Internet, Vietnam has a strong digital foundation. Building on this, major banks such as Vietcombank, BIDV, Techcombank, and VPBank have implemented comprehensive digital strategies: Vietcombank is developing a Digital Banking-as-a-Service model; Techcombank is fostering a data-driven operating

culture; VPBank launched “YOLO,” a digital bank targeting young customers; and BIDV has steadily modernized its core technology systems [7].

The results indicate that digital transformation has brought about significant changes in Vietnam’s banking sector. According to data reported by the State Bank of Vietnam and the National Payment Corporation of Vietnam (NAPAS), many credit institutions now process over 95% of their transactions through digital channels, while more than 87% of the adult population holds a payment account at a bank. In 2024 alone, the NAPAS system processed 9.56 billion transactions, an increase of approximately 30% compared to the previous year, reflecting the rapid expansion of digital banking services. These developments have contributed to improved operational efficiency, the expansion of non-credit services, and enhanced customer experience. However, Vietnam’s banking sector continues to face challenges in its digital transformation, including shortages of high-skilled technology personnel, fragmented data systems, cybersecurity risks, and a regulatory framework that has yet to fully keep pace with technological innovation [8].

2. Research Problem, Objectives, and Questions

While much of the international literature has focused on the United States, the United Kingdom, and Singapore [9], developing countries, where banks must pursue technological innovation while adapting to distinctive consumer cultures, remain underexamined. This study aims to address this gap through three specific objectives.:

- (1) To analyze the digital transformation processes and strategies of major banks in Vietnam.
- (2) To assess the impacts of digital transformation on operational performance, competitiveness, and customer experience.
- (3) To draw lessons and policy recommendations for emerging and developing economies based on Vietnam’s experience.

Accordingly, three research questions are posed:

- (1) What factors drive digital transformation in Vietnamese banks?
- (2) Which models and strategies lead to sustainable success?
- (3) What lessons can be shared with emerging economies?

The study contributes in three ways. First, it provides empirical evidence on how Vietnamese banks, operating with limited resources, have managed digital transformation effectively to enhance productivity and customer experience. Second, in the international comparative context, it positions Vietnam alongside India and several emerging Asian economies, thereby enriching academic discussions on digital finance in the region. Third, in terms of theory, the study proposes a “Hybrid Digital Banking Model,” which combines technological innovation with organizational cultural values to ensure that digital banking preserves institutional identity while strengthening the relationship between technology, people, and sustainable development.

3. Literature Review

Digital transformation in banking extends beyond data digitization and process automation; it involves comprehensive reform of organizational structures, business strategies, and leadership mindsets [1]. Its core is restructuring operations with digital technologies to improve customer experience, operational efficiency, and competitiveness [10].

According to the International Monetary Fund [11], digital financial services provided via online platforms, including payments, savings, credit, and investments, are increasingly vital to the digital financial ecosystem. Technological advances such as artificial intelligence, big data analytics, cloud computing, and distributed ledger technologies are transforming banks from traditional service providers into integrated financial-technology platforms.

At the core of digital transformation is the shift from a product-centric bank to an experience-centric bank, where data and customer insights are vital assets [1]. Success relies not only on

technology investments but also on organizational culture, leadership skills, and human adaptability [12].

This study employs three key theoretical frameworks to analyze digital transformation in banking:

(2) The Technology–Organization–Environment (TOE) framework, as identified by Tornatzky and Fleischer [13], highlights technology, organizational characteristics, and the external environment as key factors influencing technology adoption. In banking, this framework explains variations in digital technology adoption and transformation outcomes, reflecting differences in technological readiness, organizational capabilities, and environmental pressures [14].

(2) The Digital Maturity Model describes digital transformation as a staged process with five phases: Initiation, Development, Integration, Optimization, and Innovation, representing the organizational journey from early digital experimentation to a fully digital, innovation-driven bank. This view aligns with the idea that digital transformation occurs incrementally through successive maturity levels, involving not only technological adoption but also changes in organizational structures, processes, and value creation mechanisms [1].

(3) Diffusion of Innovation Theory [3]. This theory explains how and at what pace new technologies are adopted. In banking, factors such as relative advantage, compatibility, and complexity strongly influence innovation decisions [15].

Together, these three models provide a theoretical foundation for examining the factors shaping digital transformation processes in major Vietnamese banks.

Globally, digital transformation is seen as a key driver of financial system renewal. In Europe, Westerman et al. [16] emphasize that success depends on aligning technology with business strategy. In India, the Unified Payments Interface (UPI) has significantly promoted financial inclusion and broader access to formal financial services, boosting participation in the digital economy [17]. In Singapore, the issuance of digital banking licenses by the Monetary Authority aims to foster a more resilient, competitive, and vibrant banking sector, while encouraging innovation and ecosystem development in digital financial services. [18]. In emerging economies, Akter et al. [9] identify key barriers, including shortages of technology talent, conservative organizational cultures, and concerns over data security.

Overall, international studies mainly focus on countries with advanced FinTech ecosystems, while Vietnam, where digital transformation occurs alongside institutional development, remains underexplored in research.

Since the launch of Vietnam's National Digital Transformation Program in 2018, domestic research and policy analyses have increasingly focused on digital banking. Digital transformation is widely seen as an opportunity to reposition banks' roles in line with Vietnam's socialist-oriented market economy and national development goals [6]. Existing studies and sectoral reports highlight that digital banking offers significant benefits, including improved risk management, cost reduction, and expanded financial services to remote and underserved areas [8].

However, most studies remain descriptive, lack international comparison, and are not grounded in established theoretical frameworks; as a result, three major gaps persist:

(1) A lack of in-depth qualitative research on Vietnamese banks' internal digitalization strategies remains evident.

(2) Limited comparative studies exist between Vietnam and other developing countries like India and Indonesia.

(3) Insufficient attention to the role of organizational culture and transformational leadership.

Therefore, this study aims to address these gaps and proposes a hybrid theoretical framework that reflects the characteristics of emerging economies, where technology and people work together to shape the future of digital banking.

4. Research Methodology

This study employs a qualitative approach combined with case study analysis to explore the nature and context of digital transformation in Vietnamese banking. This approach enables the identification of underlying patterns, comparison of differences across banks, and development of a theory grounded in practice [19].

The choice of the case study method reflects the reality that the Vietnamese banking sector is shifting from transaction digitization to a comprehensive transformation of business models. In a context where quantitative data remain limited and transformation levels vary across institutions, a qualitative approach enables an in-depth examination of strategies and organizational culture [20].

The sample includes four major commercial banks selected based on three criteria: (i) asset size and systemic influence; (ii) extent of digital transformation; and (iii) ownership diversity, including state-owned and private banks. This group reflects a typical picture of digitalization in Vietnamese banking and enables comparison with India and selected ASEAN countries.

The data include secondary sources such as annual reports, documents from the State Bank of Vietnam, the IMF, World Bank, Deloitte, PwC, and relevant academic publications. Primary data were collected through semi-structured interviews with managers, technology specialists, and branch leaders, as well as group discussions with customers.

Data analysis followed Braun and Clarke's [21] thematic analysis, supported by NVivo 14 software, ensuring objectivity, transparency, and reliability of the findings.

Table 1.

Summary of digital transformation strategies and directions of major banks in Vietnam.

Group	Bank	Type	Key Features of Digital Transformation
1	Vietcombank	State-owned commercial bank	Comprehensive digitization of transactions and customer services; VCB Digibank platform integrates Mobile and Internet Banking.
2	BIDV	State-owned commercial bank	Implementation of a new core banking system with a strong emphasis on data security and risk management.
3	Techcombank	Private bank	Customer-centric approach; application of Big Data and AI in behavioral analytics.
4	VPBank	Private bank	Pioneer of the YOLO digital bank and SME Connect platform, expanding financial inclusion effectively.

Source: Techcombank, Vietcombank, VPBank, & BIDV's Annual reports.

5. Findings and Case Analysis

The findings reveal that digital transformation in Vietnamese banking has advanced beyond technology to become a vital strategic priority amid global competition. This process is influenced by three main drivers:

- (i) market and customer pressures demanding speed, convenience, and superior experience;
- (ii) technological advancements, particularly in AI, big data, and open banking; and
- (iii) policy directions articulated through the National Digital Transformation Strategy and the cashless payment development program.

Qualitative analysis, drawing on expert interviews, bank reports, and international comparisons, identifies five core themes characterizing the digital transformation process as follows.:

Table 2.

Key themes reflecting the nature of digital transformation in the banking sector.

Code	Theme	Summary Description
T1	Digital Transformation as a Survival Strategy	Not merely a technological trend but a new mode of operation.
T2	Data as a Strategic Asset	Data becomes central to decision-making and product development.
T3	Innovation Culture and Human Capability	Human resources are both a bottleneck and a lever for transformation.
T4	Customer-Centric Orientation	All innovations must enhance the user experience.
T5	Enabling Policies and Institutions	The government and the State Bank play a guiding and enabling role.

From the four selected bank cases, distinct models of digital transformation emerge within the Vietnamese context.

At Vietcombank, a model of "comprehensive but cautious digitalization" is observed. Vietcombank follows a strategy of "controlled, end-to-end digital transformation" built on three pillars: process digitalization, enhanced customer experience, and intelligent data governance. By 2024, 88% of transactions were conducted through digital channels; VCB Digibank unified Internet and Mobile Banking; and its AI chatbot handled more than 1.5 million queries per year. This "safety-first and incremental" approach aligns with a large-scale bank that prioritizes security and stability, though it may occasionally limit the speed of innovation. The lesson learned is to balance operational safety with mechanisms that empower internal technological creativity.

At BIDV, the model is "building a solid foundation before taking off." BIDV views digital transformation as a reconstruction of its operational infrastructure, focusing on core systems and data. In 2022, the bank completed the modernization of the Temenos T24 core banking system, automated 80% of processes using RPA, and established a centralized data warehouse to support risk management. This "foundation-first, acceleration-later" strategy creates long-term stability but may slow progress compared with private banks. The lesson learned is that investing in data infrastructure is essential, but innovation cycles must be shortened.

At Techcombank, the model emphasizes "data-driven decisions and innovation leadership." As a pioneer in data-driven management, Techcombank collaborates with AWS and Adobe to build a real-time analytics platform. Ninety-five percent of retail transactions occur on digital channels; the Techcombank Mobile application has 7.5 million users; and more than 20 credit-scoring models operate effectively. Techcombank goes beyond "digitizing services" by restructuring its entire operational workflow around customer behavioral data, reflecting an agile mindset similar to HDFC Bank in India. The lesson learned is that data must be leveraged as a tool for creating new value, and a culture of continuous learning is essential for success.

At VPBank, the approach is "a mass-market digital bank targeting younger customers." VPBank positions itself as a mass-market digital institution focused on general consumers, small businesses, and younger generations. The YOLO by VPBank application (launched in 2018) integrates payment, entertainment, travel, and personal finance services. By 2024, 70% of active customers used digital channels, and retail loan portfolios from digital lending accounted for 25%. VPBank has partnered with Google Cloud and Be Group to develop SME Connect for small enterprises. This flexible, market-oriented approach enables rapid expansion but requires streamlined risk management and security systems. The lesson learned is that speed must go hand in hand with risk control to remain competitive in the digital environment.

Taken together, the four case studies demonstrate that digital transformation in Vietnamese banking is shifting from technology adoption toward restructuring business models, with data, human capability, and leadership strategy at the center. Differences arise from varying levels of readiness, strategic orientation, and execution speed. Overall, Vietnamese banks are approaching a fully digital banking model, but long-term success will depend on integrating technology, organizational culture, and regulatory institutions within a rapidly expanding digital financial ecosystem.

5.1. Comparative Synthesis of Development Models

Three models of digital transformation emerge in Vietnamese banking:

Table 3.

Digital transformation models of the four banks.

Model	Representatives	Characteristics	Main Objective
Safety-Incremental	Vietcombank, BIDV	Focus on foundational systems, security, and compliance	Stability and sustainability
Data-Efficiency	Techcombank	Driven by data analytics and AI	Optimization and personalization
Innovation-Expansion	VPBank	FinTech collaboration and ecosystem expansion	Rapid growth and inclusion

Source: Techcombank, Vietcombank, VPBank, & BIDV's Annual reports

The three models are not mutually exclusive; instead, they complement each other and represent three stages of digital transformation in banking: process digitalization, data digitalization, and the digitalization of mindsets and business models.

Proposed Model. Drawing on Vietnam's experience and international comparisons, this study proposes the *Hybrid Digital Banking Model*, which consists of four layers:

First, the core layer emphasizes operational stability, regulatory compliance, and security, as observed in Vietcombank and BIDV.

Second, the data layer, which integrates data and leverages AI (as demonstrated by Techcombank).

Third, the experience layer optimizes customer experience through multichannel and personalized services, as demonstrated by VPBank.

Fourth, the open layer, which promotes collaboration with FinTech, BigTech, and startups.

This model aims to balance safety and innovation and is well-suited for developing financial environments such as Vietnam and other emerging economies.

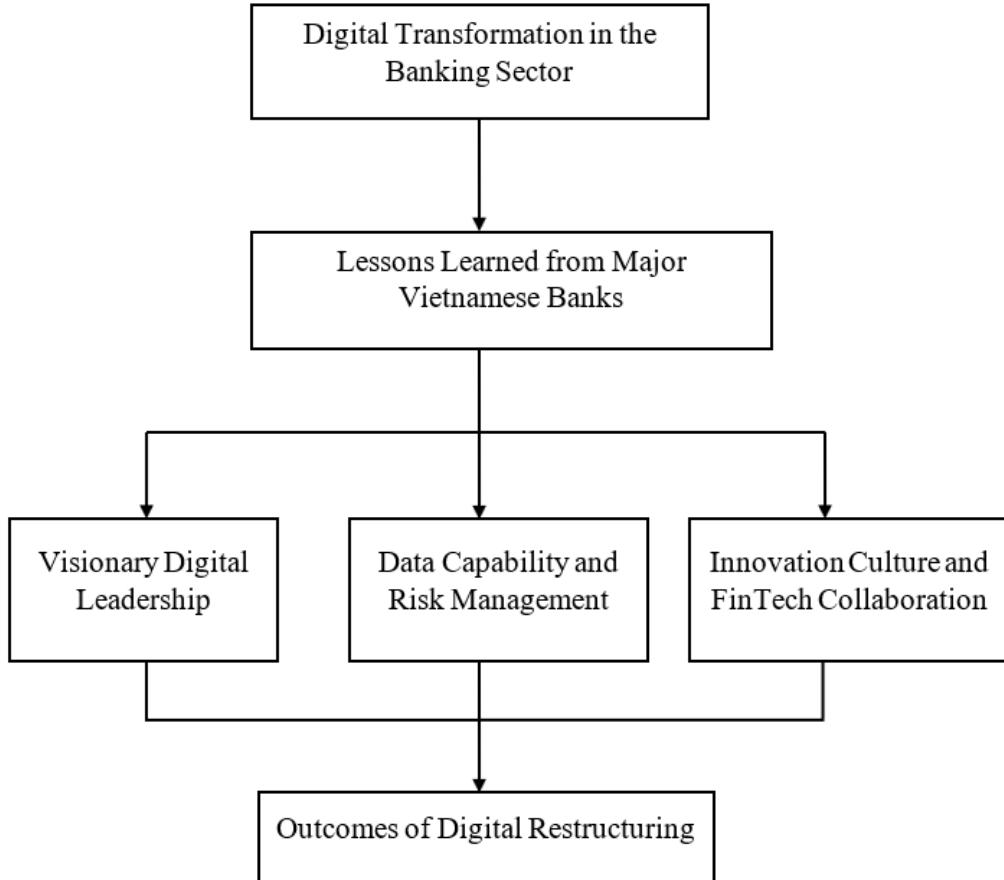


Figure 1.
Diagram of the Research Model Results.

6. Discussion

The findings confirm that digital transformation in banking is not merely the adoption of technology but a comprehensive restructuring of business models, governance, and organizational culture. Technology is only "the visible tip of the iceberg," while the roots of transformation lie in shifts in mindsets, behaviors, and beliefs, from leaders to employees and customers, within an emerging digital financial ecosystem.

The study extends Vial [1]'s theoretical framework by emphasizing eight foundational elements of digital transformation: awareness, strategy, technology, value, processes, structure, capability, and culture. In developing economies like Vietnam, organizational culture and human capability are crucial. When technical infrastructure is limited, willingness to learn and innovation drive progress, making these elements vital for successful digital transformation. Digital transformation cannot be purchased; it must be cultivated through mindset development and inspirational leadership, as reflected in the "digital mindset leadership" model proposed by Davenport and Westerman [22], clearly demonstrated at Vietcombank and BIDV.

Second, the cases of Techcombank and VPBank demonstrate that customer-centric innovation creates stronger momentum than closed, internally driven innovation. Collaboration with FinTech reflects the principles of Open Innovation [2], where value is co-created through partnerships rather than in isolation. This marks a significant cognitive shift for the Vietnamese banking sector, which has long been influenced by closed administrative mechanisms, moving from "protecting secrecy" to "sharing value."

Third, the study contributes to the development of transition-region theory by demonstrating that in Vietnam, digital transformation is more than technical refinement; it signifies organizational rebirth. Banks are transitioning from legacy administrative management to data-driven governance and adaptive learning, simultaneously learning, experimenting, and shaping their paths. The study introduces the “geo-cultural-organizational” framework, highlighting that digital transformation in emerging economies must balance institutional heritage, cultural values, and modern technology, creating a unique national transformation identity.

Drawing from the four representative cases, five key managerial implications emerge:

First, inspirational leadership: Leaders in the digital era must shift from power-based thinking to knowledge-sharing mindsets, guiding through vision and trust. At Techcombank, senior leaders participate directly in innovation sprints, demonstrating alignment among strategy, technology, and customer needs.

Banks should establish internal sandboxes for innovation, as BIDV has with SME Connect, a model balancing creative freedom and risk control.

Third, data as the new capital: Techcombank’s development of a Data Lake and AI-enabled credit processes, which reduce processing time by 40%, illustrates the role of data as a vital resource in the digital age [23].

Fourth, co-creating value with customers: VPBank’s YOLO model reflects the Service-Dominant Logic [24] in which value is measured through actual customer experience.

Fifth, three-layer risk management: this includes prevention and intelligent monitoring, real-time anomaly detection using AI, and rapid response via an independent cybersecurity center, as implemented at Vietcombank.

At the policy level, the study proposes four strategic directions:

(i) Developing interoperable payment infrastructure across banks, e-wallets, and enterprises to promote financial inclusion, especially in rural areas, is essential.

(ii) Improving the regulatory framework for open banking by enabling secure data sharing through APIs, drawing on India’s Account Aggregator model, while integrating trust and social responsibility considerations.

(iii) Investing in multi-disciplinary digital human resources through collaboration between the State Bank of Vietnam and the Ministry of Education, similar to India’s FutureSkills initiative, aims to develop hybrid talent in economics, technology, and user behavior.

(iv) Promoting regional cooperation by establishing an Asian Digital Banking Research Alliance among Vietnam, India, Singapore, and South Korea to share knowledge, open data standards, and applications of green technology in risk management.

In sum, digital transformation in banking involves organizations and people, with technology as a tool, and culture and leadership at the core that create value. The study offers three key contributions:

(i) Theoretical: developing a multi-layer analytical framework of 'culture–technology–policy' for digital banking in emerging markets.

(ii) Practical: providing qualitative evidence from four major banks, identifying Vietnam-specific transformation models;

(iii) Policy-oriented: proposing strategic pathways for sustainable digital banking development that harmonize technology, human capability, and cultural values.

7. Policy Recommendations

7.1. For the Government

In the digital economy era, the government is not only a regulator but also an architect of the digital institutional framework. The priority is to improve the legal framework for digital banking and open data sharing, moving toward a Digital Banking Transactions Law and a Financial Data Decree. Such a framework would provide the foundation for API-based connectivity among banks, FinTech firms, and customers, ensuring both information security and innovation. A flexible regulatory sandbox

should be implemented to encourage controlled experimentation, alongside investment in a nationally interoperable digital payment infrastructure that links banks, e-wallets, and enterprises to expand financial inclusion. Additionally, developing financial-technology human resources is an urgent requirement. A National Program on FinTech and Digital Data Talent should be established, following a public-private partnership model similar to India's FutureSkills initiative.

7.2. For Commercial Banks

Digital transformation is more of a revolution of mindset than technology. Insights from Techcombank, Vietcombank, and VPBank suggest three strategic orientations for success:

(1) Adopt a data-centric approach by investing in infrastructure and AI applications to personalize products, optimize customer experience, and improve risk management strategies;

(2) Embrace collaboration rather than competition by expanding partnerships with FinTech firms to build open banking ecosystems and co-create value;

(3) Restructure organizational culture and digital leadership to foster learning, experimentation, and empowerment for innovation.

Banks should enhance users' digital financial literacy, promote data security awareness, and encourage cashless payments via user-friendly platforms like MoMo, ZaloPay, and VNPay, marking a shift from traditional trust to digital trust.

8. Conclusion

Digital transformation in Vietnamese banking involves a comprehensive restructuring of business models, governance, and organizational culture. Success depends not only on technology but also on strategic thinking, inspirational leadership, and fostering a culture of continuous innovation.

Unlike developed countries, Vietnam has a unique transformation identity where technology is integrated with human values, making the banking profession more refined and accessible. This study enhances digital transformation theory by highlighting the interaction between culture, institutions, and technology, offering a strategic reference framework for Vietnam and the ASEAN region in the near future.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study, with no vital features omitted. Any discrepancies from the planned study have been explained. This study adhered to all ethical practices during writing.

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