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Digital Banking Development in Vietnam: Current Status, Challenges and Policy Implications

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Abstract

This paper examines the development of digital banking in Vietnam by synthesizing policy documents, market statistics, regulatory milestones and international literature on digital finance. The study shows that Vietnam's banking sector has moved rapidly from transaction digitization to a broader digital banking ecosystem driven by mobile banking, QR payments, electronic know-your-customer solutions, biometric authentication, data connectivity and fintech partnerships. In 2024, non-cash payments reached 17.7 billion transactions with a total value of VND 295.2 quadrillion, while the first quarter of 2026 continued to record strong growth in non-cash, internet, mobile and QR-

code payments. These developments indicate significant progress toward the targets of the State Bank of Vietnam's digital transformation agenda. However, Vietnam still faces major challenges related to cybersecurity, data protection, open banking standards, consumer protection, digital inclusion, legacy core systems, talent shortages and regulatory adaptation. The paper contributes a structured analytical framework and proposes policy implications for regulators and banks, emphasizing risk-based regulation, trusted digital identity, interoperable data infrastructure, cyber resilience, responsible artificial intelligence and inclusive digital financial services.

Keywords: Cybersecurity, Digital Banking, Digital Finance, Financial Inclusion, Vietnam

1. Introduction

Digital banking has become one of the most visible components of Vietnam's national digital transformation agenda. In contrast with earlier phases of banking modernization, which focused mainly on automated teller machines, card payments and internet banking, the current phase is characterized by mobile-first interaction, cloud-enabled infrastructure, artificial intelligence, biometric authentication, digital identity, open application programming interfaces (APIs), data analytics and platform-based financial ecosystems. For customers, digital banking reduces time, distance and transaction costs; for banks, it changes operating models, cost structures, risk management and customer acquisition; for regulators, it creates a new supervisory frontier where financial innovation must be balanced with safety, consumer trust and systemic stability.

Vietnam provides a useful case for studying digital banking in an emerging market. The country has a young and technology-oriented population, rapid smartphone adoption, expanding e-commerce, a dynamic fintech ecosystem and a policy environment that explicitly prioritizes digital government, digital economy and digital society. The Prime Minister's Decision No. 749/QD-TTg placed digital transformation at the center of national development, while the State Bank of Vietnam (SBV) issued Decision No. 810/QD-NHNN to approve the digital transformation plan for the banking sector to 2025 with an orientation toward 2030. In 2025, the SBV further announced a new digital transformation strategy to 2030, signaling that the policy focus had moved from adoption and experimentation to institutionalization, interoperability and resilience.

The current state of digital banking in Vietnam is particularly dynamic. Payment behavior has shifted rapidly from cash-based transactions to digital and mobile channels. Banks and payment intermediaries have deployed QR codes, e-wallet links, instant transfers, digital onboarding, electronic know-your-customer (eKYC), biometric verification and digital credit scoring. At the same time, the sector has been linked more closely with the national population database, chip-based citizen identification cards and the VNeID electronic identification system. These developments create the foundation for customer-centric digital banking services and for more inclusive access to finance, especially in areas where traditional branch networks are less efficient.

Nevertheless, the acceleration of digital banking also brings new policy and managerial problems. Digital channels increase

dependence on data, cybersecurity, third-party service providers and technology infrastructure. The boundary between banks, fintech companies, telecommunications firms, e-commerce platforms and big technology companies has become less clear. Customers benefit from convenience, but they are also exposed to phishing, social engineering, fraud, data leakage, algorithmic opacity and digital exclusion. Banks face pressure to modernize legacy core systems, integrate fragmented data, recruit digital talent, and redesign risk governance. Regulators must update legal frameworks fast enough to enable innovation while preserving trust in the financial system.

Against this background, this paper aims to answer three research questions. First, what are the main features of digital banking development in Vietnam in terms of policy framework, market adoption, infrastructure and business model transformation? Second, what challenges constrain the deeper development of digital banking in Vietnam? Third, what policy implications can be drawn for regulators and commercial banks to promote safe, inclusive and sustainable digital banking? The study adopts a qualitative desk-research and policy-analysis approach, synthesizing academic theories of technology adoption and financial innovation with evidence from Vietnam's banking sector.

The contribution of the paper is threefold. It provides an updated synthesis of Vietnam's digital banking development using recent policy and market evidence; it develops an analytical framework that links adoption, infrastructure, regulation, ecosystem integration and risk governance; and it proposes policy implications that are aligned with the Vietnamese institutional context rather than simply importing recommendations from advanced economies. The remainder of the paper is organized as follows. Section 2 reviews the literature, theoretical framework and methods. Section 3 presents and discusses the results. Section 4 concludes and provides policy implications. Section 5 lists the references.

2. Literature Review, Theoretical Framework and Methods

2.1 Conceptualizing Digital Banking

Digital banking can be defined as the delivery of banking products, services and processes through digital technologies and data-driven channels. It is broader than online banking or mobile banking because it involves changes in business architecture, customer journeys, operations, risk management, organizational capabilities and ecosystem connectivity. In a narrow sense, digital banking refers to digital channels for account opening, payments, transfers, deposits, loans and customer service. In a broader sense, it refers to the reconfiguration of banking around data, platforms, automation, digital identity, embedded finance and personalized financial services.

A distinction should be made between digitization, digitalization and digital transformation. Digitization refers to converting information from physical to digital form, such as scanning documents or replacing paper statements with electronic records. Digitalization refers to using digital technologies to improve existing processes, such as allowing customers to transfer money via a mobile application. Digital transformation is a more fundamental change in the business model and institutional logic of banking, where products, distribution, risk assessment, customer engagement and governance are redesigned around digital

data and technology. Vietnam's current banking transition contains all three levels, but the policy objective increasingly emphasizes transformation rather than isolated digitization.

Digital banking also differs from fintech. Fintech refers to technology-enabled innovation in financial services, often delivered by non-bank providers or specialized technology firms. Digital banking refers to banks' own digital transformation and their participation in digital financial ecosystems. In Vietnam, many digital-native banking propositions, such as mobile-first banking applications, operate within the legal structure of licensed commercial banks rather than under a separate digital bank license. This makes the Vietnamese model different from markets where standalone digital banks or virtual banks are licensed separately. The Vietnamese approach has the advantage of preserving prudential supervision through existing banking licenses, but it also raises questions about competition, innovation incentives and the future regulatory perimeter.

2.2 Theoretical Foundations

Several theoretical perspectives help explain the development of digital banking. Diffusion of Innovation theory argues that new technologies spread through a social system depending on perceived relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003) [16]. In digital banking, relative advantage appears in convenience, speed and lower transaction costs; compatibility depends on customers' digital habits and merchants' acceptance infrastructure; complexity affects elderly, rural and less digitally literate users; trialability is reflected in low-value transfers and QR payments; and observability appears when digital payments become common in daily commerce.

Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) provide a demand-side lens. According to Davis (1989) [4], perceived usefulness and perceived ease of use influence technology acceptance. Venkatesh *et al.* (2003) [22] later integrated performance expectancy, effort expectancy, social influence and facilitating conditions. Applied to Vietnam, these theories imply that digital banking adoption depends not only on infrastructure and regulation but also on trust, user interface design, perceived security, customer support, transaction fees and social normalization of digital payments.

The Technology-Organization-Environment (TOE) framework emphasizes that technology adoption is shaped by internal organizational readiness and external environmental pressure (Tornatzky & Fleischer, 1990) [21]. For banks, technological readiness includes core banking systems, cloud architecture, cybersecurity tools and data analytics; organizational readiness includes leadership commitment, risk culture, talent and agile governance; environmental pressure includes customer expectations, fintech competition, regulatory mandates and macroeconomic digitalization. The TOE framework is particularly useful for Vietnam because digital maturity varies substantially across large state-owned banks, private joint-stock banks, foreign bank branches, fintech firms and payment intermediaries.

Dynamic capabilities theory highlights the ability of firms to sense opportunities, seize them and reconfigure resources under technological change (Teece, 2007) [20]. Banks that

merely add mobile applications without reconfiguring products, data governance and operating models may achieve channel digitization but not digital transformation. By contrast, banks that integrate customer analytics, digital onboarding, automated risk scoring, ecosystem partnerships and real-time fraud monitoring are more likely to generate sustainable competitive advantage. This lens also explains why digital transformation is not only a technology project but also a strategic and organizational transformation. Finally, the financial inclusion and regulatory-innovation literature emphasizes the social and policy functions of digital finance. Ozili (2018) [13] argues that digital finance can expand access to formal finance, reduce transaction costs and improve financial inclusion, but it may also create new exclusion for users without digital access or skills. Global institutions such as the World Bank, BIS and OECD have similarly stressed that digital finance must be accompanied by consumer protection, cybersecurity, data governance and risk-based supervision. These perspectives are critical for Vietnam because the country's digital banking agenda is linked not only to bank efficiency but also to inclusive growth and public-service modernization.

Table 1: Theoretical lenses for analyzing digital banking development

Theoretical lens	Main argument	Application to digital banking in Vietnam
Diffusion of Innovation	Adoption depends on relative advantage, compatibility, complexity, trialability and observability.	Explains the rapid spread of QR payments and mobile banking when they become convenient, visible and low cost.
TAM/UTAUT	Users adopt technology when it is useful, easy to use, socially accepted and supported by facilitating conditions.	Highlights the role of trust, user experience, security, digital literacy and merchant acceptance.
TOE framework	Adoption depends on technology readiness, organizational readiness and environmental pressure.	Explains uneven digital maturity among banks and the role of fintech competition and regulatory pressure.
Dynamic capabilities	Firms gain advantage by sensing, seizing and reconfiguring resources under change.	Shows why banks need strategic transformation, not only mobile applications or isolated process digitization.
Financial inclusion and regulation	Digital finance expands access but creates risks requiring consumer protection and oversight.	Supports policy emphasis on rural users, Mobile Money, cybersecurity, data protection and responsible innovation.

2.3 Previous Studies and Research Gap

International studies generally find that digital finance can improve efficiency, access and competition but can also intensify operational and systemic risks. Berger (2003) [2] shows that technological progress changes the production and distribution of banking services. Gomber *et al.* (2017) [6] describe digital finance as a research field involving new products, new providers, new processes and new regulatory

issues. Philippon (2016) [14] argues that fintech has the potential to reduce the cost of financial intermediation, while Vives (2017) [27] stresses that fintech disrupts banking by changing information processing, customer interfaces and competition. Boot *et al.* (2021) [3] interpret fintech as both an old and new phenomenon: old because finance has always been information-intensive, and new because digital technology reduces frictions at scale.

Research on emerging markets emphasizes financial inclusion and institutional readiness. Digital financial services can overcome distance, reduce cash-handling costs and support micro-enterprises, but their success depends on digital infrastructure, trust, consumer protection and regulatory capacity. The World Bank's Global Findex reports show that digital payments and mobile money have become central to financial inclusion. The OECD's work on consumer protection in the digital age underlines that digital products may increase access and convenience but also expose consumers to fraud, data breaches, privacy problems and unsuitable products. The Basel Committee on Banking Supervision warns that digitalization creates new vulnerabilities for banks, customers and financial stability, including strategic risk, cyber risk, third-party dependency and operational resilience concerns.

In Vietnam, existing literature and policy commentaries often describe the rapid growth of non-cash payments, fintech partnerships and digital applications. However, many studies remain descriptive and focus on individual technologies such as mobile banking or e-wallets. There is still a need for a more integrated analysis that connects policy milestones, market indicators, institutional readiness, digital inclusion and risk governance. This paper addresses that gap by using a structured analytical framework to examine the current status, challenges and policy implications of digital banking development in Vietnam.

2.4 Analytical Framework

The analytical framework of the paper views digital banking development as the interaction of six dimensions: policy and regulatory framework; digital infrastructure and data connectivity; customer adoption and market behavior; bank business-model transformation; risk governance and consumer protection; and inclusion and human capital. These dimensions are mutually reinforcing. Strong infrastructure enables adoption, but adoption will not be sustainable without trust. Policy can promote innovation, but excessive regulatory rigidity may slow experimentation. Banks can improve efficiency through automation, but weak cybersecurity or poor data governance may undermine public confidence. Financial inclusion can expand through mobile and QR services, but digital divides may persist if disadvantaged users lack access, skills or affordable devices. This framework is used to organize the results section. The first part examines the policy landscape. The second part reviews indicators of digital payment and digital banking adoption. The third part analyzes business-model transformation among banks. The fourth part identifies the main challenges and explains why these challenges require both regulatory and managerial responses.

Table 2: Analytical framework for digital banking development

Dimension	Key questions	Indicative evidence
Policy and regulation	Do laws and supervisory rules enable safe digital banking?	National digital transformation program, SBV digital transformation strategy, non-cash payment rules, e-transaction law, data protection rules.
Infrastructure and data	Are payment, identity, data and connectivity systems interoperable?	Instant payment systems, QR standards, population database links, biometric verification, cloud and API infrastructure.
Customer adoption	Are individuals and firms using digital channels at scale?	Growth of mobile banking, internet transactions, QR payments, electronic payment services and Mobile Money.
Bank transformation	Are banks changing business models and internal operations?	Digital onboarding, automated lending, analytics, digital revenue, branch-light service models, cost-to-income improvements.
Risk and trust	Are cybersecurity, fraud, privacy and consumer protection managed effectively?	Biometric rules, cyber resilience, data governance, fraud monitoring, complaint handling and customer education.
Inclusion and skills	Does digital banking serve rural, elderly and low-income users?	Mobile Money in remote areas, financial literacy programs, accessible interface design and agent networks.

2.5 Methods and Data Sources

This paper uses a qualitative desk-research method combined with policy analysis and secondary-data synthesis. The study does not estimate an econometric model; instead, it evaluates the status and challenges of digital banking development through document review, institutional analysis and triangulation of official statistics and international literature. This approach is appropriate because the research objective is to identify development patterns and policy implications rather than to test causal relationships using firm-level or household-level microdata. The main sources include: (i) legal and policy documents issued by the Government of Vietnam, the National Assembly and the State Bank of Vietnam; (ii) public statistics and news releases from the SBV and official Vietnamese media; (iii) reports and policy papers from the World Bank, BIS and OECD; and (iv) peer-reviewed studies on technology adoption, digital finance, fintech, financial inclusion and banking innovation. The evidence is interpreted cautiously because some indicators are reported by transaction channel rather than by individual user, and because digital banking maturity is heterogeneous across banks and customer segments.

The method follows three steps. First, the paper identifies the policy trajectory of digital banking from national digital transformation to sector-specific banking transformation. Second, it synthesizes market evidence on non-cash payments, mobile banking, QR payments, eKYC, biometric verification and Mobile Money. Third, it analyzes the challenges and derives policy implications by comparing Vietnam's development trajectory with theoretical and international policy insights.

3. Results and Discussion

3.1 Policy and Regulatory Landscape

Vietnam's digital banking development has been strongly shaped by state-led digital transformation policy. Decision No. 749/QD-TTg of 2020 approved the National Digital Transformation Program to 2025 with orientations toward 2030. The program aims to develop digital government, digital economy and digital society, and explicitly includes finance and banking among priority areas. In banking, the national program encourages the use of credit scoring based on customer databases and reliable scoring models, thereby linking digital banking with improved access to credit and financial inclusion.

The banking-specific roadmap was established by Decision No. 810/QD-NHNN of 2021, which approved the Plan on Digital Transformation of the Banking Sector by 2025 with

an orientation toward 2030. The plan contains ambitious targets. By 2025, at least 50% of banking operations should be performed completely by customers in the digital environment; at least 50% of adults should use electronic payment services; and at least 70% of customer transactions should be carried out through digital channels. By 2030, the targets increase to at least 70% of banking operations, 80% of adults using electronic payment services and 80% of customer transactions through digital channels. The plan also emphasizes legal framework reform, data development, open banking, digital ecosystems, risk management, cybersecurity and human resources.

The regulatory framework has continued to evolve. The Law on Electronic Transactions 2023, effective from 1 July 2024, strengthens the legal basis for electronic data messages, e-signatures, digital signatures and e-contracts. Decree No. 52/2024/ND-CP on non-cash payments replaces the older Decree No. 101/2012/ND-CP and provides a more current framework for payment accounts, payment services, intermediary payment services and electronic money. Decree No. 13/2023/ND-CP on personal data protection introduces comprehensive obligations for data controllers and processors, which is highly relevant because digital banking relies on sensitive personal, financial and biometric data.

Security regulation has also become more stringent. Decision No. 2345/QD-NHNN of 2023 requires safety and security measures in online payments and bank card payments, including biometric authentication for certain transactions from July 2024. The rule reflects a policy shift from simple digital expansion toward trusted digital finance. In 2025, the SBV approved Decision No. 3579/QD-NHNN on the Banking Sector Digital Transformation Strategy to 2030, replacing the earlier information technology and digital transformation plans. This new strategy places people and businesses at the center, stresses digital central banking, safe digital banks, integrated data governance, cybersecurity and high-quality digital human resources.

Overall, the policy trajectory shows three stages. The first stage focused on cashless payments and banking technology modernization. The second stage focused on digital transformation targets, eKYC, customer experience and digital channels. The third stage, now emerging, focuses on digital ecosystems, open data, cyber resilience, consumer trust and supervisory modernization. This evolution is consistent with international experience: once basic digital adoption reaches scale, policy attention must shift toward interoperability, risk governance and competition in data-driven financial ecosystems.

Table 3: Major policy and regulatory milestones for digital banking in Vietnam

Year	Instrument	Relevance to digital banking
2020	Decision No. 749/QĐ-TTg on the National Digital Transformation Program	Defines the national digital transformation agenda and prioritizes digital government, digital economy and digital society.
2021	Decision No. 810/QĐ-NHNN on digital transformation of the banking sector	Sets targets for digital banking operations, electronic payment services, digital transactions, automated lending and digital work dossiers.
2023	Decree No. 13/2023/ND-CP on personal data protection	Creates comprehensive obligations for personal data processing, including sensitive data used in digital banking.
2023	Law on Electronic Transactions No. 20/2023/QH15	Strengthens legal recognition of electronic data, e-signatures, digital signatures and e-contracts.
2023	Decision No. 2345/QĐ-NHNN on secure online and card payments	Introduces stronger authentication and security requirements, including biometric authentication for relevant transactions.
2024	Decree No. 52/2024/ND-CP on non-cash payments	Updates the legal framework for payment accounts, payment services, intermediary payment services and electronic money.
2025	Decision No. 3579/QĐ-NHNN on Banking Sector Digital Transformation Strategy to 2030	Moves the sector toward integrated digital finance, digital central banking, data governance, cybersecurity and customer-centric digital banking.

3.2 Current status of digital banking development in Vietnam

The most visible indicator of digital banking development in Vietnam is the expansion of non-cash payments. In 2024, the total value of non-cash payment transactions reportedly reached VND 295.2 quadrillion, equivalent to about 26 times national GDP, while the number of transactions reached 17.7 billion, up 56% from 2023. This indicates that digital payments are no longer a peripheral service but a core infrastructure for commerce, public services, personal finance and business operations.

The growth continued in 2025 and 2026. In the first quarter of 2026, non-cash payment transactions increased by 37.98% in volume and 14.22% in value year-on-year. Internet-based transactions grew by 65.68% in volume and 28.85% in value, while mobile payments increased by 33.22% in volume and 8.35% in value. QR-code payments increased by 16.43% in volume and 52.4% in value, indicating not only broader adoption but also larger-value transactions through QR channels. At the same time, ATM transactions declined and the number of ATMs fell year-on-

year, showing reduced dependence on cash-based service points.

Mobile Money and digital payments also contribute to financial inclusion. By the end of March 2026, Vietnam had 11.45 million Mobile Money accounts, with 5.64 million transactions worth VND 154.34 billion. Although Mobile Money remains smaller than bank-based payments, it is important for rural, mountainous and underserved areas where banking branch networks may be less dense. Earlier data also showed that a large share of Mobile Money accounts belonged to users in rural, remote, border and island areas. This supports the argument that digital finance can complement traditional banking infrastructure and serve segments that are costly to reach through conventional branches.

Another important development is digital identity and data connectivity. The use of the national population database, VNeID and chip-based citizen identification cards has improved the quality of customer identification. As of April 2026, more than 156.6 million customer records had undergone biometric verification, helping reduce fraudulent accounts and improve transparency. This is a significant institutional asset because trusted digital identity is a prerequisite for secure onboarding, account management, online lending, remote authentication and fraud prevention.

Commercial banks have also transformed their internal operations and customer interfaces. Many banks now report that a very high proportion of transactions are conducted through digital channels. Digital onboarding through eKYC allows customers to open payment accounts remotely. Mobile applications increasingly integrate account management, transfers, savings, bill payments, card services, securities links, insurance, loyalty programs and ecosystem services. Some banks have deployed data analytics and artificial intelligence for credit scoring, customer segmentation, fraud detection and personalized recommendations. These changes have helped lower operating costs and improve the customer experience, particularly for retail banking.

However, the development remains uneven. Large state-owned commercial banks have extensive customer bases and public-service connectivity but often face legacy-system complexity. Private joint-stock banks tend to move faster in digital product design, user experience and ecosystem partnerships, although their scale and customer trust may differ. Foreign banks bring international standards and corporate digital banking strengths, but their retail reach is more limited. Fintech firms and e-wallet providers are agile but depend on partnerships with banks and regulatory approval. Therefore, Vietnam's digital banking landscape is best understood as a multi-actor ecosystem rather than a bank-only transformation.

Table 4: Selected indicators of digital banking and cashless payment development in Vietnam

Indicator	Latest reported evidence	Interpretation
Non-cash payments in 2024	17.7 billion transactions; VND 295.2 quadrillion in total value; transaction number up 56% from 2023.	Digital payments have become a core economic infrastructure rather than a marginal banking channel.
Non-cash payments in Q1/2026	Transaction volume up 37.98% and value up 14.22% year-on-year.	Momentum remained strong after the rapid expansion of 2024 and 2025.
Internet-based payments in Q1/2026	Volume up 65.68% and value up 28.85% year-on-year.	Internet channels are expanding rapidly for both personal and business transactions.
Mobile payments in Q1/2026	Volume up 33.22% and value up 8.35% year-on-year.	Mobile remains the dominant customer interface for digital banking.
QR payments in Q1/2026	Volume up 16.43% and value up 52.4% year-on-year.	QR is moving beyond small payments toward higher-value usage.
Mobile Money as of March 2026	11.45 million accounts; 5.64 million transactions worth VND 154.34 billion.	Mobile Money supports inclusion in areas with limited banking access.
Biometric verification as of April 2026	More than 156.6 million customer records biometrically verified.	Digital identity infrastructure is becoming central to trusted digital banking.

3.3 Transformation of digital banking business models

Vietnamese banks are increasingly moving from product-centered banking to customer-journey-centered banking. In the traditional model, customers interacted with banks through branches, paper documents, card counters and manual verification. In the digital model, banks attempt to provide end-to-end services through mobile applications, web portals, contact centers, chatbots and ecosystem partners. Customer journeys are redesigned around onboarding, daily payments, savings, credit, investment, insurance and lifestyle services. This shift is visible in the rise of digital onboarding, instant transfers, account-linked QR payments and integrated bill payment services.

The revenue logic of banks is also changing. In a branch-based model, growth depends heavily on physical networks and manual sales. In a digital model, banks can acquire customers at lower marginal cost, cross-sell through data analytics and offer personalized services in real time. Small-value retail products that were previously costly to serve become more viable when transactions are automated. Digital credit scoring based on internal banking data, credit bureau data, population data and alternative data can reduce information asymmetry, although it must be governed carefully to avoid discrimination, opacity and privacy violations.

The operating model is changing as well. Banks are investing in core-banking modernization, cloud infrastructure, cybersecurity, data lakes, API gateways, robotic process automation and artificial intelligence. Agile product teams and partnerships with fintech firms are becoming more common. Some banks have introduced digital-native brands or separate digital banking units to accelerate innovation without being constrained by traditional branch culture. However, most digital banking initiatives remain within licensed commercial banks, which means that innovation is still connected to conventional prudential requirements, capital rules, risk management and compliance obligations.

Ecosystem strategy is another defining feature. Banks increasingly connect with e-commerce platforms, telecommunications companies, insurance firms, securities companies, public-service portals, transportation providers and utilities. The strategic goal is to embed banking into everyday activities, making payments and financial services invisible but available at the point of need. This trend can improve customer convenience and data richness, but it also raises questions about data sharing, third-party risk, platform dependency and fair competition. Open banking can provide

a safer and more standardized foundation for ecosystem development, but Vietnam still needs more explicit API standards, consent mechanisms and liability rules.

The transformation also affects bank branches. Branches are unlikely to disappear completely because customers still need advisory services, complex transactions, dispute handling and trust-building interactions. However, the role of branches is shifting from routine transaction processing toward advisory, relationship management, complex sales and customer support. This shift requires banks to reskill employees and redesign performance indicators. It also requires a hybrid service model that allows customers to move smoothly between digital channels and human support when digital channels fail or when transactions are sensitive.

3.4 Benefits of Digital Banking Development

Digital banking generates benefits at three levels: customer level, bank level and system level. For customers, the benefits include convenience, speed, 24/7 access, lower transaction costs, transparent transaction history and personalized services. Digital channels are particularly valuable for small businesses and households that need frequent low-value transactions, bill payments, remittances and access to credit information. When combined with Mobile Money and agent networks, digital banking can expand access for rural, remote and disadvantaged groups.

For banks, digital banking can reduce the cost-to-income ratio, improve scalability, increase customer engagement and generate richer data for risk management. Automated processes reduce manual errors and processing time. Digital onboarding expands customer acquisition beyond branch locations. Data analytics can improve credit underwriting, fraud detection, marketing and product design. Digital operations also support environmental and administrative efficiency by reducing paper documents and face-to-face processing.

For the financial system, digital banking supports the development of a cashless economy, improves payment transparency, helps formalize economic activities and creates data trails that can support credit access. It also strengthens the connection between banking services and public administration, including taxes, fees, social welfare payments and public-service transactions. During shocks such as pandemics or natural disasters, digital financial channels can help maintain economic transactions when physical mobility is restricted.

Digital banking also enhances Vietnam’s competitiveness in the regional digital economy. Fast and affordable payments

support e-commerce, cross-border trade, tourism and small-enterprise digitalization. If Vietnam can build interoperable, secure and inclusive digital banking infrastructure, the banking sector can act as an enabling platform for other sectors such as retail, logistics, education, healthcare and public services. This is why digital banking should be understood as a general-purpose infrastructure for the digital economy rather than only a banking-sector project.

3.5 Key Challenges

Despite major progress, Vietnam faces several challenges that may constrain the next phase of digital banking development. The first challenge is regulatory adaptation. Digital banking develops faster than traditional legal drafting cycles. New questions arise about digital lending, e-contract enforceability, cloud outsourcing, cross-border data transfer, artificial intelligence governance, open banking, digital-only banking models, digital assets and platform-based financial services. Although Vietnam has made important progress through new laws and decrees, regulatory coordination across banking, telecommunications, data protection, cybersecurity, competition and consumer protection remains complex.

The second challenge is cybersecurity and fraud. As customers move to digital channels, criminals also move to digital channels. Phishing, social engineering, malware, fake applications, account takeover, SIM-swap attacks, mule accounts and deepfake-enabled scams can undermine trust. Biometric authentication and data verification reduce some risks, but they do not eliminate fraud. Criminals often target customers' behavior rather than banks' technical systems. Therefore, cybersecurity must be complemented by customer education, real-time transaction monitoring, liability rules, interbank information sharing and rapid response mechanisms.

The third challenge is data governance and privacy. Digital banking depends on collecting, processing and sharing sensitive personal and financial data. Data can improve credit scoring and personalization, but it can also create privacy risks, discrimination, unauthorized sharing and concentration of market power. Banks must comply with personal data protection requirements, but compliance alone is not enough. They need clear data governance, data minimization, customer consent management, explainable analytics and strong internal controls. The challenge becomes more difficult when banks cooperate with fintech firms and third-party service providers.

The fourth challenge is interoperability and open banking. Vietnam has made significant progress in payment connectivity, but broader open banking remains at an early stage. Without common API standards, consent architecture

and liability allocation, data sharing may remain bilateral, fragmented and costly. Fragmentation can reduce innovation and prevent smaller fintech firms from competing fairly. At the same time, open banking must be implemented carefully because poorly governed data sharing can create cybersecurity, privacy and operational risks. The policy objective should therefore be safe openness, not uncontrolled data exposure.

The fifth challenge is the digital divide. Young urban customers adopt digital banking quickly, but elderly customers, low-income households, people in remote areas and micro-enterprises may face barriers related to digital literacy, smartphone affordability, network quality, language, disability access and trust. A purely app-based strategy may leave some groups behind. Financial inclusion requires hybrid models combining mobile channels, agents, simplified interfaces, low fees, consumer education and support mechanisms. This is especially important because digital transformation should not simply shift service costs from banks to vulnerable customers.

The sixth challenge is legacy technology and organizational culture. Many banks still rely on old core systems, fragmented databases and product silos. These systems limit real-time analytics, API integration and rapid product development. Organizationally, digital transformation may conflict with traditional hierarchical decision-making, compliance culture and branch-based performance metrics. Banks need not only technology investment but also operating-model redesign, agile governance, cross-functional teams, digital talent and leadership commitment.

The seventh challenge is competition and market structure. Fintech and big technology firms can innovate faster and provide superior user experience. Banks benefit from customer trust, deposits and licenses, but they may lose customer interface control if they become back-end balance-sheet providers for platforms. Conversely, excessive restrictions on fintech may limit innovation and consumer choice. Vietnam needs a balanced approach that encourages cooperation and competition while maintaining financial stability, data protection and consumer trust.

The eighth challenge is consumer protection. Digital products can be complex and fast-moving. Customers may not fully understand fees, data-sharing consent, loan terms, fraud risks or dispute procedures. Instant credit and embedded finance may increase over-borrowing if not properly supervised. Consumer protection must evolve from branch-based disclosure rules to digital-interface supervision, including clear consent screens, transparent fees, cooling-off mechanisms, complaint channels, fair treatment standards and suitability checks for higher-risk products.

Table 5: Major challenges and policy implications

Challenge	Main risk	Policy implication
Regulatory adaptation	Rules lag behind digital lending, cloud, AI, open banking and platform finance.	Adopt risk-based regulation, regulatory sandboxes and coordinated rule-making across banking, data, telecoms and competition authorities.
Cybersecurity and fraud	Fraud moves to digital channels and targets customer behavior.	Strengthen cyber resilience, real-time fraud monitoring, biometric authentication, information sharing and customer education.
Data governance and privacy	Sensitive data may be misused, leaked or shared without meaningful consent.	Implement consent management, data minimization, privacy-by-design and accountability for third-party data processing.
Interoperability and open banking	Fragmented APIs and bilateral data sharing limit innovation.	Develop open banking standards, liability rules and secure data-sharing infrastructure.
Digital divide	Vulnerable users may be excluded from app-based services.	Promote low-cost channels, Mobile Money, financial literacy, accessibility standards and hybrid support models.
Legacy systems and culture	Old core systems and branch-based metrics slow transformation.	Modernize architecture, develop digital talent and redesign operating models.
Competition and ecosystem power	Platform dependency and unequal access to data may distort competition.	Clarify regulatory perimeter, promote fair access and supervise systemic third-party providers.
Consumer protection	Customers may face unclear fees, scams, unsuitable products and weak dispute resolution.	Update digital disclosure, complaint handling, liability allocation and responsible digital credit rules.

3.6 Discussion

The evidence suggests that Vietnam has achieved important progress in the first phase of digital banking development. Payment digitization has reached a scale that exceeds many earlier policy expectations. Digital identity and biometric verification provide a stronger foundation for trusted online transactions. Mobile banking and QR payments have become normal in urban consumer life, while Mobile Money contributes to rural inclusion. Banks are increasingly aware that digital transformation is not optional but necessary for competitiveness, efficiency and customer relevance.

However, the next stage will be more difficult than the first stage. The first stage was driven mainly by digital payments, mobile applications and customer migration to digital channels. The next stage requires deeper transformation: automated lending, open banking, data-driven supervision, artificial intelligence governance, cross-sector interoperability, digital consumer protection and cyber resilience. These tasks are institutionally complex because they involve multiple regulators, multiple technology providers and multiple types of risk.

Vietnam's approach has advantages. The SBV has issued sector-specific strategies and has connected digital banking with national digital identity infrastructure. This creates a coherent policy direction and reduces uncertainty for banks. The banking sector also benefits from strong payment adoption and a competitive commercial banking environment. Nevertheless, policy implementation must avoid two extremes. A too-permissive approach could allow fraud, data abuse and systemic technology risks. A too-restrictive approach could slow innovation and prevent Vietnamese banks from competing in a regional digital finance market. The appropriate approach is risk-based, proportionate and adaptive supervision.

The Vietnamese case also shows that digital banking should not be evaluated only by transaction numbers. High transaction growth is important, but it does not automatically mean high-quality digital banking. Quality should also be assessed through security, reliability, inclusiveness, customer trust, data protection, dispute resolution, accessibility, competition and contribution to productive credit. In other words, digital banking development must move from quantity to quality. The policy objective should be not only more digital

transactions, but also safer, fairer, more interoperable and more inclusive digital financial services.

From a theoretical perspective, Vietnam confirms that technology adoption depends on both user-level acceptance and institutional conditions. TAM and UTAUT explain why convenience and ease of use encourage mobile banking adoption, but they are insufficient without regulatory trust and infrastructure. TOE explains why banks differ in digital maturity, while dynamic capabilities explain why some banks translate technology into strategic advantage and others merely add digital channels to existing processes. Financial inclusion theory reminds policymakers that digital transformation must serve people and businesses, including those outside major urban centers.

4. Conclusions and Policy Implications

4.1 Conclusions

This paper examined the development of digital banking in Vietnam, focusing on current status, challenges and policy implications. The findings show that Vietnam's banking sector has made substantial progress in digital transformation. Non-cash payments, mobile banking, QR payments, eKYC, biometric verification and Mobile Money have expanded rapidly. The policy framework has also become more comprehensive through national digital transformation policy, the SBV's banking-sector digital transformation plans, new rules on electronic transactions, non-cash payments, personal data protection and secure online payments.

The main conclusion is that Vietnam has moved beyond the initial stage of digital payment promotion and is entering a more complex stage of digital banking ecosystem development. The sector's future development will depend on the ability to combine innovation with trust. Digital banking can improve financial inclusion, customer experience, bank efficiency and digital economic growth, but these benefits will be sustainable only if cybersecurity, data protection, consumer protection, interoperability and institutional capacity keep pace with innovation.

The paper also concludes that policy should shift from channel expansion to quality of digital finance. Transaction growth is a necessary indicator but not a sufficient measure of success. A mature digital banking system requires reliable digital identity, secure data sharing, accountable third-party partnerships, resilient infrastructure, fair competition,

responsible digital credit, accessible service design and digitally capable human resources.

4.2 Policy implications for regulators

First, Vietnam should continue to develop a risk-based and adaptive legal framework for digital banking. The regulatory framework should clearly address digital lending, e-contracts, e-signatures, cloud outsourcing, open banking, API standards, artificial intelligence, data sharing and third-party risk. Regulation should be proportionate to the level of risk, allowing low-risk innovation to proceed quickly while imposing stronger requirements on systemic or high-risk activities.

Second, the SBV and relevant authorities should accelerate the development of a regulated open banking framework. Open banking should include standardized APIs, customer consent architecture, data-security requirements, liability rules, dispute procedures and certification of third-party providers. A safe open banking framework can encourage innovation, reduce bilateral integration costs and prevent market fragmentation.

Third, cybersecurity and operational resilience should be treated as core prudential issues. Banks and payment intermediaries should conduct regular cyber stress testing, scenario analysis, incident reporting and third-party resilience assessment. The authorities should strengthen information sharing on fraud patterns and cyber threats across the sector. Supervisory technology can help regulators monitor digital risks in real time.

Fourth, Vietnam should strengthen consumer protection for digital finance. Digital disclosure should be simple, visible and understandable on mobile screens. Customers should be informed about fees, risks, data use and complaint mechanisms. Rules on liability for unauthorized transactions should be clarified to balance customer protection with responsibility for safe behavior. Financial education should focus on fraud prevention, privacy awareness and safe use of digital banking.

Fifth, data governance should be implemented as a strategic regulatory priority. Personal data protection rules should be translated into banking-specific guidance on consent, data retention, cross-border transfers, biometric data, third-party processing and automated decision-making. Banks should be required to demonstrate privacy-by-design and accountability in data-intensive products.

Sixth, inclusion should remain central to digital banking policy. The authorities should promote low-cost digital accounts, Mobile Money, agent networks, accessible design and financial literacy programs for rural users, elderly customers, low-income groups and micro-enterprises. Digital transformation should reduce exclusion rather than deepen it.

Seventh, regulatory sandboxes should be used more actively for fintech, open banking, digital lending, artificial intelligence and regtech solutions. A sandbox can help regulators learn from innovation while allowing firms to test products under controlled conditions. However, sandbox participation should not become a substitute for general regulation; lessons from sandbox trials should feed into broader legal reform.

4.3 Managerial implications for commercial banks

First, banks should treat digital transformation as a business-model transformation, not merely an information technology project. Boards and senior management need to define clear digital strategies linked to customer value, operational efficiency, risk appetite and long-term competitiveness. Digital initiatives should be evaluated not only by number of app users but also by active usage, customer satisfaction, fraud loss, service reliability, cross-selling quality and inclusion outcomes.

Second, banks should modernize data and technology architecture. Legacy systems should be gradually replaced or modularized through APIs, microservices, cloud-ready infrastructure and data platforms. Data governance should be standardized across business lines. Banks that fail to integrate data will struggle to provide personalized services, automated credit and real-time risk monitoring.

Third, cyber resilience should be embedded into product design. Security should not be added after digital products are launched. Banks should use zero-trust architecture, strong authentication, behavioral analytics, fraud detection, encryption, secure software development and incident response drills. Customer education should be integrated into mobile applications through alerts, risk warnings and clear instructions.

Fourth, banks should build responsible artificial intelligence capabilities. AI can support credit scoring, fraud detection, customer service and personalization, but models must be explainable, auditable and fair. Banks should establish model risk management, human oversight, bias testing and data-quality controls. Responsible AI is not only a compliance issue but also a trust-building mechanism.

Fifth, banks should redesign human resources for digital banking. Digital transformation requires product managers, data scientists, cybersecurity specialists, cloud architects, user-experience designers and digital risk experts. Traditional employees also need reskilling because branch staff, relationship managers and compliance officers increasingly operate in hybrid digital-human service models. Sixth, banks should pursue ecosystem partnerships carefully. Cooperation with fintech firms, e-commerce platforms and technology providers can accelerate innovation, but contracts should clearly define data ownership, cybersecurity obligations, service-level agreements, customer responsibility, outsourcing risk and exit plans. Banks should avoid becoming dependent on a small number of critical technology providers without adequate contingency arrangements.

4.4 Limitations and future research

This study is limited by its reliance on secondary data and policy documents. Some market indicators are reported at the system level and do not allow detailed comparison across banks, customer groups or regions. Future research could use bank-level data to examine how digital transformation affects profitability, cost efficiency, credit risk and customer retention. Household surveys could analyze the determinants of digital banking adoption among rural, elderly and low-income users. Case studies of leading Vietnamese banks could provide deeper insight into

organizational capabilities, technology architecture and risk governance. Comparative research with ASEAN countries could also help identify which features of Vietnam's approach are distinctive and which lessons can be generalized.

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