Digital banking model for promoting retail banking services at Vietnamese commercial banks

Chien Thang Nguyen[1], Thi Minh Hang Nguyen[2*], Mai Anh Le[3]

*[1]Digital Banking Centre, Bank for Investment and Development of Vietnam,
191 Ba Trieu Street, Le Dai Hanh Ward, Hai Ba Trung District, Hanoi, Vietnam*
[2]Banking Strategies Institute, State Bank of Vietnam, 504 Xa Dan Street, Nam Dong Ward, Dong Da District, Hanoi, Vietnam
[3]Central Institute for Economic Management, 68 Phan Dinh Phung Street, Quan Thanh Ward, Ba Dinh District, Hanoi, Vietnam

Abstract:

The Fourth Industrial Revolution is inducing rapid transformations globally, notably in the banking industry's digitalisation surge. This transformation is vital for the "survival" and growth of Vietnamese commercial banks. In recent years, commercial banks have recognised the importance of digital transformation strategies. Consequently, they have heavily invested in digital technology and conducted extensive research on its application in banking operations, particularly in the retail banking sector. However, this transition faces multiple obstacles such as limited technological capacity, rising security issues, and limitations in R&D and human resources. Using data collected from ten commercial banks in Vietnam, representing 50% of the State-owned commercial banks and 56% of the top sixteen banks with the largest total assets, and their 200 individual customers, this study analyses the difficulties those banks are encountering, the factors impacting their customers' satisfaction and loyalty, and provides a roadmap for Vietnamese commercial banks to successfully transition towards digital banking models. The empirical results indicate that: (i) a successful approach towards digital banking necessitates prioritising customers in all initiatives; (ii) security concerns are a fundamental factor undermining customer trust in retail products on digital banking platforms; (iii) effective communication by bank staff enhances customer experience with digital banking; (iv) the outdated legal framework, intense competition from fintech. In response to these challenges, the study proposes a three-phase roadmap for the development of digital banking in Vietnam, as well as suggesting recommendations for the Government, the State Bank of Vietnam, and other relevant ministries.

Keywords: **digital banking models, digital transformation, retail banking services.**

Classification numbers: **2.1, 2.2**

1. Introduction

This study was conducted in the context of the Fourth Industrial Revolution, which is significantly influencing various economic sectors in Vietnam, particularly the banking industry. Financial-technology companies (FinTech) have posed a challenge to traditional banks in their capacity to cater to the demands of young customers, particularly in providing retail services. This segment has long been regarded as one of the most lucrative and secure business segments for Vietnamese commercial banks. The number of fintech companies in Vietnam has increased fourfold over the past six years, rising from 39 companies in 2015 to surpassing 150 companies in 2021 [1].

Based on a survey conducted by the State Bank of Vietnam, it was found that the majority of fintech services in Vietnam are similar to retail banking activities, including payments, lending, capital mobilisation, personal finance services, credit scoring, and solutions for credit institutions [2]. Fintech companies are intensifying competition by providing services that traditional financial institutions execute less efficiently. This presents a potential threat to the income generated from retail banking services. In

*Corresponding author: Email: hangnguyen.sbv@gmail.com

addition to generating profits, retail banking services also function as a crucial marketing channel for enhancing the bank's public image and expanding its market presence.

Moreover, the COVID-19 pandemic has significantly influenced Vietnamese consumer behaviour, leading to a shift towards digitalisation. Vietnamese people are transitioning from traditional retail establishments to online shopping platforms and delivery apps. Payment methods for these transactions have consequently changed. A significant proportion of customers, particularly tech-savvy young individuals, have transitioned to utilising e-wallets for bill payments and employing internet banking, e-banking, and mobile banking applications for purposes such as saving money and making investments.

To prevent lagging behind and relinquishing market dominance to fintech companies, Vietnamese commercial banks must formulate strategies for digital banking models, with a particular focus on the retail sector. This policy aligns with the government's plan to promote non-cash payments from 2021 to 2025, as stated in Decision No. 1813/QD-TTg issued by the Prime Minister on 28 October 2021. It also aligns with the banking industry's action plan outlined in Resolution No. 50/NQ-CP issued by the Government on 17 April 2020, which aims to implement Resolution No. 52-NQ/TW issued by the Politburo on 27 September 2019, regarding guidelines and policies for active participation in the Fourth Industrial Revolution. Furthermore, it is consistent with the Plan for Digital Transformation of the Banking Industry until 2025, with further directions until 2030, as stated in Decision No. 810/QD-NHNN issued on 11 May 2021, and Decision No. 06/QD-TTg by the Prime Minister on 6 January 2022 approving the Scheme on developing the application of data on population, identification, electronic authentication data for national digital transformation in the 2022-2025 period, with a vision toward 2030. The main objective is to create digital banking models that improve convenience, consumer satisfaction, and achieve overall financial goals and sustainable development.

With an emphasis on retail services, the research will add to the body of knowledge about digital banking in Vietnam. While numerous economists have examined the digital transformation in the Vietnamese banking industry, none have yet provided a clear roadmap for this process. Consequently, the study seeks to address that void in research.

The research employs the technique of synthesising and analysing both domestic and foreign academic documents to identify patterns in the evolution of digital banking models worldwide, including Vietnam.

Additionally, the study analyses the current state of Vietnamese commercial banks' digital transformation and the challenges they are facing by using survey methods for both the banks and individual customers. Furthermore, the study examines the factors that influence customer satisfaction when utilising retail services on digital platforms. As a result, the study will offer a development roadmap for digital banking in Vietnam.

2. Literature review and research questions

2.1. Digital banking concept

The concept of "digital banking" represents a paradigm shift in the banking industry, characterised by a reliance on technology platforms to digitise traditional banking products and services [3]. Essentially, it entails a business model grounded in technology, facilitating seamless exchange of information and transactions between banks and customers. Services such as fund transfers, savings deposits, lending, and investment advice are seamlessly integrated into the digital banking framework, accessible via web portals or mobile applications. This eliminates the necessity for physical bank visits, offering unparalleled convenience for customers while streamlining operational processes for banks [4].

Analogous to electronic banking (e-banking), digital banking leverages modern technology to enhance efficiency and convenience in online service provision [4]. However, digital banking transcends electronic banking by embracing a more comprehensive approach, aiming to digitise all aspects of banking activities rather than focusing solely on specific features like internet or SMS banking. Consequently, it emerges as a contemporary and forward-looking model in the banking landscape. The business model of digital banking encompasses all facets of a traditional bank's operations, including organisational structures, human resource management, and the provision and processing of financial services [5]. Notably, digital banking boasts superior features such as 24/7 service accessibility, facilitated-through-internet transactions and technologically-driven applications, along with simplified administrative procedures. It heralds the emergence of branchless or automated banking, marking a significant evolution in the banking industry.

2.2. Digital banking transition

M. Sajić, et al. (2017) [6] argue that the transition from traditional banking models to digital banking is a natural and inevitable process due to several factors. Firstly, the proportion of younger customers in banks is increasing and gradually replacing the middle-aged group. Younger customers are more capable of accessing and proficient with technology and the internet. Therefore, this customer group prefers to use retail banking services through the internet and mobile phones, rather than visiting traditional bank branches like the middle-aged group. Secondly, the emergence of financial technology (FinTech) applications has created new habits for bank customers, gradually diminishing their need to access traditional banks for transactions.

R.E. Byers, et al. (2001) [7] predicted that one day bank branches would be completely replaced by digital banks in the retail sector. The most crucial factor driving this process is the change in customers' transaction methods. Banks will have to compete based on technology, and the winner will be the one that can provide the best banking service experience to customers. S. Ananda, et al. (2020) [8] conducted a survey of 200 bank customers in Oman and concluded that digital banking saves time and costs compared to traditional banking, driven by the development and widespread adoption of the internet. The major factors influencing customers' use of digital banking include the utility of the product, customer perception, and the user-friendly interface of digital banking applications.

Similarly, U. Filotto, et al. (2021) [9] conducted a survey with 446 bank customers in Italy and reached conclusions similar to those of S. Ananda, et al. (2020) [8]. The three factors affecting the frequency and preference for digital banking applications among people include the user-friendly interface of the application, the safety and security of the application, and the utility of the product (in terms of saving time and transaction costs for people). S. Reydet, et al. (2017) [10] presented a rather novel study, combining the digital transformation of banks with the behavioural psychology of customers based on quantitative surveys and analyses. Accordingly, digital banking applications (especially those that are well-designed and easy to use) significantly contribute to increasing customer satisfaction, thereby making customers more loyal to the digital banking products they prefer and are accustomed to using. Thus, digital banking acts as an intermediary that enhances customer loyalty to banks.

S.J. Kaur, et al. (2021) [11] studied the trend of people transitioning from using traditional retail services to retail services provided on digital banking platforms in India. The reality in India shows that although banks have spent substantial amounts on technology to design the most advanced digital banking applications, the participation rate of the population has not matched the level of investment. Although about 80% of India's population has digital bank accounts, 48% of accounts registered between 2014 and 2017 were not used. From this, S.J. Kaur, et al. (2021) [11] argue that technology is not the most critical factor in encouraging people to use digital banking services, but rather education. The survey by S.J. Kaur, et al. (2021) [11] shows that customer satisfaction increases when bank staff guide them in using retail services on digital banking platforms. Communication between bank staff and customers is key to making customers feel comfortable and more confident in the digital services provided by Indian commercial banks. S.J. Kaur, et al. (2021) [11] pointed out a crucial point: commercial banks should not view digital banking as merely a marketing channel, but as a channel to connect, interact, and understand the real needs of customers.

In delineating the transition process from conventional to digital banking, C. Skinner (2014) [3] proposed a nuanced roadmap for traditional banks. C. Skinner (2014) [3] underscored the paramount importance of adopting a customer-centric approach as the cornerstone of digital banking evolution. This necessitates an intensified focus on customer dialogue and guidance, aimed at enriching the overall customer experience within the digital banking ecosystem.

A pivotal facet highlighted by C. Skinner (2014) [3] is the customisation of login methodologies to align with customer preferences. Rather than mandating separate account creations, digital banking platforms are encouraged to explore integration options with popular third-party platforms such as Google or Facebook, while steadfastly upholding stringent data security protocols.

Moreover, C. Skinner (2014) [3] emphasised the ascendancy of mobile banking applications over their web-based counterparts, citing the inherent agility and convenience afforded to customers. Mobile platforms empower users to seamlessly execute transactions, make enquiries, and capture transactional snapshots, underscoring their efficacy in enhancing user engagement and satisfaction vis-à-vis web applications.

C. Skinner (2014) [3] predicted that in the near future, the Bank-as-a-Service (BAAS) model will replace mobile applications and websites, as all customer information will be stored on the iCloud. M. Sajić, et al. (2017) [6] outlined a two-step process to help traditional banks transition to the digital model, which includes integrating traditional and digital banking activities (Step 1) before completely changing into an independent digital bank (Step 2).

M. Sajić, et al. (2017) [6] also pointed out that the speed of digital transformation in banking heavily depends on the level of support from the country's regulatory framework. Therefore, institutional reform is one of the prerequisites and mandatory conditions to promote the development of digital banking.

According to Casu's 2015 textbook *Introduction to Banking*, retail banking or individual banking relates to financial services provided for customers [12], often at a small scale. Usually, all big banks provide a variety of individual banking services including payment (current accounts with cheques, credit transfers, standing orders, direct debits and cards), savings, loans, mortgages, insurance, pensions and other services. Retail banking services include: (i) Payment; (ii) Mobilisation and credit; and (iii) Investment products (Fig.1).

2.3. Digital banking models available in Vietnam

There are two principal approaches to the development of digital banking in Vietnam. The first approach involves the digitisation of an existing bank, which may include the digitisation of internal processes, business products, and distribution channels. The second approach combines the first method with the development of independent digital banks [6]. Despite these strategies, the pace of digital transformation among banks remains sluggish. Among the banks implementing core banking digitisation, the majority are only in the preliminary stages, while the rest have yet to take any concrete steps.

The systems of Vietnamese commercial banks (NHTMs) have not undergone substantial changes and continue to predominantly follow traditional
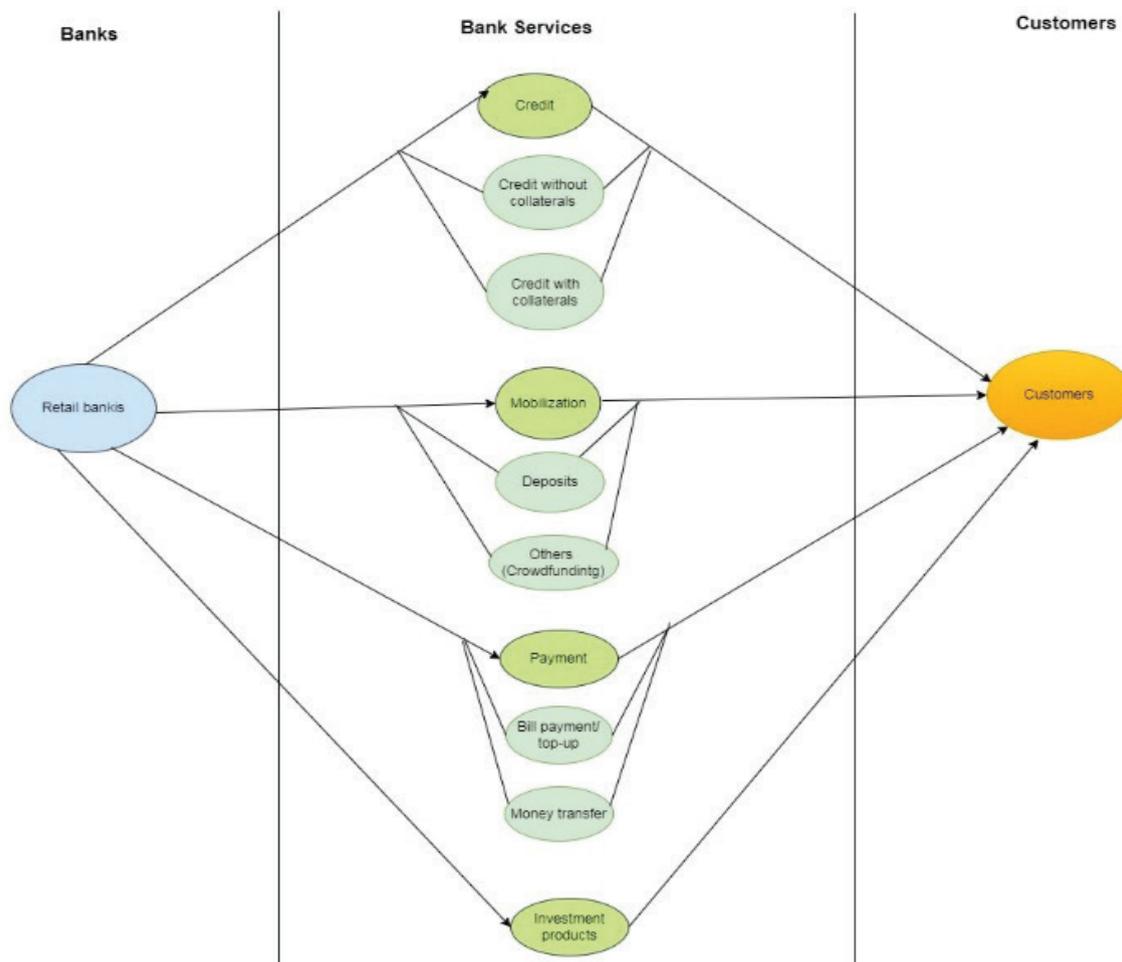

Fig. 1. Retail banking services. Source: Authors'compilation.

development models, with a continuous expansion of physical distribution channels. Although there is an acknowledgment of the significance of big data, only a few banks, such as Vietinbank and VPBank, are employing big data in a nascent and limited way. Additionally, Vietnamese commercial banks do not possess a true banking ecosystem; rather, what exists is essentially a collection of digital payment products that are quite fragmented. Current digitisation efforts have been primarily focused on customer-facing departments (front end), while operational departments (back office) continue to rely on outdated technologies [13].

Moreover, although digital transformation has been identified as a paramount objective, the level of preparation and readiness for digitisation among Vietnamese commercial banks varies significantly. According to the 2019 Vietnam ICT Readiness Index report (ICT Index 2019), the Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV) consistently ranked first in the ICT Index among commercial banks from 2017 to 2019 and led in terms of readiness to invest resources in IT development and application. Despite being in the group of state-owned commercial banks, Vietcombank and Vietinbank have significantly lower ICT indices compared to BIDV, ranking only the 18th and 22nd, respectively, among commercial banks [14]. This disparity highlights a pronounced divergence in the pace of digital transformation among Vietnamese commercial banks.

Commercial banks in Vietnam are presently implementing the following three digital banking models in order to develop retail banking services:

1. *Digital banking:* Conventional banks implement this strategy by establishing supplementary digital channels to their existing ones. Additionally, some financial institutions advance the digital ecosystem by implementing Open Banking with ground-breaking Open Application Programming Interface (a.k.a. Open API) technology. In addition to technological obstacles and complexities, the implementation of Open API is also impacted by shifts in public opinion and modifications to the legal framework. The effective execution of the legal structure governing Open API will empower the fintech sector to introduce novel and innovative services, thereby satisfying the growing expectations of customers in line with the global advancements in banking service provision.

2. *Digital bank:* Several foreign banks are presently operating in Vietnam, including CIMB's Octopus, UOB's TMRW, and an upcoming branch of KB-Thailand, which have established autonomous digital banks with the aim of advancing retail banking and

banking services in general. Nevertheless, the existing legislation fails to specify the category of digital bank or the particular criteria that must be met in order to obtain a distinct authorisation for the establishment of an autonomous digital bank entity. As a result, Vietnamese commercial banks are presently unable to implement this model, and competition between Vietnamese commercial banks and foreign banks will intensify with regard to market share of customers, products, and services.

3. *Neo-bank:* The majority of payment intermediary firms are currently adopting this framework as a means to implement their business strategies. Investing in research and technological advancement to construct and develop this model, in fact, entails enormous expenses. Furthermore, similar to the majority of non-bank financial institutions globally, neo-banks operate under a restricted and insufficient legal framework. Consequently, the deployment of advanced technological applications by neo-banks may give rise to legal liabilities, including breaches of regulations pertaining to customer identification, data security, account and transaction limits, and anti-money laundering.

Commercial banks have significantly expanded their offerings of retail services, deposits, payments, and credit through the aforementioned digital banking models. By utilising cutting-edge products and services on the digital platform, these banks have facilitated the retail banking market's growth and contributed to the promotion of non-cash payment methods within the economy. The complete digitisation of services such as establishing a payment account, transferring funds, and depositing funds/savings enables customers to conduct these transactions exclusively through digital channels. Numerous banks in Vietnam have documented a consumer transaction conversion rate of over 90% through digital channels [15]. The digital banking and digital payment ecosystem has been established through the integration of numerous digital services within the economy with digital banking services. This integration provides service users with seamless experiences and substantial advantages in the digital realm.

2.4. Research questions

Based on the preceding analyses, the transition to a digital banking model emerges as a significant trend for many commercial banks in Vietnam, with corresponding plans for implementation. It is anticipated that this transition will yield positive signals for these banks in expanding their market share among individual customers. By delivering retail services

more effectively, diversifying customer demographics, and catering to technologically savvy younger users, Vietnamese commercial banks can enhance their competitive edge in the retail banking market.

However, the selection of a suitable digital banking model and the development of a conversion roadmap necessitate careful consideration and detailed planning. Specific research questions regarding this matter are:

RQ1: What are the factors affecting customer loyalty to the retail services on a digital banking platform provided by Vietnamese commercial banks?

RQ2: What are the challenges for the development of digital banking by Vietnamese commercial banks?

RQ3: How can a conversion roadmap to digital banking, with an emphasis on retail banking, be designed for Vietnamese commercial banks?

These questions are poised to play a pivotal role in shaping the strategic direction and conversion plans of Vietnamese commercial banks in the future.

3. Methodology

3.1. Models and variables

To address research question 1, the study employed the Vietnam Customer Satisfaction Assessment Index (VCSI), which is inspired by the original American Consumer Satisfaction Index (ACSI) approach with adaptations to fit Vietnam's socio-economic characteristics (Fig. 2).
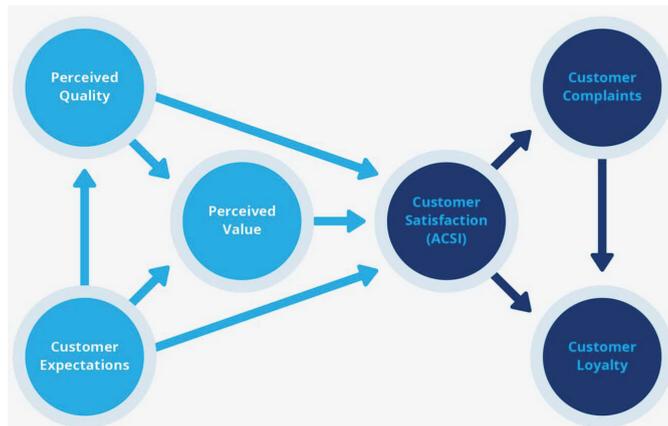

Fig. 2. The American Consumer Satisfaction Index (ACSI).
Source: https://theacsi.org/.

For this study, the authors focused on customer satisfaction to determine their behaviour (either complaints or loyalty). To model customer satisfaction, two representative variables are employed: (1) Brand image and (2) Service quality. A survey was conducted

with 200 randomly selected customers from ten Vietnamese commercial banks to gather insights into their experiences with the banks' digital retail services. The interviews were conducted at various banks' branches in Hanoi. This approach allowed the authors to identify the factors influencing customer satisfaction and, consequently, their loyalty to the bank.

A statistical analysis was carried out to address research questions 2 and 3. To assess the advantages and challenges that Vietnamese commercial banks face when transitioning to digital banking to better serve the retail sector, the research team conducted a survey on the plans and current status of digital banking development in ten Vietnamese commercial banks (Phuong Dong Bank, A Chau Bank, TP Bank, BIDV, Nam A Bank, Sea Bank, VPBank, OceanBank, Military Bank, and Agribank). These banks represent 50% of the number of state-owned commercial banks and 56% of the banks in the top 16 banks with the largest total assets. The authors calculated these figures based on the banks' 2023 financial statements and reports from the State Bank of Vietnam.

The questionnaire was meticulously designed to encompass questions regarding the banks' overarching strategic direction for digital transformation, with a particular emphasis on the retail sector. It included inquiries about conversion rates, challenges faced during the digital transformation process, the extent of investment in research and development (R&D) dedicated to digital transformation, and the range of services being transitioned to digital platforms.

Upon collecting responses from the surveyed banks, the research team analysed the data to gain insights into the banks' strategies, progress, and challenges in digital banking development. Additionally, the analysis encompassed an evaluation of customer satisfaction with the retail services provided by digital banking apps. The overarching goal was to achieve a comprehensive understanding of the current digital banking landscape in Vietnam. This understanding would then inform actionable recommendations aimed at advancing future initiatives and improving the overall performance of the retail banking sector of Vietnamese commercial banks, which will be presented in the research findings section.

3.2. Data

The selection of the ten prominent Vietnamese commercial banks for this survey - Phuong Dong Bank, A Chau Bank, TP Bank, BIDV, Nam A Bank, Sea Bank, VP Bank, OceanBank, Military Bank, and Agribank - was deliberate due to their varying sizes and ownership structures, encompassing both state-owned and private banks.

Despite the sample size not being extensive, the inclusion of banks with diverse sizes and ownership types enhances the study's representativeness. This approach provides a nuanced view of the digitalisation landscape within the Vietnamese commercial banking sector, particularly regarding retail services.

However, it is important to acknowledge the study's limitations. The sample, while diverse, may not fully capture the entire spectrum of state-owned commercial banks nationwide. Nevertheless, the findings offer valuable insights into prevalent trends and challenges in digital transformation across different types of banks in Vietnam. These insights are pertinent for policymakers, industry practitioners, and researchers seeking to advance digital banking initiatives and strategic planning in the Vietnamese banking industry.

4. Research findings

4.1. Understanding commercial banks' digital transformation from customer perspectives

The results show that banks that enhance their brand image are more likely to meet the demand of retail customers. For example, TPBank has developed the LiveBank digital banking service and several other products, including Savy (a universal savings application), QuickPay (payment by QR code), and Ebank (an electronic banking application). In January 2021, Cake, an additional digital banking model, was introduced with the intention of efficiently fulfilling customer requirements. Cake's vibrant and intuitive interface, which integrates retail services closely associated with daily necessities, has resonated particularly well with younger users. These new apps are user-friendly and easy to navigate, thus boosting user engagement. This finding indicates that brand image not only fosters the development of cutting-edge products but also significantly enhances customer satisfaction and loyalty.

In relation to service quality, the survey results reveal that a successful approach entails prioritising customers in all endeavours; strategies pertaining to product supply, services, distribution channels, ecosystem, technology utilisation, and internal governance that underpin all retail support activities should all be designed with the customer experience in mind. Digital banking has since introduced financial service products that optimise the customer experience by catering to their specific requirements. This focus on service quality has resulted in complete satisfaction for all customer segments, including retail customers, those residing in urban or rural areas, and even international tourists. Consequently, the high service quality in digital banking has significantly enhanced consumer confidence, enabling financial institutions to not only retain current clients but also acquire prospective ones, thereby increasing customer loyalty and preserving their competitive edge.

However, during interviews with retail customers of the ten Vietnamese commercial banks in the survey, several concerns were expressed, which negatively impact their experience when using digital banking platforms:

• *Information security:* The information security provided by commercial banks is perceived as inadequate, as these institutions are frequently targeted by hackers. Customers who register for cards through online platforms are particularly vulnerable to personal data leaks. Scammers often steal information by sending notifications containing malicious links via SMS, email, and messaging software.

• *Cyber fraud detection:* The banks' inability to effectively detect cyber fraud undermines customer trust in their digital banking services. Due to their lack of understanding of the dangers associated with online transactions, many people allow criminals to borrow their identities to create ghost accounts and engage in other fraudulent activities. The complexity and difficulty of detecting such fraud lead to significant consumer dissatisfaction.

• *Limited digital retail services:* Customers are dissatisfied with the limited types of digital retail services offered by the banks. Most customers have used their digital bank apps to make payments, transfer money, or open savings accounts, which they feel fail to adequately meet their rising needs. Additionally, the pricing policies for these products and services are seen as irrational.

• *Bank staff attitude and capability:* The attitude and capability of the bank staff during the service process are not perceived as entirely professional. There are instances where critical customer situations are not managed promptly due to sluggish operations and poor communication, further contributing to customer dissatisfaction.

4.2. The current state of digital banking development in Vietnam, with a focus on the retail services of commercial banks

The survey conducted among ten Vietnamese commercial banks aims to shed light on the factors considered as their challenges for the digital transformation process (RQ2) as well as to provide Vietnamese commercial banks with a roadmap for transitioning into digital banking with an emphasis on retail services (RQ3).

4.2.1. Vietnamese commercial banks' digital transformation strategies

In recent years, Vietnamese commercial banks have been actively involved in researching and investing in digital transformation strategies, especially in retail service. However, the effort is at a nascent stage due to a multitude of obstacles and challenges such as: (i) Outdated Legal Framework: The legal framework governing digital transformation often lags behind the development of technology, creating a significant barrier to implementation. (ii) Limited Technological Infrastructure: The digital and technological infrastructure of the banking system is limited and frequently misaligned with the requirements for efficient digital transformation. (iii) Cyber Securities Threats: There is increasing pressure from cyberattacks and fraud, which pose significant risks to banks' digital operations. (iv) Intense Competition: Growing competition from fintech companies challenges traditional banks, necessitating rapid and effective digital adaptation.

4.2.2. Vietnamese commercial banks' retail banking services provided via digital banking models

The current state of digital processing applications in retail banking reveals that Vietnamese commercial banks heavily rely on third parties for data processing and verification, which hinders the speed of service delivery. For instance, retail credit granting services exhibit the lowest level of digital processing. Risk assessment procedures for credit grants involve significant manual intervention, requiring bank personnel to access and verify information about collateral assets to validate the loan's mortgaged value.

The administration of this information is often entrusted to third-party agencies. To increase the use of digital processing in business processes, Vietnamese commercial banks should innovate methods of collaboration with these relevant organisations and further develop their internal operations. For instance, working with organisations that manage information and property data to streamline verification processes can enhance efficiency and service speed (Fig. 3).
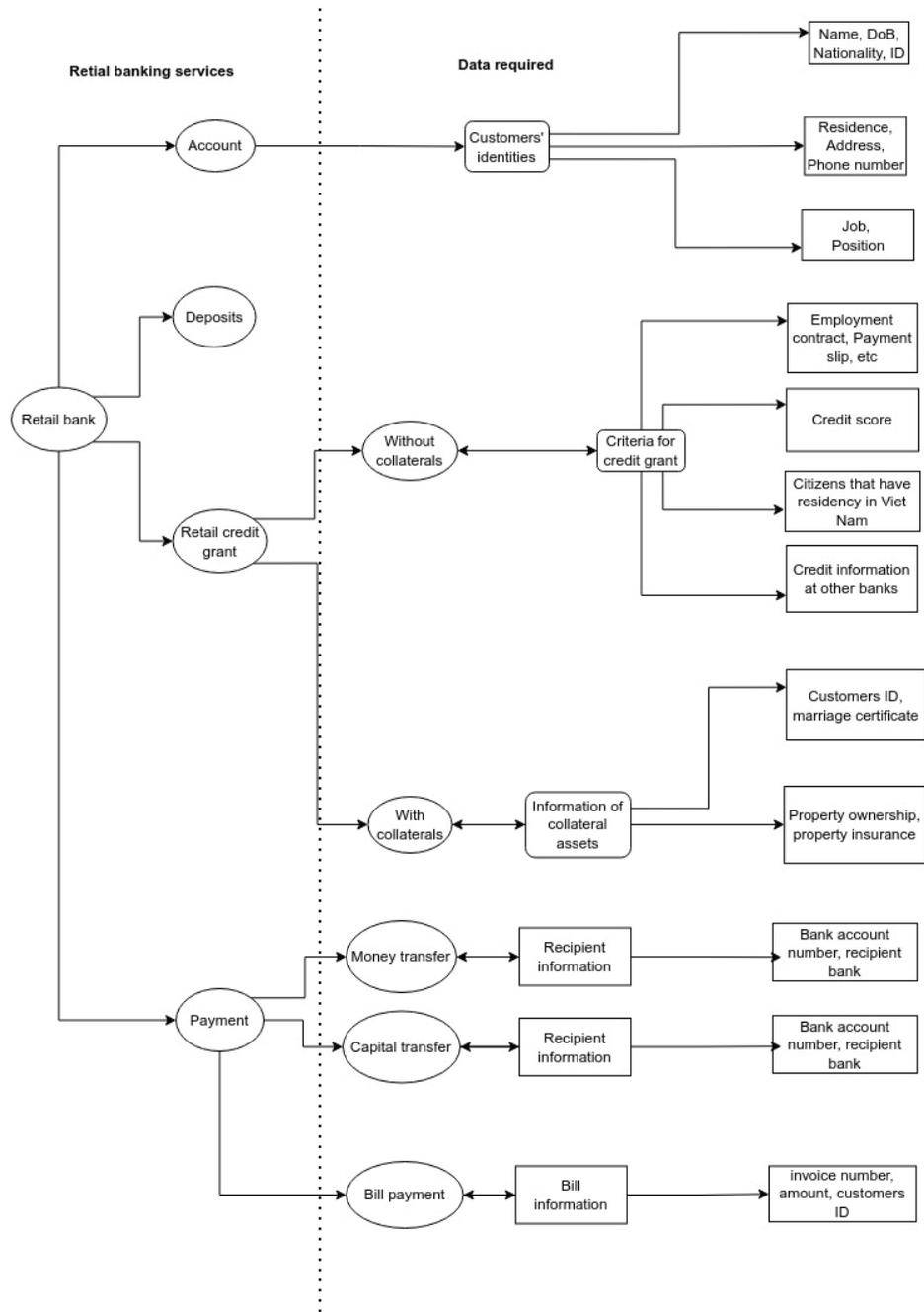

Fig. 3. Retail banking activities and required input data. Source: Authors' compilation.

When these data storages are locked and only banks are permitted access to them, this is regarded as the most formidable barrier to expanding digital processing and transformation in banking operations. The verification process is executed through a comparison with original data or through validation by a third party, such as notary bodies. Consequently, regulations and solutions governing the sharing of data storage pertaining to properties utilised as mortgages in credit granting dossiers are required.

Moreover, the absence of a synchronised and consistent electronic identification and authentication platform hinders the delivery of retail banking services through digital channels. Many financial institutions are compelled to develop their own digital signature platforms to digitise internal administrative processes. However, the authenticity of these platforms is limited to within the respective financial institutions. A standardised and consistent authentication platform would enable the implementation of numerous activities across all banking operations and other fields, including smart contracts and electronic guarantees.

Additionally, the State Bank of Vietnam (SBV) is currently engaged in the process of amending Circular No. 39/2016/TT-NHNN (as well as Circular No. 06/2023/TT-NHNN, which revises and supplements certain provisions of Circular No. 39/2016/TT-NHNN) to include regulations for small and minor loans conducted through electronic methods. However, there has been no research or policy issuance regarding the promotion of technology in credit activities to allow for electronic methods and the full automation of the lending process by credit institutions for their customers.

4.2.3. Technological and infrastructure aspects of digitising retail banking services

Nearly 70% of banks surveyed reported that they were encountering minimal to moderate difficulties in aligning their current technical infrastructure with their digital transformation objectives. Only 10% perceived this as a highly challenging issue. Additionally, 60% of banks believe that selecting investment priorities and technologies is not a significant challenge for digital transformation. These findings suggest that while the surveyed banks have generally formulated a vision and strategy for deploying digital banking, they still face significant obstacles, particularly in securing the

necessary resources for implementation. Notably, 50% of the surveyed banks identified capital investment for research and development as a moderate to very challenging issue (Fig. 4).
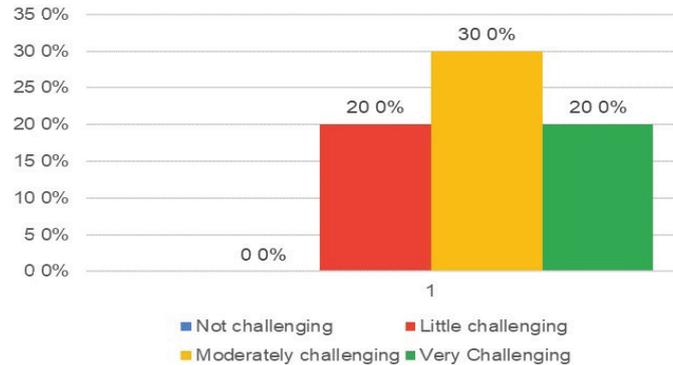
Fig. 4. Limits in investment for R&D. Source: Survey of 10 commercial banks by the authors.

The uneven development of infrastructure and technological systems across different departments within banks presents a moderate challenge, identified by 30% of surveyed institutions (Fig. 5). This discrepancy impedes the smooth integration and connectivity required across various stages in delivering retail services on digital banking platforms.
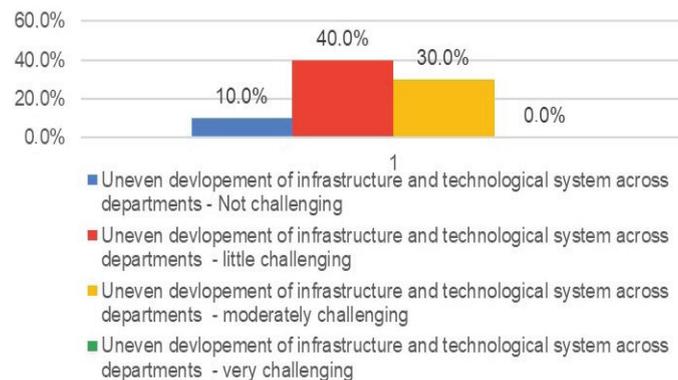
Fig. 5. Uneven development of infrastructure and technological system across departments. Source: Survey of 10 commercial banks by the authors.

It is worth noting that a significant proportion of banks, reaching 70%, perceive the swift rate of technological advancements and their application to the banking sector as a moderate to enormous challenge (Fig. 6). Specifically, the issue of escalating criminal activities and cyber-attacks is regarded by banks as the most difficult, with 50% of commercial banks responding that these are very challenging issues (Fig. 7).
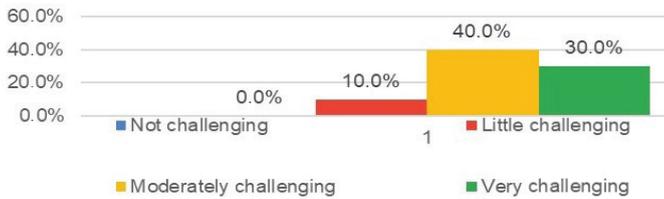
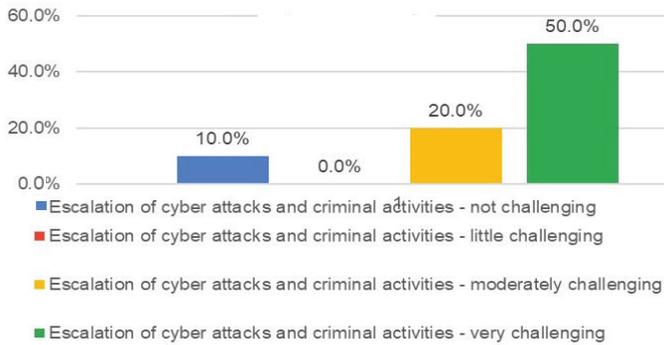**Fig. 6. Swift rate of technological advancement.** Source: Survey of 10 commercial banks by the authors.

Fig. 7. Escalation of cyber-attacks and criminal activities. Source: Survey of 10 commercial banks by the authors.

4.2.4. Resources required to implement digital banking for retail services

Several banks have established specialised divisions tasked with the direct development and deployment of digital transformation projects. Nevertheless, human resources departments that support digital transformation to develop retail services continue to face the challenges and obstacles while the demand for information technology and digital transformation personnel at all levels continues to rise, for example, the domains of data analysis and management, marketing, business operations on digital platforms, applications development and technology advancement.

Figure 8 showed that only 10% of banks have provided training on digital transformation to more than 70% of their executives, ranging from departmental to high-level positions. Meanwhile, the proportion of specialised personnel that received training on digital transformation in the surveyed banks is even lower. Only 10% of respondents indicated that 10-15% of their specialised personnel were trained in this area (Fig. 9). Vietnamese commercial banks have not yet made sufficient efforts to keep pace with the digital banking trend, despite their awareness of its significance, in comparison to their concern with the rapid advancement of technology.
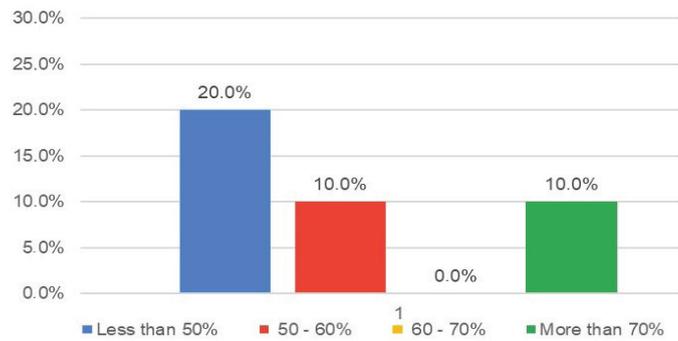

Fig. 8. Percentage of banks' leaders trained on digital transformation. Source: Survey of 10 commercial banks by the authors.
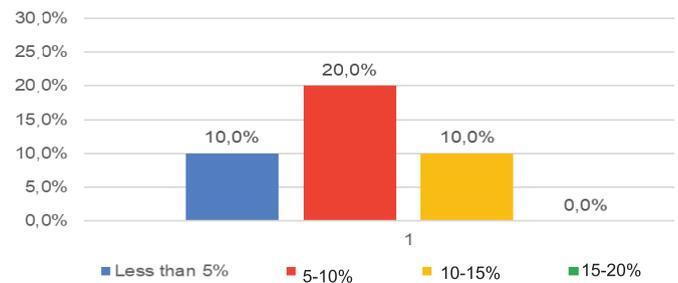

Fig. 9. Percentage of specialized staff trained on digital transformation. Source: Survey of 10 commercial banks by the authors.

4.2.5. Roadmap for the transitioning into digital banking with an emphasis on retail services (RQ3)

According to the present condition of commercial banks in Vietnam, every bank possesses a distinct scale, set of operations, consumer segments, and market. Consequently, determining a universally applicable model for all institutions is unattainable. It is the duty of every commercial bank to identify a digital banking model that aligns with their particular business strategy. Notably, the model must adhere to Decision No. 810/QD-NHNN issued by the Governor of the State Bank of Vietnam. The proposed digital banking development roadmap consists of the following three phases (Fig. 10).

Fig. 10. Roadmap for digital banking development. Source: Authors' proposal.

Vietnamese commercial banks should establish a well-defined digital banking model strategy that prioritises the following objectives: reforming business processes and procedures, perfecting the legal framework, fostering innovation, enhancing customer experience, and meeting their needs; safeguarding legislation; and ensuring safe and diverse service provision to accommodate the growing demands of customers and the overall economy in a sustainable and secure manner.

Furthermore, the successful implementation of retail services based on digital banking models and the digital transformation of the banking industry require the coordination of relevant sectors and units, as well as the guidance of the government, in the dissemination, editing, and supplementation of legal documents. This is particularly crucial in removing impediments and challenges that may arise during the implementation and practical application of Vietnamese commercial legislation.

5. Discussion and recommendations

The customer survey results from ten commercial banks exhibit similarities to the research conducted by M. Sajić, et al. (2017) [6]. Young customers (aged 20 to 40) are the demographic that utilises digital banking services the most. Payment services are the primary service utilised. Similar to the research conducted by S. Ananda, et al. (2020) [8], young individuals opt for digital banking due to its convenience and time-saving benefits. Vietnamese commercial banks are thus advised to promptly migrate their retail services to digital banking to accommodate their most critical customers in the future.

Nevertheless, the assessed group of consumers who frequently utilise digital banking services offered by these ten commercial banks expressed dissatisfaction with the information security and the limited range of retail services available on banks' digital platforms. This indicates that the current demand from customers exceeds the capacity of Vietnamese commercial banks. Vietnamese commercial banks are recommended to expand their range of retail services, including the provision of personal loans through digital platforms. To achieve this, Vietnamese commercial banks should prioritise the requirements of their customers. This advice is analogous to the findings of C. Skinner (2014) [3].

The lack of professionalism displayed by bank staff when providing instructions for online retail services is also a contributing factor that negatively impacts consumers' experiences. Customer loyalty is strongly influenced by customer experience, as highlighted in the research conducted by U. Filotto, et al. (2021) [9] and S.J. Kaur, et al. (2021) [11]. This finding indicates that Vietnamese commercial banks should offer comprehensive training in digital transformation for their officers and specialised workers to enhance customer satisfaction.

The survey uncovered numerous significant findings regarding the methods, obstacles, and challenges encountered by Vietnamese commercial banks in their digital transformation of retail services. The majority of Vietnamese commercial banks have plans to adopt digital transformation in their retail services. Nevertheless, they lack the essential resources required, specifically in terms of investment in R&D, technology, and human resources.

Moreover, these banks are facing a multitude of obstacles, including swift changes in technology, a rise in sophisticated cybercrimes, intense competition from fintech firms, and a lack of coordination in information systems across various departments within the bank. To ensure a smooth transition to digital retail services and maintain competitiveness in the changing financial landscape, it is imperative for Vietnamese commercial banks to tackle these challenges.

The study on the digital banking development strategy for Vietnamese commercial banks indicates parallels with the findings of M. Sajić, et al. (2017) [6]. It highlights the crucial role of support from the government and relevant agencies and ministries in accelerating the development of digital banking models. The proposed roadmap consists of three stages (Fig. 10), which the authors believe are suitable for Vietnam's economic characteristics, legal framework, and the Prime Minister's goal of developing digital banking models by 2025, as outlined in Decision No. 689/QD-TTg dated 8 June 2022.

Accordingly, the authors recommend several key solutions as follows for the Government, the State Bank of Vietnam, and other line ministries:

1. For the government

• Expedite the deployment of a shared database (especially the residence and biometrics database), implement more practical solutions, and provide people's data.

• Direct the issuance of detailed guidelines for the implementation of Project No. 06 in accordance with Decision No. 06/QD-TTg by the Prime Minister on 6 January 2022, approving the Scheme on developing the application of data on population, identification, and electronic authentication for national digital transformation in the 2022-2025 period, with a vision toward 2030.

• Direct the establishment of a nationwide financial education programme. Simultaneously, invent an incentive mechanism to promote collaboration among service providers, local authorities, and socio-political organisations to construct and execute individualised financial education programmes for each customer type.

2. For the State Bank of Vietnam

• Review and revise Circular No. 06/2023/TT-NHNN regarding lending transactions of credit institutions and foreign bank branches in an effort to facilitate the implementation of loan products offered by commercial banks on electronic platforms, thereby achieving the objectives outlined in Decision No. 810 regarding the digital transformation strategy.

• It is imperative to provide commercial banks with transparent and streamlined implementation guidelines for the process of electronic credit contract signing. Specifically, commercial banks should be tasked with the proactive development of technological solutions and the selection of methods to verify customer acceptance prior to contract execution, in accordance with the nature of the contract, product attributes, and system operating model (including the utilisation of an OTP authentication form).

• It is advisable to incorporate regulations governing the security of banking technology and data in the rescue and management of information security incidents that surpass the capabilities of the bank.

• With respect to electronic lending channels, it is imperative to assess the financial capabilities of customers and viable capital use plans in accordance with current lending regulations (e.g., by employing customer scoring models, alternative data models, or system integration for appraisal data).

• In relation to the mandate to assess and precisely identify the customer's related persons (including numerous subjects that necessitate identification) as well as the aggregate outstanding credit balance of related persons, regulations pertaining to minor value loans on digital channels should be taken into account.

• In regard to the electronic establishment of payment accounts, it is advisable to incorporate legal regulations that address the risks associated with fraud and forgery.

3. For other line ministries

• In the near future, it is imperative that the Ministry of Public Security issue directives concerning connection procedures, technical prerequisites, connection methods, protocols, and application programming interfaces. These directives should enable credit institutions to utilise data from the National Population Database to support banking operations, such as fraud prevention and anti-money laundering.

• Effective coordination between the Ministry of Information and Communications, the State Bank of Vietnam, and the Ministry of Public Security is imperative to safeguard and prevent deliberate assaults on the banking system in a timely manner.

• Together with the State Bank, the Ministry of Education and Training should coordinate the development of a national financial education programme regarding digital banking channels and services. This initiative aims to foster sustainable and rational public awareness regarding financial management and the utilisation of digital banking platforms.

6. Conclusions

Vietnam's financial landscape is undergoing a profound shift with the adoption of digital transformation in its banking sector. The rapid expansion of fintechs and the integration of digital banking services by Vietnamese commercial banks underscore a proactive response to emerging trends, despite the transformation being in its early stages. Findings from our survey of ten major commercial banks and 200 retail customers highlight critical success factors and challenges, emphasising the need for customer-centric approaches, addressing security concerns, improving communication between customers and bank staff, and overcoming regulatory hurdles.

To navigate these challenges and capitalise on opportunities, the study proposes a structured three-phase roadmap for digital banking development in Vietnam. Moreover, it recommends governmental support to expedite the deployment of shared databases, establish detailed implementation guidelines for key digital transformation projects, and incentivise collaborative financial education initiatives. Recommendations for the State Bank of Vietnam include revising regulatory frameworks to facilitate electronic transactions and bolstering cybersecurity measures through enhanced collaboration across relevant ministries.

Effective collaboration among regulatory bodies and stakeholders is pivotal in fostering an enabling environment for digital banking innovation and security. By embracing these recommendations, Vietnam can accelerate its journey towards a robust digital banking ecosystem that meets the evolving needs of its economy and consumers, ensuring sustainable growth and inclusivity in financial services.

Despite making significant contributions to the literature on digital banking in Vietnam, this study is not without limitations. Specifically, the data collected from only ten commercial banks may not fully represent the broader spectrum needed to draw definitive research conclusions. However, as initial research, this study sets a foundation for ongoing development, with future efforts aimed at closely monitoring the digital transformation process within Vietnamese commercial banks, particularly in the realm of retail banking services.

CRediT author statement

Chien Thang Nguyen, Thi Minh Hang Nguyen: Conceptualisation, Validation, Supervision, Project administration; Mai Anh Le, Thi Minh Hang Nguyen: Methodology, Investigation, Writing - Original draft preparation, Writing - Reviewing and Editing, Formal analysis, Data analysis, Data collection.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

[1] D.B. Ngoc (2022), "Fintech market in Vietnam: Opportunities and challenges", *The Banking Review*, https://tapchinganhang.gov.vn/thi-truong-fintech-tai-viet-nam-co-hoi-va-thach-thuc.htm, accessed 14 April 2024 (in Vietnamese).

[2] L.A. Dung, N.T. Anh, B.T. Hang, et al. (2021), *State Management on Digital Banking - Practice, International Experience, and Solutions for Vietnam*, State Bank of Vietnam (in Vietnamese).

[3] C. Skinner (2014), *Digital Bank: Strategies to Launch or Become a Digital Bank*, Marshall Cavendish International (Asia), 300pp.

[4] G. Sarma (2017), "What is digital banks?", *VentureSkies*, https://www.ventureskies.com/blog/digital-banking, accessed 1 May 2024.

[5] J. Kelman (2016), *The History of Banking: A Comprehensive Reference Source & Guide*, Create Space Independent Publishing Platform, 384pp.

[6] M. Sajić, D. Bundalo, Z. Bundalo, et al. (2017), "Digital technologies in transformation of classical retail bank into digital bank", *IEEE*, pp.1-4, DOI: 10.1109/TELFOR.2017.8249404.

[7] R.E. Byers, P.J. Lederer (2001), "Retail bank services strategy: A model of traditional, electronic, and mixed distribution choices", *JSTOR*, **18(2)**, pp.133-156.

[8] S. Ananda, S. Devesh, A.M.A. Lawati (2020), "What factors drive the adoption of digital banking? An empirical study from the perspective of omani retail banking", *Springer Nature*, **25**, pp.14-24.

[9] U. Filotto, M. Caratelli, F. Fornezza (2021), "Shaping the digital transformation of the retail banking industry. Empirical evidence from Italy", *ScienceDirect*, **39(3)**, pp.366-375, DOI: 10.1016/j.emj.2020.08.004.

[10] S. Reydet, L. Carsana (2017), "The effect of digital design in retail banking on customers' commitment and loyalty: The mediating role of positive affect", *Journal of Retailing and Consumer Services*, **37**, pp.132-138, DOI: 10.1016/j.jretconser.2017.04.003.

[11] S.J. Kaur, L. Ali, M.K. Hassan, et al. (2021), "Adoption of digital banking channels in an emerging economy: Exploring the role of in-branch efforts", *Journal of Financial Services*, **36**, pp.107-121.

[12] B. Casu, C. Girardone, P. Molyneux (2012), *Introduction to Banking (2nd Ed)*, Pearson Education Canada.

[13] N.T.T. Dung (2021), "Development of digital banking in Vietnam", *Journal of Trade Union Scientific*, **21**, pp.71-76 (in Vietnamese).

[14] N.D. Hung (2020), *Development of Digital Currency and Digital Banking Technology in The Current Phase of International Economic Integration*, Scientific Research Project (in Vietnamese).

[15] M. Phuong (2024), "Many credit institutions have over 90% of transactions conducted on digital channels", *Communist Party of Vietnam Online Newspaper*, https://dangcongsan.vn/kinh-te/nhieu-to-chuc-tin-dung-co-ty-le-tren-90-giao-dich-thuc-hien-tren-kenh-so-663894.html, accessed 1 May 2024 (in Vietnamese).