CUSTOMERS' SATISFACTION IN VIETNAMESE COMMERCIAL BANKS: DO TECHNOLOGICAL ADOPTION AND DIGITALIZED BANKING SERVICES REALLY MATTER?

13th International Conference on Emerging Challenges: Business Dynamics In Disruptive Economy

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Abstract

This study examines the impact of technological adoption and digital banking services on customer satisfaction within the Vietnamese context. Focusing on electronic Know Your Customer (eKYC) technology - a core component of digital transformation in banking - the research investigates how such innovations influence users' perceptions and satisfaction levels, taking Vietcombank, Vietnam's largest commercial bank, as a case study. A survey was conducted with 200 banking customers to collect primary data on their experiences with eKYC services. The research framework is built upon an integration of the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), enhanced with key constructs including perceived ease of use, reliability, expected performance, and bank brand image. The empirical analysis indicates that the adoption of eKYC services positively affects customer satisfaction, primarily through users' perceived usefulness, ease of use, and trust in the technology and the bank itself. Furthermore, the bank's reputation plays a moderating role in shaping user trust and engagement with digital services. These findings underscore the importance of aligning technological innovation with user-centric design and institutional trust-building in digital banking environments. This study contributes to the growing body of literature on digital transformation in emerging economies by highlighting the determinants of customer satisfaction in the context of electronic identification systems. Practical recommendations are provided for banking institutions and policymakers to enhance digital service delivery, improve user experience, and foster broader acceptance of digital financial technologies in Vietnam. In doing so, the research supports the strategic goals of promoting financial inclusion and accelerating the shift toward a more digitally integrated banking sector.

Research purpose:
This study aims to investigate how technological adoption in digital banking - specifically the implementation of electronic Know Your Customer (eKYC) systems - affects customer satisfaction in Vietnam. By focusing on Vietcombank as a representative case, the research seeks to identify key determinants of satisfaction when customers engage with digital identity verification platforms in a developing country context.

Research motivation:
The motivation behind this research stems from the rapid advancement of digital financial services in emerging markets, particularly in Southeast Asia, where digital transformation is viewed as a critical driver of financial inclusion. Although eKYC technology has been increasingly adopted by commercial banks, empirical studies examining its direct effect on customer satisfaction remain limited in the

Vietnamese context. This study addresses this gap by exploring how user-centric factors, such as perceived ease of use, reliability, and brand image, influence customers' acceptance of and satisfaction with digital banking innovations.

Research design, approach, and method:
The study adopts a quantitative research design based on a structured survey conducted with 200 customers of Vietcombank. The research framework integrates the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), enriched with five specific constructs: reliability, perceived ease of use, implementation quality, expected efficiency, and bank brand image. Exploratory factor analysis (EFA) was employed to identify the underlying dimensions of user satisfaction, followed by multiple linear regression to determine the significance and strength of the relationships between independent variables and overall satisfaction. All measurement instruments were tested for reliability and validity prior to analysis.

Main findings:
The empirical findings reveal that all five identified constructs have a statistically significant and positive influence on customer satisfaction with eKYC services at Vietcombank. Among them, ***reliability*** *emerged as the most impactful factor, highlighting the central role of system consistency and trust in driving user satisfaction.* ***Perceived ease of use*** *was the second most influential, indicating that intuitive and accessible digital interfaces are critical for user engagement. The* ***implementation quality*** *of the eKYC system ranked third, suggesting that seamless integration and operational execution also shape user experiences. Meanwhile,* ***expected efficiency*** *and* ***bank brand image*** *demonstrated moderate yet significant effects, reinforcing the importance of service convenience and institutional credibility in building trust and loyalty in digital banking.*

Practical/managerial implications:
The study provides several actionable insights for bank managers and policymakers aiming to enhance the effectiveness of digital service delivery. First, banks should implement continuous feedback mechanisms within eKYC platforms to capture real-time user input, resolve service disruptions, and improve overall reliability. Second, user interface design must prioritize clarity and simplicity, accompanied by multimedia guidance tools to accommodate users from diverse backgrounds. Third, institutions must invest in robust technologies infrastructure to ensure seamless and secure user experiences. Fourth, optimizing the eKYC system for mobile and multi-channel access is essential to meet customer expectations of convenience. Lastly, consistent brand communication and social responsibility efforts can strengthen public trust in the bank's digital transformation initiatives. Collectively, these strategies can improve customer satisfaction, drive technology adoption, and advance financial inclusion in the digital era.

Keywords: Customer' satisfaction, digitalized banking services, eKYC, Vietcombank, TPB, TAM

1. Introduction

Presently, the unfolding of the fourth industrial revolution is marked by robust and dynamic developments, characterized by the emergence and widespread adoption of advanced technologies. Digital transformation initiatives, alongside the integration of artificial intelligence (AI), have permeated almost all sectors, resulting in substantial disruptions/innovations across various dimensions of societal functioning. Given the juggernaut development of different kinds of technologies especially

information and communication technology (ICT), it is natural to expect that the financial sector in general and the banking industry in particular have also been subject to great transformations and evolution. Specifically, the provision of banking services through smart devices and mobile phones exemplifies the significant utility facilitated by the Internet for both clientele and financial institutions, particularly as the prevalence of smartphone usage continues to escalate (Pham et al., 2023). As digital banking services have become increasingly popular and affordable, the establishment and maintenance of customer trust in banking institutions emerges as a critical imperative, prompting financial institutions to implement measures to verify and authenticate customer information - among which electronic Know Your Customer (eKYC) protocols represent a notable example (Pham et al., 2023).

In Vietnam, after a trial phase of eKYC implementation across different banks, the State Bank of Vietnam (the central bank in Vietnam-SBV) issued Circular No.16/2020/TT-NHNN on December 3, 2020, officially authorizing the deployment of eKYC. The eKYC development framework in Vietnam, guided by recent regulations, encompasses technology utilized for remote authentication of individual customers, mandating both identity verification/authentication and congruent identity validation (SBV, 2020). By the end of 2023, eKYC adoption extended to about 40 banks with more than 35 million active eKYC payment accounts (Nguyen, 2024). Leveraging its contemporary banking technical infrastructure, Vietcombank (Vietnam Commercial Bank for Foreign Trade-VCB)-one of the largest commercial banks in Vietnam enjoys diverse advantages in leveraging advanced technology to automate banking processes and cultivate e-banking solutions on sophisticated platforms. Demonstrating a steadfast dedication to digital transformation, VCB has initiated partnerships with leading technology companies to explore and implement eKYC solutions with a view to streamlining customer service registration procedures and overcoming geographic, temporal, or financial barriers.

Nevertheless, accounts opened through the utilization of eKYC mechanisms predominantly emphasize payment or savings arrangements functions, hence exhibiting less diversity compared to conventional accounts. Furthermore, financial institutions usually impose daily transaction limits on these eKYC-opened accounts, consequently decreasing transaction frequencies. The banking industry is usually exposed to security loopholes/vulnerabilities associated with online transactions, raising apprehensions regarding the potential exposure of customers' personal account particulars and transaction records. These concerns may cause clientele to be skeptical about eKYC procedures, thus exercising prudence when providing personal information while in their online activities (Tran, 2021).

Given customers' concerns regarding online banking products/services in general and eKYC in particular, this research aims to discern the factors and their corresponding degrees of influence on user satisfaction in utilizing eKYC identification technology in the case of (one of) the largest commercial bank in Vietnam-VCB. By employing a mix of tools (survey data, regression model), the research outcomes are expected to provide greater insights into user satisfaction and their determinants regarding VCB's eKYC electronic identification service. This study also tries to identify the roots of user discontentment, encompassing factors emanating from both user and bank standpoints. Drawing upon the research findings, several implications and recommendations are made to improve user satisfaction and enhance the service quality of the bank.

2. Theory and hypotheses development

2.1. Theory of technology acceptance model (TAM)

Davis (1986) conducted a foundational study on the determinants of technology adoption behavior within organizational environments. Building on Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), Davis proposed the Technology Acceptance Model (TAM) as a conceptual framework to account for the processes through which individuals develop acceptance and subsequently adopt technological innovations. The model emphasizes the role of two primary cognitive

beliefs - perception of usefulness and perception of usability ease - as key determinants shaping users' attitudes, intentions, and ultimately, their actual technology usage behavior. Perceived usefulness denotes the belief of an individual that utilizing a given technology will enhance their effectiveness in completing tasks, whereas perceived ease of use signifies the extent to which the individual considers the system to require minimal effort to operate. In the context of this study, TAM provides a suitable framework for examining customer satisfaction with electronic Know Your Customer (eKYC) services at Vietcombank. The model helps explain how users form attitudes and satisfaction levels based on their experiences with the usability and functionality of eKYC technology. Specifically, users' perceptions regarding the ease of identity verification and the effectiveness of the service in facilitating secure, convenient banking access are critical in shaping their overall satisfaction.

2.2. Theory of measuring service quality (SERVQUAL, E-SERVQUAL)

The Servqual model (Parasuraman et al., 1998, 2005) is a popular tool used to measure service quality. The model delineates five core dimensions—Reliability, Responsiveness, Assurance, Empathy, and Tangibles—which collectively represent customers' expectations and perceptions regarding service performance. SERVQUAL's strength lies in its ability to capture the gap between expected service and perceived service, providing organizations with diagnostic insights into areas requiring improvement. As digital services began to proliferate, Parasuraman et al. (2005) further extended this model to create E-SERVQUAL, tailored specifically to the context of online service environments. This enhanced version introduces additional dimensions such as efficiency, system availability, security, compensation, and contact, which better reflect the characteristics and challenges of digital interactions. These refinements allow for more nuanced evaluation of service quality in online platforms, where traditional face-to-face service delivery is replaced by technology-mediated experiences.

In the context of this study, SERVQUAL and E-SERVQUAL serve as valuable tools for assessing customer satisfaction with the eKYC process at Vietcombank. As eKYC is a critical touchpoint in digital banking, evaluating service quality across both traditional (e.g., assurance, reliability) and digital (e.g., security, system availability, efficiency) dimensions enables a comprehensive understanding of user experience. This application supports the identification of strengths and shortcomings in service delivery, guiding Vietcombank toward targeted improvements that enhance customer satisfaction, trust, and loyalty in an increasingly digital financial ecosystem.

2.3. The unified theory of acceptance and use of technology (UTAUT, UTAUT2)

The Unified Theory of Acceptance and Use of Technology - UTAUT and its extension - UTAUT 2 are also foundational theories for studying consumer behavior on online platforms (Elinzano, 2022). The UTAUT framework highlights four core determinants of technology acceptance: performance expectancy, effort expectancy, social influence, and facilitating conditions. Its extended version, UTAUT2, broadens the model by integrating three supplementary constructs: Hedonic Motivation, Price Value, and Habit towards intention to use and technology acceptance. In the context of this study, UTAUT2 offers a robust lens through which to analyze user behavior and satisfaction with electronic Know Your Customer (eKYC) services at Vietcombank. Given that eKYC is increasingly adopted through digital platforms, users' expectations regarding system efficiency (performance expectancy), ease of interaction (effort expectancy), social influence from peers or family, and availability of supporting infrastructure (facilitating conditions) all contribute to their overall satisfaction and continued usage. Moreover, the added dimensions of hedonic motivation (e.g., enjoyment from convenience), perceived cost-benefit (price value), and habitual usage behaviors are particularly relevant as digital banking becomes ingrained in daily financial activities. Applying

UTAUT2 thus allows this research to holistically capture the multifaceted psychological and contextual factors influencing user acceptance and satisfaction with eKYC systems in Vietnam's evolving digital banking landscape

2.4. Literature review on customer satisfaction with banking products/services

The pursuit of customer satisfaction stands as a pivotal concern in laying down a methodical groundwork for tailored business advancement initiatives. The exploration of customer satisfaction burgeoned in the 1970s across various service industries (including banking, tourism, aviation, and healthcare, among others). The inception of electronic commerce services traces back to 1980 in Scotland. Subsequently, in 1977, banking institutions officially rolled out electronic commerce services (E-banking service) (Elhajjar & Ouaida, 2020). A multitude of inquiries has been undertaken to fathom customer satisfaction concerning banking services across various nations, including the United States (Nguyen, 2021), Taiwan (Takaragi et al., 2022), Indonesia (Muslim, 2021), Malaysia (Adel et al., 2021), Jordan (Anouze & Alamro, 2019), India (Fitree et al., 2021), and Iran (Tahe et al., 2021).

Studies in the current literature have identified the elemental facets of e-banking services contributing to user satisfaction, notably convenience (Beheshti Zavareh et al., 2012; Ali et al., 2017), safety and reliability (Choudhury & Mishra, 2022), user-friendliness (George & Kumar, 2013; Fachreza & Besra, 2022), supportive attributes (Paul, 2021; Fugkeaw, 2022), and pricing of services (Ghozi, 2022). User satisfaction, in turn, has been confirmed to play a pivotal role in shaping loyalty and the intention to continue using e-banking services (Ahmad, 2004; Gazi et al., 2024). Thirdly, prevalent research methodologies comprise survey questionnaires, along with the deployment of SERVQUAL and E-SERVQUAL service quality assessment scales (Hu et al., 2019).

In Vietnam, the introduction of e-banking services dates back to 1994, yet it wasn't until 2002 that Vietnam's information technology infrastructure became advanced to support the implementation of such services. Since then, both theoretical and empirical investigations into customer satisfaction have undergone substantial growth within the e-banking area. Various studies have emphasized the paramount importance of core attributes inherent to e-banking services. Mai et al. (2023) highlighted four primary attributes essential to e-banking service quality: tangibility, reliability, empathy, and responsiveness. Results from Mai et al. (2023) confirm that higher perceptions of these attributes correlate with increased user satisfaction, and positive perceptions of e-banking services significantly influence customers' intentions to maintain their usage of these services. Ngo (2022) contends that safety and reliability attributes play a pivotal role in the advancement of e-banking services, as the perceived level of safety and reliability, coupled with responsiveness and convenience, constitutes vital components of user satisfaction. Furthermore, user satisfaction exhibits a positive correlation with continued service usage. According to Khuu and Nguyen (2016), customer satisfaction in e-banking is associated with seven service quality dimensions, namely efficiency, website design, security, responsiveness, assurance, empathy, and service cost. More recently, Nguyen et al. (2023) examined the relationship between service quality and customer satisfaction with e-banking among Vietcombank users in Ho Chi Minh City, identifying five service attributes, including tangibility, system reliability, assurance, and service cost, with cost emerging as the most pivotal factor affecting user satisfaction. Nguyen (2020) demonstrated the significance of six attributes in determining user satisfaction with e-banking services, including reliability, responsiveness, tangibility, service capacity, empathy, and service cost, with reliability standing out as the most critical factor.

2.5. Theoretical Framework

The present study constructs its research framework by drawing upon several established theories, namely the Technology Acceptance Model (TAM) (Davis, 1986), SERVQUAL (Parasuraman

et al., 1988), its electronic adaptation E-SERVQUAL (Parasuraman et al., 2005), as well as the Unified Theory of Acceptance and Use of Technology and its extension (UTAUT and UTAUT2) (Venkatesh et al., 2003; 2012). These models have been widely utilized to explain and predict user behavior in adopting and evaluating technology-driven services, particularly within banking and public service contexts. Building upon these foundations and empirical studies related to e-banking and digital identification systems, we propose a conceptual framework consisting of five independent variables: Implementation of eKYC Services at the Bank, Perception of Usability Ease, Reliability, Expected Effectiveness, and Bank Brand. The variables are specifically described as follows:

The implementation quality of technological services is often overlooked in consumer satisfaction studies, yet it remains a vital operational determinant. This construct refers to how well a bank deploys and integrates eKYC technology into its service infrastructure. It encompasses the system's stability, ease of access, consistency across user touchpoints, and the quality of support provided during the user experience.

eKYC implementation specifically includes automated digital identity verification through facial recognition, ID card scanning, and real-time data matching (Ghozi, 2022). Proper execution reduces procedural errors, improves customer onboarding speed, and limits fraud (Perlman & Gurung, 2019). The concept aligns with the Facilitating Conditions dimension of UTAUT, which posits that organizational and technical support are prerequisites for effective use. Moreover, it is closely related to the System Availability and Efficiency dimensions of E-SERVQUAL, which evaluate the technical readiness and functional capacity of online services. Thus, the following hypothesis is proposed:

H1: Implementation of eKYC services at the bank positively impacts user satisfaction.

The Perceived Ease of Use construct originates from TAM and refers to the degree to which users believe that a system requires minimal effort to use. This subjective evaluation is influenced by individual experiences, interface design, digital literacy, and emotional responses to the system. In the case of Vietcombank's eKYC service, the user journey involves downloading the mobile banking application, filling out forms, uploading ID images, and completing facial recognition (Le et al., 2023). Complexity or ambiguity at any step can become a barrier to service adoption and satisfaction. Nayanajith and Damunupola (2019) emphasize that the perceived cognitive load during digital identification processes significantly impacts the user's overall appraisal of the system. In line with Effort Expectancy in UTAUT, when users perceive a service as easy to use, their intention to engage and satisfaction levels increase. From there, the following hypothesis is proposed:

H2: Perception of usability ease positively impacts user satisfaction.

Reliability is one of the most consistently validated dimensions in the SERVQUAL and E-SERVQUAL models and refers to the consistency, dependability, and trustworthiness of a service in delivering promised outcomes. In the context of digital banking, where privacy and financial risk are prominent concerns, perceived reliability becomes even more critical. Security breaches, data leakage, or system downtime can erode user trust rapidly. As noted by Le and Duong (2022), Vietnamese users are particularly vigilant regarding data safety when interacting with online services. Phan and Nguyen (2022) affirm that reliable authentication processes—those that are stable, accurate, and consistent—are essential for cultivating trust in eKYC services. This construct also resonates with Performance Expectancy in UTAUT and Assurance in SERVQUAL. Therefore, the authors propose the following hypothesis:

H3: Reliability positively impacts user satisfaction.

This construct is conceptually aligned with Perceived Usefulness in TAM and Performance Expectancy in UTAUT. It reflects the user's belief that utilizing eKYC technology contributes to greater efficiency and performance, namely, saving time, reducing travel, and streamlining account activation. Users no longer need to physically visit bank branches, instead verifying their identities

remotely via a mobile platform. Tahe et al. (2021) confirm that digital identity verification can yield outcomes equivalent to those obtained through conventional methods, while improving convenience and accessibility. Paul et al. (2019) further note that heightened operational productivity often leads to increased satisfaction with e-government and digital services. Thus, the following hypothesis is proposed:

H4: Expected effectiveness positively impacts user satisfaction.

Brand image is an intangible but influential element in shaping user expectations and trust. Within the UTAUT2 framework, it overlaps with constructs such as Social Influence and Habit, as well as brand loyalty theories. A strong brand not only reduces perceived risk but also enhances credibility, especially when dealing with sensitive technologies such as digital identity verification. Nayanajith and Damunupola (2019) argue that in competitive banking environments, brand reputation is often a decisive factor in customers' technology adoption decisions. Since many Vietnamese banks have adopted similar eKYC systems, the brand serves as a signal of quality and reliability. Hu et al. (2019) emphasize that differentiated brand positioning, supported by consistent digital performance, reinforces customer loyalty and satisfaction. Therefore, the following hypothesis is proposed:

H5: Bank's brand positively impacts user satisfaction.

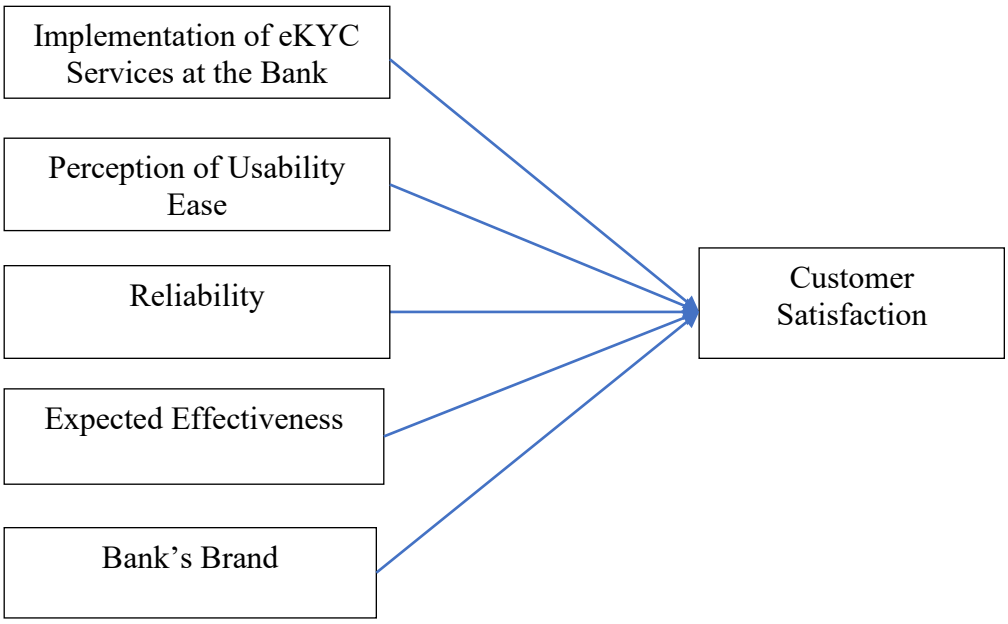


Figure 1. The proposed conceptual model

Source: Authors' creation

3. Research Methodology

3.1. Questionnaire development

The scales and variables of measurement are detailed in Table 1.

Table 1. Variables, items, and explanations

No	Explanation	Reference	Items
1	**Implementation of eKYC Service at the Bank**		**IS**
1	I find the implementation of eKYC identification technology necessary for my needs.	Ghozi (2022); Perlman & Gurung (2019)	**IS1**
2	The eKYC identification technology aligns with the		**IS2**

	general development trends in Vietnam and globally.		
3	The bank's eKYC identification technology service is equipped with modern features.		**IS3**
4	The bank's eKYC identification technology service has an attractive and user-friendly design.		**IS4**
2	**Perception of Ease of Use**		**PEU**
1	Performing eKYC identification via the Internet Banking (IB) application is very easy for me.	Le et al. (2023); Nayanajith Damunupola (2019)	**PEU1**
2	The instructions for the eKYC identification steps are clear and easy to understand.		**PEU2**
3	Interacting with the eKYC identification process does not require remembering many things.		**PEU3**
4	I easily became proficient in performing eKYC identification at Vietcombank.		**PEU4**
3	**Reliability**		**R**
1	The bank's eKYC identification technology meets expectations.	Le & Duong (2022); Phan & Nguyen (2022)	**R1**
2	The bank's eKYC identification technology follows the correct procedures.		**R2**
3	The bank's eKYC identification technology is accurate on the first attempt.		**R3**
4	The bank's eKYC identification technology securely protects customer information.		**R4**
4	**Expected Efficiency**		**EE**
1	The bank's eKYC identification saves me time.	Tahe et al., (2021); Paul et al., (2019)	**EE1**
2	The bank's eKYC identification saves me money.		**EE2**
3	The bank's eKYC identification helps me open a bank account more efficiently.		**EE3**
4	The bank's eKYC identification can be performed anywhere with an Internet connection.		**EE4**
5	The bank's eKYC identification provides convenience for customers wanting to use banking services.		**EE5**
5	**Bank's brand**		**BB**
1	VCB has a good reputation in the financial market.	Nayanajith & Damunupola (2019); Huet al. (2019)	**BB1**
2	The customer service at VCB is of high quality.		**BB2**
3	I feel secure opening a bank account at VCB.		**BB3**
4	People around me trust and use VCB services.		**BB4**

Source: own, 2024

3.2. Data collection

After the survey was distributed and answers were collected, we process with data cleaning before running the model. The sample size was established based on the minimal criterion necessary to attain the required reliability of the study. According to Tabachnick and Fidell (2007), the following empirical formula can be used to determine the minimum sample size: $n \geq 50 + 8 * m$, where n is the minimum sample size and m is the number of factors (independent variables) in the research model. The study consists of 5 independent variables, including Implementation of eKYC services at the bank,

Perception of usability ease, Reliability, Expected effectiveness, and Bank brand. Therefore, $m = 5$. Thus, we have: $n \geq 50 + 8 * 5; n \geq 90$.

Upon the acquisition of adequate raw data via the survey questionnaire, it necessitates synthesis, organization, filtration, and cleaning. We utilize SPSS software to perform the following tasks: Descriptive statistics, Assessment of the scale's reliability utilizing Cronbach's Alpha coefficient, Exploratory Factor Analysis (EFA), Regression analysis, and correlation amidst variables, as well as Hypothesis testing.

4. Results and Discussion

4.1. Profiles of the respondents

Detailed information regarding the sample characteristics is presented in Table 2.

Table 2. The demographic profile of the respondents

Criterion	Frequency (people)	Percentage (%)
Gender		
Male	92	46.0
Female	108	54.0
Age		
Under 18 years old	41	20.5
From 18 - 30 years old	97	48.5
Above 30 years old	62	31.0
Education		
Primary school	2	1.0
secondary school	10	5.0
High schook	57	28.5
graduate	93	46.5
Postgraduate	33	16.5
Others	5	2.5
Occupation		
Student	83	41.5
State agencies	39	19.5
Worker	23	11.5
Business	29	14.5
Others	26	13.0
Residential area		
Inner Hanoi	109	54.5
Outer Hanoi	91	45.5
Experience using VCB bank's eKYC technology identification service		
used before	136	68.0
not used yet	64	32.0
Total	**200**	**100**

Source: own, 2024

Table 2 provides a summary of the demographic characteristics of 200 respondents who participated in the survey on customer satisfaction with Vietcombank's eKYC service. Female participants slightly outnumber males, accounting for 54.0% of the sample. The majority fall within the

18–30 age group (48.5%), followed by those above 30 (31.0%) and under 18 (20.5%). Most respondents hold a university degree (46.5%) or have completed high school (28.5%). Students represent the largest occupational group (41.5%), followed by individuals working in state agencies (19.5%). In terms of residence, 54.5% live in inner Hanoi. Notably, 68.0% of the participants have previously used Vietcombank's eKYC service, indicating a relatively high level of exposure to digital banking technology among the surveyed population.

4.2. Testing the reliability of Cronbach's Alpha scale

Table 3. Reliability Analysis of the Measurement Scale using Cronbach's Alpha Coefficient

Factor/Variable	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Apha
1. Implementation of eKYC services at the bank (IS)			
IS1	0.594	0.737	
IS2	0.543	0.761	
IS3	0.682	0.689	
IS4	0.570	0.748	**0.787**
2. Perception of usability ease (PUE)			
PUE1	0.693	0.798	
PUE2	0.640	0.821	
PUE3	0.677	0.805	
PUE4	0.714	0.788	**0.845**
3. Reliability (R)			
R1	0.684	0.752	
R2	0.657	0.763	
R3	0.660	0.764	
R4	0.568	0.803	**0.818**
4. Expected effectiveness (EE)			
EE1	0.696	0.826	
EE2	0.669	0.831	
EE3	0.628	0.841	**0.859**
EE4	0.681	0.831	
EE5	0.722	0.818	
5. Bank brand			
BB1	0.749	0.798	
BB2	0.715	0.810	
BB3	0.670	0.827	
BB4	0.668	0.828	**0.855**

Source: Authors' compilations

Table 3 shows that the independent variables all exhibit Cronbach's alpha coefficients greater than 0.7. The variable Implementation of eKYC services at the bank (IS) has the lowest Cronbach's alpha coefficient at 0.787, while the variable Expected Effectiveness (EE) boasts the highest Cronbach's Alpha coefficient at 0.859. This indicates a close, intimate relationship among the observed variables within the same independent variable scale.

The total correlation coefficients of all observed variables are greater than 0.3, ranging from 0.543 to 0.749, thereby warranting the acceptance of all observed variables. These observed variables will be utilized in the Exploratory Factor Analysis (EFA).

4.3. Exploratory Factor Analysis (EFA)

Table 4. KMO and Bartlett's Test, Eigenvalues, and Explained Variance (1st)

KMO	0.926
Sig. of Bartlett's Test	0.000
Total Variance Explained	73.470%

Source: Authors' compilations

From the KMO coefficient analysis table and Bartlett's Test (Table 4), we can see that the KMO coefficient = 0.926 > 0.05; the Sig. coefficient of Bartlett's Test = 0.000 < 0.05. Therefore, factor analysis EFA is appropriate. The total variance explained by these 5 factors is 73.470% > 50%. Thus, the 5 extracted factors explain 73.470% of the data variability of the 21 observed variables involved in the exploratory factor analysis (EFA).

Table 5. Varimax-rotated factor matrix (1st)

Observational Variable	**Factor**				
	1	2	3	4	5
PEU4	0.799				
EE5	0.771				
EE3	0.708		0.454		
EE1	0.703				
R2	0.154	0.702			
R1		0.652	0.434		
EE2		0.628			
EE4		0.622			
R3		0.618			
R4		0.598		0.385	
IS2			0.592		
IS4	0.452		0.585		
IS1	0.118		0.566		
IS3			0.792		
PEU3				0.691	
PEU1				0.683	
PEU2		0.447		0.673	
BB3					0.663
BB2					0.662
BB1					0.639
BB4				0.348	0.578

Source: Authors' compilations

From the results of the first exploratory factor analysis (EFA) (Table 5), we observe that the observed variables R1, R4, IS4, BB4, EE3, PEU all load onto two factors, but the loading coefficients in both factor groups have a difference of < 0.3. Therefore, these observed variables will be excluded, and exploratory factor analysis (EFA) will be conducted again with the remaining observed variables.

Table 6. KMO and Bartlett's Test, Eigenvalues, and Explained Variance (2nd)

KMO	0.889
Sig. of Bartlett's Test	0.000
Total Variance Explained	78.399%

Source: Authors' compilations

The authors conducted an exploratory factor analysis for the 5 groups of independent variables. A summary table of the key values from the EFA for the independent variables is presented in Table 6. The KMO is 0.889, which exceeds the threshold of 0.6, indicating that the factor analysis is suitable for the dataset. Bartlett's Test has Sig. = 0,000 < α = 0,005. Thus, the null hypothesis H_0 "The observed variables have no interaction with each other in the population" can be rejected. Therefore, it can be concluded that there are statistically significant points and observed variables correlated with each other in the factor.

Table 7. Varimax-rotated factor matrix (2nd)

Observational Variable	Factor				
	1	2	3	4	5
EE5	0.845				
EE1	0.809				
EE2	0.755				
EE 4	0.754				
R2		0.744			
R1		0.696			
PUE4			0.770		
PUE 3			0.747		
PUE 1			0.740		
IS2				0.736	
IS1				0.725	
IS3				0.695	
BB3					0.788
BB2					0.736
BB1					0.691

Source: Authors' compilations

The findings derived from Table 7 demonstrate that the Factor Loading coefficients for all indicators > 0.45. Through the utilization of exploratory factor analysis (EFA), five distinct factors are identified, satisfying all assessment criteria. Nonetheless, the outcomes of the factor analysis unveil fluctuations in the constituent variables across each factor cluster:

The first factor group comprises the observed variables EE5, EE1, EE2, and EE4, which collectively represent user perceptions of expected efficiency. These items are associated with how effective, fast, and time-saving the eKYC service is perceived to be. The consistency among these variables suggests that users place high value on the operational efficiency of the system, such as reduced waiting times, quick identity verification, and simplified digital procedures. This aligns with the broader literature emphasizing the importance of technological efficiency in enhancing user experience in digital banking services.

The second factor group includes R2 and R1, which load significantly onto a factor representing reliability. These variables reflect the degree to which users trust the eKYC system to function correctly, consistently, and without error. Trustworthiness is particularly critical in digital financial services, where concerns about identity fraud and data misuse can undermine user confidence. This factor confirms that perceived system reliability is a fundamental determinant of satisfaction in technology-mediated banking interactions.

The third factor group consists of PUE4, PUE3, and PUE1, relating to the perceived ease of use of the eKYC service. This factor emphasizes the intuitive interface design, user-friendliness, and simplicity of the digital identification process. When users feel that a system is easy to navigate without requiring technical expertise, they are more likely to engage with it positively and express higher levels of satisfaction.

The fourth factor group, including IS2, IS1, and IS3, represents the implementation quality of the eKYC service at the bank. This factor captures the internal execution of the technology—how well it is integrated into banking operations, the clarity of instructions, and the seamlessness of the experience. The high internal consistency of these variables indicates that the institutional readiness and service design quality of Vietcombank significantly shape users' satisfaction.

The fifth factor group is composed of BB3, BB2, and BB1, which describe aspects of bank brand image. These variables reflect users' perceptions of Vietcombank's credibility, reputation, and overall corporate identity. A strong, positive brand image can serve as a trust anchor in digital environments where face-to-face interactions are minimal.

In summary, the five factor groups—Expected Efficiency, Reliability, Perceived Ease of Use, Implementation of eKYC Services, and Bank Brand—jointly explain key psychological and experiential dimensions of customer satisfaction with the eKYC service. These findings provide a solid empirical basis for subsequent regression modeling and strategic recommendations aimed at enhancing digital banking adoption.

4.4. Regression Results

Given the significant relationship observed between the dependent and independent variables in the model, the analysis advanced by applying a multiple regression approach, incorporating the four remaining independent variables alongside the dependent variable: "customer satisfaction when using VCB's eKYC identification technology", as represented in the following regression equation:

$$CS = \beta_0 + \beta_1 * IS + \beta_2 * PUE + \beta_3 * R + \beta_4 * EE + \beta_5 * BB$$

In which CS refers to Customer Satisfaction, IS indicates the Implementation of eKYC Services at the Bank, PUE indicates Perception of Usability Ease, R represents Reliability, EE represents Expected Effectiveness and BB is Bank Brand

4.4.1. Model Evaluation

Table 8. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error	–DW-stat
1	0.779[a]	0.607	0.294	0.38752	2.038

Source: Authors' compilations

From the model evaluation (Table 8), it is observed that R = 0.779 > 0.5, indicating that the expected significance of the regression model is good. Additionally, The R^2 value of 0.607 indicates that the independent variables in the regression collectively explain 60.7% of the variation in the

dependent variable, whereas the remaining 39.3% can be attributed to unobserved factors beyond the model and stochastic error.

Moreover, the Durbin-Watson statistic is provided in the Table 8 to assess the presence of first-order autocorrelation. The DW = 2.038, falls within the range of values from 1.5 to 2.5, indicating no violation of the assumption of first-order autocorrelation.

Table 9. ANOVA

ANOVA[a]						
Model		Sum of Squares	Degrees of fredom	Mean Squares	F value	Sig.
1	Treatment	81.457	5	16.291	18.004	0.000[b]
	Residual error	148.172	164	0.903		
	Total	229.629	169			
a. Dependent variable: CS						
b. Independent variables: (C), IS, PEU, R, EE, BB						

Source: Authors' calculationss

To test the regression model (Table 9), the null hypothesis is set as H_0: $R^2 = 0$. The F-test is used to test this hypothesis. The result of the test is as follows:

Sig. = 0.000 < 0.05 → Reject the null hypothesis H_0, indicating that $R^2 \neq 0$ with statistical significance. Therefore, the regression model is appropriate.

Table 10. Regression Results

Coefficients[a]

Model	*Coef.*		*Std. error*	*t*	*Sig.*	*VIF*	
	B	*Std. error*	*Beta*			*Tolerance*	*VIF*
(C)	4.864	1.226		6.677	0.000		
IS	0.013	0.078	0.321	0.179	0.017	0.657	1.521
PEU	0.078	0.165	0.362	0.466	0.004	0.488	2.054
R	-0.051	0.141	0.456	-0.361	0.011	0.412	2.430
EE	0.067	0.169	0.250	0.396	0.000	0.612	1.633
BB	-0.112	0.019	0.157	-1.002	0.029	0.402	2.491

Dependent Variable: CS

Source: Authors' calculationss

4.4.2. Testing for Multicollinearity

The Variance Inflation Factor (VIF) is used to assess multicollinearity. From Table 10, which presents the statistical results of the regression model parameters, it is observed that all VIF < 10. Therefore, it can be affirmed that there is no multicollinearity among the variables.

4.4.3. Testing the Regression Coefficients of the Independent Variables

To conduct the regression model analysis, the research team will assess the significance of the regression coefficients of each independent variable based on the t-test (Student's t-test) with the null hypothesis H_0: The regression coefficient of independent variable $X_i = 0$. Testing each independent variable as follows:

According to Table 8, the Sig. values of the independent variables Implementation of eKYC services at the bank, Perception of usability ease, Reliability, Expected Effectiveness, and Bank brand are all < 0.05. Therefore, we reject the null hypothesis H0, indicating that the regression coefficients of these independent variables are statistically significant. Each variable has an impact on the dependent variable.

4. 5. Discussion of Research Findings

According to the results in Table 8, the beta coefficients of the five independent variables are all positive, indicating that these variables have a positive relationship with the dependent variable in the model. Therefore, the five factors: Reliability, Perception of usability ease, Implementation of eKYC services at the bank, Expected effectiveness, and Bank brand, all positively influence user satisfaction when using VCB's electronic identification technology service eKYC.

The standardized regression equation of the study, after performing the testing and validation steps, is expressed as follows:

$$CS = 0.456 * R + 0.362 * PEU + 0.321 * IS + 0.250 * EE + 0.157 * BB \quad (1)$$

Based on the results presented in Equation (1), it is evident that among the independent variables analyzed, "Reliability" exerts the most significant influence on user satisfaction with Vietcombank's electronic identity verification service (eKYC), with the highest standardized regression coefficient value of 0.456. This indicates that the degree to which users perceive the eKYC service as dependable, consistent, and trustworthy plays a pivotal role in shaping their overall satisfaction. High levels of perceived system reliability likely instill greater confidence in users, particularly in a digital context where trust in technology and security is essential.

The second most influential variable is "Perceived Ease of Use", with a coefficient of 0.362. This finding confirms that users place considerable importance on the user-friendliness and intuitiveness of the eKYC system. A straightforward, easy-to-navigate interface contributes positively to users' experiences and satisfaction, especially for individuals who may not be highly tech-savvy.

Ranking third is the variable "Implementation of eKYC Services at the Bank", with a coefficient of 0.321. This reflects the impact of how effectively the bank integrates and delivers the eKYC system in practice—such as the clarity of procedures, service readiness, and operational support. Although ranked third in influence, customer satisfaction within this factor group remains favorable, suggesting that customers generally appreciate the way the bank has rolled out the service.

The "Expected Efficiency" variable holds a coefficient of 0.250, placing it fourth among the identified influencing factors. While efficiency remains a key determinant, its slightly lower weight suggests that while speed and time-saving features are valued, they are secondary to issues of trust and usability in this service context.

Lastly, "Bank Brand" has the smallest regression coefficient at 0.157, indicating the least influence among the five factors. Nonetheless, the satisfaction level within this group is still evaluated positively. This suggests that while Vietcombank's brand image contributes to trust and credibility, it plays a more supporting role compared to direct service experiences like reliability and ease of use.

In summary, all five factors positively influence user satisfaction, with Reliability, Ease of Use, and Implementation Quality emerging as the most critical predictors. These insights provide important implications for banks aiming to enhance digital service delivery and customer experience in the era of financial technology.

5. Conclusion, Implication and Future Research Directions

This study adopts a rigorous and systematic research design to examine the factors influencing user satisfaction with Vietcombank's electronic Know Your Customer (eKYC) technology. By employing a combination of structured survey instruments, validity-tested measurement scales, exploratory factor analysis (EFA), and multiple linear regression, the study offers a comprehensive quantitative evaluation of the determinants shaping users' perceptions and satisfaction levels in the context of digital identity verification.

The exploratory factor analysis identified five latent constructs that reflect the multidimensional nature of user satisfaction with eKYC services. These include: Reliability, referring to the system's ability to function consistently and securely; Perception of Usability Ease, capturing the level of effort required by users to interact with the technology; Implementation of eKYC Services at the Bank, reflecting the quality and integration of service deployment within the bank's operations; Expected Efficiency, representing users' expectations regarding time savings and process effectiveness; and Bank Brand, referring to the influence of institutional reputation on users' confidence in the digital service.

The multiple regression analysis confirmed that all five factors have a statistically significant and positive impact on the dependent variable, user satisfaction. Notably, Reliability was identified as the most influential factor, suggesting that trust in the system's consistency and accuracy is paramount in shaping positive user experiences. Perception of Usability Ease ranked second, reinforcing the importance of intuitive and user-friendly interfaces in technology acceptance. The third most influential factor was the Implementation Quality of the eKYC System, highlighting that smooth and professional execution of the service contributes directly to satisfaction levels

Based on the empirical findings of this study, several strategic recommendations can be made to enhance user satisfaction with eKYC services at Vietcombank and other financial institutions operating in similar digital environments.

First, the bank should establish a comprehensive customer feedback and engagement system to ensure continuous service improvement. Since reliability emerged as the most significant predictor of satisfaction, it is essential to capture real-time customer experiences and systematically analyze recurring issues. Feedback mechanisms should be integrated into the eKYC system to allow users to report difficulties or suggest enhancements directly. Furthermore, frontline employees must be rigorously trained not only in the technical operation of eKYC systems but also in customer interaction and problem-solving strategies, ensuring that user concerns are addressed efficiently and empathetically.

Second, given the importance of perceived ease of use, Vietcombank should invest in refining the user interface (UI) of its eKYC platform. The interface should be intuitively designed, minimizing complexity, and ensuring that key features are easily accessible. The provision of clear, step-by-step instructions, including multimedia tutorials or real-time assistance (such as live chat support), will enhance usability. The language used in user guidance must be clear, concise, and free of technical jargon, enabling customers across different demographics to navigate the process confidently.

Third, to uphold the reliability and expected effectiveness of the system, the bank must continue to invest in advanced technologies and infrastructure upgrades. This includes the deployment of high-performance facial recognition algorithms, the enhancement of backend data-processing capabilities,

and the reinforcement of cybersecurity measures to prevent identity theft and data breaches. Regular performance audits and system evaluations should be conducted to proactively identify service disruptions and implement timely improvements based on user data and feedback.

Fourth, to expand accessibility and improve service convenience, the eKYC platform should be fully optimized for mobile and multi-channel use. The ability to complete the eKYC process from any location with internet access aligns directly with users' expectations of flexibility and operational efficiency. Integration of eKYC functionalities across all digital and physical customer touchpoints—including mobile apps, web portals, and in-branch systems—will create a seamless and unified user experience.

Fifth, strategic brand management efforts should be prioritized, as findings suggest that the bank's image has a measurable, albeit smaller, influence on satisfaction. To strengthen brand trust and visibility in the digital space, Vietcombank should engage in consistent public communication, showcase its technological leadership in financial services, and participate in social responsibility initiatives. These actions not only reinforce customer loyalty but also enhance the perceived credibility of the bank's digital innovations.

Nevertheless, as "every coin has its two sides", this paper is inherited with certain limitations which in turn, open new directions for future research. Budgetary limitations have constrained the extent of available information. Consequently, the research team only managed to survey a segment of Vietcombank's customer base in the Hanoi locale, primarily comprising students. As a result, a comprehensive evaluation of customer satisfaction across all age demographics utilizing eKYC services at VCB remains incomplete. Therefore, scholars may want to broaden the scope of research, expand the segments of customers surveyed in order to have a more comprehensive evaluation of user's satisfaction with banking services in general and eKYC service in particular.

Additionally, the research scope is temporally confined, focusing solely on appraising customer satisfaction during the period spanning 2023 to 2024, thus overlooking longer-term trends. Hence, future studies may employ a longer period of time and also include external shocks with a view to figuring out additional factors and also offer more insightful implications and recommendations toward banks' managers, especially those in the Board of Directors or Board of Management.

References

Adel, Z., Othman, A. H. A., & Bin Hasan, A. (2021). The attitude of potential customers toward eKYC at Malaysian banks during the coronavirus pandemic: Perspectives of clients. *Review of International Geographical Education Online, 11*(5), 1245–1259.

Ahmad, J. (2004). Retail banking and customer behaviour: A study of self-concept, satisfaction and technology usage. *The International Review of Retail, Distribution and Consumer Research, 14*(3), 357–379. https://doi.org/10.1080/0959396041000167838l

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management, 37*(3), 99–110. https://doi.org/10.1016/j.ijinfomgt.2017.01.002

Anouze, A. L. M., & Alamro, A. S. (2019). Factors affecting intention to use e-banking in Jordan. *International Journal of Bank Marketing, 38*(1), 86–112. https://doi.org/10.1108/IJBM-10-2018-0271

Beheshti Zavareh, F., Md Ariff, M. S., Jusoh, A., Zakuan, N., Bahari, A. Z., & Ashourian, M. (2012). E-service quality dimensions and their effects on e-customer satisfaction in internet banking services. *Procedia - Social and Behavioral Sciences, 40,* 441–445. https://doi.org/10.1016/j.sbspro.2012.03.213

Choudhury, P. K., & Mishra, N. R. (2022). Online banking innovations and its impact on customer satisfaction: A study with reference to commercial banks. *Central European Management Journal, 30*(3), 124–140.

Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* (Doctoral dissertation, Massachusetts Institute of Technology). Massachusetts Institute of Technology.

Elhajjar, S., & Ouaida, F. (2020). An analysis of factors affecting mobile banking adoption. *International Journal of Bank Marketing, 38*(2), 352–367. https://doi.org/10.1108/IJBM-02-2019-0055

Elinzano, G. B. O. (2022). *Adoption and use of online bank account opening through e-KYC using UTAUT and its extensions* [Master's thesis, University of the Philippines Open University]. UPOU Digital Repository.

Fachreza, J. A., Besra, E., & Verinita. (2022). Effect of perceived usefulness and perceived ease of use on intention to use mobile banking (Brimo) with attitude as intervening variable (Study at Lubuk Basung Sub-Branch Office of Pt. Bank Rakyat Indonesia). *Enrichment: Journal of Management, 12*(3), 1552–1561. https://www.enrichment.iocspublisher.org/index.php/enrichment/article/view/616

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley.

Fugkeaw, S. (2022). Enabling trust and privacy-preserving e-KYC system using blockchain. *IEEE Access, 10,* 49028–49039. https://ieeexplore.ieee.org/document/9770032

Gazi, M. A. I., Mamun, A. A., Masud, A. A., Senathirajah, A. R. S., & Rahman, T. (2024). The relationship between CRM, knowledge management, organization commitment, customer profitability and customer loyalty in telecommunication industry: The mediating role of customer satisfaction and the moderating role of brand image. *Journal of Open Innovation: Technology, Market, and Complexity, 10*(1), 100227. https://doi.org/10.1016/j.joitmc.2024.100227

George, A., & Kumar, G. S. G. (2013). Antecedents of customer satisfaction in internet banking: Technology acceptance model (TAM) redefined. *Global Business Review, 14*(4), 627–638. http://dx.doi.org/10.1177/0972150913501602

Ghozi, A. (2022). The urgency of electronic know your customer (e-KYC): How electronic customer identification works to prevent money laundering in the fintech industry. *Diponegoro Law Review, 7*(1), 34–52. https://doi.org/10.14710/dilrev.7.1.2022.34-52

Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019). Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model. *Symmetry, 11*(3), 340. https://doi.org/10.3390/sym11030340

Khuu, H. K. D., & Nguyen, C. Q. N. (2016). Factors influencing the e-banking acceptance of customers in Joint Stock Commercial Bank for Investment and Development of Vietnam, Dong Nai branch. *Journal of Science of Lac Hong University, 5,* 72–76.

Le, M. S., & Duong, L. T. T. (2022). Identifying risks to electronic customer identification (eKYC) activities in banking activities. *Banking Review.*

Le, T. T., Nguyen, T. T., Tran, D. T. H., Do, L. H. G., Nguyen, M. K., An, Q. T., & Chu, H. M. (2023). The impact of online identity theft on the intention to use e-banking services in Vietnam in an uncertain context. *Journal of Economics and Development, 313,* 70–79. https://js.ktpt.edu.vn/index.php/jed/article/view/1209

Mai, T. D., Do, K. V., & Nguyen, G. B. (2023). Financial technology in commercial banks: Situation and solutions. *International Research Journal of Economics and Management Studies, 2*(3), 430–438.

Muslim, N. A. (2021). Examining factors influencing consumers' intention and usage of digital banking: Evidence from Indonesian digital banking customers. *Asia Pacific Management and Business Application, 9*(3), 193–210. https://doi.org/10.21776/ub.apmba.2021.009.03.1

Nayanajith, G., & Damunupola, K. A. (2019). Effects of subjective norms and security on online banking adoption: Multilevel linear model analysis. *Asian Journal of Multidisciplinary Studies, 2*(1), 9–16. https://asianjournals.org/online/index.php/ajms/article/view/175

Ngo, M. T. (2022). The influence of personal characteristics on customers' perception of e-banking service quality and cost effectiveness in Vietnam. *Open Journal of Social Sciences, 10*(11), 377–391. http://dx.doi.org/10.4236/jss.2022.101029

Nguyen, D. V. (2021). Experience in eKYC application and lessons for Vietnam. *Financial and Monetary Market Review, 1–2*(562–563), 64–69.

Nguyen, T. O. (2020). Factors affecting the intention to use digital banking in Vietnam. *Journal of Asian Finance, Economics and Business, 7*(3), 303–310. https://koreascience.kr/article/JAKO202014862061657.pdf

Nguyen, V. (2024, March 12). The time of digital banking transformation. *Banking Times.*

Nguyen, V. T., Pham, N. T. H., & Vu, P. K. A. (2023). Completing the law on electronic customer identification in Vietnam: Experience from several countries. *Journal of Democracy and Law, 1*(376), 15–22.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12-40.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research, 7*(3), 213-233. https://doi.org/10.1177/1094670504271156

Paul, S., Bruntha, P. M., Raj, A., Saurabh, S., & Masih, S. (2021). Anti-spoofing face-recognition technique for eKYC application. In *2021 3rd International Conference on Signal Processing and Communication (ICPSC)* (pp. 321–324). IEEE. DOI:10.1109/ICSPC51351.2021.9451703

Perlman, L., & Gurung, N. (2019). *Focus note: The use of eKYC for customer identity and verification and AML*. Columbia Business School – Institute for Tele-Information. SSRN. https://ssrn.com/abstract=3370665

Pham, T. H., Ngo, T. N. H., Tran, T. T., & Dang, M. H. (2023). Factors affecting the intentions to use e-KYC at commercial banks in Bac Ninh province. *Banking Review, 7,* 19–29.

Phan, T. H. Y., & Nguyen, T. H. (2022). Study on the customers' satisfaction in using digital banking services in Vietnam. *Money and Financial Markets, 9,* 41–52.

State Bank of Vietnam. (2020). *Circular No. 16/2020/TT-NHNN dated December 4, 2020 on instructions for opening and using payment accounts at payment service providers.*

Tahe, F., & Siregar, M. U. (2021). Perbandingan faktor-faktor yang mempengaruhi penggunaan electronic-know your customer (e-KYC). *JISKA (Jurnal Informatika Sunan Kalijaga), 6*(3), 189–200. https://doi.org/10.14421/jiska.2021.6.3.189-200.

Takaragi, K., Kubota, T., Wohlgemuth, S., Umezawa, K., & Koyanagi, H. (2022). Secure revocation features in eKYC-privacy protection in central bank digital currency. *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences, 106*(3), 325–332. http://dx.doi.org/10.1587/transfun.2022CIP0008

To, T. D. L. (2022). Experience in the digital banking development in some Asian countries and lessons learned for Vietnam. *Banking Review, 6,* 11–19.

Tran, P. H. C. (2021). The current electronic know your customer (eKYC) implementation of Vietnamese commercial banks. *Industry and Trade, 21*(9), 55–60.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157-178. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2002388

Vu, D. V., Le, L. T. T., Nguyen, T. Q., & Nguyen, C. (2021). Factors affecting individual customer satisfaction with the service quality of Vietnamese banks. *International Journal of Management Concepts and Philosophy, 14*(3), 193–213. https://doi.org/10.1504/IJMCP.2021.118973