THE STRATEGY OF VIRTUAL BANKING ADOPTION IN THE DIGITAL ECONOMY

Ruangchan Thetlek *, Tanpat Kraiwanit **, Pongsakorn Limna *, Yarnaphat Shaengchart *, Papon Moolngearn *

* Faculty of Economics, Rangsit University, Pathum Thani, Thailand
** *Corresponding author*, Faculty of Economics, Rangsit University, Pathum Thani, Thailand
Contact details: Faculty of Economics, Rangsit University, 52/347 Phahon Yothin Road, Muang Eke, Pathum Thani 12000, Thailand

OPEN ACCESS

How to cite this paper: Thetlek, R., Kraiwanit, T., Limna, P., Shaengchart, Y., & Moolngearn, P. (2024). The strategy of virtual banking adoption in the digital economy [Special issue]. *Corporate & Business Strategy Review, 5*(1), 264–272. https://doi.org/10.22495/cbsrv5i1siart1

ISSN Online: 2708-4965
ISSN Print: 2708-9924

Received: 21.02.2023
Accepted: 14.02.2024

JEL Classification: E42, G21, L86, O30, O33
DOI: 10.22495/cbsrv5i1siart1

Abstract

Most traditional banks offer digital services, promoting cashless payments. Digital-only banks, operating solely through mobile apps, are a growing trend. These virtual banks have no physical branches and reshape individuals' financial habits (Windasari et al., 2022). This study aims to explore virtual banking adoption in Thailand, using a qualitative approach. In-depth interviews with ten informants were conducted through purposive sampling. Data analysis involved content analysis and NVivo. The findings reveal Thailand as a recent adopter of virtual banks, driven by technology firms meeting regional demand. Virtual banks aim to enhance financial inclusion through improved accessibility and cutting-edge online experiences, emphasising simplicity, personalization, and client focus. However, technological advancements may deepen financial exclusion for those unable to access or utilise technology, creating unbanked or underbanked segments. To address this, banks must prioritise user-friendly digital platforms; ensuring customers can access services anytime, anywhere, like branchless banking. In regard to further research, it is recommended that researchers study ethical and policy issues related to virtual banking. In addition, quantitative research, such as an online questionnaire, should be considered to explain the relationship phenomenon in a large group in general.

Keywords: Virtual Banking, Financial, Technology

Authors' individual contribution: Conceptualization — R.T., T.K., and P.L.; Methodology — R.T., T.K., and P.L.; Software — R.T., T.K., and P.L.; Validation — R.T., T.K., P.L., Y.S., and P.M.; Investigation — R.T., T.K., and P.L.; Resources — R.T., T.K., P.L., Y.S., and P.M.; Writing — Original Draft — R.T., T.K., P.L., Y.S., and P.M.; Writing — Review & Editing — R.T., T.K., P.L., Y.S., and P.M.; Supervision — T.K.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

The transformation of our lifestyles has been greatly influenced by economic progress, leading to social, cultural, and technological advancements (Kraiwanit et al., 2019). Technology now plays a crucial role in our daily lives, particularly in the banking industry. Banks, as major financial institutions, continuously seek innovative ways to enhance customer experience and convenience through technology (Hew, 2022; Limna, Kraiwanit, & Siripipattanakul 2023). Despite the ongoing pandemic, a significant portion of the population is transitioning to digital channels for contactless banking services (Bhambra, 2022). This integration of technology, finance, and services is rapidly reshaping the banking landscape in Asia. Various players, including large tech and fintech firms, non-bank financial institutions, and incumbent banks, are acquiring stakes in banks. Many newcomers leverage social media platforms and advanced data analytics, creating opportunities for financial inclusion while also raising regulatory and competitive concerns. One key reason why borrowing through the banking system lags behind the global increase in bank accounts is the requirement for collateral in conventional business loan models across different economies. However, new technology-driven business models utilise individuals' and firms' extensive data footprints to generate information capital and reduce reliance on collateral when providing financial services (Chen et al., 2022). Data and data management entities play a central role in this transformation within the regulated banking system. Furthermore, advancements in the financial and banking sectors have influenced people's behaviour and preferences in how they conduct and receive financial services. The emergence of financial technology has led to the adoption of virtual banking models in countries like China, Taiwan, and Korea (Hew, 2022). Virtual banking represents the digitization of all traditional banking operations and services previously conducted at physical bank branches. This new model relies heavily on technology for every banking activity, process, and stage involved in providing products and services (Salahudin & Joo, 2022).

As reported by Banchongduang and Toomgum (2023), the central bank has set expectations for banks to offer a wide range of services that cater to the unique needs of retail borrowers and small and medium-sized enterprises (SMEs), including those in underserved segments. Virtual banks in China utilise alternative data and artificial intelligence in their lending processes, enabling them to extend microcredit to a significant number of low-income earners and previously overlooked SMEs who were denied loans by traditional banks. The Bank of Thailand foresees positive customer experiences for virtual bank users. In South Africa, certain virtual banks allow individuals to open accounts within five minutes using fingerprint-scanning technology. The regulatory body hopes that licensing virtual banks will foster competition in the financial sector and lead to the development of innovative services and products. To stay competitive with virtual banks, some commercial banks in Hong Kong have eliminated specific fees. However, the central bank emphasises the importance of responsible lending practices by virtual banks, cautioning against granting loans to borrowers who are already heavily in debt. Additionally, virtual banks must avoid favouring related parties or abusing their dominant market position (Banchongduang et al., 2023). Given the significance of virtual banking, the adoption of virtual banking is a critical topic to examine. Several studies on virtual banking have been conducted in various countries. For instance, Tham et al. (2017) investigated customers' perceptions of trusting the internet and data security in adopting virtual banking in Malaysia. Fathima (2020) explored the challenges of virtual banking services in its challenge management strategies in India. Law (2021) studied financial inclusion and virtual banking in the era of digitalisation in Hong Kong. Still, there have been few studies on the adoption of virtual banking in Thailand. Therefore, this paper aims to explain the adoption of virtual banking in Thailand. The findings will be useful for the banking sector in assessing the impact of information technology and developing appropriate strategies for increasing customer satisfaction, which may lead to loyalty, thereby enabling them to retain customers.

The structure of this paper is as follows. Section 1, the introduction, serves as the study's starting point. Section 2 contains a review of the literature. Section 3 describes the research methodology. Section 4 presents the study's findings. Section 5 discussed the findings of the study. Finally, Section 6 presents the study's conclusions, limitations, and recommendations.

2. LITERATURE REVIEW

The finance industry has been among the early adopters of and users of Internet and mobile technology in consumer markets, and as a result, its service delivery has changed at an unprecedented rate in its history. Financial institutions have also extended a plethora of innovative services to customers, with digital payment solutions at the top of the list, by leveraging information and communication technologies (Alzuod & Alqhaiwi, 2022; Kajol et al., 2022; Pula, 2022; Khatwani et al., 2023). In the digital economy, most traditional banks offer digital services, and the government encourages people to use cashless payments in their daily lives, particularly during the pandemic, when the demand for avoiding physical encounters is increasing. There is a growing trend in the development of digital-only banks, which are fully virtual banks with no individual physical branches and conduct all banking activities through mobile applications. Fully virtual operations alter how people interact with services and, as a result, their consumption and financial habits (Almunawar et al., 2022; Windasari et al., 2022).

The establishment of an inclusive financial sector brings forth two interconnected contributions. Firstly, it allows for the connection of individuals who were previously excluded from the market, enabling them to participate in economic development through financial inclusion. Secondly, as economic growth takes place, new individuals are attracted to the economy and the financial system, further strengthening its overall growth trajectory. The advancements in inclusive finance have the potential to alleviate poverty by providing funding for growth-oriented elements. These elements include increasing access to savings mobilisation and entrepreneurial opportunities, reducing individuals' vulnerability to risks, and improving their overall standard of living. Through financial inclusion, marginalised individuals gain access to essential financial services, which can have a transformative effect on their lives and contribute to broader socio-economic development (Asif et al., 2023; Chowdhury & Chowdhury, 2023). The pursuit of expanding access to financial services has led to the emergence of new types of banks, such as small banks, mobile money services, and payment banks. These innovative financial institutions cater specifically to individuals who do not possess traditional bank accounts, bridging the gap and addressing the needs of the unbanked population. Moreover, financial inclusion has extended beyond traditional banking institutions to encompass nonbank fintech businesses, which are actively competing for a more significant share in the banking value chain (Mpofu, 2022; Omarini, 2023; Shaikh et al., 2023).

The terms "online banking", "mobile banking", and "virtual banking" have been used interchangeably, but there are some distinctions between them (Hew, 2022). Online banking involves the use of a bank's website to access banking services and features. Similarly, mobile banking refers to banking services that are delivered via mobile devices. Online banking and mobile banking are simply extensions of the traditional banking platform. Virtual banking is a hybrid of online and mobile banking (Napoletano & Foreman, 2021). In addition, virtual banking is a modern banking model that digitises all bank operations and activities, whereas online and mobile banking are subsets of virtual banking. It replaces the physical presence of the bank with an everlasting online presence, eliminating the need for the customer to visit a branch (Hew, 2022). Virtual banks can serve all customer segments, with a particular emphasis on underserved and unserved segments, retail borrowers, and SMEs. When lending to the unserved and underserved segments, virtual banks can use alternative data and technology to assess their risks (Banchongduang & Toomgum, 2023).

According to Chen et al. (2022) and Murinde et al. (2022), the banking landscape is rapidly changing because big techs, fintech firms, non-bank financial institutions, and incumbent banks are all investing in virtual banking. New technology-driven models are capitalising on individuals' and firms' expanding data footprints to generate information capital and reduce the reliance on collateral when providing loans and other financial services. Data and entities that manage data are central to this transformation. Thus, financial regulators must ensure that regulatory oversight delivers on the inclusion and intermediation-enhancing benefits of digital finance without jeopardising traditional regulatory goals. Simultaneously, there is an urgent need for a data governance system that allows consumers and businesses to exercise control over their data by granting and withdrawing consent for the use and transfer of their data.

According to Hew (2022), there is currently a lack of understanding regarding the behavioural intentions of Malaysian Gen Z individuals towards virtual banking, despite them being a significant customer segment targeted by virtual banking services. This research aims to identify the factors that influence Gen Z's behavioural intention to use virtual banking. Building upon the unified theory of acceptance and use of technology 2 (UTAUT2), the study examines the positive and significant relationships between factors such as effort expectancy, performance expectancy, social influence, facilitating conditions, hedonic motivation, trust, and behavioural intention, with the exception of hedonic motivation. Ni (2020) also explores the relationship between core constructs, including trialability, compatibility, observability, perceived usefulness, perceived ease of use, and consumer intent to adopt digital banking services. Perceived ease of use, compatibility, and observability are vital explanatory variables that influence behavioural intentions towards digital banking services. Furthermore, Akbari et al. (2022) identify the factors influencing security and privacy in the development of virtual banking in Iran. They emphasise the importance of a comprehensive plan and attention to future needs to ensure the effectiveness of security and privacy measures, which in turn leads to customer satisfaction. Thus, it is necessary to develop general policies for future banking system reform. Experts also highlight customer satisfaction with the quality of banking services, trust, and ease of use as strengths of virtual banking that can attract more customers and improve competitiveness in the industry. In today's modern world, customers' reliance on e-services is inevitable, and bank e-services have become one of the fastest and most trustworthy methods of conducting financial transactions online, with trust being a key requirement for these services.

By embracing financial inclusion and fostering the growth of diverse financial service providers, economies can unlock new opportunities, drive inclusive growth, and empower individuals who were previously excluded from the financial system. However, it is essential to maintain a balance between innovation and regulation to ensure consumer protection, privacy, and stability in the evolving financial landscape. Continued efforts to promote financial inclusion, explore innovative approaches, and adapt to the changing needs of individuals and businesses are crucial for achieving sustainable and inclusive economic development. Through these endeavours, societies can reap the benefits of an inclusive financial sector, which serves as a catalyst for social progress and economic advancement (Asif et al., 2023; Ediagbonya & Tioluwani, 2023).

3. RESEARCH METHODOLOGY

This study employed a qualitative approach as a research strategy, including carrying out in-depth interviews. Qualitative research aims to explain why a specific phenomenon has occurred by elucidating the contexts in which individuals or groups make decisions and behave in specific ways. Additionally, communication in both directions facilitates the collection of additional data throughout the interview (Siripipatthanakul et al., 2022). In-depth interviews provide detailed answers on a specific topic, resulting in accurate information that can be utilised to meet the research objectives (Salmons, 2014). The study employed an interview protocol that targeted experts, workers, and customers of virtual banks to gather valuable insights. The protocol consisted of a comprehensive set of in-depth questions, enabling participants to provide detailed and nuanced feedback on the relevant topics. The interviews were conducted either in-person or remotely based on the participants' preferences, and audio recordings were made for subsequent analysis.

To obtain the primary data results, the researchers employed the documentary method, which involved reviewing secondary data from previous research to identify relevant key survey questions. Additionally, the interview questions were meticulously designed to elicit comprehensive and insightful perspectives. The interview questions were as follows:

1) How do you perceive the potential of virtual banks in enhancing financial inclusion and improving your experiences?

2) What are your thoughts on the risks associated with virtual banking that could potentially widen existing gaps of exclusion?

3) How do you view Thailand's adoption of virtual banking in line with other countries' trends in the financial services sector?

4) How do you think technology companies like Ant Group and Grab Holdings are impacting the demand for financial services in the region?

5) In what ways do you believe virtual banks can increase accessibility and offer more personalised and customer-centric experiences?

6) How has technology, particularly the Internet and mobile phones, transformed the way people approach banking and its significance in their lives?

7) What are your thoughts on the transition towards a cashless society and its implications for digital financial services adoption?

8) How do you perceive the competition between virtual banks and online platforms like Grab that already provide financial services to their users?

9) What are the potential challenges of technological advancements in terms of financial inclusion, particularly for those who lack access to or familiarity with technology?

A pilot test was conducted to ensure the clarity and effectiveness of the questions. Before commencing the interviews, informed consent was obtained from all participants, and the interviews were carried out in comfortable settings, taking into account the preferences of each participant. Detailed notes or recordings were taken with their consent, and later, the recorded interviews were transcribed for analysis, following the recommendation by Limna, Kraiwanit, Jangjarat, et al. (2023).

Purposive sampling, a technique commonly employed in qualitative research in which researchers apply their expertise to select the most useful sample, was used as a sampling method. The goal is to comprehend everything there is to know about a particular phenomenon or population (Siripipatthanakul et al., 2022). In their recent qualitative study, Jangjarat et al. (2023) suggested that conducting a minimum of six interviews is generally advisable to achieve data saturation in qualitative research. The respondents in this study were 10 experts, workers, and customers of virtual banks who were over the age of 18 and were all Thai residents living in Thailand. The study required participants with up-to-date knowledge and recent experience in utilising virtual banking services. The selection criteria ensured that the participants had direct exposure to the functionalities and features of virtual banks, enabling them to provide relevant and informed insights. Content analysis is a qualitative method for systematically and objectively describing and quantifying specific phenomena through the use of valid inferences derived from verbal, visual, or written data (Viphanphong et al., 2023). Moreover, Mortelmans (2019) and Limna (2023) assert that NVivo is an excellent tool for broadening and deepening one's analysis. Therefore, content analysis and NVivo software were used to analyse the qualitative data collected through the in-depth interviews.

4. RESULTS

The participants expressed that virtual banks have the ability to enhance financial inclusion and provide better customer experiences. Nonetheless, it is essential to remain cautious about the potential risks that could further widen existing gaps of exclusion.

In the process of examining the establishment of virtual banks as new financial service providers, the Bank of Thailand has released a consultation paper outlining the licensing framework for virtual banks. Thailand joins other countries in embracing the concept of virtual banking, with technology companies like Ant Group and Grab Holdings expanding their financial services to meet the growing regional demand. The promises offered by virtual banks aim to enhance financial inclusion by providing increased accessibility and advanced online customer experiences that are simpler, more personalised, and customer-centric. The advent of technology, particularly the Internet and mobile phones, has significantly transformed various aspects of people's lives, including banking and its significance. Additionally, the transition towards a cashless society, where having a bank account and the ability to comprehend and utilise technology is crucial, will accelerate the adoption of digital financial services. These services are essential for businesses and individuals to leverage the opportunities presented by the Internet. For instance, platforms like Grab, which already provide certain financial services to their customers and drivers, are expected to compete with virtual banks. While technological advancements can enhance financial inclusion for some, they may also inadvertently create or perpetuate segments of the population that are unbanked or underbanked. This occurs as individuals who lack access to or familiarity with technology become increasingly disconnected from the financial system.

"The issuance of a consultation paper for the virtual bank licensing framework by the Bank of Thailand signifies their hearings into the establishment of virtual banks as new financial service providers" (Participant 1, personal communication, January 6, 2023).

"Thailand has joined the global trend of embracing virtual lenders, following the expansion of technology companies like Ant Group and Grab Holdings, who are meeting the increasing regional demand for financial services" (Participant 2, personal communication, January 6, 2023).

"The promises made by virtual banks imply the goal of increasing financial inclusion through increased accessibility and cutting-edge online customer experiences" (Participant 3, personal communication, January 6, 2023).

"Technology, particularly the Internet and mobile phones, has changed every aspect of people's lives, including how they bank and the importance of banking" (Participant 4, personal communication, January 7, 2023).

"A transformation into a cashless society, which necessitates access to a bank account and the ability to use technology, will hasten the adoption of digital financial services" (Participant 5, personal communication, January 7, 2023).

"Online platforms such as Grab are expected to compete with virtual banks as they already provide financial services to their customers and drivers" (Participant 6, personal communication, January 6, 2023).

"Technological advancements may help some people become more financially included, but they may also create new unbanked or underbanked segments among those who are unable to access or use the technology, further excluding them from the financial system" (Participant 7, personal communication, January 8, 2023).

"Virtual banks seem to offer several advantages. They have the potential to enhance financial inclusion, making banking services more accessible and convenient for a wider range of people. Moreover, the improved customer experiences they promise can make managing finances easier and more personalized" (Participant 8, personal communication, January 8, 2023).

"While virtual banks offer many benefits, we must be aware of the risks. One concern is that if not properly regulated, virtual banks could further widen existing gaps of exclusion. Those who are unfamiliar with technology or lack access to it may find it even more challenging to access financial services. Regulations and oversight are essential to ensure that virtual banks operate responsibly and don't inadvertently create new forms of exclusion" (Participant 9, personal communication, January 9, 2023).

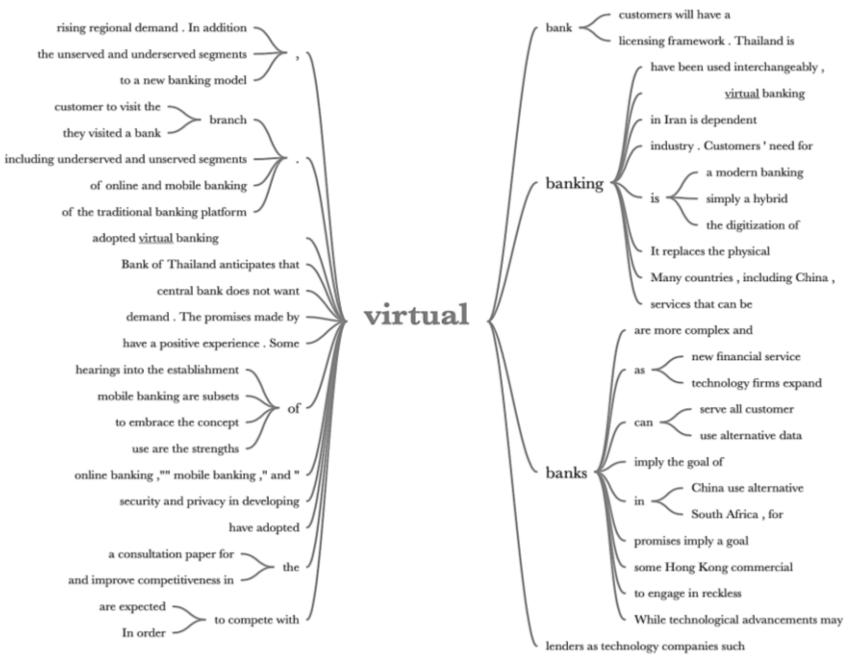
"It is clear that virtual banks have the potential to enhance financial inclusion but must be carefully regulated to avoid creating new forms of exclusion. The transition to a cashless society is on the horizon, and it is our responsibility to ensure that this shift is as inclusive as possible" (Participant 10, personal communication, January 9, 2023).

The interpretation and analysis were based on NVivo. Figures 1–5 depict the word frequency query (word cloud) and text searches (word trees).

Figure 1. Word cloud

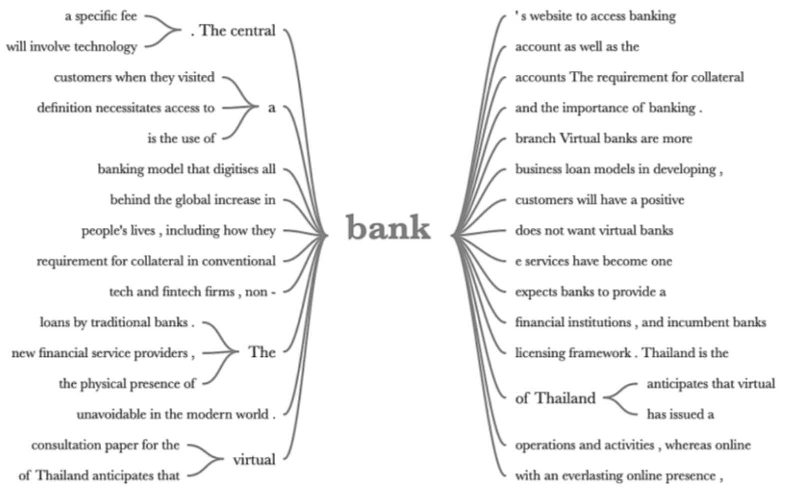
Source: Authors' elaboration.

Figure 2. Word tree (virtual banking)



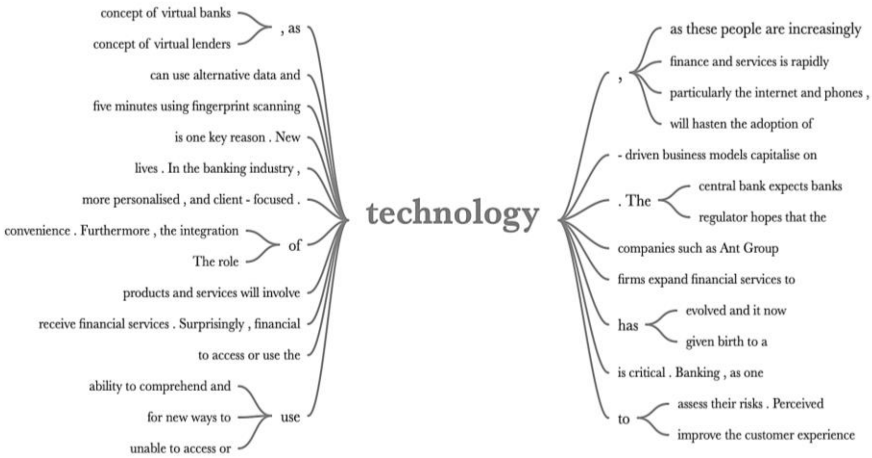
Source: Authors' elaboration.

Figure 3. Word tree (bank)



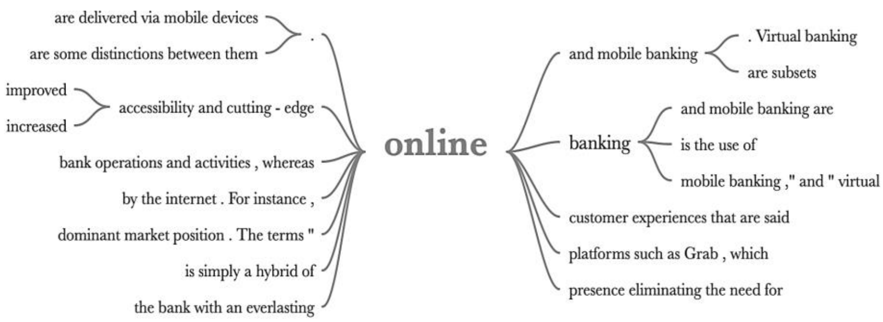
Source: Authors' elaboration.

Figure 4. Word tree (technology)



Source: Authors' elaboration.

Figure 5. Word tree (online)



Source: Authors' elaboration.

5. DISCUSSION

This study explained the adoption of virtual banking in Thailand. The findings indicated that the establishment of virtual banks as new financial service providers in Thailand as highlighted by the Bank of Thailand's consultation paper reflects the growing trend worldwide. Countries are embracing virtual lenders to cater to the rising demand for digital financial services and leverage technology companies' expertise in this field.

The promises made by virtual banks revolve around two key aspects: increasing financial inclusion and providing cutting-edge online customer experiences. By leveraging technology, virtual banks aim to enhance accessibility, simplify processes, personalise services, and prioritise client needs. This approach aligns with the changing landscape of banking, where technology, particularly the Internet and mobile phones, has significantly impacted people's lives and their banking habits.

The transition towards a cashless society, which requires access to a bank account and technological literacy, further drives the adoption of digital financial services. This shift opens up opportunities for businesses and individuals to leverage the benefits offered by the Internet. For example, technology-driven platforms like Grab, which already provide financial services to their customers and drivers, are expected to compete with virtual banks.

While technological advancements and the expansion of virtual banks can contribute to financial inclusion by providing greater access to financial services, there are concerns about potential exclusion. Some individuals may struggle to access or effectively use technology, leading to the creation of unbanked or underbanked segments. This digital divide can further marginalise certain groups, cutting them off from the financial system and its benefits. To ensure that the establishment of virtual banks aligns with the goal of increasing financial inclusion, it is crucial to address the challenges associated with technology access and literacy. This may involve initiatives to bridge the digital divide, provide education and support for technology adoption, and ensure that traditional banking services remain accessible for those who are unable or prefer not to engage with virtual banks.

The results supported the previous research by Ladkoom and Thanasopon (2020), which indicated that Thai e-commerce has grown rapidly in recent years. Increased Internet and mobile phone use, as well as improved e-payment and logistics, are driving factors for the rapid growth. The Thai government has launched a national e-payment initiative called "PromptPay" with the goal of reducing cash use and catalysing e-payment adoption in Thailand. Moreover, according to Chaiyasoonthorn and Suksa-Ngiam (2019), the adoption and spread of e-payments can improve the economy's effectiveness and efficiency. Governments are trying to persuade their citizens to use e-payment systems so that they can save money on printing paper money. They can also compel businesses to pay taxes by employing e-payment systems as monitoring tools. People can also benefit from the use of e-payment systems when purchasing products or services over the Internet or other electronic systems without having to physically send money. Furthermore, because e-commerce is part of the global digital economy, e-payments allow businesses to connect with customers all over the world. Navavongsathian et al. (2020) concluded that customers' acceptance of mobile banking services in Thailand was influenced by service quality, perceived usefulness, perceived ease of use, safety in use, and social factors. Kasemharuethaisuk and Samanchuen (2023) revealed that individual investors' intention to use digital investment services is significantly influenced by their perception of the usefulness of these services. Other variables such as convenience, trust, and subjective norm also influence this intention, but not perceived ease of use. This could be due to the fact that the majority of this study's participants are technologically savvy.

To summarise, the establishment of virtual banks in Thailand aligns with the worldwide trend of leveraging technology to enhance financial services. Virtual banks have the potential to promote financial inclusion and offer improved customer experiences. However, it is crucial to be mindful of the potential risks of exacerbating exclusionary gaps. Striking a balance between technological advancements and initiatives to bridge the digital divide is essential for fully realising the benefits of digital financial services in Thailand and other countries embracing virtual banking.

6. CONCLUSION

Technology, particularly the Internet and mobile phones, has revolutionised various aspects of people's lives, including banking practices and their significance. The transition towards a cashless society, driven by the need for access to bank accounts and technological proficiency, further accelerates the adoption of digital financial services. To capitalise on the opportunities offered by the Internet, businesses and individuals must embrace digital platforms, with online platforms like Grab expected to compete with virtual banks in offering financial services. However, while technological advancements have the potential to enhance financial inclusion for many, it is essential to address the risks of deepening disparities. Those who lack access to technology or face challenges in utilising it may become further marginalised from the financial system. It is crucial to prioritise efforts to improve digital literacy and provide alternative access channels to ensure that the benefits of digital financial services reach all segments of society. Establishing comprehensive regulatory frameworks is also crucial to safeguard consumer rights, mitigate cyber threats, and foster fair competition between virtual banks and traditional financial institutions. The Bank of Thailand's consultation paper demonstrates a commitment to creating a secure and inclusive virtual banking ecosystem through public input and effective regulations. Overall, Thailand's embrace of virtual banks signifies a shift towards technology-driven financial services. By focusing on digital literacy, alternative access channels, and robust regulations, Thailand can harness the potential of virtual banking while ensuring that financial inclusion is extended to all members of society.

In terms of policy recommendations, banks should provide their customers with ease of use through digital platforms, allowing them to access services anywhere, at any time. In regard to further research, it is recommended that researchers study ethical and policy issues related to virtual banking. This could include examining issues such as data privacy, security, and consumer protection in the context of virtual banks.

Limitations of this study include the small sample size of only ten key informants, which may limit the generalizability of the findings. Future research should consider broadening the geographic scope to include a wider range of countries and regions, employing larger sample sizes. Moreover, this study did not specify the demographic characteristics of the informants, which may limit the representation of different segments of the population and their unique experiences with virtual banking. In future studies on virtual banking adoption in Thailand, it is important to consider the demographic characteristics of the informants to ensure a more comprehensive understanding of the experiences and perspectives of different segments of the population. By including a diverse range of participants in terms of age, gender, income level, education, and geographical location, researchers can capture a broader spectrum of insights and identify any variations in virtual banking adoption patterns and challenges across various demographic groups. This will help to ensure that the findings are more representative and applicable to the overall population, enhancing the validity and generalizability of the research outcomes. While qualitative research provides valuable insights and in-depth understanding, it may limit the generalizability of the findings. Quantitative research methods could complement the study by providing a broader understanding of virtual banking adoption trends. Conducting large-scale surveys or quantitative studies can provide a broader understanding of virtual banking adoption and its impact on financial inclusion. This approach would allow for statistical analysis and the identification of key factors influencing adoption rates and customer satisfaction.

REFERENCES

1. Akbari, M., Vashan, M. M., & Hakimpour, H. (2022). Factors underpinning security and privacy in the development of virtual banking in Iran. *International Journal of Digital Content Management, 4*(6), 217–285. https://doi.org/10.22054/dcm.2022.69017.1129
2. Almunawar, M. N., Islam, M. Z., & Ordóñez de Pablos, P. (Eds.). (2022). *Digital transformation management: Challenges and futures in the Asian digital economy* (1st ed.). Routledge. https://doi.org/10.4324/9781003224532
3. Alzuod, M. A., & Alqhaiwi, L. A. (2022). The role of strategic flexibility in enhancing crisis management in the commercial banking sector during the COVID-19 pandemic. *Corporate Governance and Organisational Behavior Review, 6*(2), 104–112. https://doi.org/10.22495/cgobrv6i2p10
4. Asif, M., Khan, M. N., Tiwari, S., Wani, S. K., & Alam, F. (2023). The impact of fintech and digital financial services on financial inclusion in India. *Journal of Risk and Financial Management, 16*(2), Article 122. https://doi.org/10.3390/jrfm16020122
5. Banchongduang, S., & Toomgum, S. (2023, January 18). *Determining the future of virtual banking.* Bangkok Post. https://www.bangkokpost.com/business/2485207/
6. Banchongduang, S., Toomgum, S., Tortermvasana, K., & Leesa-Nguansuk, S. (2023, January 23). *Banking on virtual success.* Bangkok Post. https://www.bangkokpost.com/business/2489077/banking-on-virtual-success
7. Bhambra, R. K. (2022). Adoption of online banking in Goa amidst the pandemic. *International Journal of Electronic Banking, 3*(2), 163–175. https://doi.org/10.1504/IJEBANK.2022.122232
8. Chaiyasoonthorn, W., & Suksa-Ngiam, W. (2019). The diffusion and adoption of electronic payment systems in bangkok. *International Journal of E-Business Research, 15*(2), 102–115. https://doi.org/10.4018/IJEBR.2019040106
9. Chen, S., D'Silva, D., Packer, F., & Tiwari, S. (2022). *Virtual banking and beyond* (BIS Papers No. 120). BIS. https://www.bis.org/publ/bppdf/bispap120.htm
10. Chowdhury, E. K., & Chowdhury, R. (2023). Role of financial inclusion in human development: Evidence from Bangladesh, India and Pakistan. *Journal of the Knowledge Economy, 2023,* 1–26. https://doi.org/10.1007/s13132-023-01366-x
11. Ediagbonya, V., & Tioluwani, C. (2023). The role of fintech in driving financial inclusion in developing and emerging markets: Issues, challenges and prospects. *Technological Sustainability, 2*(1), 100–119. https://doi.org/10.1108/TECHS-10-2021-0017
12. Fathima, J. S. (2020). Challenge management of banking services — With special reference to virtual banking service challenges. *Shanlax International Journal of Management, 7*(3), 57–66. https://doi.org/10.34293/management.v7i3.1620
13. Hew, J. H. (2022). *Factors affecting generation Z's intention to use virtual banking in Malaysia: A study in the post COVID-19 pandemic* [Doctoral thesis, Universiti Tunku Abdul Rahman]. Universiti Tunku Abdul Rahman. http://eprints.utar.edu.my/4858/
14. Jangjarat, K., Kraiwanit, T., Limna, P., & Sonsuphap, R. (2023). Public perceptions towards ChatGPT as the robo-assistant. *Online Journal of Communication and Media Technologies, 13*(3), Article e202337. https://doi.org/10.30935/ojcmt/13366
15. Kajol, K., Singh, R., & Paul, J. (2022). Adoption of digital financial transactions: A review of literature and future research agenda. *Technological Forecasting and Social Change, 184*, Article 121991. https://doi.org/10.1016/j.techfore.2022.121991
16. Kasemharuethaisuk, H., & Samanchuen, T. (2023). Factors influencing behavior intention in digital investment services of mutual fund distributors adoption in Thailand. *Sustainability, 15*(3), Article 2279. https://doi.org/10.3390/su15032279
17. Khatwani, R., Mishra, M., Bedarkar, M., Nair, K., & Mistry, J. (2023). Impact of blockchain on financial technology innovation in the banking, financial services and insurance (BFSI) sector. *Journal of Statistics Applications & Probability, 12*(1), 181–189. https://doi.org/10.18576/jsap/120117
18. Kraiwanit, T., Panpon, P., & Thimthong, S. (2019). Cashless society in Thailand. *Review of Integrative Business and Economics Research, 8*(s4), 44–56. https://ssrn.com/abstract=3398225
19. Ladkoom, K., & Thanasopon, B. (2020). Factors influencing reuse intention of e-payment in Thailand: A case study of PromptPay. In *22nd International Conference on Enterprise Information Systems proceedings* (pp. 743–750). SciTePres. https://doi.org/10.5220/0009410407430750
20. Law, S.-W. (2021). Financial inclusion and virtual bank in the era of digitalisation: A regulatory case study in Hong Kong. *SocioEconomic Challenges, 5*(3), 81–91. https://doi.org/10.21272/sec.5(3).81-91.2021
21. Limna, P. (2023). The impact of NVivo in qualitative research: Perspectives from graduate students. *Journal of Applied Learning and Teaching, 6*(2), 1–12. https://doi.org/10.37074/jalt.2023.6.2.17
22. Limna, P., Kraiwanit, T., & Siripipattanakul, S. (2023). The relationship between cyber security knowledge, awareness and behavioural choice protection among mobile banking users in Thailand. *International Journal of Computing Sciences Research, 7*, 1133–1151. https://doi.org/10.25147/ijcsr.2017.001.1.123

23. Limna, P., Kraiwanit, T., Jangjarat, K., Klayklung, P., & Chocksathaporn, P. (2023). The use of ChatGPT in the digital era: Perspectives on chatbot implementation. *Journal of Applied Learning and Teaching, 6*(1), 64–74. https://doi.org/10.37074/jalt.2023.6.1.32
24. Mortelmans, D. (2019). Analyzing qualitative data using NVivo. In H. Van den Bulck, M. Puppis, K. Donders, & L. Van Audenhove (Eds.), *The Palgrave handbook of methods for media policy research* (pp. 435–450). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-16065-4_25
25. Mpofu, F. Y. (2022). Industry 4.0 in financial services: Mobile money taxes, revenue mobilisation, financial inclusion, and the realisation of sustainable development goals (SDGs) in Africa. *Sustainability, 14*(14), Article 8667. https://doi.org/10.3390/su14148667
26. Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis, 81*, Article 102103. https://doi.org/10.1016/j.irfa.2022.102103
27. Napoletano, E. & Foreman, D. (2021, February 24). *What is digital banking?* Forbes Advisor. https://www.forbes.com/advisor/banking/what-is-digital-banking/
28. Navavongsathian, A., Vongchavalitkul, B., & Limsarun, T. (2020). Causal factors affecting mobile banking services acceptance by customers in Thailand. *The Journal of Asian Finance, Economics and Business, 7*(11), 421–428. https://doi.org/10.13106/jafeb.2020.vol7.no11.421
29. Ni, T. W. (2020). Factors influencing behavioural intention towards adoption of digital banking services in Malaysia. *International Journal of Asian Social Science, 10*(8), 450–457. https://doi.org/10.18488/journal.1.2020.108.450.457
30. Omarini, A. (2023). Shifting paradigms in banking: How new service concepts and formats enhance the value of financial services. In T. Walker, E. Nikbakht, & M. Kooli (Eds.), *The fintech disruption: How financial innovation is transforming the banking industry* (pp. 75–113). Palgrave Macmillan. https://doi.org/10.1007/978-3-031-23069-1_4
31. Pula, F. (2022). Co-creating value and its impact on customer satisfaction and customer loyalty: A banking sector perspective. *Journal of Governance & Regulation, 11*(4), 179–190. https://doi.org/10.22495/jgrv11i4art17
32. Salahudin, S. N., & Joo, C. F. (2022). The future of virtual banking in Malaysia. *Research in Management of Technology and Business, 3*(2), 1–13. https://penerbit.uthm.edu.my/periodicals/index.php/rmtb/article/view/9131
33. Salmons, J. (2014). *Qualitative online interviews: Strategies, design, and skills.* Sage Publications. https://doi.org/10.4135/9781071878880
34. Shaikh, A. A., Alamoudi, H., Alharthi, M., & Glavee-Geo, R. (2023). Advances in mobile financial services: A review of the literature and future research directions. *International Journal of Bank Marketing, 41*(1), 1–33. https://doi.org/10.1108/IJBM-06-2021-0230
35. Siripipatthanakul, S., Jaipong, P., Limna, P., Sitthipon, T., Kaewpuang, P., & Sriboonruang, P. (2022). The impact of talent management on employee satisfaction and business performance in the digital economy: A qualitative study in Bangkok, Thailand. *Advance Knowledge for Executives, 1*(1), 1–17. https://ssrn.com/abstract=4157704
36. Tham, J., Ab Yazid, M. S., Khatibi, A. A., & Azam, S. F. (2017). Internet and data security–understanding customer perception on trusting virtual banking security in Malaysia. *European Journal of Social Sciences Studies, 2*(7), 186–207. https://oapub.org/soc/index.php/EJSSS/article/view/199
37. Viphanphong, W., Kraiwanit, T., & Limna, P. (2023). Goodness bank, volunteer bank, and time bank in the digital age. *Advance Knowledge for Executives, 2*(1), 1–14. https://ssrn.com/abstract=4344570
38. Windasari, N. A., Kusumawati, N., Larasati, N., & Amelia, R. P. (2022). Digital-only banking experience: Insights from gen Y and gen Z. *Journal of Innovation & Knowledge, 7*(2), Article 100170. https://doi.org/10.1016/j.jik.2022.100170