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An integrative framework enhancing perceived e-banking service value: A moderating impact of e-banking experience

Long Kim^{a,*}, Kanyanit Wichianrat^b, Sook Fern Yeo^{c,d}^a Department of Digital Marketing and Branding, School of Management, Walailak University, Thailand^b Department of Logistics Management, School of Management, Walailak University, Thailand^c Faculty of Business, Multimedia University, Malaysia^d Department of Business Administration, Daffodil International University, Dhaka, Bangladesh

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ABSTRACT

In the era of banking 5.0, providing electronic banking service value to the users is a key to maintaining customer satisfaction which results in high customer retention. So far, a wider utilization of e-banking services such as internet banking (e.g., cardless ATM and smartphone banking) and e-banking cards with microchip sensors (e.g., master, credit, and visa cards) by many users persuades banks to develop and promote e-banking service value to the users. Thus, banks must continue promoting their e-banking service value to their customers, and this requires all banks to evolve and update their current e-banking services constantly. This research aims to explore how e-banking service value is developed by constructing an integrative framework consisting of perceived risk (financial and performance risk), convenience (access and transaction), perceived quality, and perceived quality with the e-banking experience as a moderator. Researchers collected data from 700 Cambodian e-banking users via a survey questionnaire to accomplish this objective. In addition, this study employed a path analysis method to analyze the data. Results showed that perceived quality was significantly influenced by transaction convenience, access convenience, and performance risk, except financial risk. Next, the perceived value was significantly influenced by perceived quality, financial risk, transaction convenience, performance risk, and access convenience. Finally, e-banking experience significantly moderated the relationship between perceived quality and perceived value.

Introduction

Banking services are evolving and being equipped with more advanced technology, which significantly enhances service conveniences for bank users in the new era of banking 5.0 (Nicoletti, 2023). These days, banks offer many electronic services, namely Internet banking, cardless ATMs, visas, credit cards, and master cards, that allow bank users to perform their duties in both online and offline transactions with less time and effort (Ghali, 2021). For internet banking services, users can use an inter-banking transfer or QR code scanner while transferring money to another party. For cardless ATM functions, users can use an Internet banking service to create a series of PIN codes to log in and withdraw money at ATMs without using their actual ATM cards. In contrast, e-banking cards (e.g., credit, visa, and master cards) are equipped with microchip sensors along with a 16-digit account number, which allows users to settle their electronic transactions both online and

offline. These days, various commercial activities highly require these e-banking services to conduct smooth and convenient transactions between customers and sellers. However, one question has been raised, “Do the e-bank services offer users enough value that meets the users’ needs and expectations since most banks provide similar services to their users?”. In response to users’ needs and expectations, the importance of e-banking service value in the era of banking 5.0 is to ensure the convenience and security of online fund transfer services for every user. At the same time, e-banking application systems can allow users to manage and track their transactions (e.g., financial statements) after opening an online bank account. With advanced technology and more innovations, including the existing e-banking services, e-banking services become even smarter and faster; therefore, these are advantages that allow users to complete their transactions in the digitalized banking system effectively and efficiently. Subsequently, e-banking users can continuously analyze their account balances, transaction history, and account

* Corresponding author.

E-mail addresses: long.ki@wu.ac.th (L. Kim), wkanyani@wu.ac.th (K. Wichianrat), yeo.sook.fern@mmu.edu.my (S.F. Yeo).<https://doi.org/10.1016/j.joitmc.2024.100336>

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statements in real-time so that they can make better decisions to conduct other upcoming transactions. These can enhance the value of e-banking services for the users, which can significantly influence their attitudes and behaviors toward current banks. Previous research emphasizes that giving customers high service value can promote high customer satisfaction, leading to a better relationship between customers and firms (Sebastián-Morillas et al., 2024). Meanwhile, service value also has a significant impact on user loyalty (Sheykhan et al., 2024) and the intention to continue or change service providers (Vu et al., 2024). To stay competitive in the current banking industry 5.0, banks must provide users with superior services containing high e-banking service value, which is considered “worth spending for their users.” Hence, understanding key factors influencing e-banking service value is a primary mission for every bank.

Past research explains that customers can see the service value when they see no service risk (Share et al., 2021). Customers are normally afraid of unexpected losses caused by service risks; therefore, if firms can minimize their service risks, it can make customers see the high value of their services. In contrast, convenience is considered the main antecedent of perceived service value (Zeqiri et al., 2023). Convenience has played a great role in minimizing distance, time, effort, and costs for customers. These are advantages that can meet customer expectations, leading to greater perceived value among customers. On the other hand, perceived quality is seen as the main player promoting perceived service value (Suttikun and Meeprom, 2021). Service quality can offer customers high service performance and accurate information, which enhances a satisfactory customer experience. It is important to promote the importance and value of service to customers. Unlike the above studies, using experience can influence perceived value among customers (Kusumawati and Rahayu, 2020). Customers can learn, understand, and change perspectives regardless of the significance of service consumption, depending on the duration of their consumption.

To our best understanding, many business studies have tested how perceived risk, convenience, and perceived quality commonly influence perceived value, while developing a multi-dimensional mechanism to test these factors' dimensional impacts on both perceived quality and perceived value has received less attention in the e-banking service industry. Furthermore, examining how e-banking experience moderates a relationship between perceived quality and perceived value in the e-banking service industry has not been widely studied. To fill in the current research gaps, this study aims to develop a dimensional construct of perceived risk (financial and performance) and convenience (access and transaction) influencing perceived quality and perceived e-banking service value, along with e-banking experience as a moderator between perceived quality and perceived value. To provide further contributions to existing literature, this study employs a means-end theory (MET) (Gutman, 1982) to explain the above-dimensional mechanism. The exploration processes and results of this study offer novel contributions regardless of psychological concepts of perceived value among e-banking users.

Literature review

Perceived e-service value and theoretical foundation

Perceived value is conceptualized as an individual's evaluation outcome deriving from a comparison between perceived benefits and perceived sacrifices (Kim et al., 2021). Perceived value also describes a person's opinion on how important services or products are to his or her needs and wants (Auka, 2012). To check how perceived value develops, a means-end theory (MET) is employed to explain. The theory explains that humans are driven by goal-directedness, and they use service attributes as a means of interfering with their desired end states (Gutman, 1982). To acknowledge the results of service attributes, the person's decision-making processes on his or her consumption are affected by three main stages, such as (1) relations with service attributes, (2)

perceived consequences of consumption, and (3) personal value of the consumer (Sánchez-Fernández and Iniesta-Bonillo, 2007). The person's perspective and decision on his service consumption value change based on the changes in relations between service attributes and perceived consequences of consumption. Likewise, this theory's guidance can underscore that e-banking service value is judged following the above processes. As a result, perceived e-banking service value is seen as the ending result, which provides a significant standpoint for the users to make their final decision regardless of switching or continuing the current e-banking services (Singh et al., 2021).

In the current competitive environment, e-banking services are developed to let customers experience smooth and convenient transactions available anywhere they go (Nicoletti, 2023). Especially, when the banking industry reaches 5.0, e-banking services evolve and are constantly upgraded with advanced technology. For example, many visa, credit, ATM, and master cards nowadays are equipped with smaller and more efficient microchips' sensor detection which have a high ability to interpret and transfer data within seconds (Nicoletti, 2023). Meanwhile, internet banking services become even faster and more widely convenient for millions of e-banking users to access and settle their transactions with other parties through either QR codes or inter-bank transfers. Meanwhile, there are 67 commercial banks with 1528 branches offering a variety of financial products and services to their customers in Cambodia (National Bank of Cambodia, 2023). Meanwhile, around 90 % of the Cambodian people actively use the internet (Kim and Yeo, 2024; Wong, 2022). As many commercial activities, such as shopping, banking, and payments, are conducted online, many e-banking services (e.g., cardless ATM, e-banking cards (ATM, master, visa, credit, and debit cards), and internet banking services) have been developed to support the all-electronic transactions in the Cambodian markets. However, the banks need to ensure that customers can see the obvious benefits of using the e-banking service and thus will continue using it. E-banking has some distinctive features that set it apart from other industries or service channels. E-banking offers several benefits to customers, such as saving time and money, providing convenience and accessibility, enhancing reliability and performance, and reducing environmental impact (Yun et al., 2023). Additionally, e-banking also faces some challenges, such as customer lack of knowledge and skill, security and privacy risks, and trust and loyalty issues. These features affect how customers perceive value in e-banking and how they behave online. To remain competitive, banks continue developing their e-services value as this technique is the key to differentiating their services from other competitive banks and maintaining their customer satisfaction and loyalty.

In response to this situation, several investigations were conducted to explore all related factors that significantly influence users' perceived e-banking service value. For instance, Kaabachi et al. (2022) found that customers could see the value of their e-banking service value when the e-banking services offered them better personalization, transparency, customer service support, reliability, product portfolio, and electronic security. In contrast, Hossain et al. (2023) emphasized only three main dimensions of e-banking service quality, namely outcome quality, environmental quality, and interaction quality. These researchers explained that many users highly valued the e-banking services when they received accurate performances, a high ability to access and complete transactions, and a good environment to obtain the e-banking services from the banks. On the other hand, Xie et al. (2022) suggested paying high attention to performance expectancy, effort expectancy, and unexpected risk if banks considered crafting their e-banking service value in response to the current market demands. E-banking users saw the benefits of using the e-banking services with the banks only when the e-banking services met their expectations with minimal side effects or risk. Unlike the above researchers, (Fusva et al., 2022) revealed that the value of e-banking services changed depending upon the level of service quality and bank image because these were considered core competitive advantages which made the users have high confidence and belief in

using the e-banking services with the banks.

In research gap analysis, past studies have ignored side effects of perceived risk, convenience, and perceived quality which develop perceived value in the e-banking service industry. Meanwhile, these factors have been investigated in electronic consumption behaviors in different areas but not limited to online shopping (Lu, 2024), cloud service (Altes et al., 2024), social media (Wu et al., 2024) and transportation service (Wu et al., 2024). From customer perspectives, perceived quality, perceived risk, and convenience are employed to test satisfaction, and trust and elicit desired responses from customers. Moreover, academic insights to employ these factors' dimensional impacts on perceived e-banking service value have not been extensively explored since the existing literature often tested these factors' overall impacts on perceived value. To our knowledge, not many studies have explored the dimensional construct mechanism by which perceived e-banking service value is cultivated. The concept which is derived from dimensional impacts of perceived risk and convenience influencing perceived quality and value can vary significantly from past literature. Therefore, we develop a dimensional constructed model and include e-banking experience as a moderator between perceived quality and perceived value (Fig. 1).

Convenience

Convenience refers to the level of ease in helping customers obtain services with less distance, time, and effort (Chang et al., 2014). In business research, service conveniences give customers easy access and transactions serving their needs and purposes (Widiyanto and Wibowo, 2021). Service conveniences these days contain technological assistances and functions that are currently used in my service areas, namely, cloud services (Cheng et al., 2019) and online shopping services (Raman, 2019) which gives users high accessibility and quick transactions.

In link with perceived quality, the service is often viewed as “good quality by the users when firms offer more service conveniences to their users (Moghavvemi et al., 2018). In e-service quality evaluation, the quality of the service is normally rated using stars “1=very low to 5=very high”. The more stars it gets, the higher the quality it is. Once the service system provides easy access and transaction, the users rate the service “high quality” (Udo et al., 2010). Previous studies also indicate

that convenience can minimize individuals' psychological and physical effort. Therefore, providing service conveniences can enhance not only high comfort to users but also positive perspectives toward the service quality (Eryigit and Fan, 2021).

In association with perceived value, the benefits of service conveniences are less distance, time, and effort for the users who come to interact with firms for services (Kim and Jindabot, 2021). In online shopping attitude, online buyers often praise and value the service system containing no crushing access and lagging transaction settlement which causes low frustration to the buyers (Pham et al., 2018). Previous research emphasizes that any service providing more conveniences to customers is seen as a valuable asset that users enjoy getting their tasks done (Garcia-Fernandez et al., 2018). Therefore, the relationships can be hypothesized as below:

- H1. Access convenience significantly influences perceived quality.
- H2. Transaction convenience significantly influences perceived quality.
- H3. Access convenience significantly influences perceived value.
- H4. Transaction convenience significantly influences perceived value.

Perceived risk

Perceived risk refers to a level of uncertainty in which a person possesses and is concerned with unexpected consequences caused by firms' services (Kim et al., 2021a). Based on individual psychology, risk can be regarded as financial and performance risks (Kim and Jindabot, 2022). Performance risk underscores a propensity of poor service performance offered by the firms whilst financial risk indicates a propensity of financial loss after investing with the firms. These risks are often seen to have significant impacts on customers' judgement which can severely influence their decision outcome (El Mokrini and Aouam, 2022; Li et al., 2020).

In link with perceived quality, while using the services, consumers always worry and want to avoid all possible risks (Adasme-Berríos et al., 2019). Once the services with high risks can threaten the service users who in turn are doubtful about the current service quality of the firms (Kim and Jindabot, 2020). In e-banking services, some consumers are worried significantly about financial risks (e.g., debit balance insecurity

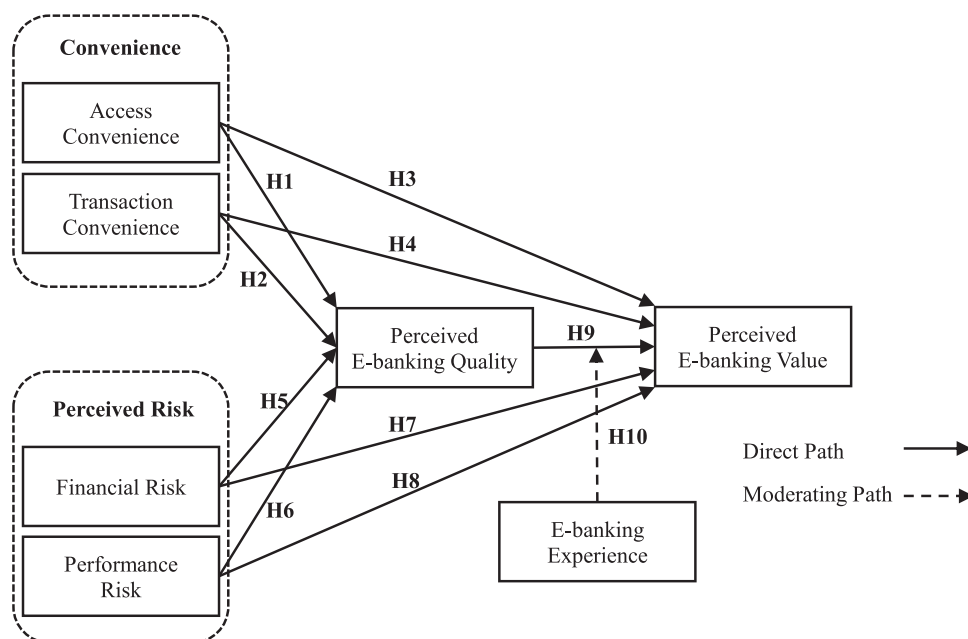


Fig. 1. An integrative dimensional model of perceived e-banking service value.

or e-money hacking) (Alsondos and Salameh, 2020) whereas others are worried about poor electronic performance and technology out of date (Vo and Nguyen, 2015).

In connection with perceived value, all types of service risks can damage individuals' physical and emotional efforts (Aufegger et al., 2021). While using the services, any errors such as interruption or lagging can make the users feel frustrated and stressed, and the users no longer see any significant service value of the firms (Share et al., 2021). Consequently, services are also no longer important to the users anymore when their money and service performances are in a vulnerable position (Kim and Jindabot, 2022; Share et al., 2021). Therefore, this indicates that the current services may not provide any significant return to the users. The relationships can be hypothesized as below:

- H5. Financial risk significantly influences perceived quality.
- H6. Performance risk significantly influences perceived quality.
- H7. Financial risk significantly influences perceived value.
- H8. Performance risk significantly influences perceived value.

Perceived quality

Perceived quality refers to a propensity of service performance that can promote individuals' service consumption and experiences (Suttikun and Meepprom, 2021). In quality perspectives, there are two main good attributes which services or products can demonstrate the propensity of quality, namely intrinsic attributes (e.g., core performances, taste, and scent) and extrinsic attributes (e.g., appearance, color, and size) (Kim et al., 2022).

In connection with perceived value, consumers consider quality as a core benefit of their service utility which can meet their needs and expectations (Feng et al., 2020). Based on consumer psychology, high service quality offers users high performance and accurate information while settling each transaction (Suttikun and Meepprom, 2021). Thus, this allows users to see the propensity of service offering significance to their daily consumption which they cannot live without. Meanwhile, they may also continue seeing the core value of the service offerings of the firms. The relationships can be hypothesized as below:

- H9. Perceived Quality significantly influences perceived value.

E-banking experience as a moderator

Experience is conceptualized as a person's response (e.g., sensation, feeling, and cognitions) to a particular service or product after using it (Kim et al., 2023). Experience is a broad term that is an outcome of previous participation, involvement, and practice. It can develop itself as knowledge and familiarity of the person. Many management research has found experience having direct relations with worker behavior (e.g., organizational commitment and turnover) (Lucas et al., 1987). However, experience has also been found in consumer research and may moderate the relationship among sales force perceptions, behaviors, and attitudes (Churchill et al., 1976). In e-service experience, the duration of using e-service experience outlines the degree of customer understanding and knowledge (Chang and Chen, 2008) which significantly influences their perspectives on service quality (Yunus et al., 2021) and service value (Habibi and Rasoolimanesh, 2021). Research reveals that consumers evaluate service quality differently when they experience using the products or services depending upon a certain period (Clemes et al., 2005). It also leads to change in the way they think about the service value (Roy et al., 2019). This indicates that the propensity of experience seems to promote the link between the quality and value of the services. The relationships can be hypothesized as below:

- H10. E-banking experience moderates a relationship between perceived quality and perceived value.(Fig. 1).

Methods

Sample criteria and data collection

This research contextualized in Cambodia, one of the developing countries in Southeast Asia, where 67 commercial banks with 1528 branches were providing many types of e-banking services (e.g., cardless ATM, internet banking, e-banking cards) to their customers (National Bank of Cambodia, 2023). The study involved a broad pool of seven hundred individuals, all of whom came from a variety of different walks of life. Targeting respondents who had previous experience with e-banking services was accomplished through the use of a pragmatic convenience sampling strategy. The gathering of data from 700 e-banking users encountered in a variety of public areas was eased by this method, which ensured a sample that was both varied and representative of the population. To be qualified in the survey processes, they had to have at least one year experience of using e-banking services at any bank in Cambodia. This ensured that the participants had enough knowledge and experience to understand the current e-banking services and answer the questionnaires appropriately.

Furthermore, this study conducted a pilot test to check content reliability using Cronbach's alpha (α scores ≥ 0.7) (Kim et al., 2023) with at least 30 respondents. In Table 1, all variables' statistical α scores passed the minimum requirement indicating enough content reliability. Finally, researchers were able to fully collect 700 data from respondents using a snowball sampling method. In the survey processes, all respondents had to pass a screening survey "Are you currently using any e-banking services (e.g., internet banking and visa cards) with at least 1 year at any bank in Cambodia?". Once, they said "yes", they were asked to provide their consent to join the survey. After that, they were provided self-administered questionnaires with 10–15 min to complete the survey. Finally, they were asked to provide researchers with other related participants at the end of the survey so that researchers could further survey those people.

Variable measurement

There were five main variables in this study. First, the e-banking experience with 4 items was originally developed by researchers. Next, convenience had two dimensions (access=2 items and transaction=2 items) that were borrowed from Roy et al. (2016). Then, perceived risk had two dimensions (financial risk=2 items and performance=2 items) that were borrowed from Kim and Jindabot (2022). After that, the perceived quality with 4 items was borrowed from Fourie (2015). Last but not least, the perceived value with 4 items was borrowed from Kim et al. (2022). All of the items were adopted from different contextual studies; thus, researchers modified and revised them to be more suitable for the e-banking context.

Moreover, this study applied a 5-point Likert scale to let the participants answer the questionnaire items. This Likert scale technique allowed the participants to rate their opinions relaxingly since this technique contained a mid-scale (3=neutral) separating a clear cut between positive and negative scales (Kim et al., 2023). This scale technique together with the adopted items was tested to find content validity in the pilot testing sample (30 participants). Despite all of the items obtained enough content reliability, some items' contents were revised following the pilot-testing participants' suggestions to enhance the clarity of the contents so that the whole survey could obtain high content validity. The information regardless of variable measurement was reported in Table 1.

Model measurement construct

A path analysis technique was employed to analyze the data set of this study. Four main statistical measurements were reported in this section. First, multi-collinearity and normality were tested among

Table 1
Variable measurement and pre-test.

Variable	Items	Pre-test Alpha	Scale
E-banking Experience	1) 1–3 years 2) 4–7 years 3) 8–11 years 4) Above 11 years	0.83	-
Convenience	<u>Access Convenience</u> 1) I can use my bank's visa cards can be easily used. 2) I can check my personal information and all updated information about my credit balance through the Internet at any time. <u>Transaction Convenience</u> 1) I can use Internet banking to transfer and deposit to any party at anywhere. 2) I can use my visa cards with less time and effort when shopping online or at a store.	0.74 0.77	5-Likert Scale 5-Likert Scale
Perceived Risk	<u>Financial Risk</u> 1) I am afraid that someone may steal money from my visa cards. 2) I am afraid that someone may hack my Internet banking and steal money from my savings account. <u>Performance Risk</u> 1) I am afraid that this bank's visa cards may have many errors while transferring money to the shop. 2) I am afraid that Internet banking services may lag and show inaccurate information.	0.88 0.92	5-Likert Scale 5-Likert Scale
Perceived Service Quality	1) This bank's Internet banking service always shows clear and accurate information. 2) This bank's visa card is very secure when spending money online. 3) This bank's visa card always performs accurately when settling the service fee at any store. 4) This bank's overall e-banking services are high quality.	0.79	5-Likert Scale
Perceived E-banking Service Value	1) This bank's Internet banking service is very important to my daily business transactions. 2) This bank's visa card helps me shop and pay at anywhere. 3) I can always use this internet banking service to pay my electric bill at the end of the month. 4) This bank's internet banking service contains a cardless card helping me withdraw cash at the ATK machine.	0.90	5-Likert Scale

variables. In the multi-collinearity test, it was suggested that scores of variance inflation factor (VIF) representing each variable had to be equal or below 10 (acceptable level); otherwise, it could cause highly conflicting results in regression performance statistics (Kim et al., 2022). For the normality test, experts suggested checking scores of Skewness and Kurtosis which had to stay between -1.96 to +1.96 (Kim et al., 2022). In Table 2, the scores of collinearity and normality in each variable passed the minimum requirements in the Path Analysis Technique assumptions.

Second, the content reliability of each variable using Cronbach's

Table 2,
Normality and multi-collinearity diagnostics.

Variable	Data Normal Distribution		Collinearity Diagnostic
	Skewness	Kurtosis	VIF Score
Access Convenience	0.38	0.86	4.33
Transaction Convenience	0.48	0.39	3.08
Financial Risk	-0.94	-0.35	2.99
Performance Risk	-1.03	-0.69	3.67
E-banking Experience	0.81	0.47	4.01
Perceived Service Quality	0.55	0.66	4.82
Perceived E-banking Service Value	0.90	0.52	5.60

Alpha (α) and composite reliability (CR) (scores ≥ 0.7) (Kim and Jindabot, 2022). In Table 3, each variable got scores of Alphas (α) and CR more than the thresholds indicating acceptable content reliability.

Third, convergent and discriminant validity statistics were also reported. For convergent validity, average variance extracted (AVE) scores had to be more than 0.5 to obtain enough convergent validity of the research model (Kim et al., 2023). AVE scores in Table 3 were higher than the requirements indicating the existence of convergent validity in the current research model. For discriminant validity, square root scores of AVEs had to be bigger than correlation scores to obtain enough discriminant validity. The square root scores of AVEs with bolded numbers were bigger than all correction scores of each variable, thus, the discriminant validity existed in this research model.

Finally, research model fitness was also assessed using the following indexes $CMIN^2/df$, GFI, CFI, NFI, AGFI, RMSEA, and PCLOSE) (Adulyarat et al., 2024). Table 4 revealed that all indexes obtained favorable scores of fitness degree showing the model fit of this study.

Results

In this section, the regression and moderating results were briefly summarized in Fig. 2, Table 5, and Graph 1. In relationships with perceived quality, access, and transaction conveniences significantly influenced perceived quality ($\beta=0.37$, $p<0.001$ and $\beta=0.41$, $p<0.001$; respectively). Moreover, performance risk significantly influenced perceived quality ($\beta=-0.33$, $p<0.001$) whereas financial risk did not have any significant impact on perceived quality ($\beta=-0.08$, $p>0.05$).

In relationships with perceived value, perceived quality significantly influenced perceived e-banking service value ($\beta=0.63$, $p<0.001$). Next, access and transaction conveniences significantly influenced perceived value ($\beta=0.19$, $p<0.05$ and $\beta=0.25$, $p<0.001$; respectively). Finally, financial and performance risks significantly influenced perceived value ($\beta=-0.34$, $p<0.001$ and $\beta=-0.22$, $p<0.001$; respectively).

In moderating testing results, interacting variables (Exp x Quality and Exp x Value) significantly influenced perceived value ($\beta=0.14$, $p<0.05$ and $\beta=0.27$, $p<0.001$; respectively). Furthermore, e-banking experience significantly influenced perceived value ($\beta=0.31$, $p<0.001$). In a moderating testing principle, when interacting variables and the main factor had significant impacts on the dependent variable, it offered confirmation of the moderating impact of the e-banking experience. In Graph 1, With less e-banking experience, the quality of e-banking service increased from 1 to 3 while the value of e-banking service increased from 2.2 to 2.6. With more e-banking experience, the quality of e-banking service increased from 1 to 3 whereas the value of e-banking service increased from 2.6 to 3.5. Thus, the e-banking experience acted as a moderator between perceived quality and perceived value.

Discussion

In relations to perceived e-banking service quality, access convenience positively influenced perceived e-banking service quality which accepted hypothesis 1. From service attributes to quality development,

Table 3

Variable and model measurement.

N	Variable	Alpha (α)	CR	AVE	Discriminant Validity Test						
					1	2	3	4	5	6	7
1	Access Convenience	0.83	0.70	0.65	0.86	0.31	-0.23	-0.30	0.42	0.58	0.51
2	Transaction Convenience	0.79	0.96	0.76		0.75	-0.23	-0.28	0.67	0.49	0.62
3	Financial Risk	0.74	0.76	0.62			0.77	0.35	-0.68	-0.70	-0.57
4	Performance Risk	0.95	0.85	0.82				0.83	-0.52	-0.68	-0.63
5	E-banking Experience	0.87	0.82	0.69					0.86	0.69	0.46
6	Perceived Service Quality	0.93	0.74	0.64						0.79	0.61
7	Perceived E-banking Service Value	0.71	0.83	0.78							0.87

Table 4

Model fitness.

Indexes	Scores	Thresholds	Results
CMIN ² /df	2.309	≤ 3	Good
GFI	0.935	> 9	Good
NFI	0.946	> 9	Good
CFI	0.928	> 9	Good
AGFI	0.896	> 8	Good
RMSEA	0.062	< 0.08	Good
CLOSE	0.091	> 0.05	Good

Note: Fitness indicators following a suggestion of [Adulyarat et al. \(2024\)](#).

people found access convenience as a significant factor that could change their degree of e-banking service quality. In this stage, e-banking services (e.g., master cards, debit cards, and Internet banking services) must provide quick information to the users such as personal information, savings account balance, and other utilities. Particularly, the cards needed to have a strong sensor of microchips to send quick information through either plugging into ATM or tapping near swape machines so that the users could check and take further action as they pleased. Furthermore, internet banking applications also had to be easily used with less complicated functions. This allowed users to read and verify any updated information provided by the banks. [Nicoletti \(2023\)](#) also claimed that the quality of banking services had changed depending on how fast the users could get what they needed in the service system. The quicker access was rated the better quality. Therefore, this was the case

that the users saw a significant change in e-banking service quality. Next, transaction convenience positively influenced perceived e-service quality which accepted hypothesis 2. From service attributes, the users saw the level of e-banking service quality change following the influence of transaction convenience. E-banking services must have been designed in convenient ways for users. In particular, master cards are needed to perform a quick information transfer using the latest technology sensor or swapping technology when paying at the counter. All data processing transfer was detected, and the transactions of the settlement were completed within seconds, thus, it made the lives of both sellers and users even more convenient. Meanwhile, users could easily deposit their money at the ATMs or withdraw cash using either ATM cards or cardless ATMs. In the case of using transaction services using a banking application, [Pham et al. \(2018\)](#) reported that customers reacted positively toward their firm's service quality when their payment and deposit transactions were settled anywhere with just one click on their smartphones. Then, performance risk negatively influenced perceived e-service quality accepting hypothesis 6. From the evaluation to the reaction process, the users outlined a great concern about performance risk which could be a potential factor in reducing the degree of e-banking service quality. This type of risk involved mainly functional errors while transferring money to another party via Visa card or Internet banking services. Moreover, the lag process and inaccurate information could be considered as parts of performance risk which caused the users to feel frustrated and stressed about their e-banking services. Any error that interrupted the individual transactions could lead to a significant loss of trust and confidence in the services, thus, quality could be poorly rated

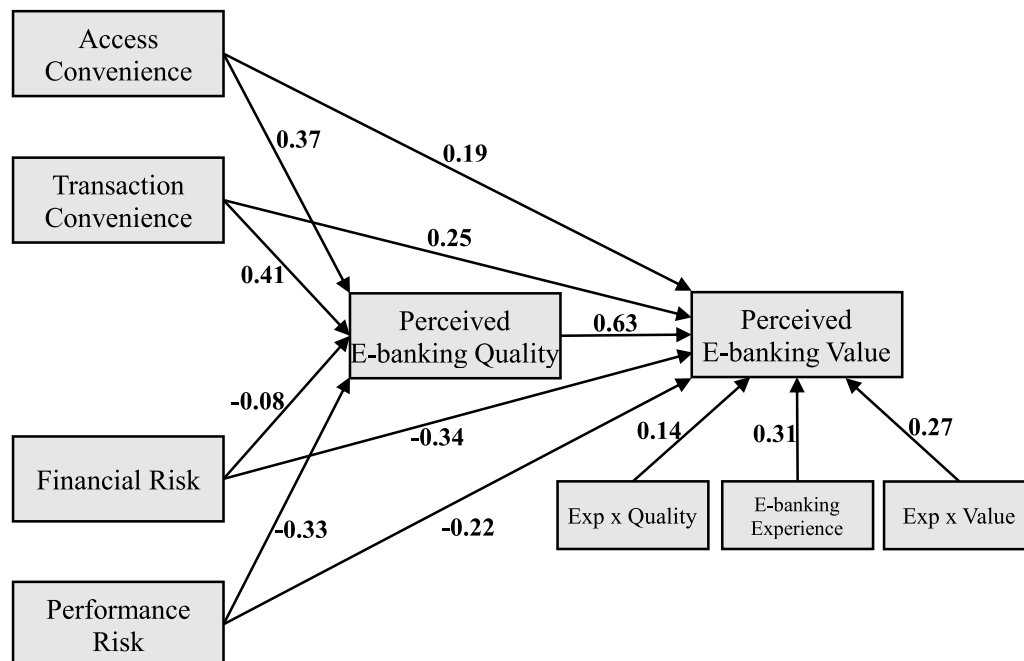
**Fig. 2.** Path analysis results.

Table 5

Results summary.

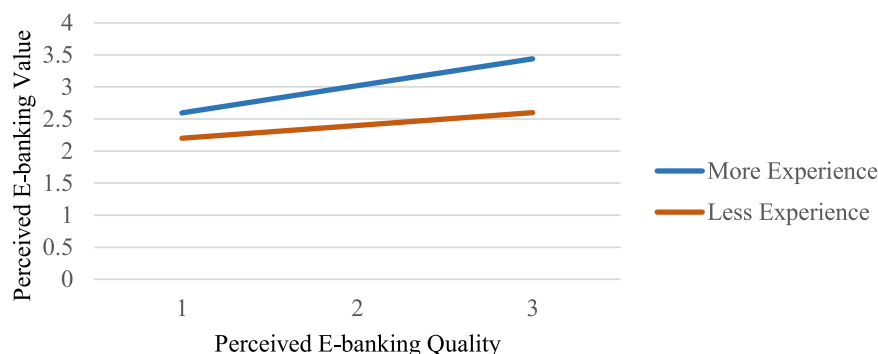
Penal A: Direct Path Co-Efficient Results				
Predictors	Dependent Variables	St.D Beta (β)	Sig. P-value (p)	Hypothesis Assumption
Access Convenience	Perceived E-banking Quality	0.37	0.000**	Accepted
Transaction Convenience		0.41	0.000**	Accepted
Financial Risk		-0.08	0.199	Rejected
Performance Risk	Perceived E-banking Value	-0.33	0.000**	Accepted
Access Convenience		0.19	0.018*	Accepted
Transaction Convenience		0.25	0.000**	Accepted
Financial Risk		-0.34	0.000**	Accepted
Performance Risk		-0.22	0.000**	Accepted
Perceived E-banking Quality		0.63	0.000**	Accepted
Penal B: Moderating Impact Diagnostic				
Variable and Interacting Variables	Dependent Variable	St.D Beta (β)	Sig. P-value (p)	Moderating Test
Exp x Quality	Perceived E-banking Value	0.14	0.047*	-
Exp x Value		0.27	0.000**	-
E-banking Experience		0.31	0.000**	Confirmed

Note: With a standard error of 5 %, * represents the p-value ($p < 0.05$) whilst ** represents the p-value ($p < 0.01$).

among the users. In contrast, Vo and Nguyen (2015) and Kim and Jindabot (2022) reported that bank users always talked about high service quality when the services were well performed with accurate information. This could mark a significant control over the quality of e-banking service if performance risk could be well minimized. Unlike the above factors, financial risk had no significant relationship with perceived quality rejecting hypothesis 5. This study rejected the study outcomes of past literature (Adasme-Berrios et al., 2019; Alsondos and Salameh, 2020) indicating financial risk as the main indicator of perceived quality. The different results could be related to the perceived trust of the current e-banking users. It was possible that the e-banking services probably had some special features and functions that gave better customizations to the users to settle their transactions with their paces in the current digitalized banking system; thus, these gained more trust from users. As a result, it may have reduced the propensity of unexpected financial losses while completing their online fund transfer. In addition, individual users may have trusted the accurate financial information provided by the e-banking services. Therefore, the e-banking users did not see financial risk as a threat which could deteriorate their e-banking service quality.

In relations with perceived e-banking service value, access convenience positively influenced perceived e-service value, accepting hypothesis 3. Giving high e-banking service access (e.g., cardless ATM, QR

codes, prompt-pay, and inter-bank transfer) to individual users could give more e-banking service advantages to get their e-banking transactions done at all available places. Users were likely to feel less frustrated and less stressed with the e-banking services which promoted individual positivity to believe not only the quality but also perceived benefits of their e-banking services. In this positive psychology, users obtained good e-banking service experiences from their banks; thus, this increased the value of e-banking services to the users. Second, transaction convenience positively influenced perceived e-banking service value which accepted hypothesis 4. The users found transaction convenience beneficial to their service consumption. Especially, when internet services could well perform their functions through either inter-bank settlements, prompt-pay, or QR codes. At the same time, their visa cards may have provided a quick and complete transaction to the users. Kjeldsen et al. (2023) also supported that the users enjoyed their shopping experiences and remained confident with the current services offered by the firms when they could use and settle their service transactions at any store or place. Based on this claim, underscored the significant positive views among e-banking users on the current e-banking services. As long as the e-banking services continued offering the users more transaction conveniences, the users still considered the services as their essential assets. Third, financial risk negatively influenced perceived e-banking service value, accepting hypothesis 7. Many individual users somehow saw the direct impact of financial risk as a direct threat to the e-banking service value. In the judgment outcome, individual users may have worried about a certain degree of financial loss that they were unsure about it. It could directly affect the overall benefits of users' investment with their current banks where the services were already purchased by the users. Furthermore, it may have also been linked with the possibility of financial loss during depositing or transferring to another party through electronic banking services. Past studies also revealed that customers did not recognize the necessity of the services to their daily consumption anymore when they wasted too much money on the services (Kim and Jindabot, 2022; Share et al., 2021). However, if banks could minimize financial risk to their users, the value of e-banking services may not have been depleted. Fourth, performance risk negatively influenced perceived e-service value, accepting hypothesis 8. Many users also raised a concern of poor e-banking service performance which could negatively influence individuals' perceived benefits. For instance, errors in money transfers, unsmooth transactions, and crushing banking applications could cause high frustration and panic to many users. These side effects may have resulted in forms of loss of confidence and trust in the banks, therefore, the e-banking services could also be poorly rated by the users. Previous studies also reported that users no longer see any value in the services when they encounter crushing internet banking services and unresponsive master cards multiple times (Ghali, 2021; Kim and Jindabot, 2022). To avoid this issue, e-banking service performance may have been equipped with artificial intelligence (AI) which ensured greater performance and reduced bugs and systematic errors; therefore, the

**Graph 1.** Moderating impact diagnostic.

users could feel safe conducting their online fund transfers with another party. Overall, the services could remain essential to individual users if the performance issues were quickly solved. Finally, perceived e-banking service quality positively influenced perceived e-banking service value which accepted hypothesis 9. From reaction to the overall judgment, the quality of e-banking service mattered a lot among the users when considering a certain degree of e-banking service value. As the degree of e-banking service quality rose, people saw how the services greatly served their needs and purposes which outlined the core concept of value among individuals. The users simply understood and judged that the e-banking services were beneficial and worth spending with the banks. In principle, Kim and Jindabot (2021) revealed that the users saw the value of the service only if the services showed great promise in their performance allowing them to accomplish their daily tasks without any technical errors. This could develop a significant value of e-banking service among the current users.

For moderating impact, e-banking experience moderated the link between perceived quality and perceived value. This study found that when the users possessed more e-banking experiences, their opinions on the quality of the e-banking services also positively changed; thus, it also promoted their perceived value in e-banking services. Previous studies explained that experiences provided awareness and know-how to individuals (Chang and Chen, 2008; Churchill et al., 1976; Clemes et al., 2005; Roy et al., 2019). The more they had, the more they understood how the services worked. Furthermore, experiences also taught people to find solutions to fix their existing problems and sometimes complain for a better change. This allowed the users to continue receiving better service offerings which could further provide the users more benefits in accomplishing their daily business activities and transactions through the e-banking services.

Theoretical and practical implications

Our research provides a significant contribution to the existing literature by conceptualizing, operationalizing, and investigating the dimensional impacts of convenience and perceived risk on perceived quality and perceived value in the e-banking service context. Furthermore, this research also includes e-banking experience as the moderator between perceived quality and perceived value. Thus, this makes our theoretical model different from previous studies (Kim and Jindabot, 2022; Suttikun and Meeprom, 2021; Zeqiri et al., 2023). In this sense, the study provides a deeper analysis of dimensional impacts of convenience and perceived risk which further enhances our understanding of the reasons why and how the users see the quality and the overall e-banking service value. Meanwhile, it also enables tailored solutions in the setting of electronic banking services which give new insights into relationships between perceived risk, convenience, perceived quality, and perceived value along with the e-banking experience in contributions to the Means-end Theory (MET) (Gutman, 1982). In contributions to MET, it makes the readers further understand that users show their personal e-banking service value only after their perceived consequences of consumption (perceived quality) were significantly influenced by the service attributes (access convenience, transaction convenience, performance risk, and financial risk). Furthermore, the involvement of the e-banking experience also further enhances the readers' understanding of how experience promotes awareness and knowledge in using the e-banking service which can positively enhance perceptions of the e-banking service quality leading to better improvement of perceived e-banking service value. As a result, the users can finally demonstrate their propensity of the overall judgment of the e-banking service value allowing us to predict how essential the e-banking services are.

In practical implications, banks must promote perceived e-banking service quality to their customers by integrating know-how and other innovations (e.g., artificial intelligence (AI)) assistance to the users' e-banking services (Turoń, 2022). For know-how, banks must offer

significant training to their staff to improve their staff's knowledge and understanding of e-banking service utilities which they can offer all technical solutions to fix various issues related to their e-banking services to their customers (Yun et al., 2022). Furthermore, banks have to adopt AI assistance which can have a better data arrangement, smart diagnostics, and immediate detection of all bugs and other systematic errors (Haddad, 2023) while the e-services are being processed. This can also develop the current e-banking service industry to be a more digitalized banking system (Lee et al., 2021). Next, banks need to continue offering more access and transaction conveniences to their users by offering a wide range of available services that can be accessed and used anywhere they go. Meanwhile, they need to ensure that their e-banking services are quickly responsive to serve the users to settle their transactions with a less complicated means. Finally, banks have to minimize financial and performance risks to their users, particularly performance risk. They have to make sure that their e-banking services provide accurate financial information and high-security services to protect individuals' financial information while the users conduct any online payment. Moreover, banks must keep updating and evolving their existing technology to maximize their overall e-banking service performance to their customers.

Limitations and future research directions

This study is not without limitations. Firstly, some cultural service conveniences related to access and transaction conveniences provided by banks can be a fascinating discussion in the current era of banking 5.0 since there are different consumer preferences in settling transactions using QR codes among some groups of users while others may prefer prompt-pay or inter-bank transfer. Future research can include e-banking service convenience preferences into their research to explore the insights among the users. Second, this study focused on the influences of perceived risk, convenience, and perceived quality on perceived e-banking value; however, there could be other potential factors (e.g., trust, security, and customer loyalty) that significantly changed the value of e-banking services. Therefore, future research should incorporate these additional relevant factors to explore bank users' insights which can help banks find better solutions to develop better e-banking service value for their customers. Third, this research contained diverse opinions from different customer segments. Future research may consider exploring how cultural or demographic differences influence the perceptions of e-banking service value among different customer segments. Fourth, it can be an interesting topic if future research can conduct longitudinal or cross-national research to enhance the generalizability of the findings. Finally, this research contextualizes in e-banking service context in Cambodia where the current advancement of technology and facilities is emerging as this country just emerges from the least developed country; therefore, it may limit the generalizability of the findings to more developed banking systems. Future research should address whether these findings hold in different contexts.

Informed ethical statement

The anonymity of all participants involved in this research is assured.

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CRedit authorship contribution statement

Sook Fern Yeo: Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. **Long Kim:** Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Kanyanit Wichianrat:** Data curation,

Formal analysis, Funding acquisition, Methodology, Software, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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