Embedded Banking in E-Commerce Distribution: Navigating Consumer Intention

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Abstract

Purpose: Business on the e-commerce channel has great potential for development. To provide better service, embedded banking services have been incorporated to bring many conveniences to customers. However, research on intentions to use this service is still minimal. This study was conducted to understand the intention to use embedded banking services on e-commerce platforms in Vietnam. **Research Design, Methodology and Approach:** The article uses quantitative research methods, based on the technology acceptance model. Data for the study was gathered from 780 consumers and processed in two stages using the SEM linear structure model and SmartPLS 4.0 software. **Results:** The results show that perceived ease of use, perceived usefulness, and facilitating conditions had a positive relationship with the attitude towards using embedded banking and intention to use embedded banking. Attitude towards using embedded banking is found to play a mediating role in the relationship between perceived ease of use, perceived usefulness, facilitating conditions and the intention to use embedded banking services. **Conclusions:** The results of this study help commercial banks and e-commerce platforms build more effective digitalization strategies. It can attract more customers to use embedded banking services as well as online shopping platforms.

Keywords : Behavioral Intention, Embedded Banking, Embedded Finance, E-commerce Channel Distribution, Insustry 5.0, User Attitude

JEL Classification Code: C83, M15, G21

1. Introduction

The development of Industry 5.0 in the banking sector has been bringing many benefits to society (Ghobakhloo et al., 2022). These breakthroughs have helped reduce operating costs and increase reliability and efficiency (Tsai & Su, 2022). It allows banks and businesses to solve several common problems, especially when businesses increase their sales channels through e-commerce platforms (Raja Santhi & Muthuswamy, 2023). Research on the intention to use embedded banking (EB) services on e-commerce

channels plays an important role in the context of the strong digital transformation of the finance and e-commerce industry (Wang, 2021). Understanding the factors that influence usage intent not only helps banks and e-commerce platforms develop effective marketing strategies but also creates conditions to improve the user experience. This is particularly crucial in Vietnam, where the use of EB services is expanding quickly, but there are still a lot of issues with customer awareness and trust (To & Trinh, 2021).

According to the TAM model, behavioral intention to use a new technology is driven by attitudes toward behavior.

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Perceived usefulness (PUNE) and perceived ease of use (PEOU), in turn, have a significant impact on usage attitudes. TAM model is used in many studies related to digital banking services. Embedded banking is also one of the digital banking services that has been strongly deployed in recent times, so TAM is suitable for considering the behavioral intentions of customers.

Research on user attitudes towards M-banking by Abdennebi (2023) shows that both PUNE and PEOU have a significant influence. Research on other digital banking services such as mobile banking, e-banking, e-wallet, chatbot, and internet banking also shows similar results (Aldammagh et al., 2021; Alsmadi et al., 2022; Alt et al., 2021; Ho et al., 2020; Ly & Ly, 2022). New users who access new technologies often also face certain barriers in terms of knowledge and resources. Previous research has also shown that when users are given more faciliating conditions (FACI), their attitude towards using embedded banking (ATTD) is also more ready (Tam et al., 2020; Tun, 2020) Furthermore, scholars also confirm that attitudes towards the use of the new technology not only have a direct impact on the intention to use the new technology, but it also has an indirect impact (Safari et al., 2022; Natasia et al., 2021; Ly & Ly, 2022).

Research on embedded banking is currently limited. However, the findings suggest that global interest in this service is more prevalent in Asian and European countries (Ozili, 2023). Hensen & Kötting (2022) has also affirmed that the service offers seamless processes and a higher level of convenience for guests. This service allows third parties to access banking data through application programming interfaces (APIs). From there, partners can provide financial services to their customers directly at the time of need. This service especially thrives along with the dynamic growth of e-commerce. The growth of embedded finance is symbiotic with the development of digital channels and platforms, where a common currency provides a better user experience and provides a seamless service in context to customers (Bugvi & Endress, 2024). However, no research has been conducted in the context of EB. This is the research gap.

EB services are considered one of the recent innovations of banks in digital products (Wullweber, 2020). It is coordinated with e-commerce platforms to provide better service and help e-commerce platforms reach a wide customer base (Hensen & Kötting, 2022). By analyzing factors such as PUNE, PEOU, and FACI, this study not only provides insight into customer behavior and needs but also helps businesses design products and services that are more relevant to the Vietnamese market. Thereby, the research will contribute to promoting the sustainable development of EB services, supporting economic growth, and improving the quality of life for people. In addition, the research results also contribute to the TAM model in terms of the results of

empirical research on EB services on e-commerce platforms. The remaining section of the study is divided into four sections. The literature review is covered in the second section, followed by the research methodology, research findings, and conclusions and management implications in the third and fourth sections, respectively.

2. Literature Review

2.1. Embedded Banking

Embedded banking is the incorporation of bank services into the business platform of a non-financial company or business organization (Hensen & Kötting, 2022). EB was then regarded as a service offered to clients of these businesses and institutions. For the financial industry as a whole, this service presents fantastic opportunities. (Best, 2003). These services bring vast market opportunities for businesses doing business on digital platforms (Wullweber, 2020). One way to combine financial services and improve customer satisfaction at a reasonable price is through EB (Ozili, 2023). The service is especially useful for small businesses that do not meet the eligibility and time to access banking financial services.

When using EB in an e-commerce channel, customers can pay for a product or service through a single app without having to navigate to another app to enjoy that product or service (Jafar et al., 2023). Recently, EB has been focused on development and has become popular among big tech and non-financial companies to create a satisfactory customer experience (J. S. Wang, 2021). In addition, the increasing use of EB is due to competition from new players, expectations of new customers, and the decay of the banking system through application programming interfaces (APIs) (Gregori & Holzmann, 2020). Banking service providers and the need to access untapped markets are also one of the reasons for this increase (Caldecott, 2022). EB has the potential to disrupt traditional banking as non-financial companies will be able to embed or incorporate financial services into their platform (Wullweber, 2020). It provides financial services to customers by connecting Fintech and banking to their platforms through APIs (Hensen & Kötting, 2022).

2.2. Technology Acceptance Model (TAM)

The TAM model is a predictive model of the acceptance of an information system for individual users (Davis, 1993). The model is an adaptation of the Theory of Reasonable Action (TRA) by Ajzen & Fishbein (1975) that has been implemented specifically to model user acceptance of technology systems (Davis, 1989). The theory was

developed from psychological theory, the main purpose of which is to provide a basis for exploring the influence of external factors on users' beliefs, attitudes, and goals (H. Usman et al., 2022). TAM believes that there are two personal beliefs, including PU and PEOU (Kaur et al., 2020). These two factors can be used to explain some aspects of consumer behavior. People may act or behave in a way that is considered normal when they accept technology because of its convenience and advantages. As technology becomes more user-friendly, it indicates that less work is required to increase its efficiency. Similarly, the more advantages users experience, the more power they have over how they use the technology (Aldammagh et al., 2021).

This model is applied by many researchers in many fields such as M-commerce adoption (Salimon et al., 2023), AI adoption (Chatterjee et al., 2021), and computer adoption (Thongsri et al., 2020). Although TAM has been criticized in some respects, it is still considered a useful general theoretical framework and is consistent with several investigations related to the factors that influence users' intention to use the new technology (Mustafa & Garcia, 2021).

2.3. Perceived usefulness, attitude towards using embedded banking, and intention to use embedded banking services

PUNE is a person's belief that using a technology system can improve their performance (Davis, 1993). If someone believes that the service can be useful in their operation, then the customer will use the service, and vice versa. Even though customers have had a bad experience with using the new technology before, they will still accept it if they find it useful (Safari et al., 2022). PUNE can be measured using indicators such as the ability to provide services efficiently, useful and improve the quality of life (Tian et al., 2023).

According to previous studies, PEOU, attitudes to adopt innovation, and intent to use the service were positively correlated (Himel et al., 2021; Safari et al., 2022). These are also the main factors in the TAM model (Davis, 1989). TAM model gives a better understand customer needs, thereby adjusting their implementation strategies to enhance the adoption and use of technology. A study of 250 customers using mobile banking in Palestine has shown that PUNE has a positive effect on user usage intention (Kaur et al., 2020). A study of 300 e-banking customers in Indonesia also showed similar results (H. Usman et al., 2022). According to a study conducted in Cambodia on 391 users of Internet banking services, users' attitudes improved when they realized how beneficial the service was (Ly & Ly, 2022). Research by Abdennebi (2023) for 202 users in Tunisia has also confirmed that PUNE plays a decisive role in the attitude of M-banking users. Research in Vietnam on

mobile wallets shows that PUNE has a positive correlation with service usage intention (To & Trinh, 2021). However, no studies related to EB services have been found. Therefore, research for Vietnam is very necessary, especially in the context of the financial market is undergoing a strong digital transformation. Understanding how Vietnamese consumers evaluate the usefulness of EB services will provide insight into their needs and behaviors, and clarify the connection between PUNE and ATTD, which in turn influences on intention to use EB services (INTN). From there, the following research hypothesis is proposed:

Hypothesis H1. PUNE has a positive effect on ATTD in the e-commerce channel distribution.
Hypothesis H2. PUNE has a positive effect on INTN in the e-commerce channel distribution.

2.4. Perceived ease of use, attitude towards using embedded banking, and intention to use embedded banking services

PEOU represents consumer opinions or assessments of the technology's usability and ease of operation (Davis, 1989). Individuals who are willing to use and learn new features of a technology application if the technology is easy to use (Ho et al., 2020). Therefore, ease of learning, ease of control, ease of understanding, flexibility, ease of application, and ease of use are some of the indicators that evaluate the level of ease of use (Himel et al., 2021). The researchers measured PEOU using metrics such as timely, easy to understand and easy to use (Kumar et al., 2020; Safari et al., 2022). In the context of this study, consumers intend to use EB services as a new payment method if it is easy to use and learn.

According to the TAM model, PEOU is one of the determinants of ATTD that affect the intention to use a technology-related service. Previous studies have demonstrated the unidirectional impact of PEOU on attitudes toward new technologies and intention to use new technologies (Caffaro et al., 2020; Kumar et al., 2020; Safari et al., 2022). Regarding technologies in banking, a study of 215 Internet banking users in Congo showed that PEOU, although not a decisive factor, promotes positive attitudes and helps users increase their intention to use. Another study by Alt et al. (2021) for users in Romania, shows that customers tend to increase their intention to use Chatbot when they feel that this service is easy to use. The results are similar for Fintech services at Jordanian banks (Alsmadi et al., 2022), and Alipay e-wallet in Malaysia (Tian et al., 2023). However, the results have not been determined for EB services. Industry 5.0 indicates that Vietnamese companies are putting more of an emphasis on e-commerce platform sales. Studying the relationship between PEOU, ATTD, and INTN in the e-commerce channel in Vietnam is

very necessary in the context of the strong development of the digital economy. Based on the theoretical basis and the above research results, the article proposes the following research hypothesis:

Hypothesis H3. PEOU has a positive effect on ATTD in the e-commerce channel distribution.

Hypothesis H4. PEOU has a positive effect on INTN in the e-commerce channel distribution.

2.5. Facilitating condition, attitude toward using embedded banking, and intention to use embedded banking services

Facilitating condition (FACI) refers to the extent to which an individual believes that technical infrastructure exists to support the use of the system (Venkatesh et al., 2012). These are external conditions that help users overcome obstacles to using new technologies (Natasia et al., 2021). FACI involves having sufficient resources and support for individuals using the technology. Individuals may be hesitant to use technology due to lack of support, lack of timely help, insufficient knowledge, or lack of resources (Tam et al., 2020).

EB providers play an important role in creating a conducive environment for commercial transactions on social platforms (Caldecott, 2022). They are the ones who change user behavior and foster user trust. In Vietnam, the percentage of people who do not have access to financial and banking services and have real needs is still high (O. T. Nguyen, 2020). Especially customers in rural and remote areas still have many people who have not yet accessed the bank's services (SANG, 2021). Meanwhile, telecommunications service providers have an advantage thanks to infrastructure, telecommunications networks, and transaction points spread across the country. In addition, the rate of people accessing telecommunications services and using phones is very high (H. H. Nguyen & Tran, 2022). These are FACI for the development of EB services. This will help to better meet the needs of customers.

FACI has been proven by many scholars to be an important factor affecting the attitude of using and deciding the intention to use the service (Kimiagari & Baei, 2022; Chatterjee et al., 2021; Kaur et al., 2020). In the banking sector, it is the premise for the use of modern technologies such as e-wallets and mobile banking. Nevertheless, the study's findings were inconsistent. According to research by Tam et al. (2020) for 304 users in Portugal, FACI is one of the important factors affecting the intention to use mobile banking. Meanwhile, the research of Tun (2020) shows that FACI does not affect the intention of Myanmar users to use mobile wallets. Similarly, Venkatesh et al. (2016) state that FACI does not affect behavioral intentions. Given the inconsistent findings regarding the significance of FAC for

technology use intention, further investigation is required to ascertain how the two variables relate to one another. Therefore, the article proposes to test the following research hypothesis:

Hypothesis H5. FACI has a positive effect on ATTD in the e-commerce channel distribution.

Hypothesis H6. FACI has a favorable correlation to INTN in the e-commerce channel distribution.

2.6. Attitude towards using embedded banking and intention to use embedded banking services

The cognitive capacity or likelihood that a user will engage in a specific behavior is known as behavioral intent (Humida et al., 2022). In addition, behavioral intent also refers to the ability of the user's subjective reasons to perform an act on a system (Himel et al., 2021). Meanwhile, attitude refers to the positive or negative emotions of the user. Davis (1989) argues that the attitude towards use is the attitude towards acceptance or rejection of technology. The degree to which a person is trustworthy determines whether they embrace or reject technology. Positive attitudes are strengthened by adopting a technology when there is a high degree of trust in it, and vice versa (Himel et al., 2021). Attitudes can influence customer behavior. If the customer has a positive attitude towards a service, the customer may decide to use that service (H. Usman et al., 2022). Consequently, banks that offer technology-based services must be able to influence consumers' opinions about the service in a positive way (Safari et al., 2022).

The TAM model assumes that this intention will be governed by the person's attitude towards the use of the system and also by PEOU and PUNE. According to Davis (1989), an individual's attitude is not the only factor that determines their use of a system but also based on its impact on the performance of technology use. Consequently, if users believe that an information system will enhance their productivity at work, they are likely to continue using it even if they do not like it (Alt et al., 2021). In addition, the TAM model hypothesizes a direct relationship between PEOU and PUNE.

Empirical research by scholars on banking services has shown that ATTD has a positive relationship with INTN (Tian et al., 2023; Safari et al., 2022). Banking services that have been explored in this connection such as internet banking (Safari et al., 2022), e-wallet (Tian et al., 2023), mobile banking (Ho et al., 2020; Himel et al., 2021; Aldammagh et al., 2021). However, there is still no research on EB services on e-commerce channel distribution. Therefore, more in-depth research is needed to clarify this relationship. Especially in the context of Vietnam today with the strong development of digital technology and e-commerce, consumers are increasingly inclined to use built-

in banking services in online shopping platforms (C. N. Wang et al., 2021). Understanding ATTD not only helps banks adjust their marketing strategies and develop products more appropriately but also contributes to improving customer experience, thereby promoting digital transformation in the financial industry. From the results of previous studies and expectations in the Vietnamese market, the article proposes the following research hypothesis:

Hypothesis H7. ATTD has a positive impact on INTN in the e-commerce channel distribution.

2.7. The Mediating role of attitudes toward using embedded banking

According to the TAM model, INTN is influenced by ATTD (Davis, 1993). ATTD can be a negative or positive emotion (H. Usman et al., 2022). Moreover, ATTD plays a mediating role in the relationship between PEOU, PUNE, and INTN (J. S. Wang, 2021). ATTD is a strategic bridge, transforming positive perceptions into specific behaviors in the context of embedded banking applications.This means that PEOU and PUNE indirectly impact INTN through the intermediate variable ATTD (Tian et al., 2023). Even though the TAM model proposes an intermediate function of ATTD in a variety of contexts and has been validated (Aldammagh et al., 2021; Himel et al., 2021; Ho et al., 2020; Ly & Ly, 2022). However, there have been no investigative studies in the context of EB services. Based on the TAM model, the research proposed the following two research hypotheses:

Hypothesis H8. ATTD plays an intermediary role in the relationship between PEOU and INTN in the e-commerce channel distribution.
Hypothesis H9. ATTD plays an intermediary role in the relationship between PUNE and INTN in the e-commerce channel distribution.

Several previous studies have demonstrated that FACI is a direct and significant factor affecting ATTD (Teo, 2011; Humida et al., 2022; O. Usman et al., 2020). In Indonesia, ATTD is defined as the intermediate variable in the relationship between FACI and the intention to use M-banking (O. Usman et al., 2020). Similar findings were found in Spain, which indicates that FACI has a direct and indirect effect on the intention to use mobile banking services (Muñoz-Leiva et al., 2017). Research for e-banking services in Iran also shows comparable results (Kimiagari & Baei, 2022). However, no results have been found in the context of EB services in the context of e-commerce in the Vietnamese market. Therefore, more research is needed to examine the mediating role of attitudes toward technology use in different technological contexts to examine technology adoption patterns. In the context of this study, the authors hypothesize that FACI has a direct and indirect impact on INTN through ATTD. From there, the following research hypothesis is proposed:

Hypothesis H10. ATTD plays an intermediary role in the relationship between FACI and INTN in the e-commerce channel distribution.

EB is a fairly new concept in business. Therefore, relevant research is also very limited. An overview of relevant studies in Table 1 shows that studies directly related to EB are conducted mainly by qualitative and situational discussion methods. Several other studies are also relevant through the concept of embedded finance, which is also unclear for EB. In particular, there has been no research related to user behavior. Therefore, it is necessary to conduct these studies in a timely manner to provide the necessary data to stakeholders such as banks and e-commerce platforms. This study aims to understand INTN of EB services in the e-commerce channel distribution. Based on the TAM model and research hypotheses, the proposed research model is shown in Figure 1.

Table 1: Summary of Studies Regarding EB

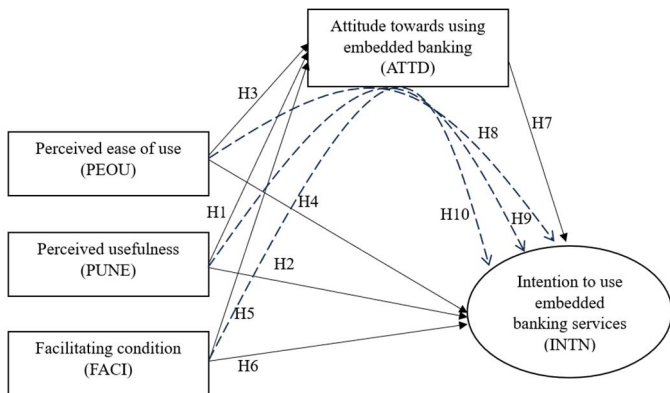| Author(s)	Research objective	Research method
Hensen & Kötting (2022)	The article explores Deutsche Bank's experience in converting services provided to customers to EB services.	Qualitative research, case discussion
Beimborn et al. (2007)	This paper explores the link between information technology systems and the use of EB in business.	Qualitative research, case discussion
Ozili (2023)	This paper analyzes the global interest in information on the Internet related to decentralized finance, embedded finance, open finance, ocean finance, and sustainable finance and the relationship between them.	Qualitative and quantitative research; The ordinary least square (OLS) estimations and The generalized method of moment (GMM) are used to process the data; The data obtained from Google Trends database.
Okello Candiya Bongomin et al. (2020)	The article analyzes the relationship between embedded finance and sustainable finance in developing countries	A cross-sectional research design was used for the study, and data were gathered from Uganda's rural poor. Utilizing analysis of moment structures (AMOS) and structural equation modeling (SEM), the data was examined.

Figure 1: Research Model

3. Research Methodology

This study uses quantitative research methods. This research method helps to describe and examine the relationship between PEOU, PUNE, FLCN, ATTD, and INTN. The research sample is customers who have been using EB services on e-commerce platforms in Vietnam such as Tiki, Lazada, Shopee, Tiktok, … The sampling method used in this study is convenient. Since the study uses Structural Equation Modeling (SEM) to analyze the multidimensional relationship between many variables in a model, the method of determining the sample size is based on the proposal of Comrey & Lee (2013). Accordingly, a sample size of less than 100 is not enough, 200 is satisfactory, 300 is acceptable, 500 is excellent, and 1000 is ideal. Based on this basis, the study determined the sample size to be 780. The survey is divided into two sections. The first set of questions asks about the respondent's details. A 5-level Likert scale is used in the second section, which comprises 17 questions that represent 5 factors. The questionnaire was designed using the five-factor scale that was taken from earlier research (Table 3). Filtering question is included in the questionnaire to make sure that respondents are the target survey population.

To achieve the research objectives, the process of selecting the scale of the model is based on previous studies. In particular, PEOU and PUNE are based on the research of Singh et al. (2020); To & Trinh (2021), FACI is based on the research of Humida et al. (2022), INTN and ATTD are based on the scale of Tian et al. (2023). Details of the scales are presented in table 3.

To ensure the validity of the questionnaire, the questions were consulted by 3 researchers in the field of customer behavior research and 3 experts in EB services in e-commerce in Vietnam. After interviewing these experts, the questions in the questionnaire are tailored to fit the context of the study. Next, a pilot test was conducted to ensure that

all respondents understood the question clearly before conducting the official survey. The questionnaire was handed out to 30 customers, the results showed that the customer took about 5 minutes to complete the questionnaire. All participants understood the questionnaire well. Therefore, there is no need to adjust any items or question order. The survey is then sent to the official survey using Google Forms and sent by email, text message, and zalo. Informed consent was obtained from all individual participants included in the study. This study was reviewed and deemed exempt by the Ho Chi Minh City University of Economics and Finance Review Board.

Based on the research results of Al Haq et al. (2020), the research paper identifies the model as a reflective model. The measurement model and the structural model must be evaluated to assess this model. In the step of evaluating the measurement model, the authors evaluated the Composite Reliability (CR) and Conbach's Alpha coefficient. In addition, this study also tested the AVE (Average Variance Extracted), outer loading, and HTMT coefficients. The second step is to evaluate the structural model to test the research hypotheses. All of the above steps are performed using SmartPLS 4.0 software.

4. Research Results

4.1. Statistical Description

According to the survey results, 49% of respondents were men, and 51% were women. The survey's respondents' ages don't differ much. Those with a university degree make up 60% of the respondents. Respondents primarily use Shopee, Lazada, and TikTok as their shopping platforms (Table 2).

Table 2: Statistical Description Results

Demographic characteristics	Value	Frequency	%
Gender	Male	382.2	49
	Female	397.8	51
Age	16-25	187.2	24
	25-45	195	25
	45-60	241.8	31
	Over 60	156	20
Education	High School	85.8	11
	Graduate	468	60
	Postgraduate	226.2	29
Shopping channels	Tiktok	195	25
	Shopee	312	40
	Lazada	234	30
	Other	39	5
Total		**780**	**100**

4.2. Evaluate the Measurement Model

According to research by Sarstedt et al. (2022), the reliability and value of each item must be evaluated, as well as the outer loading. A measure is considered reliable if it consistently produces results incompatible settings, and each item's value must be at least 0.7.

Table 3: Measurement Model Evaluation Results

Variable symbol	Content	Outer loading	Cronbach's Alpha	rho_A	AVE
Perceived ease of use (PEOU)	**Source:** Singh et al. (2020); To & Trinh (2021)				
PEOU1	Using embedded banking saves me time and effort.	0.930	0.923	0.925	0.866
PEOU2	The instructions for using the embedded bank are clear and easy to understand.	0.939			
PEOU3	Embedded banking is easy to use.	0.923			
Perceived usefulness (PUNE)	**Source:** Singh et al. (2020); To & Trinh (2021)				
PUNE1	Embedded banking helps me shop on the e-commerce channel more efficiently.	0.776	0.871	0.886	0.721
PUNE2	Things get easier when I use the embedded bank to shop on the e-commerce channel.	0.852			
PUNE3	Using an embedded bank helps me improve my quality of life.	0.881			
PUNE4	Overall, embedded banking is useful.	0.884			
Facilitating condition (FACI)	**Source:** Humida et al. (2022)				
FACI1	I have enough resources to use embedded banking.	0.756	0.805	0.947	0.711
FACI2	I have enough knowledge to use embedded banking.	0.839			
FACI3	Embedded banking is compatible with the technologies I'm using.	0.925			
Intention to use embedded banking services (INTN)	**Source:** Tian et al. (2023)				
INTN1	When I have the opportunity, I will use embedded banking services.	0.858	0.769	0.791	0.680
INTN2	I would like to use embedded banking services shortly.	0.822			
INTN3	I plan to use embedded banking more often in my life.	0.794			
Attitude towards using embedded banking (ATTD)	**Source:** Tian et al. (2023)				
ATTD1	I'm attracted to embedded banking	0.910	0.912	0.914	0.791
ATTD2	I like to use embedded banking when shopping on e-commerce channels	0.896			
ATTD3	I'm happy to use embedded banking	0.880			
ATTD4	Overall, I'm satisfied with the embedded banking service	0.871			

Additionally, Cronbach's Alpha values should fall between 0.6 and 0.95 for overall reliability. All items in Table 2 are dependable and satisfy the standards. The new scale's applicability to other variables and single-structure measures is also known as the convergence value. A popular metric for determining convergence values is extracted mean-variance (AVE). A structure is said to explain more than half of its item's variation if its AVE value is greater than 0.5. According to the findings, Cronbach's Alpha ranged between 0.6 and 0.95, indicating AVE values above 0.5 and a degree of confidence. Thus, the structure's convergence value is determined.

Similarly, HTMT ratio and Fornell Lacker criterion are used to further evaluate the discriminant validity. The results in Table 4 show that all research concepts are markedly different (Henseler et al., 2016). This result ensures the requirements of the discriminant validity criteria of the Smart PLS SEM model. In addition, the authors performed a multicollinearity test through the statistical value of the variance magnification factor (VIF). The results show that the VIF coefficients of the variables are all less than 3, indicating that there is no multicollinearity.

Table 4: Discriminant Validity Assessment

	HTMT ratio					Fornell Lacker criterion				
	ATTD	**FACI**	**INTN**	**PEOU**	**PUNE**	**ATTD**	**FACI**	**INTN**	**PEOU**	**PUNE**
ATTD						0.889				
FACI	0.322					0.300	0.843			
INTN	0.245	0.593				0.212	0.470	0.825		
PEOU	0.269	0.424	0.346			0.246	0.359	0.299	0.931	
PUNE	0.213	0.500	0.504	0.438		0.192	0.415	0.424	0.394	0.849

Note: PEOU: Perceived ease of use; FACI: Facilitating condition; PUNE: Perceived usefulness; ATTD: Attitude towards using embedded banking; INTN: Intention to use embedded banking services

4.3. Evaluate the Structural Model

The model is evaluated by calculating the degree of difference between the dependent variables. Path coefficients (β) and the coefficient of determination (R^2) are the basic measures used to estimate the structural model. R^2 shows the proportion of variation to a dependent variable explained by an independent variable or variables in a regression model. β describes the strength of the relationship between the independent and dependent variables. While R^2 describes the degree of variation of one variable explaining the variance of the other variable.

Table 5: Results of Structural Model Evaluation

Hypothesis	Relationship	Beta Coefficient	t value	p-value	Conclusion
Direct effect					
H1	PUNE -> ATTD	0.241	3.803	0.002	Accept
H2	PUNE -> INTN	0.250	4.669	0.000	Accept
H3	PEOU -> ATTD	0.148	3.197	0.002	Accept
H4	PEOU -> INTN	0.280	3.746	0.001	Accept
H5	FACI-> ATTD	0.231	4.454	0.000	Accept
H6	FACI -> INTN	0.332	7.260	0.000	Accept
H7	ATTD -> INTN	0.212	1.001	0.000	Accept
Indirect effect					
H8	FACI -> INTN	0.210	3.978	0.008	Accept
H9	PUNE -> INTN	0.202	3.486	0.007	Accept
H10	PEOU -> INTN	0.207	3.900	0.008	Accept

Note: PEOU: Perceived ease of use; FACI: Facilitating condition; PUNE: Perceived usefulness; ATTD: Attitude towards using embedded banking; INTN: Intention to use embedded banking services
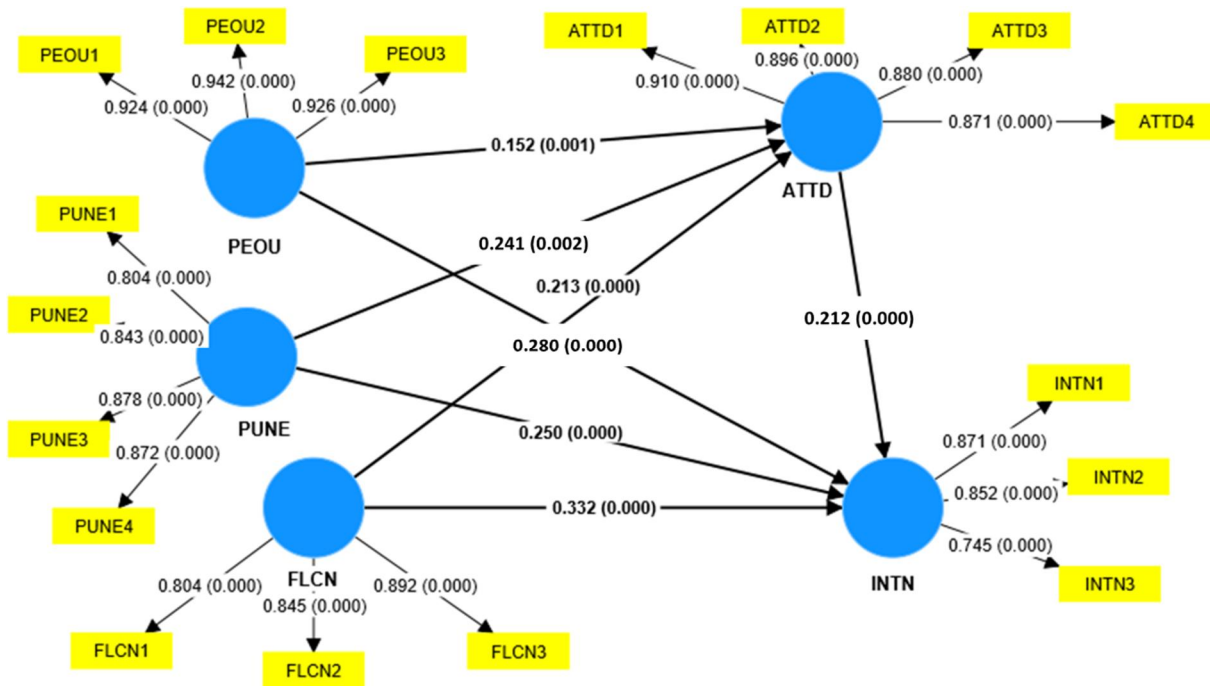
Figure 2: Standardized SEM Results of the Research Model

The results show that the R^2 of INTN is 65.3%, proving that INTN has a significant effect on the acceptance of EB services on the e-commerce channel in Vietnam. ATTD accounted for 56.3%, explaining the significant influence of ATTD on EB services; 46.1% for PUNE; 51.3% for PEOU; and 54.4% for FACI. This shows a moderate degree of influence of PUNE, PEOU, and FACI for EB services. Path analysis estimates p-values and β to prove each hypothesis.

All hypotheses are supported, indicating that all paths between independent and dependent variables make sense. Furthermore, an NFI of 0.651 (0.08 < NFI < 0.9) indicates an almost optimal level of fit (Forza & Filippini, 1998). Standardized Root Mean Square Residual (SRMR) equals 0.05 (<0.08) (Hu & Bentler, 1999), affirming that this model is very relevant and valuable for research.

According to the findings, hypothesis H1 ($\beta = 0.241$; $p < 0.05$) describes a direct relationship between PUNE and ATTD. The results show that PUNE has a positive impact on ATTD. The hypothesis H2 ($\beta = 0.250$; $p < 0.05$) describes the relationship between PUNE and INTN. The findings show that PUNE has the same directional impact on INTN. The hypothesis H3 ($\beta = 0.280$; $p < 0.05$) shows a correlation in the same direction between PEOU and ATTD. However, the relationship between these two variables is weaker than the other relationships in the model. The hypothesis H4 ($\beta = 0.152$; $p < 0.05$), shows the relationship between PEOU and INTN. The results of the analysis show a positive relationship between these two variables. The hypothesis H5 ($\beta = 0.213$; $p < 0.05$) describes the relationship between FACI and ATTD. The results show that FACI has an impact on promoting ATTD. The hypothesis H6 ($\beta = 0.332$; $p < 0.05$) describes the relationship between FACI and INTN. This is the strongest and most important relationship among others. The results show that FACI has a strong positive impact on INTN. The H7 hypothesis ($\beta = 0.246$; $p < 0.05$) describes the relationship between ATTD and INTN, which shows that the relationship is in the same direction. Thus, PUNE, PEOU, FACI, and ATTD have a positive impact on INTN. A higher INTN for integrated banking services in e-commerce channels will result from higher PUNE, PEOU, FACI, and ATTD.

For indirect relationships, hypothesis H8 ($\beta = 0.210$; $p < 0.05$) describes the mediating effect of ATTD on the relationship between FACI and INTN. The hypothesis H9 ($\beta = 0.202$; $p < 0.05$) describes the mediating effect of ATTD on the relationship between PUNE and INTN. The results show that ATTD has a positive and strong impact on the above relationship. The hypothesis H10 ($\beta = 0.207$; $p < 0.05$) represents the strong and intermediated effect of ATTD on the relationship between PEOU and INTN. Thus, ATTD is an important intermediary variable, significantly affecting the relationships between independent variables and dependent variables, determining INTN.

The results prove that all hypotheses are supported. The proposed model has successfully met the research objectives and identified the factors influencing the intention to use the embedded banking service. Research shows that perceived usefulness, perceived ease of use, and facilitating condition have a direct impact on attitude towards using EB, which in turn affects the intention to use EB services. This result is similar to some previous studies (Singh et al., 2020; Tian et al., 2023; Tun, 2020; To & Trinh, 2021; Alsmadi et al., 2022). This result shows that there is no difference in factors affecting user attitudes between digital banking services and EB. Perceived usefulness is key, because when users perceive that EB helps them achieve their financial goals more effectively, they will have a more positive attitude towards this technology (To & Trinh, 2021). Similarly, perceived ease of use reduces psychological and cognitive barriers to accessing EB, increases satisfaction, and reinforces positive attitudes. In particular, support conditions, including technological infrastructure and support from banks, create a favorable environment, minimize difficulties in accessing and using EB, thereby increasing sympathy for services (Alsmadi et al., 2022). More importantly, this positive attitude is not only the result of the above factors, but also the driving force behind the intention to use EB, through the creation of trust and willingness to accept the new technology. This result emphasizes the mediating role of attitudes and suggests that banks need to focus simultaneously on improving the user experience, ensuring effective technical support, and emphasizing the value that EB brings to drive both awareness and behavior of the service in the long term (Tian et al., 2023).

The core findings of this study indicate that when consumers feel that EB offers practical benefits and is easy to use, they will have a more positive attitude and are more likely to decide to use this service. Facilitating conditions such as technical support, knowledge, and resources of users also play an important role in strengthening user trust. These factors not only affect the adoption of new technology but also promote the development of EB services in the Vietnamese market, helping banks and e-commerce platforms optimize their development strategies to better meet the needs of customers (Tian et al., 2023; To & Trinh, 2021).

This study also confirms the mediating effect of attitudes on the above relationships. The results were found to be similar to the study of Aldammagh et al. (2021); Himel et al. (2021); Ho et al. (2020). When consumers find EB services to provide tangible value (PUNE) and accessibility (PEOU), they will form a more positive attitude toward using the service. This positive attitude leads to higher usage intent. This emphasizes the importance of creating a smooth and easy user experience, as well as communicating the benefits that the service offers. Moreover, facilitating conditions such as technical support and resources not only directly impact the intention to use, but also indirectly through the improvement of usage attitudes. This shows that banks and e-commerce platforms need to focus on creating a positive environment to improve the adoption and use of EB services.

5. Conclusions and Management Implications

5.1. Conclusion

The results show that perceived usefulness, perceived ease of use, and facilitating condition have a direct impact on attitude towards using EB and intention to use EB services on e-commerce platforms in Vietnam. The results of the study also confirm the positive mediating effect of attitude towards using EB on the above relationships.

There are some significant contributions made by research. First of all, the study advanced the field of research on EB service usage patterns in developing nations. The study's findings indicate that the intention to use EB is comparable to that of certain other developing nations. The results confirm the hypotheses of the TAM model. This result also provides the evidence for the TAM model in the EB field, which is still relatively new and not much research has been done. Moreover, the results provide more knowledge about customer behavior in the field of EB. This outcome enables Vietnamese commercial bank managers to plan and implement digital banking products more proactively. Second, the study's findings indicate that facilitating conditions are the most significant factor influencing the intention to use EB services. When providing services to users, administrators, and e-commerce platforms must concentrate on this foundation.

5.2. Management Implications

Based on the research results, the article proposes some management implications for bank administrators and e-commerce platforms as follows:

The findings show that facilitating conditions have very significant influences on attitudes and the intention to use an EB service on e-commerce channels in Vietnam, providing very important governance implications for bank administrators and e-commerce platforms. Firstly, a technical support environment should be set up solidly by banks. This included a stable and secured information technology infrastructure system, which would help consumers feel secure when using the services. While doing so, simplified and lucid guidelines on how the service is used should also be provided as a way to reduce customer concerns about the process. It is worth considering for banks and e-commerce the partnership with third parties to create comprehensive financial solutions that would provide convenience to users. E-commerce platforms should focus on integrating advanced technologies like artificial intelligence to enhance personalization and streamline the user experience, all while ensuring that electronic business transactions are conducted safely and efficiently. Additionally, establishing a 24/7 support system is crucial

for quickly addressing user issues, ranging from technical glitches to transaction concerns. It's also important for e-commerce platforms to implement robust security measures, including two-factor authentication, end-to-end data encryption, and real-time fraud monitoring, to reduce the chances of financial loss or data breaches.

The result proves that perceived usefulness has a positive effect on attitude and intention to use EB services on e-commerce channels in Vietnam. Hence, for managers, highlighting the use benefits of this service to customers is significant. It will be necessary to improve the feeling of usefulness, foster positive attitudes, and create intentions to use the facilities of EB, which needs several useful solutions for bank administrators and e-commerce platforms. First of all, it is worth conducting media campaigns. Customers need to be educated about the benefits that wait for them with EB. This means creating videos, articles, and infographics that will make them realize the practical value of it. Also, the interface should be user-friendly and easy to use for customers to use this service as soon as possible. It is also a kind of incentive-promotion and offers entailed to all new users to have them experience the service. Moreover, listening to the feedback provided by the users will enhance not only the service but also create a sense that banks and e-commerce sites value customer satisfaction. It would finally apply advanced technology to make it personal, develop a community of users for cohesion, and make many customers want to join in. E-commerce platforms should prioritize the seamless integration of embedded banking services into the shopping experience. This could include options like flexible installment payments, personal finance management tools, and cashback offers. By clearly highlighting practical benefits—such as saving time, enhancing convenience, and optimizing costs—users can better appreciate the value that embedded banking provides, fostering a positive attitude towards its use. Additionally, e-commerce platforms must implement stringent supervision and control measures to ensure the safety of embedded banking transactions. This involves adopting security technologies like data encryption and utilizing fraud detection algorithms.

Perceived ease of use positively influences the attitude and intention to use the facility of EB services on e-commerce channels in Vietnam, and thus it has several administrative implications for bank administrators and e-commerce platforms. This would include investment in designing an intuitive, user-friendly interface that helps consumers get accustomed to the service with ease and bereft of technical barriers. Hosting tutorials or webinars on how to use the service could also enhance perceived ease of use. Again, an effective and fast customer support system will go a long way in solving queries and problems that users come across, hence the bettering of the consumer experience. Finally, embedding innovation and creativity in the culture

of developing the product will avail the best EB solutions and ease of use, hence increasing consumer adoption. E-commerce platforms should prioritize enhancing the perceived ease of use of embedded banking services to foster positive attitudes and increase user intentions to engage with these services. To accomplish this, platforms can refine the user interface by creating a design that is simple, intuitive, and accessible to individuals of all ages and technological backgrounds. Key processes related to embedded banking, such as account registration, credit approval, and transaction execution, should be automated to reduce processing times. Additionally, incorporating visual guides or chatbots directly on the e-commerce platform can assist users in quickly adapting to and confidently utilizing the service with minimal external assistance. Collaborating with partner banks to devise crisis management strategies and offer transaction insurance to users is also an effective approach to alleviate potential negative consequences.

6. Limitations of the Study

Despite the significant contributions that research has made, some limitations remain. First off, because the study is quantitative, it ignores variables that might influence the intention to use EB services. To find additional potential factors, future research may combine qualitative methods. Second, this research is cross-sectional, meaning it gathers data at a time. This approach's drawback is that it isn't appropriate for researching behavior over time. This model can be used in future studies to carry out investigations over time. Third, this study's research model is developed using the TAM model. Specifically, enabling conditions are thought to be an outside influence on users' attitudes and intentions to use EB services. The intention to use EB services can be explained by a variety of additional external environment-derived factors. The study could be expanded in the future by looking at additional factors.

7. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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