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Factors Affecting the Internet Banking Adoption

(Faktor yang Mempengaruhi Penggunaan Perbankan Internet)

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ABSTRACT

Internet banking is a beneficial service; it is less costly, offers the flexibility of time and space, and have excellent customer service. The commercial banks of Mongolia are offering internet banking to its customers to capitalize on its advantages. However, these services remain underutilized by their customers. The factors affecting the use of internet banking in Mongolia remain unknown. This study has integrated the E-service-quality model with the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) to investigate the factors affecting the use of internet banking services offered by the commercial banks in Mongolia. The data was collected through the survey method. Structured Equation Modeling (SEM) was used for the analysis. The results indicate that the E-service quality model is effective and robust. The hypotheses were supported by the data. Attitude, subjective norm, perceived behavioral control, perceived usefulness, and E-service quality were found to be the factors that affect customer's intentions to use internet banking in Mongolia. In the end, the future recommendations, limitations, and implications of the research are discussed.

Keywords: E-service quality, Internet banking, Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB)

ABSTRAK

Objektif kajian ini adalah untuk mengkaji faktor-faktor yang mempengaruhi penggunaan perbankan internet. Menggunakan bank perdagangan Mongolia, kajian ini mengembangkan model kualiti e-perkhidmatan untuk mengkaji faktor-faktor yang mempengaruhi penggunaan perkhidmatan internet yang ditawarkan oleh bank perdagangan tersebut. Makalah ini telah membangunkan model kualiti e-perkhidmatan dengan mengintegrasikan Model Penerimaan Teknologi dan Teori Tingkah Laku Terancang. Data dikumpulkan melalui kaedah tinjauan dan Permodelan Persamaan Berstruktur digunakan untuk analisis. Hasil kajian menunjukkan bahawa model kualiti e-perkhidmatan berkesan dan mantap. Hipotesis disokong oleh data. Kemudahan penggunaan yang dirasakan, kawalan tingkah laku yang dirasakan, hubungan kecekapan, dan peningkatan berterusan perkhidmatan perbankan Internet didapati menjadi faktor yang mempengaruhi niat pelanggan untuk menggunakan perbankan internet. Cadangan pada masa akan datang, batasan dan implikasi kajian turut dibincangkan.

Kata kunci: Kualiti e-perkhidmatan; perbankan internet; Model Penerimaan Teknologi (TAM); Teori Tingkah Laku Terancang (TPB); Permodelan Persamaan Berstruktur

INTRODUCTION

The development and acceptance of Internet banking as the new standard for commerce can reduce the cost of conducting banking transactions. It is user friendly, cheaper, offers flexibility of time and space, has better customer services and offers a variety of services (Turban et al., 2000; Nazaritehrani & Mashali 2020). All such benefits can facilitate customers' online banking experience.

However, despite of the range of services and benefits offered by internet banking (Kalakota & Whinston 1997), many customers are hesitant in using the internet banking due to uncertainty and concerns for cybersecurity (Kuisma et al., 2007; Arthur & Owen 2019). The factors affecting the use of internet banking need to be explored to develop strategies to increase the use of internet banking.

This research has developed a theoretical model by integrating the Technology Acceptance Model (TAM) and the Theory of planned behavior (TPB) model with E-service-quality model to investigate the factors affecting the adoption of Internet banking in Mongolia. Mongolia is undergoing a remarkable turning point in its economic field. The banking industry has developed rapidly, and its business model has gradually developed from agricultural banking to commercial banking. Banks are extremely eager to provide customers with digital services now. Commercial banks in Mongolia want to provide online banking services to their customers to benefit from their cost advantages, because of the country's broad and sparse population. However, these services are still not fully utilized by customers, and banks are unable to grasp what factors will affect consumers' willingness to use online banking. Moreover, the literature has not yet fully discussed the willingness to use online banking in developing countries. For those reasons, this study aims to use a complete model to explore what kind of factors will affect consumers' use of an online banking system (Enkhjargal 2016).

This research aims to answer the following questions: (1) what are the factors affecting user intention to adopt internet banking? (2) which model has better results to predict the intention to use internet banking? (3) which dimension of E-service quality should the banks in Mongolia consider first when they try to improve the service quality of their internet banking services?

LITERATURE REVIEW

THEORY AND HYPOTHESES DEVELOPMENT

Most of the current researches on Internet banking focused on developed countries (Chang & Coppel, 2020; Khattak et al., 2020; Sharma et al., 2020), while only few have discussed the situation in developing countries (Enkhjargal 2016; Thusi et al 2020); secondly, the TAM, TPB and E-SQ models have been used respectively to discuss Internet banking (Baudier et al., 2020; Ziba & Kang 2020), but only few studies have integrated these three models to discuss the status quo of Internet banking. Therefore, this study, by integrating the three models, has its theoretical contributions (Carlos & Oliveira 2017), and the content is described as follows.

Model 1: TAM

Davis (1989) proposed the Technology Acceptance Model (TAM), which is a specific case of the Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980). TAM explains the factors that affect the acceptance and use of technology. TRA, on the other hand, explains the factors that affect the intentions of an individual to perform a specific behavior (Ajzen & Fishbein 1980). Therefore, if the behavioral construct of TRA is replaced by the use or acceptance of the technology, it becomes TAM.

According to TAM, perceived usefulness and perceived ease-of-use are the factors which affect the acceptance of technology (Davis 1989). Perceived usefulness is the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context. It affects the individual's attitude towards exhibiting the behavior, ultimately affecting the actual use through the intention (Davis 1989). On the other hand, perceived ease-of-use is defined as the degree to which the prospective user expects the target system to be free of effort. It affects the perceived ease-of-use (Arshad et al. 2020; Lin et al. 2020).

TAM has been validated in explaining the use of diverse technologies including use of spreadsheets (Adams et al. 1992; Doll et al. 1998; Hendrickson et al. 1993; Mathieson 1991) and electronic mail (Adams et al. 1992; Segars & Grover 1993). According to Davis et al. (1989), TAM is simpler and more robust model than TRA in predicting the use of technology. Venkatesh (1999) suggested that TAM was a simple and reliable model in predicting the use and acceptance of technology. Mathieson (1991) found that TAM was equally useful in measuring the satisfaction level of users with diverse interests. Figure 1 represents the TAM as developed by Davis (1989).

Model 2: TPB Model

The TPB model has successfully explained diverse human behaviors, including the use of information technology (Ajzen 1991; 2002). TPB suggests that one's behavior is affected jointly by attitude towards the behavior and subjective norms (Zhang et al. 2019).

Behavioral intention (BI) measures the strength of the willingness to perform a behavior. On the other hand, attitude measures the extent to which a person has a favorable or unfavorable assessment of the behavior. Subjective norms (SN) measure the perceived pressure of the people, which are of importance to the individual. They include family members, office colleagues and important others. SN is the belief about the expectations of important others, about performing or not performing the behavior. The perceived behavioral control (PBC) is the measure of one's perception of the ease with

which it will perform the task. Therefore, Theory of Planned Behavior (TPB) is grounded on TRA, but it has strengthened TRA by incorporating the variable of PBC to measure the volitional control of the users over the behavior in question (Ajzen 1991).

TAM, while parsimonious, omits important factors of predicting technology use (Mathieson et al., 2001). According to Mathieson (1991) and Taylor and Todd (1995a) the SN, PBC and the constructs of TAM are only minimally overlapping. Since TPB covers more predictors than TAM, it is less parsimonious. Figure 2 shows the TPB model by Ajzen (1991).

Model 3: E-Service Quality (E-serv-Q)

Parasuraman et al. (2005) used SERVQUAL (Parasuraman et al., 1985, 1988) to develop and operationalize the measuring instruments, which was titled E-SQUAL. It consisted of four dimensions with 22 items, with the help of which the dimensions of service quality were captured. The four dimensions were based on Zeithaml et al., (2002). They proposed the website features at the attribute level. They categorized it into eleven electronic service dimensions of quality. The eleven dimensions are reliability, responsiveness, access, flexibility, ease of navigation, efficiency, assurance/trust, security/privacy, price knowledge, site aesthetics and customization/personalization. They were tested and validated. Based on the data and statistical analysis, four different dimensions emerged, which are: 1) efficiency, 2) fulfilment, 3) system availability, and 4) privacy. Efficiency refers to the ease of use of the site. Its responsiveness and fulfilment refers to the needs of the users which are met. System availability is about the technical functioning of the site while privacy refers to the security, the site offers to the information of its customers. e-RecS-Qual is one of the subscales of E-Serv-Qual. It encompasses the phenomenon of handling service problems. It pertains to recovery issues faced by the customers. e-RecS-Qual is a three-dimensional construct which consists of 11 items. The 11 items encompass the three dimensions, which are 1) responsiveness, 2) compensation and 3) contact. The speed with which the issues of the site are handled is known as responsiveness, while compensation measures the level with which the site compensates the customers with the problems they have faced. Contact dimension, on the other hand, is about the assistance that is available in the form of online representatives. The electronic services quality is an exogenous variable in the E-Serv-QUAL scale. It influences loyalty-intentions and perceived-value. It has strong footings as the scale items are based on the customer perceived value of the cost and benefits tradeoff (Zeithaml 1988). The loyalty intentions scale consists of 5-items, which is based on behavioral loyalty scale, which was developed by Zeithaml et al. (1996).

TPB and TAM relationship

The TAM and TPB models have been widely used to analyze the use of IT and acceptance of electronic services (Davis 1993; Hsu 2004; Hsu et al., 2006; Udo et al. 2012; Oviedo-Trespalacios et al. 2020). Nevertheless,

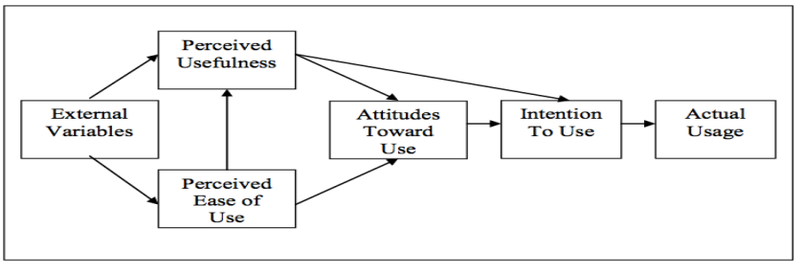

FIGURE 1. Technology Acceptance Model (TAM) Source: Davis (1989)

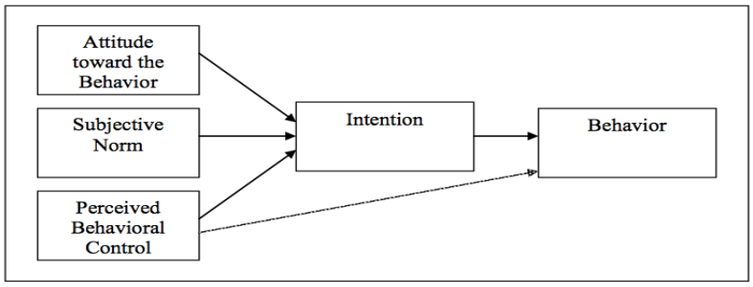

FIGURE 2. Theory of Planned Behavior (TPB) Source Ajzen (1991)

they both failed to provide consistent results (Chen et al. 2007). Therefore, the researchers have integrated them to see if they better predict the behavior together. Since the two models augment each other, it has been found that the integrated models have better explanatory power than if they are utilized independently (Bosnjak et al. 2006; Chen et al. 2007; Wu & Chen 2005; Udo et al. 2012; Oviedo-Trespalacios et al. 2020).

In this research, the integrated model of TAM and TPB were used to study the behavior of the use of internet banking services. The integrated model is utilized mainly because the use of internet banking services encompasses both the use of technology, social systems and personal characteristics of individuals. Therefore, using the integrative model will serve the purpose, comprehensively. The integration of TPB and TAM is done from the perspective of attitude, perceived ease of use, perceived usefulness, subjective norm (SN), and perceived behavioral control (PBC) (Taylor & Todd 1995a; Liao 1999). However, the concept of satisfaction will be not considered as synonymous to attitude, as regarded synonymous by many. It is because attitude is a relatively permanent change than the satisfaction which is temporary.

The integrated model of TPB and TAM was proposed by Taylor and Todd (1995a), which was termed as combined TAM-TPB model. Liao (1999) found empirical support for the use of TAM-TPB model. Many researchers also adopted perceived usefulness and perceived ease of use as the antecedents of intentions as inconsistent results were found for attitude, as the antecedent of behavioral intentions (Venkatesh & Davis 2000; Gefen et al. 2003; Tweneboah-Koduah & Adams 2019).

TPB, TAM, and E-service-quality models provide a conceptual framework for this research. The research identifies the factors affecting the intention to use the internet banking and the variables contained in each model.

ATTITUDE

Many studies exist which encompass the use of diffusion of technological innovations by expanding the TAM to use attitudes of TRA and TPB (Davis et al. 1989; Jayawardhena & Foley 2000; Karjaluoto et al. 2002). It was found that attitude is one of the drivers of consumer attributes and utility (Lancaster 1966). Attitude has been defined as the positive and negative behavior towards an object or a behavior (Triandis 1979). The attitude has been utilized to describe the perception of the usefulness of electronic banking, adaption features, electronic banking features, risk and privacy, and personal preferences. Positive and negative attitudes about a behavior are also formed, keeping in view the outcomes or consequences of a behavior. Thus, a person is likely to have a positive attitude about a behavior which has a positive outcome and vice versa. As far as the customers' attitudes are concerned, they are composed of one's beliefs about the behavior, object or phenomenon. Polatoglu and Ekin (2001) suggested that customer attitude about the use of a service offered by the company primarily constitute of the beliefs about the object. It also depends on the perceived importance. In the context of the internet banking, the customer attitude depends on the perception about the product information provided, mode of payment, privacy and security risk involved, delivery, services offered, quality of experience and ease during the whole process of the transaction. Research suggests that attitudes have a significant and positive effect on the intentions of the customers to use the technology that is, if the customer experience is good, the customer is likely to use the electronic service and vice versa (Hernandez & Mazzon 2007; Eriksson et al. 2005; Jaruwachirathanakul & Fink 2005; Bobbitt & Dabholkar 2001; Dastjerdi et al. 2019). Therefore, based on the existing literature and discussion above, the following hypothesis is proposed:

H1: Attitude positively affects behavioral Intention towards the use of internet banking.

SOCIAL NORM (TPB)

Subjective norms are the product of one's normative beliefs and motivation to follow these beliefs. Therefore, if the result of the product is high, the subjective norms are high and vice versa (Fishbein & Ajzen 1975). The beliefs refer to the expectations of the important others. Important others are the ones to whom the subject give importance; the subject takes care of them for their relationship with him or her. They include persons such as immediate family members, office colleagues, friends and others. The more significant the motivation to follow and comply with the important or referent others, the higher will be the subjective norms. The subjective norms have a more significant effect in the adoption of technology or the use of an electronic service when the technology or the service is new. It is because a potential user takes the necessary input and service information from the important others and then decide to experience it or not. It happens when the customers have no or little prior experience of the use of the electronic services (Hartwick & Barki 1994). In line with the argument stated above, Taylor and Todd (1995) found that the subjective norms better predict the intentions to perform a behavior when the sample included respondents with little or no exposure to the services. It was also found that the subjective norms affect intentions under mandatory scenarios. However, the effect weakens with time (Venkatesh & Davis 2000).

Nonetheless, there are researches which showed that an insignificant relationship was found between subjective norms and consequent intentions to exhibit

the behavior (Shih & Fang 2004). However, other studies have found that the adoption of consumer-centered offers and services is influenced by subjective norms. The subjective norms are formed based on external and interpersonal influence (Fishbein and Ajzen 1975). Hong (2019) found the significant positive effect of subjective norms on the use of mobile value-added services. Therefore, based on the literature review and the discussion above, the following hypothesis is proposed:

H2: Subjective norms positively affect behavioral Intention towards the use of internet banking.

PERCEIVED BEHAVIORAL CONTROL (PBC)

The perceived ease of exhibiting a behavior or performing a task is encapsulated by the variable titled perceived behavioral control. The perceived behavioral control affects the people to decide whether to exhibit the behavior or not. For example, for the tasks for which a person feels that s/he has no control over, it is likely that the person will not perform that behavior. On the other hand, if a person believes that s/he has the control to perform that behavior, the person is likely to exhibit that behavior. According to Bandura (1982), perceived behavioral control is affected by the preparedness, efforts involved, and emotional experience during the exhibition of the behavior. The perceived behavioral control has two components which are 1) self-efficacy and 2) facilitating conditions. The self-efficacy is about one self-confidence in performing the behavior (Bandura 1977; 1982), while facilitating conditions are about the availability of resources to perform the behavior (Triandis 1979). The two components predict the behavioral intention to perform the behavior. It has been found that self-efficacy has a significant positive effect on the use of technology products (Hill et al. 1987). Similarly, Goh (1995) found that the use of Internet banking intentions was facilitated by better technology infrastructure in place. George (2004) found that self-efficacy for online purchasing have a significant positive effect on perceived behavioral control which lead to online purchasing behavior of the customers.

The research conducted by Ajzen (1991) and Davis (1989) to compare TRA and TPB found that perceived behavioral control was a better predictor of intention. Shih and Fang (2004) suggested that perceived behavioral control failed to affect intention significantly in the pure TPB model. Similarly, Ajzen and Madden (1986) and Faham and Asghari (2019) found that perceived behavioral control is less likely to be related to intention. Therefore, based on the literature review and the above discussion following hypothesis is proposed:

H3: Perceived behavioral control positively affects behavioral Intention toward internet banking.

PERCEIVED USEFULNESS (PU)

Plenty of evidence supports the applicability of TAM, as the variables of TAM were found to have a direct significant influence on the intention of use (Davis et al., 1989; Venkatesh and Davis, 1996; 2000; Jackson et al., 1997; Agarwal and Prasad, 1999; Hu et al., 1999; Venkatesh, 1999; Venkatesh et al., 2003; Singh, Sinha, and Liébana-Cabanillas, 2020). One of the most important reasons for using the e-service systems is the perception of the usefulness of the transaction. Lee (2009) and Yadav et al. (2015) found that perceived usefulness significantly influences the consumer's intention to adopt internet banking. Therefore, based on the literature review and the discussion above, the following hypotheses are proposed:

H4: Perceived usefulness positively affects behavioral Intention towards the use of internet banking.
H5: Perceived usefulness positively affects attitude towards the use of internet banking.

PERCEIVED EASE OF USEFULNESS (PU)

Given the difficulty in understanding the ever-changing technology, the construct of perceived ease of use has remained promising in predicting the intentions and the consequent behavior (Davis et al., 1989; Venkatesh and Davis, 1996; 2000; Jackson et al., 1997; Agarwal and Prasad, 1999; Hu et al., 1999; Venkatesh, 1999; Venkatesh et al., 2003; Singh et al., 2020). In the case of website usage, where the customer does not directly talk to the vendor, the variable of ease of use, significantly affects intentions and the usage behavior. A responsive website with a preference for ease of use features will be likely to get more traffic than a difficult to use the website (Gefen et al., 2003). At the same time, it is worth noting that easy and fast processes are a must for a fruitful business transaction (Kumar, 1996). If the ease of use of the website is emphasized through the website design and the website is made user-friendly, there are more chances of a transaction on an e-commerce website that otherwise. Such type of websites also pass the message of being a secure website to the users, and the users also have the feeling that the owner of the website is serious in the business and they will not exploit the information provided to them by the customers (Moon and Kim, 2001). Such indicators also imply that the ease of use will have a positive influence on the intention to use the online services offered by the website (Wang et al., 2003). In other words, customers who perceive to have experienced ease-of-use on the website will perceive the credibility of the website more than otherwise. Further, the perceived ease of use has been found to have a significant relationship with intentions and consequent behavior. It was also found to have a significant effect on trust-related constructs (Gefen et al., 2003; Wang, 2003; Wang et al., 2003; Luarn and Lin, 2005). Therefore,

based on the discussion above, the following hypotheses are proposed:

H6: Perceived ease of use positively affects attitude towards the use of internet banking.
H7: Perceived ease of use positively affects perceived usefulness towards the use of internet banking.

E-SERVICE-QUALITY

Electronic service quality is operationalized in this research as "the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery of products and services" (Zeithaml et al., 2002). The customer assesses the quality of a website and e-service quality based on many variables and touchpoints. This includes website interaction experience, which also has dimensions of core service quality such as efficiency, and privacy, etc. The quality of a website is also assessed by the customers through the quality of e-recovery services such as responsiveness, compensation, contact, etc. (Parasuraman & Grewal, 2000). It has been found that website design, fulfilment/ reliability, privacy/security, and customer service are the hallmarks of service quality for an e-commerce website (Keating et al., 2003; Shankar and Jebarajakirthy, 2019). With the ever-evolving technology and website designs, the research on the dynamics of giving better online shopping experience is still under-researched. Few of the researchers have found that service quality is significantly related to satisfaction and website patronage. Therefore, based on the literature review and above discussion following hypotheses are proposed:

H8: Overall E-service quality has a positive effect on users' behavioral intention towards the use of Internet banking.

RESEARCH DESIGN AND METHODOLOGY

RESEARCH FRAMEWORK

The framework of this study is based on the behavioral intention model, referred to as TPB, TAM, and E-service quality. Figure 3 shows the related variables in this research. The model's main concepts focusing on attitude and behavioral intention are affected by both TAM and TPB with E-service quality. For example, attitude is affected by perceived ease of use and perceived usefulness with an E-service quality system. Thus, this study uses H_2, H_3, and H_{10} to examine the relationships. Another core variable, behavior intention, is affected by attitude, social norm, and PBC with an E-service quality system. Here, the study uses H_6, H_7, and H_8 to examine these relationships. As the research framework is based on the integration of the three models, the model inevitably has some assumptions, which have facilitated the research to have a more comprehensive understanding of the use behaviors of internet banking in developing countries.

MEASUREMENT AND QUESTIONNAIRE DESIGN

A pilot study was conducted in which a questionnaire was distributed among 30 subjects. The questionnaires containing socio-demographic items and items related to the constructs of the study were floated. As the result of the pilot study some of the items were removed. However, some items were adapted to ensure the item-statement clarity and remove any redundancy. Overall, the research questionnaire consisted of variables form both TAM and TPB model. It was done so to have a comprehensive set of variables to better predict consumer intention to use internet banking. Therefore, our research model consisted of six constructs that were: 1) perceived ease of use, 2) perceived usefulness, 3) attitude, 4) subjective norm, 5) perceived behavioral control as intervening variable, and 6) intention to use as the dependent variable.

The scales of attitude, perceived ease of use, perceived usefulness and intentions were adapted from Cheng et al. (2006). The scale of attitude and perceived ease of use contained four and three items respectively. In the scale of perceived ease of use, one reverse coded item was added to verify that the respondent paid attention while filling the questionnaire. The scale of Perceived usefulness and intention to use contained four and three items respectively.

The scale of perceived behavioral control and subjective norms was adapted from Wu and Chen (2005), consisting of five and three items, respectively. However, one item in the subjective norms was adopted from Sripalawat et al., (2011). The scale of E-service quality was adapted from Zeithaml et al., (2000, 2002).

This research focused on the users' experience of the services offered by the internet banking website. Therefore, it was important to examine the scale based on pure service sites. It required modifications in the scale without compromising the psychometric properties. Since the sale of the product was not involved, fulfillment, responsiveness, and compensation dimension were dropped. This research applied 1) efficiency, 2) system availability, 3) privacy, and 4) contact from the E-SQUAL (Parasuraman et al., 2005) to compose the construct of E-service quality. Thus, a comprehensive examination of the adapted scale was performed.

The questionnaires containing the finalized items were distributed online to the population of Ulaanbaatar. The total of 211 questionnaires were returned; 61 of the questionnaire returned were unusable. Therefore, the final useful sample contained 150 respondents. By G-power tool, sample size of 120 sample was sufficient for conducting relevant statistical results in our case.

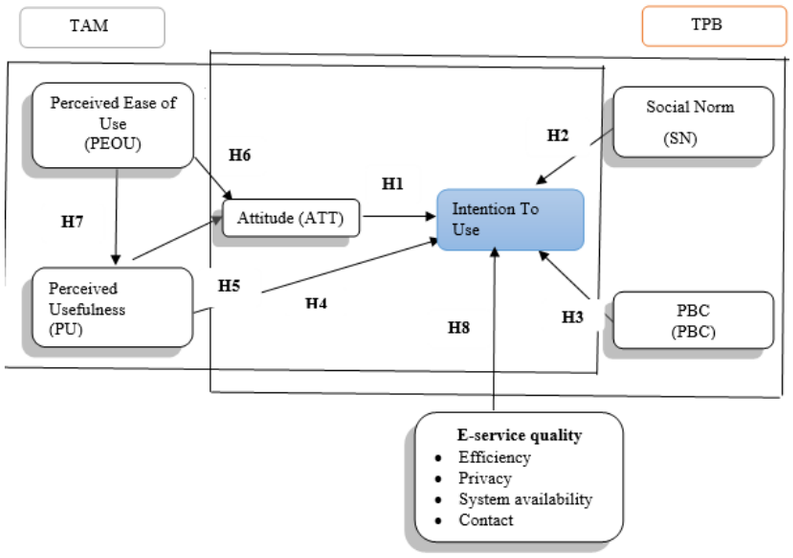

FIGURE 3. Research Framework

RESULTS AND DISCUSSION

VALIDATING THE MEASUREMENT MODEL WITH FIRST-ORDER REFLECTIVE CONSTRUCTS

Reliability

The reliability of the scales in the questionnaire was found by using the Cronbach's alpha. The values of composite reliability for each item was found to fall between 0.760 - 0.959; as shown in Table 1, while the reliability of all the constructs was found to be above 0.70 which is acceptable reliability score (Werts et al., 1974; Fornell & Larcker, 1981). Therefore, our scale was found as reliable.

Convergent Validity

When the variance explained by L.V. of its indicators is higher than the variance due to the measurement error, the construct is said to have good reliability. According to Fornell and Larcker (1981) the average variance extracted (AVE) higher than 0.50 shows that this requirement has been met. Table 1 shows that the AVE of our model was above 0.76 and over 0.560. Therefore, the convergent validity of our variables was found to exit.

Discriminant validity

If the square root of the average variance extracted of each construct is found to be higher than its bi-variate correlation, discriminant validity is said to have been achieved for the constructs. It is further complemented if the indicators are loaded more on their constructs than others (Chin 1998; Compeau et al., 1999). It is evident from the Table 5.10 that square roots of AVE are higher than the bi-variate constructs correlation. The AVE are written on the diagonal while the bi-variate construct correlation is given off-the-diagonal elements. It is evident that the measurement model is reliable, convergent and discriminant validity is achieved. Therefore, none of the items were deleted. Thus, we were confident in proceeding to assessing the structural model. This is shown in Table 2.

VALIDATING THE MEASUREMENT MODEL WITH SECOND-ORDER FORMATIVE CONSTRUCTS

Reflective indicators are interchangeable; however, in formative measurement models, high correlations between items are not expected. In case, a high correlation is found in formative models, it is known as collinearity. It can be of significant problem from both the methodological point of view and interpretational point of view.

The SMART PLS version 3.2.3 is powerful tool for structural equation modelling, which also provides the acceptable values (tolerances) and the VIF values. However, SPSS was used for a detailed analysis and results. The tolerance represents the amount of variance of one formative indicator unexplained by the other indicators in the same block. (i.e., VIFx1=1/TOLx1). If a variable has a high collinearity with another variable which is indicated by tolerance value of 0.20 or lower and a VIF value of 5 or higher, it should be eliminated, merged as one, or a higher-order latent variable. Table 3 shows that the Contact has the highest VIF value (2.269). Therefore, all the values of VIF of other variables are below the threshold value of 5. This

suggests that collinearity does not reach critical levels in the E-Serv-Q formative construct. Therefore, there is no problem in using it in estimating the PLS path model in our research.

STRUCTURAL EQUATION MODELING (SEM) AND PATH ANALYSIS FOR HYPOTHESES TESTING

Partial Least Squares Path Analysis (PLS) can be of great help to have insights into complex theoretical relations between constructs even when the sample size is small. The sample size which otherwise would be considered insignificant in estimated SEM. PLS is closely related to SEM. In PLS theoretical relations are tested for a system of variables. PLS is a widely used technique, which is used in organizational behavior, psychology, marketing, information management systems, and accounting-journals-report. PLS analyses are utilized as frequently as SEM (Hair et al., 2013). However, the PLS does not estimate model fit as there is no standard to compare a model against or with.

TABLE 1. Factor loadings, CR, and AVE Results

Variables	Indicators	Factors loadings	CR	AVE
Attitude	ATT1	0.855	0.935	0.781
	ATT2	0.888		
	ATT3	0.899		
	ATT4	0.893		
Intention	BI1	0.879	0.918	0.789
	BI2	0.915		
	BI3	0.871		
Contact	CS1	0.829	0.869	0.689
	CS2	0.859		
	CS3	0.801		
Efficiency	EFF1	0.782	0.914	0.569
	EFF2	0.795		
	EFF3	0.758		
	EFF4	0.766		
	EFF5	0.714		
	EFF6	0.769		
	EFF7	0.718		
	EFF8	0.731		
Perceived Behavioral Control	PBC1	0.765	0.917	0.688
	PBC2	0.864		
	PBC3	0.808		
	PBC4	0.851		
	PBC5	0.857		
Perceived Ease of Use	PEOU1	0.866	0.882	0.713
	PEOU2	0.845		
	PEOU3	0.821		
Privacy	PRI1	0.797	0.893	0.677
	PRI2	0.827		
	PRI3	0.862		
	PRI4	0.805		
Perceived Usefulness	PU1	0.841	0.907	0.708
	PU2	0.815		
	PU3	0.868		
	PU4	0.842		
Social Norm	SN1	0.946	0.959	0.887
	SN2	0.932		
	SN3	0.948		
System Availability	SYS1	0.766	0.839	0.571
	SYS2	0.862		
	SYS3	0.571		
	SYS4	0.792		

To test the hypotheses, a structural model was built using the Smart PLS program. The path coefficients were produced using a bootstrapping procedure. With the help of bootstrapping the sample size (n=150) was increased to 5000 re-samples. The results are shown in Table 4. The hypotheses result presented in Table 4 show that the t-value exceeds 1.65 at $p<0.1$, $t>1.96$ at $p<0.05$, and $t>2.57$ at $p<0.01$ for a two-tailed test which is the minimum requirement.

The results of the structural model with significance values and the standardized path coefficients between each construct are shown in Table 4. In this study behavioral intention was jointly predicted by Attitude (path-coefficient = 0.235; $p<0.05$), Perceived Behavioral Control (path-coefficient = 0.251; $p<0.05$), Perceived Usefulness (path-coefficient = 0.095; $p<0.05$) and E-service quality (path-coefficient = 0.445; $p<0.05$) and E-service quality has the highest impact level. These variables explained 82.8% of the total variance, though the impact of SN (path-coefficient = 0.005; $p>0.05$) is not significant. The test of the hypotheses in this study is shown as follows.

1. Attitude and adoption intention of internet banking.

Hypothesis 1 is concerned if there is a significant relationship between attitude and adoption intention of internet banking. Table 4 shows that the t-value for this relationship is 3.250 that is greater than 2.57 the requirement of significance at $p<0.01$. H1 is supported. Therefore attitude will positively affect behavioral intention towards the use of internet banking. This finding supports the findings of Hernandez and Mazzon (2007) and Dastjerdi et al. (2019).

2. Subjective norm and adoption intention of internet banking

Hypothesis 2 is concerned if there is a significant relationship between subjective norm and adoption intention of internet banking. Table 4 shows that the t-value is for this relationship 0.155 which is smaller than 1.65 the requirement of significance at $p<0.1$. H2 is not supported. Therefore subjective norms will not positively affect behavioral intention towards the use of internet banking. This finding conflicts with the findings in Lee (2009) and reflects the reality that the service of internet banking is still not fully utilized by customers.

TABLE 2. Correlation Matrix and Average Variance Extracted for Principal Construct

	Attitude	Contact	Efficiency	Intention toward Internet Banking	Perceived Behavioral Control	Perceived Ease of Use	Perceived Usefulness	Privacy	Social Norm	System Availability
ATT	0.884									
CS	0.617	**0.830**								
EFF	0.625	0.741	**0.754**							
BI	0.787	0.799	0.772	**0.888**						
PBC	0.762	0.692	0.623	0.803	**0.829**					
PEOU	0.707	0.511	0.505	0.565	0.65	**0.844**				
PU	0.66	0.583	0.549	0.671	0.601	0.588	**0.841**			
PRI	0.641	0.755	0.718	0.78	0.664	0.478	0.603	**0.823**		
SN	0.307	0.162	0.199	0.244	0.213	0.195	0.189	0.215	0.942	
SYS	0.13	0.266	0.282	0.152	0.187	0.081	0.05	0.225	0.094	**0.756**

* Diagonal elements are square roots of AVE

TABLE 3. Validation of 2nd order formative construct of E-service quality

Dimensions	VIF	Weight	t-value	Significance
Contact	2.866	0.235	20.4678	P<0.01
Efficiency	2.555	0.530	25.2356	P<0.01
Privacy	2.680	0.306	19.1868	P<0.01
System Availability	1.089	0.076	2.7853	P<0.01

3. Perceived behavioral control and adoption intention of internet banking.

Hypothesis 3 is concerned whether there is a significant relationship between perceived behavioral control and adoption intention of internet banking. Table 4 shows that the t-value for this relationship is 3.500 that is greater than 2.57 the requirement of significance at p<0.01. H3 is supported. Therefore perceived behavioral control will positively affect behavioral intention towards the use of internet banking in Mongolia. This finding supports the research conducted on Indian youth by Yadav, Chauhan, and Pathak (2015).

4. Perceived usefulness and adoption intention of internet banking.

Hypothesis 4 is concerned whether there is a significant relationship between perceived usefulness and adoption intention of internet banking. Table 4 shows that the t-value for this relationship is 1.733 which is only greater than 1.65 the requirement of significance at p<0.1. H4 is minor supported. Therefore perceived usefulness will positively and with less importance affect behavioral intention towards the use of internet banking in Mongolia. This finding supports the research conducted on Indian youth by Yadav, Chauhan, and Pathak (2015) and in Taiwan conducted by Lee (2009).

5. Perceived usefulness and the attitude toward the adoption intention of internet banking.

Hypothesis 5 is concerned whether there is a significant relationship between perceived usefulness and the attitude toward the adoption intention of internet banking. Table 4 shows that the t-value for this relationship is 4.573 which is greater than 2.57 the requirement of significance at p<0.01. H5 is minor supported. Therefore perceived usefulness will positively affect the attitude toward the behavior of using internet banking in Mongolia. This finding is similar to the research conducted on Indian youth by Yadav et al (2015) and in Taiwan conducted by Lee (2009).

6. Perceived ease of use and the attitude toward the adoption intention of internet banking.

Hypothesis 6 is concerned whether there is a significant relationship between perceived ease of use and the attitude toward the adoption intention of internet banking. Table 4 shows that the t-value for this relationship is 6.958 which is greater than 2.57 the

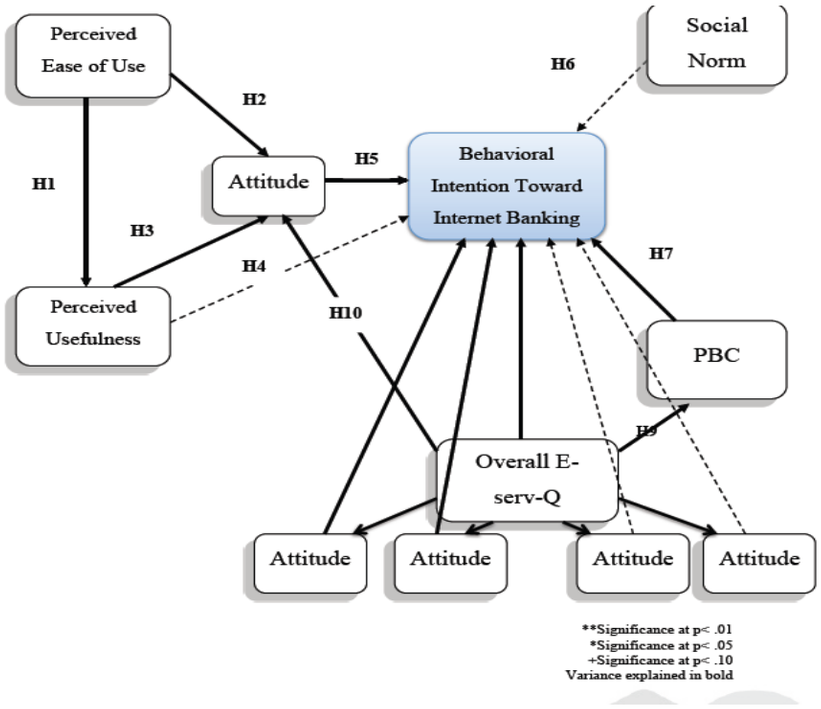

FIGURE 4. Full Structural Equation Model

TABLE 4. Path coefficients of the structural model

Path	Coefficient	T Statistics	P-value	Conclusion
ATT -> Intention	0.235	3.250	P<0.01	H1 is supported
SN -> Intention	0.005	0.155	P>0.05	H2 is not supported
PBC -> Intention	0.251	3.500	P<0.01	H3 is supported
PU -> Intention	0.095	1.733	P<0.1	H4 is supported
PU -> ATT	0.360	4.573	P<0.01	H5 is supported
PEOU -> ATT	0.491	6.958	P<0.01	H6 is supported
PEOU -> PU	0.588	7.310	P<0.01	H7 is supported
E-SQ -> Intention	0.445	6.688	P<0.01	H8 is supported

TABLE 5. Regression estimation and their significance for the second-order model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
E-serv-Q-> Attitude	0.33	0.329	0.092	3.579	0.001
E-serv-Q-> Intention	0.464	0.457	0.069	6.75	0.001
E-serv-Q-> Perceived Behavioral Control	0.721	0.721	0.049	14.698	0.001

requirement of significance at p<0.01. H6 is supported. Therefore perceived ease of use will positively affect the attitude toward the behavior of using internet banking in Mongolia. This finding is similar to the findings in Singh et al. (2020) and also similar to the research conducted on Indian youth by Yadav et al (2015) and the research in Taiwan conducted by Lee (2009).

7. Perceived ease of use and attitude towards the use of internet banking.

Hypothesis 7 is concerned whether there is a significant relationship between perceived ease of use and the perceived usefulness of adopting internet banking. Table 4 shows that the t-value for this relationship is

7.310 which is greater than 2.57 the requirement of significance at p<0.01. H7 is supported. Therefore perceived ease of use will positively affect the perceived usefulness of using internet banking in Mongolia. This finding is the same as the research conducted by Lee (2009).

8. E-service Quality and adoption intention of internet banking

Hypothesis 8 is concerned whether there is a significant relationship between E-service quality and the intention of adopting internet banking. Table 4 shows that the t-value for this relationship is 6.688 which is greater than 2.57 the requirement of significance at p<0.01. H8 is supported. Therefore E-service Quality will positively affect the intention of using internet banking in Mongolia. This finding supports the research conducted by Shankar and Jebarajakirthy (2019) and the integration of E-service quality with TPB and TAM.

EXAMINATION OF THE PREDICTIVE POWER OF THE PROPOSED MODEL

A research model provides us with the opportunity to make statistical inferences from a sample to make inference about the population. To do so, the model must be robust, comprehensive enough to describe the relationship but parsimonious to analyze, understand and use (Claeskens and Hjort, 2008). Smart PLS doesn't provide any g-o-f indicators; thus, R-square has been used to examine the predictive power of the proposed model. Table 6 shows the intention to adopt Internet banking's R-square of each model.

TABLE 6. R square comparison

Model	R square
TAM	0.660
TPB	0.719
TAM+TPB	0.738
TAM+TPB+E-service quality	0.826

To find if an exogenous variable has a substantial impact on the endogenous variable, the exogenous variable is omitted from the model and the change in the value of R2 is observed. This measure is referred to as the f2 effect size. The effect size can be calculated according to Eq. (1)

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}}, \quad (1)$$

Guidelines for assessing f4 are that values of 0.02, 0.15 and 0.35 to represent small, medium and large effects, respectively (Cohen, 1988) of the exogenous latent variable. We compared our model with the other four models to examine the predictive power of our model in terms of adjusted R2: (1) TAM, (2) integrated TAM and TPB, and (3) integrated TAM and TPB with E-serv-Q. To calculate the effect size (f2) (Chin, 1998), Cohen's (1988) formula was utilized.

1. TAM predicts R^2 = .66 of the variance in intentions to adopt Internet banking.
2. An integrated TAM-TPB explains R^2 = .74 (f^2 = .30) of the variance in intentions to adopt Internet banking.
3. An integrated TAM-TPB with E-serv-Q explains R2 = .83 (f^2 = .53) of the variance in intentions to adopt Internet banking.

In sum, integrated TAM and TPB with E-serv-Q has significantly higher predictive validity compared to the original TAM and TPB models, as shown by the substantial effect sizes (Cohen,1988). The integrated model which contains TAM, TPB and E-Serv-Qual better predicts intentions to use internet banking than other independent models.

CONCLUSION AND IMPLICATION

RESEARCH DISCUSSIONS AND CONCLUSIONS

This study has proposed a new integrated model of E-service quality, TPB, and TAM to better predict the intentions of a behavior. The model was tested to predict the intention of using internet banking in Mongolia. The results of the study come from data using Structured Equation Modeling (SEM) to evaluate the strength of the hypothesized relationships. The results provide support for TAM and TPB integrated with E-service quality models and confirm their robustness in predicting customers' intention toward the adoption of internet banking. Several new findings have also been established regarding E-service quality, TPB, and TAM. Based on the findings, the answers to the research questions are proposed as follows.

1. What are the factors affecting user intention to adopt internet banking?
   Intention towards adopting the internet banking was jointly predicted by Attitude (path-coefficient = 0.235; p<0.05), Perceived Behavioral Control (path-coefficient = 0.251; p<0.05), Perceived Usefulness (path-coefficient = 0.095; p<0.05) and E-service quality (path-coefficient = 0.445; p <0.05) and E-service quality has the highest impact level. E-service quality had the highest explanation power, followed by perceived behavioral control. However, there is no significant difference between

the intention toward adopting internet banking and the social norm.

2. Which model has better explanatory power?
   Our results show that the integrated model of TPB, TAM, and E-service quality has the highest explanatory power with R-square = 82.6%.

3. Which dimension, among the four dimensions of E-service quality, should the banks consider while evaluating their internet banking services?
   E-service quality has four dimensions: Contact (path-coefficient = 0.235; $p<0.01$), Efficiency (path-coefficient = 0.530; $p<0.01$), Privacy (path-coefficient = 0.306; $p<0.01$), and System availability (path-coefficient = 0.076; $p<0.01$). Efficiency has the highest path coefficient, which means the customers prefer efficient use of web site interfaces. Privacy has the second-highest power of explanation. The Privacy dimension is more concerned with the protection of customer's personal information. If the internet banking service in Mongolia exhibits efficient performance and complete protection of the personal information of customers, customers will enjoy using internet banking in Mongolia. Therefore, the banks should consider the Efficiency and Privacy dimensions of the E-service quality model while evaluating their internet banking services.

MANAGERIAL IMPLICATIONS

The findings of this study have a profound effect on the use of internet banking services offered by commercial banks in Mongolia. This study provides the essential factors that are considered by customers to affect their intentions to use internet banking services. It is evident from the findings that the banks should focus on the efficiency of internet banking websites and service selection features. During such planning of the websites, software developers must pay attention to the informative content, which must include crisp and concise information and services. Similarly, marketing experts should pay heed to sell the benefits and privacy protection of internet banking to its users. Moreover, the banks must allocate a marketing budget to promote internet banking and its advantages rather than only allocating budget on the branding of the bank.

Generally speaking, the integration of the E-service quality model with the TAM and TPB model can significantly increase the explanation power of the intention toward using internet banking and the efficiency is most important among the four dimensions in the E-service quality model. In economic implications, the efficiency of online banking will affect bank value and then influence a country's economic performance through financial development. Furthermore, in the current internet era, consumers using online banking services can also quickly reduce the information asymmetry between borrowers and lenders, improve the efficiency of bank operations, and activate the flow of cash. A monetary policy can also timely improve the currency multiplier and eliminate international trade imbalances as well.

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