



## **What Motivates the Adoption Intention of e-banking Services: The Moderating Role of Age and Gender**

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### **ABSTRACT**

Despite the benefits of using e-banking services, the adoption intention of e-banking in Sri Lanka is still under-researched. This paper integrates awareness, convenience, and website usability with moderators' effects to test customer acceptance of e-banking services. Hence, this paper extends the technology acceptance model (TAM). Data were collected through a primary survey of 186 banking customers and used the structured equation modeling for data analysis. The results show that perceived usefulness, convenience, and website usability influence customers' intention to e-banking adoption. In contrast, perceived ease of use and awareness failed to show a significant relationship. Age and gender did not have substantial moderating effects but explain the impact on the exogenous variable relationship. This study integrates moderators into a broader model to investigate the users' acceptance of e-banking services, and particularly, the country-specific research could be more viable ground for other countries similar in context

**Keywords:** E-banking Adoption Intention, Technology Acceptance Model, Sri Lanka.

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## INTRODUCTION

Over the last two decades, rapid advancements in technology have made increasing utilization of electronic banking services (Al-Otaibi et al., 2018). E-banking is a modern trend in the banking sector, but its adoption intention is very low as the composition of the population. According to the Central Bank Report (2018), of the 21 million total population 7,263,161 internet and e-mail users, which accounted for 34.5%. Among this desk-top or laptop 25%, mobile phones 70.9%, tablet 2.2%, and other devices 1.9% are using the internet connection (Mano et al., 2020). Although prior studies have examined e-banking service adoption intention, most of these studies have explored in developed countries, and only a few have focused on developing countries contexts (e.g., Mano et al., 2020; Mansour, 2016; Jaruwachirathanakul & Fink, 2005a; Khan et al., 2017). Similarly, prior studies have addressed the adoption intention of e-banking from rapidly developing Asian countries' context (e.g., Chan and Lu, 2004; Brown et al., 2004; Susanto et al., 2013a). Most of these studies are covering only a fraction of e-banking service adoption intention in the Asian region. However, researchers have not treated the adoption of e-banking services in detail, and little attention has been paid to the Sri Lankan context (Aboobucker & Bao, 2018). Relatively, the banking sector in Sri Lanka is undeveloped compared to developed and developing countries in the World and the Asian region (Aboobucker & Bao, 2018). Therefore, an empirical study that focuses on the factors that motivate the adoption intention of e-banking services will provide useful insights into the Sri Lankan context.

E-banking is the same as accessing banking services via electronic devices and the Internet (Nasri & Charfeddine, 2012). Nowadays, the increased use of mobile services and greater utilization of the Internet have become a new delivery channel for banking transactions in e-banking. Though Internet usage is high, E-banking usage is comparatively low in Sri Lanka (Mano et al., 2020). Further, in the banking industry, traditional banking practices are replaced by e-banking activities in the modern economy. E-banking offers benefits such as cost savings, greater control over service delivery, reduced waiting times, higher perceived levels of customization, and convenient access to services without time or space constraints to customers (Montazemi & Qahri-Saremi, 2015; Khan et al., 2017). Researchers claimed that e-finance could be a revolution, that can be introduced swiftly even where basic financial infrastructure is weak in developing country context (Benamati & Serva, 2007). The banking sector is an example in which IT infrastructures have had

implications for the economic development of many nations in developing countries (Kamel, 2005). People accept or reject the application of technology due to several reasons such as the user's beliefs and attitude, satisfaction, adaptation to change, culture, education, and awareness. But from the banking perspective, the business value of e-banking is to generate additional revenue, improve customer service, extend marketing, and increase cost savings.

According to Khan et al. (2017), Asian countries are becoming more and more involved in online banking services, and the customers in these countries are more likely to use e-banking for their financial transactions. The reason for the success of e-banking is the range of benefits it offers to banks, customers, enterprises, public organizations, and society (Themistocleous et al., 2015). The recent years' competition, advancement in IT, and customers' lifestyles have changed the face of banking activities among Sri Lankan customers as well. Prior studies emphasized that the call for further investigation on Internet banking acceptance either in different countries or other context (e.g., Martins et al., 2014; Cockrill et al., 2009; Yousafzai et al., 2009; Benamati et al., 2010). There is less empirical evidence that IT acceptance models established in developed countries can be applied equally well to less-developed countries without some modification (Sukkar & Hasan, 2005). Scholars have suggested that the inclusion of a set of moderators that remain mostly untested such as culture dimensions (Min et al., 2009) and experience (Venkatesh & Bala, 2008). Similarly, age and gender have relatively been paid little attention in the literature (Wang et al., 2009). Against this backdrop and from these research gaps, this study is motivated and tries to explore the motivating factors with the moderating role of age and gender. Thus, this study addresses the following research questions:

RQ1. Which factor/s motivating the acceptance of e-banking services among banking customers in Sri Lanka?

RQ2. How age and gender have the moderating effect of each motivating factor – Internet banking acceptance relationship?

This study aims to contribute to e-banking literature in the Sri Lankan context in the following aspects. First, this study integrates moderators into a broader model to investigate the users' acceptance of e-banking services which are lacking in the previous studies. Second, Sri Lanka could be a more viable ground for examining factors that motivate customer adoption intention in e-

banking services, especially after the 30 years of civil war and the economic restoration of its economy. Third, this study uses TAM and extends three other exogenous latent constructs such as awareness, convenience, and website usability that are typically considered an essential characteristic in online systems acceptance.

The rest of the paper organized as follows. The second section develops the background and theoretical framework. Hypothesis development, research methodology, data analysis, hypothesis testing, discussion of results, and findings follow. The paper concludes with a discussion of theoretical and practical implications and limitations.

## **LITERATURE REVIEW**

The advancement of technological innovation has made tremendous changes in the banking industry (Nasri & Charfeddine, 2012). As such, the evolution of banking has driven the mode of bank service delivery by automated teller machine (ATM), mobile banking, telebanking, and Internet banking (Nasri & Charfeddine, 2012; Sinha and Mukherjee, 2016). The literature suggests many terminologies to refer to electronic banking, such as Internet banking, e-banking, and online banking (Nasri & Charfeddine, 2012). E-Banking offers customers to perform a wide range of banking activities and transactions, such as paying bills, fund transfer, printing statements, account balance inquiry, and e-payments. Internet banking helps retain present customers, advance customer satisfaction, increase banks' market share, decrease administrative and operational costs, and improve banks' competitive positions (Khalfan et al., 2006; Almogbil, 2005). IT is transforming the banking sector towards development, such as it allows access to information, loans, and microcredit for poor farmers in rural communities (Kamel, 2005). As banks become ever more automated in developed countries, banks must carefully consider the implications of using technology to substitute for interpersonal interaction with the customer, as this automation may decline trust and increase distrust among customers (Benamati & Serva, 2007).

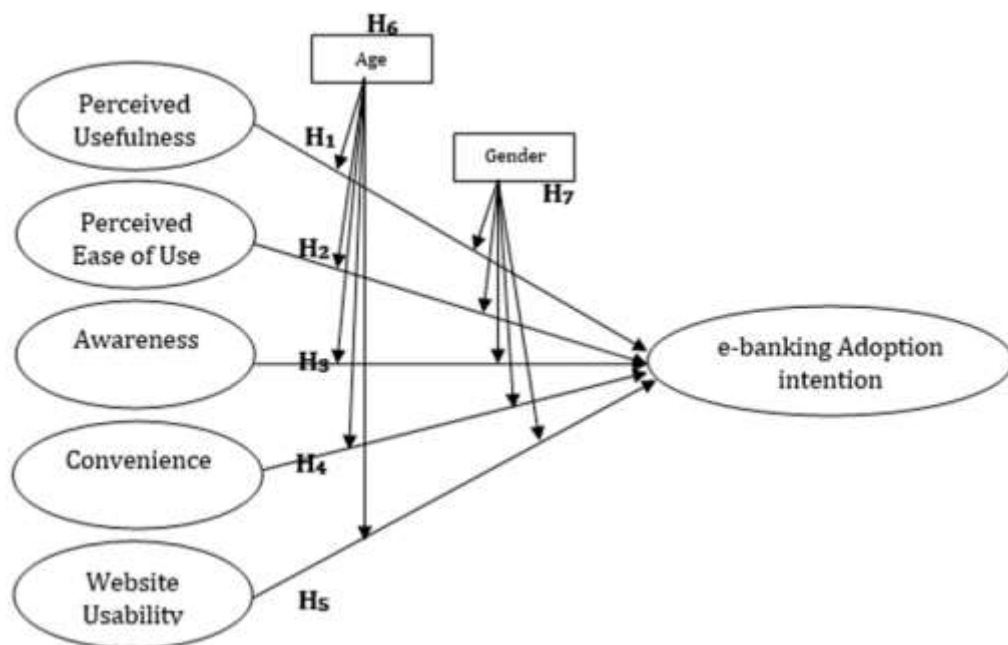
In the literature, various theoretical models have been applied to explain the determinants of e-banking adoption among banking customers (Nasri & Charfeddine, 2012). The popular theoretical models which describe the relationship of user beliefs, attitudes, and intentions included in the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Technology Acceptance

Model (TAM) (Davis, 1989) and, Theory of Planned Behavior (TPB) (Ajzen, 1991). TRA suggests that beliefs influence the attitudes that direct to intentions and then generate behaviors (Ajzen & Fishbein, 1977). Except for the above theories in social psychology, TAM has been validated as an essential framework in explaining IT adoption by users (Davis, 1989). TAM is intended to predict IT acceptance, where perceived usefulness and perceived ease of use are the primary determinants of attitudes that influence behavioral intention to use the actual system (Wang et al., 2003; Davis, 1989; Venkatesh et al., 2003). TPB is more focused on the perceived behavioral control, which is the perceived ease or difficulty of performing the behavior (Ajzen, 1991). According to Lee (2009), TAM is an adaptation of the theory of reasoned action by Fishbein and Ajzen (1975) and was primarily designed for modeling user acceptance of information technology. This model assumes that system use is directly decided by behavioral intention to use, which is pressured by users' attitudes toward using the system and the perceived usefulness of the system.

Technology Acceptance Model (TAM) has been found to have adequate explanatory power, and the addition of moderators could further improve it (Sun and Zhang, 2006). Past research applied the TAM model in several countries' contexts to predict the adoption of Internet banking, for example, Taiwan (Lee, 2009), Tunisia (Nasri & Charfeddine, 2012), India (Sinha & Mukherjee, 2016), Malay and Chinese ethnic group (Khalil & Sutanonpaiboon, 2010). Despite this region, some studies, for example, Al-Otaibi et al. (2018), studied user satisfaction of mobile banking in both the United Kingdom and Saudi Arabia. Also, Giordani et al. (2014) show that branch dissatisfaction and high branch fees have no impact. Customers prefer to visit branches and ATM users are more likely to adopt Internet banking services in Greece. Moreover, in 2003 researchers introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which can explain 70% of the variance in intention. It includes four constructs that act as determinants of behavioral intentions and use behavior such as (i) performance expectancy, (ii) effort expectancy, (iii) social influence, and (iv) facilitating conditions and four moderator variables such as gender, age, experience, and voluntariness of use. According to (Rodrigues et al., 2016), the behavioral intention depends on the cognitive choice of an online user to respond positively (like) or negatively (dislikes) to online shopping.

To attend to the above-stated highlights, this research model includes TAM and extending with three additional constructs and enlarges the scope of the adoption intention decision by focusing on five exogenous latent constructs such as perceived usefulness (PU), perceived ease of use (PEOU), awareness, convenient and website usability linked with endogenous construct e-banking adoption intention which is moderated by age and gender. In this study, the reason for extending the existing TAM model with the new constructs are as follows. First, the original TAM model is already well examined in past studies. Second, the TAM model-based findings are widely generalized in the literature. Third, researchers believe that including additional constructs with the existing TAM will bring noteworthy insights for e-banking adoption intention research. Finally, this is the first research attempt that uses the extended TAM in Sri Lankan context e-banking adoption intention study.

**Research Model and Hypothesis Development**



**Figure 1: Research Model**

**Table 1:** Prior Studies on e-banking Services

Study	Research Model / Variables Used	Sample Size & Statistical Test	Findings
Foon and Fah (2011)	Unified theory of acceptance and use of technology (UTAUT)	200, Multiple linear regressions	Performance expectancy, effort expectancy, social influence, facilitating condition and trust positively correlated with behavioural intention among Malaysian.
Lassar et al. (2005)	Integrates TAM and adoption of innovation framework	349, logistic regression & exploratory factor analysis	Positive relationship between internet related innovativeness and online banking, general innovativeness is negatively related to online banking.
Celik (2008)	Extended TAM model	161, The partial least squares (PLS) procedure	PU, PEOU have direct influence & perceived playfulness positively influences only PEOU, perceived behavioural control exerts positive direct effects on PEOU and PU and indirect effects on PU and attitudes.
Khalil et al. (2010)	TAM and included "Trust" variable	742, principal component analysis, multiple regressions	Malay and Chinese ethnic groups PU, PEOU, and trust have a significant effect, while cultural traits may explain the extent to which they influence to use e-banking.
Riffai et al. (2012)	UTAUT with trust, awareness of service, output quality, perceived playfulness, and web-design	329, Correlation analysis and descriptive statistics	Trust, usability and perceived quality are key drivers and significant except social influence, moderating effects from UTAUT not important to explain intention.
Yiu et al. (2007)	TAM with personal innovativeness in IT(PIIT) and perceived risk	150, t-test and Pearson correlation	PU is the strongest predictor of Internet banking adoption intention, followed by PEOU and perceived risk.
Nasri and Charfeddine (2012)	Technology Acceptance Model (TAM) and the theory of planned behaviour (TPB).	284, SEM with confirmatory factor analysis	Banks should improve the customer's security and privacy information, which will increase the trust of users. The government should implement a clear and solid law which brings confident for using Internet banking.
Lee (2009)	TAM, the theory of planned behaviour (TPB), Perceived risk & perceived benefit	368 confirmatory factor analysis	80% of intention explained by security risk, financial risk, perceived behaviour control, subjective norm, attitude, perceived benefit, and perceived usefulness.
Martins et al. (2014)	UTAUT with perceived risk	249 Structural Equation Modelling	Support with UTAUT, such as performance expectancy, effort expectancy, and social influence, and the role of risk as a stronger predictor of intention.

## **Perceived Usefulness (PU)**

Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989; Al-Somali et al., 2009). In the context of e-banking PU is "the extent to which individual believes that internet banking is more advantageous when compared to the traditional way of conducting banking transactions" (Yee-Loong Chong et al., 2010). Perceived usefulness is the key factor of the attitudes which lead to behavioral intention (Aboobucker & Bao, 2018). Prior studies show PU has a strong influence on users' intention towards e-banking (Wang et al., 2003; Lee, 2009). Further, it was found to be a significant factor in e-banking adoption in various countries' contexts. For instance, Celik (2008) found that PU has an immediate direct determinant of customers' attitudes in internet banking among Turkish customers. Pikkarainen et al.'s (2004) study show PU is the main factor influencing online banking acceptance among private banking customers in Finland. Along the same lines, Yee-Loong Chong et al. (2010) explored that PU positively associated with using online banking in Vietnam. In the context of Asian region studies such as Jaruwachirathanakul and Fink (2005b) the attitudinal factor PU appears to encourage the adoption of Internet banking in Thailand. In Singapore, it has a significant impact on customer interactions with e-banking services (Liao and Wong, 2008). Moreover, the study shows that PU has a significant factor that leads adoption of Internet banking among Malaysian university students (Al-Fahim, 2012). The PU was found to be a significant determinant to predict the intention to use Internet banking among Tunisian customers (Nasri & Charfeddine, 2012). The research of Safeena et al. (2011) demonstrates that PU is an essential determinant of online banking adoption in India, another example in the South Asian region. Therefore, it is reasonable to infer that perceived usefulness positively influence user intention in using e-banking service, and we hypothesized that:

H1: Perceived usefulness has a positive influence among banking customers towards the intention to adopt e-banking services in Sri Lanka.

## **Perceived Ease of Use**

Unlike the traditional banking, e-banking website has less user-friendliness, the absence of face-to-face interaction, security, and trust. As a result, ease of use will shorten the adoption intention of e-banking services. Perceived ease of use (PEOU) is defined as "the degree to which a person



believes that using a particular system would be free of effort" (Davis, 1989). Many passed studies show PEOU influence on customer adoption intention on e-banking (Pikkarainen et al., 2004; Liao and Wong, 2008). It is also worth noting that prior studies reported the PEOU influence in several countries' contexts as that PEOU has an immediate direct determinant of customers' attitudes towards internet banking among Turkish customers (Celik, 2008). In a similar spirit, Wang et al.'s (2003) study show a significant effect of computer self-efficacy on behavioral intention through PEOU in the acceptance of internet banking in Taiwan. PU, PEOU, and perceived risk were the essential determinants of online banking adoption in India (Safeena et al., 2011). At the same time, perceived difficulties in using computers and the lack of personal service were found to be the main barriers to Internet banking adoption among mature customers in Finland (Mattila et al., 2003). The research of Yousafzai and Yani-de-Soriano (2012) reveals PU and behavior were stronger for younger males with high levels of optimism and innovativeness, while the relationship between ease of use and behavior was stronger for older females with a high level of discomfort among UK internet banking users. To assess customer's behavior on the gamified application of e-banking especially enjoyment and PEOU study of Rodrigues et al. (2016) exposed that PEOU and enjoyment are consistent and influence e-banking usage. Therefore, we hypothesized that:

H2: Perceived ease of use has a positive influence among Sri Lankan users towards an intention to adopt e-banking services.

### **Awareness**

Besides the PU and PEOU viewpoint, the usage intention of Internet banking could be affected by users' awareness. According to Sathye (1999), e-banking services are a reasonably new experience, and low awareness of e-banking is a vital factor in causing many customers not to adopt online banking. Lack of awareness about the benefits of e-banking is why consumers resist using e-banking services (Howcroft et al., 2002). This is confirmed; thus, Australian customers were not aware of the benefits and disadvantages connected to e-banking (Sathye, 1999). While awareness has a significant negative relationship with internet banking adoption among Malaysian university students (Al-Fahim, 2012). The lack of awareness of the barriers to the adoption of internet and mobile banking was highlighted in the study of Laforet and Li (2005). Al-Somali et al.'s (2009) research show that the awareness of online banking and its benefits has significant effects on PU and

PEOU of online banking acceptance in Saudi Arabia. Thus our Third hypothesis is stated as:

H3: The awareness has a significant influence on customer intention to use e-banking services among Sri Lankan banking customers.

### **Convenience**

As e-banking eases customers to use at any time in any equipped location, the quality attribute of time and location is likely to be significant in distinguishing it from traditional banking. E-banking offers a higher level of convenience that facilitates customers to execute e-banking services at any time in any place. The innovative features such as interactive loan calculators, exchange rate converters, and mortgage calculators draw the attention of both the users and non-users towards the e-banking websites, while accessibility and convenience are sources of customer e-banking satisfaction (Poon, 2007). Similarly, Internet banking adopters perceive the service to be more convenient, less complex, more friendly, and more suited to PC skilled people (Gerrard & Barton Cunningham, 2003). The convenience (24-hour banking access) and reassurance about security are the significant concerns in customers registering for Internet banking (Durkin, 2007). Not only convenience factors like efficiency and safety are also significant, which determine the differences in customer value perceptions in Internet and mobile banking (Schierholz & Laukkanen, 2007). As Lichtenstein and Williamson (2006) described, convenience regarding lifestyle, workplace use, housebound use, not having to travel, personal safety, and not having to wait where convenience is essential in deciding on internet banking. Also, they emphasized that convenience for females is higher than males, with two-thirds of the sample interviewed being female, particularly the ability to bank at home and 24/7 in Australia. In Tunisia, the study demonstrates that Internet banking is influenced most strongly by convenience, risk, security, and prior Internet knowledge (Nasri, 2011). Convenience stands the primary way that influences customer interactions in e-banking services (Liao and Wong, 2008). According to (Dauda & Lee, 2015), banks need smart and practical branded services to promote a universal adoption of e-banking services which will insert extra convenience to customers such as ease of usage containing a digital wallet, real-time interaction (video banking), ATMs integrated with smartphones, website customization, biometric services, and digital currency. These services, in turn, contribute to increasing the adoption intention of e-banking services. Thus our fourth

hypothesis is stated as follows:

H4: Convenience has a significant influence on customer intention to use e-banking services among Sri Lankan customers.

### **Website Usability**

Developing a usable website is crucial for e-business success as online consumers touch, feel, search, and experience products or services primarily through websites (Lee & Kozar, 2012). E-banking service providers can make the process of using e-banking more enjoyable by enriching website interactivity and creating unique online experiences. In addition, Future e-banking penetration and the success of complex financial services will be dependent on increased website responsiveness (Loonam & O'Loughlin, 2008). Website usability is deemed a multidimensional construct that covers effectiveness, efficiency, and satisfaction due to website design (Lee & Kozar, 2012). Hence, a systematic examination is needed to find the relationships on website usability concerning e-banking services intention, but few attempts have been made to study the relationships. Bank website had a positive effect on customer loyalty and positive word-of-mouth (WOM), in which website usability has a positive effect on customer satisfaction (Casaló et al., 2008). Web design and content are sources of satisfaction (Poon, 2007), while website usability was considered a significant impact on e-banking (Susanto et al., 2013b; Yoon & Steege, 2013; Casaló et al., 2008). The perceived website usability was an influencing factor of customer satisfaction with previous interactions with an online bank (Casaló et al., 2008). Information on online banking website was the main factor in online banking acceptance among private banking customers in Finland (Pikkarainen et al., 2004). Thus, our fifth hypothesis is as follows:

H5: Website usability has a positive impact on e-banking service adoption intention among Sri Lankan customers.

### **Moderators: Age and Gender**

Several studies focused on moderators in e-banking research. For instance, the technology readiness, age, and gender moderate the beliefs intention relationship among UK Internet banking users (Yousafzai & Yani-de-Soriano, 2012). The influence of consumer adoption versus rejection decisions in Internet and mobile banking in Finland where gender and age significantly

predict adoption and rejection decisions (Laukkanen, 2016). Moderators are categorized into organizational, technological, and individual factors in which age and gender lie in this third category to analyze the role of moderating factors in user technology acceptance (Sun & Zhang, 2006). In a similar spirit, sex, income, and age are related to the possibility of e-banking adoption (Flavian et al., 2006). The possibility of banking online is correlated with the urbanization of the area of residence, education, respondent age, in which gender has a statistically significant impact on Internet banking (Polasik & Wisniewski, 2009). Age explains behavioral intention; thus, if respondents are older, they more likely to have the intention to use Internet banking (Martins et al., 2014). While in the study of Jaruwachirathanakul and Fink (2005b)) found the significant moderating factors are gender, educational level, income, internet experience, and Internet banking experience. Though prior research focused on various moderators, we used only age and gender as the moderators in customer's intention on e-banking services. Thus our hypotheses are stated as:

H6: The influence of determinants (PU, PEOU, awareness, convenience and website usability) toward banking customer intention is significantly moderated by age.

H7: The influence of determinants (PU, PEOU, awareness, convenience and website usability) toward banking customer intention is significantly moderated by gender.

## **METHODOLOGY**

### **Measurement Development**

The questionnaire was designed on an electronic platform and reviewed by three academic researchers for its content validity and questionnaire accessibility in the electronic platform. The above researchers' suggestions concerning the arrangement of the questions, design features, and minor wording arrangements in the questions were incorporated into the complete version of the questionnaire. The questionnaire was developed by using English. The completed questionnaire was sent to 20 people for pilot testing to establish its reliability. To avoid the possibility of multiple responses from a respondent 'limit to one response' option was set when developing it in the electronic platform. The questionnaire includes two parts; thus, the first part includes the nominal type of questions to collect the respondent's demographic

information such as age, gender, education, occupation, income, type of e-banking service use, types of IT-driven banking service, and type of e-banking service use. Accordingly, the second part consists of five-point Likert scales, ranging from (1) “strongly disagree” to (5) “strongly agree” which includes constructs of perceived usefulness, perceived ease of use, awareness, convenience, and website usability.

All the constructs in this study extracted from the existing literature. Accordingly, the TAM model’s perceived usefulness refers to “*the degree to which the person believes that using the particular system would enhance her/his job performance.*” Perceived Ease of Use refers to “*the degree to which the person believes that using the particular system would be free of effort*” (Davis et al., 1989). Awareness refers to enough information about the benefits of online banking Al-Somali et al., 2009. Convenience refers to the comfort, user-friendliness, and easiness of the service (Nasri, 2011). Website usability refers to the richness of information, content and visibility of the website (Belanche et al., 2012).

### **Data Collection**

To collect e-banking users' data, we employed online and offline sources. The population for this study is the e-banking users, including private and state employees, students (undergraduates, postgraduates, and others), business people, and other e-banking users. Data collection was started from June 2016 to May 2017. The electronic version of the questionnaire link was sent to around 700 banking customers, and the same questionnaire was printed and issued to 80 customers as convenient sampling. In general, the electronic survey method has less response rate, and to increase the sample size, we decided to distribute the printed questionnaires. We received 218 responses in total, and the response rate is 27.95%. Finally, 158 electronic versions and 28 printed altogether 186 usable questionnaires, nearly 23.85% included in the final analysis. The rest of the incomplete questionnaires were omitted from the analysis.

### **Data Analysis**

The Partial Least Squares (PLS) technique with structural equation modeling (SEM) was applied to test the measurement model. The reason for selecting the PLS-SEM, it is recommended for fairly low sample size, the data

no need to be normally distributed, and the formative constructs were used in the model (Hair et al., 2011). The usable dataset was electronically imported into a Smart PLS 2.0 for statistical analysis. This paper applies the Smart PLS 2.0 to perform partial least square (PLS) to validate the research model. PLS is an extensively used statistical technique with many benefits over other structural equation modeling techniques (Srivastava & Teo, 2007). Information systems-related studies used PLS to be an effective analysis method that leads to more consistent results, robustness, and avoids the indeterminacy problem, and gives an exact (Srivastava & Teo, 2007; Subramani, 2004; Chin et al., 2003). The path coefficient, correlation, reliability test with descriptive statistics were done.

The common method bias assessed using different methods. Firstly, Harman's single-factor test suggested by Podsakoff et al. (2003) in which all independent and dependent variables included for the exploratory factor analysis. Hence, 5 factors were created (Eigenvalues value over 1), in which the first factor explained 37.08 % variance out of 73.97% of the total variance that is lower the cut-off value of 50% in the Harman's single factor test (Podsakoff et al., 2003). Secondly, any high correlation ( $r > .90$ ) is also the evidence for the common method bias (Gaskin, 2011; Lowry and Gaskin, 2014). Hence, all Pearson's correlations  $r$  value is less ( $r < 0.9$ ) in this study (Table 4).

## RESULTS

In analysing the data, we employed a two-step procedure suggested by Anderson and Gerbing (1988). First, we checked the measurement model to measure convergent and discriminant validity. Subsequently, we examined the structural model to test the strength and direction of the relations among the theoretical constructs.

**Table 2:** Demographic Profile of the Sample

<b>Gender</b>	<b>N</b>	<b>%</b>	<b>Age Category</b>	<b>N</b>	<b>%</b>	<b>Education</b>	<b>N</b>	<b>%</b>
Male	129	69.4	18 - 25 years	52	28.0	GCE O/L	1	.5
Female	57	30.6	26 - 30 years	74	39.8	GCE A/L	7	3.8
			31 - 40 years	38	20.4	Higher Diploma	21	11.3
			41 - 50 years	18	9.7	Undergraduate	98	52.7
			51 - 60 years	4	2.2	Master degree	53	28.5
						PhD	6	3.2
<b>Income</b>			<b>Profession</b>			<b>Profession</b>		

Below Rs. 20,000	35	18.8	Student	28	15.1	Business People Foreign employee	5	2.7
Rs. 21,000 - 40,000	37	19.9	Teacher	10	5.4		17	9.1
Rs. 41,000 - 60,000	32	17.2	Other state worker	15	8.1			
Rs. 61,000 - 80,000	22	11.8	Academic Staff	48	25.8			
Rs. 81,000 - 100,000	12	6.5	Private Employee	62	33.3			
Above Rs. 100,000	48	25.8	Self-Employment	1	.5			

## Measurement Model

The measurement model includes assessment of the research instrument's internal consistency, reliability, convergent and discriminate validity, which specify the strength measures to test the proposed model. In order to analyze the indicator reliability, factor loadings should be statistically significant and preferably greater than 0.7 (Chin et al., 2003; Henseler et al., 2009). Table 3 shows factor loadings, t-value, AVE and Cronbach's Alpha from items measured. The t-statistic obtained from boot-strapping (300 iterations) shows that all loadings are statistically significant at 1%. Moreover, it can be concluded that all items have loadings greater than 0.7, except the item AWR1 - 0.690 and Conv5- 0.691 (which is near to threshold) and signifying the internal consistency.

To evaluate the constructs' reliability, we used two indicators such as composite reliability (CR) and Cronbach's alpha (CA). The most common criterion is CA, which provides an estimate of the reliability based on the indicator inter-correlations and assuming that all indicators are equally reliable (Henseler et al., 2009). As shown in Table 3, CR and CA are for each construct above the expected threshold of 0.7, confirming the evidence of internal consistency. To make sure the convergent validity, average variance extracted (AVE) was applied as the AVE is the amount of indicator variance that is accounted for the primary items of construct and should be greater than 0.5, so that the latent variable explains more than half of the variance of its indicators (Henseler et al., 2009). As shown in Table 03, AVE for each construct is greater than the required threshold of 0.5, confirming the convergent validity. At last, to confirm discriminant validity, the square root of AVE should be greater than the correlations between the construct (Henseler et al., 2009; Chin et al., 2003). As shown in Table 4 for all constructs, comparatively the square root of the AVE greater than the correlations between the constructs and any other constructs in the model, and thereby we conclude that all the constructs show evidence of discriminant validity. Also, all diagonal values exceeded (except

minor deference 0.003 in CONV and 0.005 in PEU) the inter-construct correlations, and we confirmed that our instrument had suitable construct validity.

**Table 3: Construct Reliability and Convergent Validity**

Construct	Items	Factor Loadings	t -value	CR	AVE	Cronbach's Alpha (CA)
Perceived Usefulness	PU1	0.837	18.116	0.934	0.701	0.915
	PU2	0.791	15.554			
	PU3	0.853	22.649			
	PU4	0.834	16.082			
	PU5	0.853	20.930			
	PU6	0.854	19.996			
Perceived Ease of Use	PEU1	0.849	19.697	0.937	0.712	0.919
	PEU2	0.895	28.604			
	PEU3	0.868	25.228			
	PEU4	0.858	21.942			
	PEU5	0.785	14.023			
	PEU6	0.804	16.232			
Awareness	AWR1	0.690	6.956	0.885	0.607	0.837
	AWR2	0.804	17.618			
	AWR3	0.799	17.046			
	AWR4	0.739	11.855			
	AWR5	0.853	19.048			
Convenience	Conv1	0.775	14.474	0.897	0.637	0.856
	Conv2	0.882	22.278			
	Conv3	0.871	26.185			
	Conv4	0.756	11.377			
	Conv5	0.691	7.725			
Website Usability	WU1	0.856	16.169	0.942	0.764	0.923
	WU2	0.882	23.858			
	WU3	0.894	29.480			
	WU4	0.905	31.845			
	WU5	0.832	11.408			
EBADOPTION	CI1	0.824	14.804	0.916	0.685	0.885
	CI2	0.809	12.161			
	CI3	0.828	16.749			
	CI4	0.837	16.072			
	CI5	0.841	17.151			

**Table 4: Correlation Coefficient and Square Roots of AVEs of Latent Variables**

	AWR	CONV	PEU	PU	WU	EBADOPTION
AWR	<b>0.779</b>					
CONV	0.775	<b>0.880</b>				
PEU	0.784	0.779	<b>0.959</b>			
PU	0.761	0.830	0.786	<b>0.837</b>		
WU	0.753	0.747	0.836	0.718	<b>0.874</b>	
EBADOPTION	0.716	0.828	0.779	0.807	0.746	<b>0.828</b>

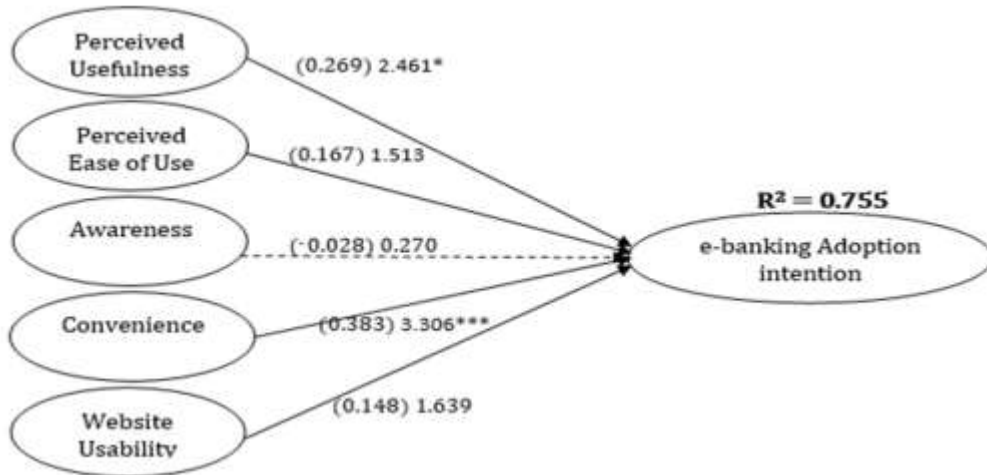
Note: Diagonal elements are the square root of AVE; these should exceed the inter-construct correlations for adequate discriminant validity. Off-diagonal elements are the correlations among constructs

### Structural Model and Hypothesis Testing

The structural model can be evaluated by observing path coefficients " $\beta$ " weight which indicates how strong is the relationships between the dependent and independent variables and the ( $R^2$ ) value, which illustrates total



variance explained by independent variables (Al-Somali et al., 2009). It is not recommended in PLS-SEM to find the measure for the goodness-of-fit (Sarstedt et al., 2017).



**Figure 2:** Results of the structural model

Note:  $\beta$  values are in parentheses, \*\*\* Significance at  $p < 0.01$ . \*\* Significance at  $p < 0.05$ . \* Significance at  $p < 0.1$

In the above results of the structural model within bracket values are path coefficient with their respective t-value and the non-significant path is shown by dotted lines. It was found that the five exogenous latent constructs (PU, PEOU, awareness, convenience, and website usability) together explained 76% of the variance on the endogenous construct e-banking adoption intention. Among the independence variables, some of the constructs have positive path coefficient with e-banking adoption intention such as PU  $\beta = 0.269$ , PEOU  $\beta = 0.167$ , convenient  $\beta = 0.383$  and website usability  $\beta = 0.148$  except awareness  $\beta = -0.028$ . For the statistical significance of parameter estimates, we used t-values (Lee, 2009). The t-values were derived from bootstrapping (500 iterations). The independence variables are significant for PU 5 % significant level ( $t = 2.461$ ;  $p < 0.05$ ), 1% significant level for convenience ( $t = 3.306$ ;  $p < 0.001$ ), and 10% significant level for website usability ( $t = 1.64$   $p < 0.10$ ). Whereas the PEOU ( $t = 1.513$ ;  $p > 0.10$ ), and Awareness ( $t = 0.270$ ;  $p > 0.10$ ) are not statistically significant. Hence, the hypotheses such as H1, H4, and H5, are supported and H2 & H3 not supported as they not statistically significant. As seen in Table 05, the hypothesis testing of all the variables are given with their statistical measures.

**Table 5:** Assessment of the Structural Model for Hypothesis Testing

Hypotheses	Hypothesis Path	Path coefficient ( $\beta$ )	t-Value	Supported?
H1	PU -> EBADOPTION	0.269	2.461*	✓
H2	PEU -> EBADOPTION	0.167	1.513	×
H3	AWR -> EBADOPTION	-0.028	0.270	×
H4	CONV -> EBADOPTION	0.383	3.306***	✓
H5	WU -> EBADOPTION	0.148	1.64 †	✓

Note: \*\*\*Significance at  $p < 0.001$ , \*\*Significance at  $p < 0.01$ . \*Significance at  $p < 0.05$ . Significance at  $p < 0.10$

### Summary of Moderating Effect on Individual Construct

The sample consists of 129 males and 57 females. To examine the age's moderating effect, the sample was categorized into two groups as younger and older. A similar method was applied in the study of Tarhini et al. (2014), in which they split the participant's age to investigate e-learning acceptance in England. Accordingly, our initial variable 'age category' was classified as *younger* (18 - 30 years old) and *older* (above 31 years old) from our sample. Within the age group, there were 126 younger (67.7%) and 60 older (32.3%) banking customers. Table 6 shows the moderating effects of *gender* and *age* on the relationship between our exogenous constructs (PU, PEOU, awareness, convenience and website usability) and endogenous construct EBADOPTION.

This study investigated the moderating effect of age and gender for the relationship variables in the proposed model. This research employed multi-group moderation analysis to investigate the moderating effect. In the first step, the dataset was split based on the sub-dataset for gender - male and female, age - younger and older. Then the same structural model was run for each dataset separately. It then followed a pairwise comparison of path coefficient and strength of significant difference across the groups considering the p-value. So for that, two group's t-statistics were compared with their path difference to assess and find the moderation effects. The path coefficient and t-value were measured for each moderator group (gender and age) separately. Then the t-statistic difference was measured by using the formula suggested by Gaskin (2016) to find a moderator variable's significant difference in their respective relationship; then the conclusion was drawn from the findings.

The findings show that there is no stronger and significant moderating effect of age and gender on the research variable relationship. But we observed moderators have a few differences in the research model constructs. Thus, in the male group, PU and WU have comparatively higher difference than the

female group (PU,  $t = 2.453$  WU,  $t=1.366$ ). On the other hand, for convenience female group has a higher difference than the male group (Conv,  $t= 4.274$ ). In the case of awareness and PEOU approximately generated equal t-values and male and female group are the same in condition.

For the younger age group convenience and PEOU comparatively has slightly moderating effects than the older group (CONV  $t=3.861$ , PEOU $1.528$ ). But for the PU older age group has slightly moderating effects than the younger (PU  $t=3.420$ ). In the case of WU, both younger and older have approximately the nearest value, and AWR has no moderating impact. (t values are equal to 0 and p is very high). Therefore, our hypotheses H6 and H7 did not show a stronger moderating effect on the research model.

**Table 6:** Moderating Effect Comparison of Gender and Age

Constructs	Male R <sup>2</sup> =0.781(129)		Female R <sup>2</sup> =0.688(57)		t-statistics comparison of effect	Younger R <sup>2</sup> =0.807(126)		Older R <sup>2</sup> =0.624(60)		t-statistics comparison of effect
	Standardized path coefficient	t-value	Standardized path coefficient	t-value		Standardized path coefficient	t-value	Standardized path coefficient	t-value	
PU -> EBADOPTION	0.276	2.453**	0.187	1.692*	0.477 P = 0.634	0.238	2.082**	0.279	3.420 ***	0.235 P =0.816
PEU -> EBADOPTION	0.188	1.433	0.113	1.408	0.337 P = 0.736	0.150	1.528	0.135	1.389	0.089 P =0.929
AWR -> EBADOPTION	0.010	0.007	0.031	0.022	0.120 P = 0.905	0.017	0.101	0.010	0.003	0.051 P =0.959
CONV -> EBADOPTION	0.316	2.720**	0.489	4.274***	0.914 P = 0.362	0.430	3.861***	0.328	2.818**	0.572 P =0.568
WU -> EBADOPTION	0.153	1.366	0.102	1.096	0.291 P = 0.771	0.119	1.428	0.175	1.450	0.387 P =0.700

Note: \*p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.

## DISCUSSION AND CONCLUSION

Banks are highly investing in e-banking to broaden the adoption of e-banking, but its penetration is low level among banking customers in developing countries. This research investigates the influencing factors which determine the adoption intention of e-banking services in Sri Lanka. The success of e-banking is decided not only by banks or government support but also by customers' acceptance and adoption intention.

This research finding supports the research model and hypotheses relation in the model variables. In this research, the total explanatory power of five exogenous constructs (PU, PEOU, awareness, convenience, and website usability) are explained 76% ( $R^2$  0.755) variance on e-banking adoption intention. Among these five constructs except awareness, the other four constructs positively influence the e-banking adoption intention. Thus our hypotheses H1, H4, and H5 were supported, and H2 & H3 were not supported. These research findings are consistent with prior researches. Accordingly, PU was recognized as a determinant factor for e-banking adoption in several countries contexts (Lee, 2009; Celik, 2008; Pikkarainen et al., 2004; Nasri, 2011; Yee-Loong Chong et al., 2010; Sinha & Mukherjee, 2016). PU is not only in e-banking adoption but also in technology adoptions and has a strong influence on users' intentions to adopt the technology. For instance; in the review of technology adoption between 1992 - 2003, PU was found to be significant in 26 out of 29 studies (Jeyaraj et al., 2006).

Comparatively, the variable convenience received the highest path coefficient ( $\beta$ ) 0.383 and t-value 3.306 among the independent variables. The advancement of technology made the lifestyle of people more convenient and easiness. Thus, in our research for the construct convenience's items answers both 'agree' and 'strongly agree' received the highest frequency from the respondents (Conv1 - 135, Conv2 - 169, Conv3 - 161, Conv4 - 130, Conv5 - 131). Moreover, the e-banking service convenience was identified as the strong determinant factor in the prior research as well (Poon, 2007; Lichtenstein & Williamson, 2006; Liao & Wong, 2008; Dauda & Lee, 2015). The website usability is not objective in nature; rather it is a subjective perception of online customers and closely related to user interaction with the website (Lee & Kozar, 2012). Our results indicate the website usability is also considered as an influencing factor for e-banking adoption intention. This is related to the prior study findings as well (Casaló et al., 2008; Yoon & Steege, 2013). Our third

hypothesis "awareness" did not support, as this may be due to the lack of bank marketing campaign about their e-banking services. In Sri Lanka, customers still want to use traditional banking, customers did not feel properly aware of the benefits of e-banking, and fear of security, privacy and trust issues. This finding is similar to other countries' contexts, such as Australia (Sathye, 1999), Malaysia (Al-Fahim, 2012), and China for mobile and e-banking (Laforet & Li, 2005).

### **Moderating Effects**

Surprisingly the overall moderating results indicate that the age and gender did not make significant differences or stronger moderating effects, but have a little effect on the exogenous and endogenous variable relationship. Under the male group comparatively, PU demonstrated moderating effects than female. This supports the earlier work, but those show stronger moderating effects (Yousafzai & Yani-de-Soriano, 2012; Venkatesh et al., 2003; Venkatesh & Morris, 2000). For PEOU, the younger age group has moderating effects. But this finding contradicts the prior studies (Yousafzai & Yani-de-Soriano, 2012; Venkatesh et al., 2003) where older has strong moderating effects. Our findings show convenience for the female is higher compared to males. This supports the previous finding of Lichtenstein and Williamson (2006) in which they emphasized convenience for females is higher compared to males in Australia. Also, our findings show convenience for the younger age group has higher moderating effects than older; this is because older may believe security and privacy concerns in e-banking and prefer the traditional banking services.

In the case of website usability, we observed a higher difference in the male group than the female group. This finding is similar to other research works where male customers are using e-banking higher than females (Laforet & Li, 2005; Maniraj, 2004). According to Minton and Schneider (1985) men are more "pragmatic" than women and men are fairly more task-oriented. We used website usability as a new construct which is very rarely tested in the prior e-banking adoption studies and very limited literature exist. We were unable to find supportive literature for the website usability moderating effects. Though, awareness and PEOU has a slight effect; we received approximately nearest values for the male and female group. Thus we did not distinguish their moderating effects separately. Under the age category, the website usability for younger and older has approximately the nearest value, and it did not show higher differences between these groups. Finally, awareness has a few

moderating effects, and this variable's hypothesis was unsupported in our model. Considering all the above facts, age and gender moderating effects on our research model variables did not show stronger moderating effects, but they have insignificant effects.

### **Theoretical and Practical Implications**

Theoretically, our findings suggest that the proposed model has good illustrative power and confirms its robustness in predicting customer's e-banking adoption intention in Sri Lanka. This research model includes TAM and extending to include three additional constructs in determining customer adoption intention of e-banking services. Hence, the actual TAM is extended in this study's context. By incorporating the additional constructs with the existing TAM, this study contributes to the information system theoretical basis. The users' attitudinal factors such as perceived usefulness, perceived ease of use with awareness, convenience, and website usability linked with e-banking adoption intention moderated by age and gender in the Sri Lankan context. Also, the proposed model mostly useful in developing countries where consumers are reluctant to use e-banking, yet the services are sophisticated.

Further, the findings highlight some managerial implications as managers should formulate strategies to retain their valuable customers and expand their customer base. This research variable awareness is not supported. Thus, they should make more awareness and promote the benefits of using e-banking than traditional ways of banking. Also, managers need to ensure that their e-banking platform is free from security threads, technically sound, with good security practices, free from service disruptions, the pioneer in introducing e-banking services in smart devices, and robustness in innovation. Building risk-free e-banking services are much more important to retain valuable customers. As a result, managers should find risk-reducing strategies that might inspire high confidence in potential e-banking customers. E-banking improves the quality of the banking services; hence it is considered a strategic weapon for competitors. However, it offers various advantages for banks and customers, the low level of customers' adoption of e-banking services noted in Sri Lanka. As a result, to enhance e-banking service, banks should include demonstration through the video presentation of the banking activities to convince more traditional banking users and older customers. Such initiatives will be more informative to become more familiar and attract many non-users and illiterate people. Moreover, e-banking service providers in Sri Lanka could develop

trust-building mechanisms to pull more customers, such as statements of guarantee, long-term customer service, and increased familiarity through advertising.

### **Limitation and Future Research**

Though this research contributes to the existing body of knowledge, we also report its limitations. First, this study's sample size is less, and most of the respondents are young and educated customers whose e-banking behavioural intention might differ from the average people. In this research, 92% of the respondents are highly educated (Higher diploma 21, undergraduate degree 98 and master degree 53). These customers are more likely willing to accept and more knowledgeable about new technologies. Thus, this may have biased our results. On the other hand, older citizens, and illiterate banking customers will face greater difficulties in accessing e-banking services. Second, it could give more insight when including other demographic factors as moderators such as income, education, banking experience, and culture, etc. Third, it is highlighted the importance of researching with a broad diversity of respondents. As that, comparative studies in view of diverse demographics give more generalizability and generate meaningful findings. Accordingly, Liao and Wong (2008) suggested getting data, especially from senior citizens and customers with diverse banking experiences. Fourth, it also limits that the longitudinal study in this context would investigate further insights and compare online banking adoption intention among customers in Sri Lanka. It would be more interesting to apply this model to other countries' contexts with different settings like customer behavioral intention in banking with longitudinal data. Moreover, future research should incorporate security, privacy, and trust issues that are highly determined by the user adoption behaviors in e-banking.

### **Conclusion**

Although e-banking adoption intention has received substantial empirical validation and confirmation, still existing user acceptance, theoretical models have room for improvement. Their restricted explanatory power and conflicting relationships call for the inclusion of additional factors to consider looking for country-specific research. Drawing upon the theoretical background, this present study is the move in this direction and investigated the factors influencing the customer intention on the adoption intention of e-banking services in Sri Lanka using TAM with taking into account additional



constructs. The results of this study shed light on some important highlights of the e-banking adoption intention. It is noteworthy that the inclusion of moderators in this study is more certain in explaining the real effects meanings between exogenous and endogenous variable relationships. The results indicated that perceived usefulness, convenience, and website usability influence customer intention on e-banking adoption intention in Sri Lanka. The variables perceived ease of use and awareness fail to support the hypothesis; thus, awareness does not significantly influence customer intention to use e-banking services among Sri Lankan banking customers. The moderator's age and gender did not show significant moderating effects but explained the effect on the exogenous variable relationship. This study gives a better understanding of e-banking adoption intention factors, especially for a developing country's context such as Sri Lanka.

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**Appendix A**

$$t = \frac{Path_{sample\_1} - Path_{sample\_2}}{\left[ \sqrt{\frac{(m-1)^2}{(m+n-2)} * S.E.^2_{sample1} + \frac{(n-1)^2}{(m+n-2)} * S.E.^2_{sample2}} \right] * \left[ \sqrt{\frac{1}{m} + \frac{1}{n}} \right]}$$

**Appendix B: Construct Development Methodology**

Construct Type	Construct Code	Sub Construct	Source
Intention to use e-banking (First order formative)	IU	I. I am using e-banking services as it fulfill my banking needs.	Foon and Fah, (2011); Al-Somali et al. (2009); Khalil et al. (2010)
		II. I intend to use e-banking if the cost and times are reasonable to me.	
		III. In future, I plan to use e-banking services very often	
		IV. I am using e-banking services as it has convenient, security, trust and easiness.	
		V. I intend to increase my usage of the e-banking services.	
Awareness (First order formative)	Awr	I. I generally receive enough information about e-banking services	Pikkarainen et al. (2004); Al-Somali et al. (2009)
		II. I am clearly aware about the benefits of using e-banking services	
		III. I can use e-banking services without others to show me how to do it	
		IV. I can use e-banking services without online help or instructions for assistance	
		V. It is easy for me to learn, to see how E-banking works and what it can do	
Convenience (First order formative)	Conv	I. I can access e-banking services anytime and anywhere	Liao and Wong, (2008); Gerrard and Barton Cunningham, (2003); Nasri, (2011)
		II. e-banking services save time compared to traditional banking	
		III. E-banking transactions are easy to use and more user friendly	
		IV. I check my transaction details and statement regularly	
		V. Mobile devices helps me to do e-banking services more conveniently	
Perceived Usefulness (First order formative)	PU	I. E-banking enables me to do banking activities more quickly	Yousafzai and Yani-de-Soriano (2012); Khalil et al. (2010); Pikkarainen et al. (2004); Yee-Loong Chong et al. (2010)
		II. E-banking services increase my job performance	
		III. E-banking services increase my productivity	
		IV. I believe e-banking enable me to manage my financial resources more effectively	
		V. I believe e-banking services make my job easier	
		VI. I feel e-banking services are convenient and useful for me	
Perceived Ease of Use (First order formative)	PEU	I. I feel e-banking services have easy to learn procedures	Yee-Loong Chong et al. (2010); Pikkarainen et al., (2004); Yousafzai and Yani-de-Soriano (2012); Khalil et al. (2010)
		II. My interaction with e-banking is clear and understandable	
		III. I feel it is easy to become skilful to perform transactions via e- banking website	
		IV. I feel e-banking services are easy to use	
		V. I feel e-banking websites are controllable	
		VI. e-banking transaction procedures are easy to remember	

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Website Usability	WU	<ul style="list-style-type: none"><li>I. I can easily navigate through the web content and web pages</li><li>II. The structure and contents of this e-banking website is clear and understandable</li><li>III. The experience that I had with this e-banking website was satisfactory</li><li>IV. When navigating this e-banking web site , I feel I am in control of what I can do</li> <li>V. The organization of the contents, design and user friendliness make it easy for me to know where I am when navigating it.</li></ul>	Belanche et al. (2012); Jaruwachirathana kul and Fink, (2005b); Barnes and Vidgen, (2002)
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