Research Journal of Applied Sciences 8 (5): 278-285, 2013
ISSN: 1815-932X

Predicting Internet Banking Adoption Determinants in Yemen Usin Extended Theory of Reasoned Action

Ali Saleh Al-Ajam and Khalil Md Nor
Department of Management, Faculty of Management and Human Resource Development,
University Teknology Malaysia, Skudai, Johor, Malaysia

Abstract: Despite great efforts have been made to find out the factors that influence individuals intention to adopt a new technology worldwide, there is still very few empirical studies that have been conducted in this field in Arab countries, in general and in Yemen, in particular. Therefore, the aim of this study is to determine the factors that influence individuals' intention to adopt Internet banking by extending the Theory of Reasoned Action (TRA) in the Republic of Yemen. In this study, the TRA was extended by technology readiness. Study survey was used to collect data from 1500 bank customers. The research employed structural equation modeling to investigate the relationships. The results derived from fitting the structural equation model on the sample indicated that behavioral intention was significantly influenced by attitude, subjective norms and technology readiness. The model explained 44.7% of the variance in the behavioral intention.

Key words: Internet banking, theory of reasoned action, behavioral intention, structural equation modelling, norms

INTRODUCTION

The potential of online or Internet banking was well recognized a decade ago (Booz and Hamilton, 1997) when key institutions began to align the product delivery mix with new technology and explore and exploit new approaches to their business. The last three decades witnessed a remarkable development in the Internet banking services. Now a days, the Internet banking is playing a significant role in the world of business, especially in banking services. Many financial institutions have used Internet banking as a distribution channel for the bank's services due to the characteristics of the Internet that simplified remote access to banks (Riffai *et al*., 2012). Internet banking provides many benefits not only for banks but also for customers. Customers can conduct financial activities from anywhere at any time and Internet banking is cheaper than traditional banking. At the same time, banks could provide lower cost financial services and enhance customer satisfaction (Keswani and Chaturvedi, 2010). However, the advantages of Internet banking cannot be accomplished unless customers adopt the Internet banking services (Chioua and Shenb, 2012). Initial adoption of e-Service is an important first step toward realizing e-Service success. Technology acceptance is playing a significant role in the business world today specifically with respect to Internet banking (Hsu and Chiu, 2004). Although, many studies have been conducted to determine factors that influence behavioral intention to adopt new technologies, however, they neglected emotional dimension related to individuals technology readiness. Customer acceptance of electronic banking services has been considered a cornerstone for the success of e-Commerce (Oni and Ayo, 2010; Salehi and Alipour, 2010). Without customer acceptance of Internet banking, banks cannot achieve the objective of investing in the technology. Internet banking service acceptance has become a critical issue in the business world today.

Although, Internet banking services have been widely adopted in various developed countries, consumers adoption of Internet banking service in developing countries has been slower than anticipated. That is in developing countries, Internet banking services have not been used as much as they could or should have been. Interestingly, there is still a limited empirical research on Internet banking services in developing countries (AbuShanab *et al*., 2010; Al-Gahtani, 2011; Nasri and Charfeddine, 2012). Yemen, as one of the developing countries, in particular has faced the same problem of limited studies on Internet banking services.

Lack of acceptance is a concern given the fact that banks in Yemen have spent a huge amount of money to provide a high quality of Internet banking service and yet, customers still reluctant to use this service

Corresponding Author: Ali Saleh Al-Ajam, Department of Management, Faculty of Management and Human Resource Development, University Teknology Malaysia, Skudai, Johor, Malaysia

(Alhariry, 2007; Zolait, 2011). Therefore, this study attempts to fill this gap. There is a clear need to investigate the factors that influence customers intention to adopt the IB so that banks can better formulate their marketing strategies to increase Internet banking usage in the future. This study was begun with the introduction followed by a review of the literature in technology adoption was presented, based on which we propose a model of customers intention to adopt Internet banking and formulate the associated research hypotheses. The research methodology was discussed. Then, the study explained the analysis technique followed by findings from the empirical test.

Literature review: A great deal of research has been conducted to determine factors that influence the adoption of Information Technology (IT). Due to a lack of grounded theory in the IT field, researchers have turned to models that have been developed in other areas as a foundation for their research. In the case of predicting an individual's intention to adopt IT, Information Systems (IS) researchers have borrowed intention models from social psychology as the foundation for their research (Ozer and Yilmaz, 2011). The theory of reasoned action and technology readiness which serve as a base for the development of this study model.

Theory of Reasoned Action (TRA): The Theory of Reasoned Action (TRA) was introduced by Fishbein in 1963 and was subsequently refined by Fishbein and Ajzen (1975) to its current form. The TRA posits that behavioral intentions which are the immediate antecedents to behavior are a function of salient information or beliefs about the likelihood that performing a particular behavior will lead to a specific outcome (Madden *et al*., 1992). TRA postulates that the boundary of volitional control over the behaviors in question and that intention to perform such behavior will predict the actual behavior. The TRA uses the attitude components to understand the behavior and not merely predict it (Ajzen and Fishbein, 1980). The general form of the TRA is shown in Fig. 1.

The TRA has been applied in the Internet Banking domain to predict the performance of behavior and

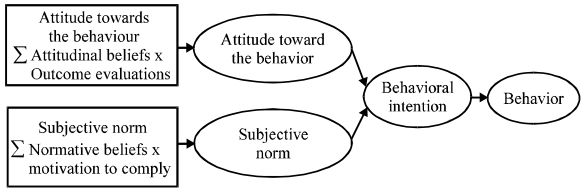

Fig. 1: Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975)

individuals intention toward Internet banking acceptance (Nor *et al*., 2008; Ok and Shon, 2010; Sadeghi and Farokhian, 2011; Yousafzai *et al*., 2010).

TRA considers only a narrow perspective of only two variables (attitude and subjective norm) that may affect individuals' behavioral intention. However, these two factors insufficient to predict individuals' intention toward adoption Internet banking services. The psychological processes of TRA have been demonstrated to be applicable in understanding a variety of behaviors. It has been argued that the predictive power of TRA may be weak because it was designed to predict only behaviors under volitional control. Although, some behaviors can be explained based on the logic of the TRA, under some circumstances an individual's behavior can also be determined by non volitional factors such as opportunities and resources (e.g., time, money and skills). In addition, TRA has ignored individuals emotional dimension. Therefore, to bridge TRA limitations, the current study proposes adding technology readiness into TRA will increase explanatory power.

Technology readiness: Many people avoid technology if they are not comfortable with and not ready to use it. Therefore, as new technologies are developed, it is important to explore individual's readiness to use them. The Technology Readiness (TR) refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at research (Parasuraman, 2000). The TR construct can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use new technologies (Parasuraman, 2000). The earlier studies have shown that TR has played a direct and indirect main role in influencing on individuals intention to adopt new technology (Berndt *et al*., 2010; Chan and Lin, 2009; Lin *et al*., 2010; Chen *et al*., 2008; Lai, 2008; Ranaweera *et al*., 2008; Theotokis *et al*., 2008; Wu and Herlina, 2008).

Research model and hypotheses: Internet banking service is a new distribution channel for the delivery of banking services. From both academic and practical perspectives, it is interesting to understand and assess customers' intention to use Internet banking services. Researchers have chosen the theory of reasoned action as the baseline model for this study because it is a well-tested model concerning users' acceptance of technology. Researchers extend TRA by technology readiness. Researchers examined the strength of the proposed relationships embedded in the theoretical model and the robustness of the model in predicting individuals intention to adopt Internet banking in the Republic of Yemen. The theoretical model is graphically presented in Fig. 2.

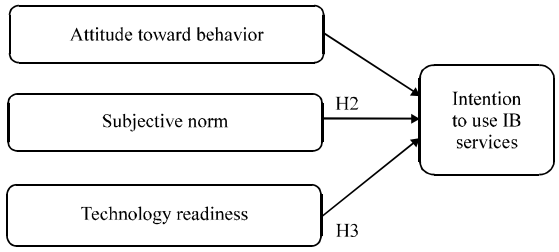

Fig. 2: The proposed model

A considerable amount of literature has been published about using a TRA Model framework or extended it by adding other variables. Researchers use TRA with the technology readiness to assess the determinants of individuals intention to adopt Internet banking. While researchers adapt the original TRA in this study, researchers use behavioral intention as the dependent variable. On the practical front, it is worth noting that Internet banking is still at an early stage of development in Yemen. The percentage of usage is very low. Therefore, the choice of behavioral intention, rather than actual usage as the dependent variable is considered both appropriate and necessary.

Hypothesis development: Based on the theoretical model developed above, researchers formulate the research hypotheses as follows. Researchers derive the following hypotheses in the context of Internet banking adoption.

Attitude: Attitude is defined as the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question (Ajzen, 1991). The earlier studies that conducted in a technology field indicated that attitude has a significant influence on behavioral intention in various domains of technology such as purchasing from an Internet bookstore (Wu, 2006) e-Health care (Egea and Gonzalez, 2011) e-Commerce (Beiginia *et al*., 2011; Crespo and del Bosque, 2010; Grandona *et al*., 2011; Ha and Stoel, 2009; Wessels and Drennan, 2010). The effect of attitude on intention has been also confirmed in the Internet banking domain (Agarwal *et al*., 2009; Al-Majali and Nik Mat, 2010; Suh and Han, 2002; Tan and Teo, 2000; Kleijnen *et al*., 2004; Kuisma *et al*., 2007; Lee, 2009a, b; Jaruwachirathanakul and Fink, 2005; Nor *et al*., 2008). It can be concluded that the attitude has played a significant role in influencing an individual's intention to adopt new technology. Therefore, the following hypothesis is presented:

H1: Individuals' attitude about Internet banking positively affects their intention to use the technology.

Subjective norm: Subjective norm is defined in TPB as the perceived social pressure to perform or not to perform the behavior (Ajzen, 1991). Several studies have suggested that social influence has played a significant role in forming user behavior. The studies results indicated that subjective norm plays an important role on individual's intention to adopt various types of technology such as mobile payment (Schierz *et al*., 2010; Yan *et al*., 2009) mobile commerce (Wei *et al*., 2009) Mobile Virtual Network Operators (MVNO) (Shin, 2010) m-Learning (Wang *et al*., 2009) e-File (Schaupp *et al*., 2010) e-Tax payment (Ramayah *et al*., 2009) e-Learning (Karaali *et al*., 2011; Lee, 2010) and e-Commerce (Crespo and del Bosque, 2010). Based on the review of the above studies factors, it can be clearly seen the significant positive effect of the subjective norm on intention regard adoption of new technology. Therefore, the related hypothesis is as follows:

H2: Subjective norm positively affects the intention to use Internet banking.

Technology readiness: Technology Readiness (TR) is defined as: people's propensity to embrace and use new technologies for accomplishing goals in home life and at work. The construct can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use new technologies (Parasuraman, 2000). Technology readiness provides a new construct which play a significant role in predicting individuals intention to adopt new technology that is a person who has a high degree of technology readiness has a high probability to accept Internet banking services. In contrast, a person who had a low degree of technology readiness may tend to reject this service. Several studies indicated that technology readiness has a significant effect on individuals intention (Berndt *et al*., 2010; Chan and Lin, 2009; Lin *et al*., 2010; Parasuraman, 2000). Therefore, the related hypothesis is as follows:

H 3: Individuals' technology readiness positively affects their intention to use Internet Banking.

MATERIALS AND METHODS

In devising a valid measurement instrument for this study, researchers adapted the instrument and scales from past literature which have been developed and validated in the following studies: attitude, subjective norm and intention were adapted from the measurements developed by Nor and Pearson (2008) and Shih and Fang (2004), containing four items for each construct (attitude and subjective norm) and five items for intention. Technology

readiness was adapted from the measurements developed by Parasuraman (2000) containing five items. In this study, researchers used a 7-point Likert scale for each of the items (1 = strongly disagree and 7 = strongly agree).

The unit of analysis in this research bank's customers at four main banks that provide Internet banking services in Yemen. The respondents were the banks customers who have not used Internet banking services in four cities (Sanaa, Aden, Hodeidah and Taiz) which located in three regions; the North, the South and the middle of Yemen. To observe a certain degree of random sampling, the questionnaire was given to the third customers who visit the banks at 3 cluster times, i.e., 9.30 am, 12.00 and 3.00 pm. A total of 1500 questionnaires were distributed in this study. Assigned counter staff requests the customer to respond to the questionnaires while waiting for the banking services and collects them before the customers leave the bank. Using these procedures, 1446 questionnaires were returned indicating a 96.4% rate of returned. The final count for this study was 1286 cases after excluding incomplete questionnaires, responses from users of IB, missing data and outliers. Several statistical validity tests and analysis were conducted such as reliability test and composite reliability tests, validity tests using Confirmatory Factor Analysis (CFA) for construct validity, descriptive analysis, correlation and Structural Equation Modeling (SEM) analysis using AMOS.

RESULTS AND DISCUSSION

To ensure research rigor and validity of the results, researchers followed the procedures proposed by Hair and Anderson (2010) in applying SEM to analyze the data. First, researchers developed an instrument for the measurement scale by following a systematic approach and incorporating a pre-test and a pilot test to ensure the appropriateness of the instrument. Second, researchers adopted an effective approach for data collection. Third, researchers performed an evaluation at the item level using the tests for convergent validity and item reliability. Fourth, as a satisfactory model was derived researchers carried out the analysis with an assessment of the model fit and unidimensionality. Fifth, Confirmatory Factor Analysis (CFA) was used for the diagnostics and tests for discriminant validity, composite reliability and variance extracted to validate the measurement scales. Finally, researchers tested the structural model by Confirmatory Factor Analysis (CFA).

Demographic characteristics of the respondents: The descriptive statistics of the respondents demographic characteristics were analyzed and shown in Table 1.

Table 1: Demographic profile of respondents

Variables	Category	Frequency	Percent
Gender	Male	1098	85.4
	Female	188	14.6
Age	18-24	201	15.6
	25-34	420	32.7
	35-44	210	16.3
	45-54	261	20.3
	55 and older	194	15.1
Education	School certificate	144	11.2
	Diploma	315	24.5
	Bachelor	404	31.4
	Master	204	15.9
	Ph.D	184	14.3
	Other	35	2.7
Occupation	Student	205	15.9
	Self-employed	478	37.2
	Officer in the government sector	300	23.3
	Officer in a private sector	265	20.6
	Unemployed	34	2.6
	Other	4	0.3
Income	<40000	224	17.4
	40,001-70,000	291	22.6
	70,001-100,000	415	32.3
	>100,001	356	27.7
IB knowledge	Yes	897	69.8
	No	389	30.2
IB awareness	Yes	699	54.4
	No	587	45.6

From Table 1, researchers can observe that the majority of the sample is male (85.4%) and female (14.6%). In terms of the age of the respondents, 16% were in the 18-24 age group, 33% were 25-34 in age, 16% were 35-44 in age and 20% were 45-54. Few were under the age of 18 or >55. It can also be observed that the majority of the sample holds a Bachelor qualification (31%) followed by Diploma holders (25%) and Ph.D (14%). Other demographic details can be shown in Table 1.

Confirmatory factor analysis: Researchers performed the Confirmatory Factor Analysis (CFA) on the data to assess the measurement reliability and validity. The initial confirmatory factor analysis result showed an acceptable overall model fit. The descriptive statistics of the items, their loadings and reliabilities are shown in Table 2.

As shown in Table 3, the confirmatory factor analysis revealed an acceptable overall model fit. Each confirmatory factor analysis has achieved a good fit as indicated by the goodness of fit indices such as GFI = 0.949; NFI = 0.970; IFI = 0.976; TLI = 0.970; CFA = 0.976 and root mean square error of approximation RMSEA of values 0.057. These results indicate an acceptable model fit and suggested that we could proceed to evaluate the reliability and validity of the measurement model. After demonstrating that measurement model fit data well researchers move to assess reliability and validity.

Table 2: Confirmatory factor analysis results

Codes	Item	FL	CA
Attitude			
AT1	Using Internet banking is a good idea	0.860	0.901
AT2	I like the idea of using Internet banking	0.710	
AT3	Using Internet banking is a pleasant idea	0.813	
AT4	Using Internet banking is an appealing idea	0.850	
Subjective norm			
SN1	People who are important to me think that I should use Internet banking	0.881	0.951
SN2	People whose opinions I value think I should use Internet banking	0.926	
SN3	People who are close to me think that I should use Internet banking	0.937	
SN4	People who influence my decisions think that I should use Internet banking	0.900	
Technology readiness			
TR1	I am prepared to use Internet banking	0.860	0.946
TR2	I am set to use Internet banking	0.925	
TR3	I am eager to use Internet banking	0.868	
TR4	I have high motivation to adopt Internet banking	0.923	
Behavioral intention			
IN1	I intend to use Internet banking in the future	0.738	0.906
IN2	I expect to use Internet banking in the near future	0.805	
IN3	I plan to adopt Internet banking in the future	0.925	
IN4	I will use Internet banking in the future	0.724	
IN5	If I will given the opportunity, I will use the Internet banking	0.868	

FL: Factor Loading and CA: Cronbach Alpha

Table 3: Fit statistics of measurement model

Model	χ^2	df	χ^2/df	GFI	NFI	IFI	TLI	CFI	RMSEA
Measurement model	631.397	165	3.827	0.949	0.970	0.976	0.970	0.976	0.057

Table 4: Composite reliability and average variance extracted

Codes	Variables	CR	AVE
AT	Attitude	0.881	0.656
SN	Subjective norm	0.951	0.830
TR	Technology readiness	0.946	0.778
IN	Behavioral intention	0.897	0.640

CR: Composite Reliability and AVE: Average Variance Extracted

Table 5: Average Variance Extracted (AVE) matrix of variables

Variables	AT	SN	TR	IN
AT	0.810	-	-	-
SN	0.171	0.911	-	-
TR	0.278	0.041	0.882	-
IN	0.348	0.251	0.384	0.800

Values in diagonal are the square root of AVE and in off-diagonal are inter-construct correlations

Reliability and validity: From Table 2, it can be seen that all factors loading were greater than 0.70 cutoff point as suggested by Hair and Anderson (2010). Table 2 also reveals that Cronbach alpha exceeds the 0.80 threshold. Thus, item reliability and convergent validity were established for this study. The Composite Reliability (CR) was calculated to assess the internal consistency of the construct indicators. From Table 4, it can be observed that all constructs had a CR>0.70 which was higher than the benchmark of 0.70, recommended by Hair and Anderson (2010). In addition to the composite reliability measures, the Average Variance Extracted (AVE) was also computed. All constructs' values were above 0.5, the guideline suggested by Hair and Anderson (2010). Furthermore, according to Fornell and Larcker (1981), CR should be more than the AVE to support discriminant validity. Table 4 shows that each CR value is more than AVE.

Table 5 shows square roots of AVE (diagonal elements) are bigger than off diagonal. At the same time, all off diagonal correlations are less 0.80 thus discriminant validity is supported.

Structural model: After confirming the measurement model, path analysis was conducted to test the structural model. Reviewing the fit statistics of the model in Table 6, researchers noted that all the fit statistics indicated a well-fit. The key fit statistics showed a value of GFI of 0.940, NFI of 0.964, IFI of 0.970, TLI of 0.962, CFI of 0.970 and RMSEA of 0.064. These statistics indicated that the current structural model is adequate to represent the sample data.

Results of hypothesis testing: The standardized regression coefficient or Beta Coefficient (β) of the variables is used to evaluate the strength relationship between variables. The regression weights are reported in Table 7. Figure 3 shows the results of the SEM analysis. All the hypotheses were supported.

Table 7 shows that attitude (β = 0.854, CR = 22.747, p<0. 001) has a direct positive and significant effect on individuals intention to adopt Internet banking. Thus, H1 was supported. This finding was consistent with the earlier study's results (Beiginia *et al*., 2011;

Table 6: Fit statistics of structural model

Model	χ^2	df	χ^2/df	GFI	NFI	IFI	TLI	CFI	RMSEA
Structural model	683.930	174	3.930	0.940	0.964	0.970	0.962	0.970	0.064

Table 7: Path statistical results (unstandardized coefficient)

Independent	Relationship	Dependent	Estimate	SE	CR	p
AT	→	IN	0.854	0.038	22.747	***
SN	→	IN	0.108	0.021	5.215	***
TR	→	IN	0.575	0.029	13.934	***

CR = t-value

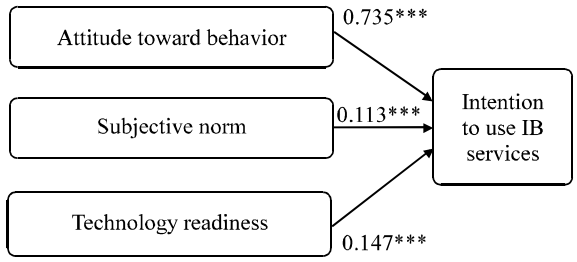

Fig. 3: The structural model (standardized coefficient)

Crespo and del Bosque, 2010; Egea and Gonzalez, 2011; Grandona *et al*., 2011; Ha and Stoel, 2009; Wessels and Drennan, 2010). The significant effect of the attitude on individuals intention is not surprising given the fact that the extrinsic benefits of using Internet banking are numerous. Banks should publicize Internet banking advantages to create a positive attitude amongst its customer towards Internet banking. Banks should also consider how to influence the perceptions of their customers by highlighting the positive features of Internet banking services. They should relay messages to customers whom the transaction via the Internet includes many advantages comparing to traditional banking. These may increase the customers positive feeling toward Internet banking services.

Subjective norm ($\beta = 0.108$, CR = 5.215, $p<0.001$) was also found to have a significant effect on the intention to use Internet banking services. Thus, H2 was also supported. A significant effect of the subjective norms on the intention is consistent with findings in earlier empirical studies of technology adoption related literature (Crespo and del Bosque, 2010; Lee, 2010; Karaali *et al*., 2011; Schierz *et al*., 2010; Wei *et al*., 2009; Yan *et al*., 2009). This suggests that social pressure is an influencing factor in shaping ones behavior towards the intention to use Internet banking. Social influence on person's intention to adopt new technology is not surprising given the fact that Arabic traditions and Islamic teachings urge respect between society members. Thus, an individual may be influenced by other's opinion. Therefore, bank managers should bear in mind the characteristics of these groups that influence individuals behavior when they are designing advertising and media campaigns of the Internet banking services.

Technology readiness ($\beta = 0.575$, CR = 13.934, $p<0.001$) was also found to have a significant positive effect on the intention to use Internet banking. Thus, H3 was also supported. This finding is consistent with other empirical studies (Berndt *et al*., 2010; Chan and Lin, 2009, 2010; Parasuraman, 2000). As we live in the era of technology, no one can be denied that technology has invaded everything in the life. But the degree of acceptance of technology relies heavily on to which extent of the individuals' readiness to use this technology. An individual who has a high degree of technology readiness has a high probability to accept Internet banking services. However, the person who has a low degree of technology readiness may tend to reject this service. The bank should pay more attention of factors that influence individuals' readiness to adopt the Internet banking service. The discussion indicates that the customers' intention towards the adoption of Internet banking service is positively related to their attitude, subjective norm and technology readiness.

CONCLUSION

The findings of this empirical study provide support for the theoretical model embracing theory of reasoned action and the technology readiness. The results support the view that attitude, subjective norm and technology readiness have played a significant and positive role in influencing individuals' intention to adopt a new technology (i.e., Internet banking service). In addition, as it is clear from the key fit statistics, the model testing yielded a set of fit indices with an overall well-fit indicating that the model fitted well with the data. The results of hypothesis testing provide satisfactory support for the extended TRA through the SEM analysis. Finally, the proposed model explained 44.7% of the variance in behavioral intention.

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