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A structural equation model for evaluating user's intention to adopt internet banking and intention to recommend technology

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A B S T R A C T

Although several prior research projects have focused on the factors that impact on the adoption of information technology, there are limited empirical research works that simultaneously capture technology factors (UTAUT2) and customer specific factors (perceived technology security and intention to recommend) helping users adopt internet banking. Thus, the current study aims to develop an integrated technology adoption model with extended UTAUT model and perceived technology security to predict and explain user's intention to adopt internet banking and intention to recommend internet banking in social networks. A quantitative approach based survey was conducted to collect the data from 398 internet banking users. For statistical analysis, structural equation model (SEM) approach was used. Convergence and divergence with earlier findings were found, confirming that performance expectancy, effort expectancy, social influence, hedonic motivation and perceived technology security had significant influence on user's intention to adopt internet banking. Additionally, IPMA analysis show that among all constructs hedonic motivation and perceived technology security had the highest impact on user's intention to adopt internet banking. For researcher, this study provides a basis for further refinement of technology adoption model while for practitioner improving security factor (perceived technology security) may turn users towards adoption of internet banking.

1. Introduction

In recent years, banking sector has evolved in information technology for its internal business operation and banking services. In effect, providing branchless banking services to customers has become a big challenge for all banks (Rahi, 2015). Banks are trying to discover different ways to dematerialize customer relationship with physically banking system (Rahi & Ghani, 2016). Owing to this, the adoption of internet banking services will not only beneficial for banks but it will also give an opportunity to banks to satisfy their customers from a distance (Frye & Dornisch, 2010; Martins et al., 2014; Rahi, 2016a). However, banks are facing difficulties to fully maximize their operations and this attributes to customer's unwillingness to adopt internet banking irrespective of the benefits (Martins et al., 2014). Internet banking refers to the use of the Internet as a remote delivery channel for banking

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services (Samar & Mazuri, 2016). For banks, technology has emerged as a strategic resource to achieve high efficiency, control of operations, productivity and profitability (Samar Rahi et al., 2017). Meanwhile for customers, it is a dream of banking anywhere and anytime. Internet banking is convenient for customers while for banking it is a source of cost reduction and better delivery of customer services (Rahi, 2016b; Rahi & Ghani, 2016). Despite the surge of information internet technology across the globe, internet banking adoption is still a big challenge in banking sector of Pakistan. A recent report issued by state bank of Pakistan revealed that there was a squeak growth in internet banking which is only 3%. Question arises why customers are reluctant to use internet banking while it is convenient and advantageous. According to Susanto et al. (2011), in spite of rapid growth of information and technology there are still a large number of individuals who prefer to use traditional banking services. Similar to this, Nasri and Charfeddine (2012) illustrated that a number of individual access Automated Teller Machine (ATM) but they are unwilling to use internet banking services. Thus, it is crucial to analyse the genuine perception of people's willingness to adopt these technologies. In order to identify which factors influence on user's intention to adopt internet banking we merge an existing and empirically validated theoretical model (UTAUT2) with perceived technology security. Hence, this study may help banks understand which factors influence on user's intention to adopt internet banking and how they can improve internet banking system for potential customers.

2. Literature Review

2.1 Extended unified theory of acceptance and use of technology (UTAUT2)

The unified theory of acceptance and use of technology (UTAUT) was introduced by Venkatesh et al. (2003). Since its inception, researchers have increasingly tested it in organisational context (Venkatesh et al., 2003). Therefore, it was extended (UTAUT2) by adding three core constructs namely: hedonic motivation, price value and habit. The details of these constructs are as follows.

2.2.1 Performance expectancy (PE)

Performance expectancy (PE) is defined as the extent where user perception of performance excel by use of Internet banking on tasks, i.e., individual believes that using Internet banking will help to attain benefits in performing banking operations (Rahi et al., 2018). Performance expectancy in other models is described as perceived usefulness, relative advantage, outcome expectancy and extrinsic motivation. According to Alalwan et al. (2014) performance expectancy is considered as a term of utility that is encountered during the use of internet banking. Previous studies have found significant influence of performance expectancy on user's intention to adopt internet banking (AbuShanab et al., 2010; Martins et al., 2014; Rahi et al., 2018; Samar et al., 2017). Therefore, we hypothesized performance expectancy as:

H1: Performance expectancy positively influences on user's intention to adopt internet banking.

2.2.2 Effort expectancy (EE)

Rahi et al. (2018) explained effort expectancy as, the degree of ease related with the use of internet banking. Effort expectancy positively influences on user's intention, when they feel internet banking is easy to use, and not required much effort (Zhou et al., 2010). According to Zhou et al. (2010) when user feels that internet banking is easy to use and does not require much effort, there is a high chance to adopt internet banking. Previous studies have confirmed that effort expectancy positively influence on user's intention (Rahi et al., 2018; Thompson et al., 1991). Thus, effort expectancy is proposed as:

H2: Effort expectancy positively influences on user's intention to adopt internet banking.

2.2.3 Social influence (SI)

Originally, social influence was derived from subjective norm, social factors and image. Social influence is defined as the effect of environmental factors, for instance the opinions of user's friends, relatives (Rahi et al., 2018). Authors like, Chaouali et al. (2016) postulated that an individual who believes that important others believe his usage of new product or services will be more inclined to use these products or technology services. Similarly, Martins et al. (2014) stated that social influence has significant influence on user's intention to adopt internet banking. Thus, social influence is hypothesized as:

H3: Social influence positively influences on user's intention to adopt internet banking.

2.2.4 Facilitating condition (FC)

Facilitation condition was derived from perceived behavioural control and compatibility. Facilitating conditions is explained as the effect of organizational and technical infrastructure to support the use of Internet banking, such as user's knowledge, ability, and resources (Rahi et al., 2018). Authors like, Venkatesh et al. (2012) stated that facilitating condition refers to consumers perception of the resources and support available to perform a behaviour. In internet banking context, Martins et al. (2014) have found significant influence of facilitation condition on user's intention to adopt internet banking. Thus, we hypothesised facilitating condition as:

H4:Facilitating condition positively influences on user's intention to adopt internet banking.

2.2.5 Hedonic motivation (HM)

Hedonic motivation is defined as the fun or pleasure derived using a technology. It has been found to be an important construct in determining the technology adoption (Venkatesh et al., 2012). Hedonic motivation has played an important role in e-payment platform. In information system research, hedonic motivation has seen as user's perceived enjoyment whereas in consumer context it is found as important determinant of user's intention to adopt technology (Venkatesh et al., 2012). In internet banking context, we see hedonic motivation as enjoyable service that leads towards technology adoption. Thus, we proposed hedonic motivation as a predictor of user intention to adopt internet banking. We hypothesised hedonic motivation as:

H5: Hedonic motivation positively influences on user's intention to adopt internet banking.

2.2.6 Price value (PV)

Price value is defined as the consumer's cognitive trade-off between the perceived benefits of the technologies and the monetary cost of using them (Venkatesh et al., 2012). In marketing research, the monetary cost is usually conceptualized together with the quality of the products or services in order to determine the perceived value of the products or services (Rahi et al., 2017). Price value may have significant influence on consumer adoption of new technology. For instance, short messaging services are popular in china due to lower price of SMS relative to other types of services (Venkatesh et al., 2012). The Price value is perceived having positive impact on customer's intention when the perceived benefits of using a technology is greater than the monetary cost (Venkatesh et al., 2012). In financial sector, price value is studied in mobile payment context by Oliveira et al. (2016). In internet banking setting, we assumed that price value has positive impact on user's intention to adopt internet banking. Thus, we hypothesised price value as:

H6: Price value positively influences on user's intention to adopt internet banking.

2.2.7 Habit (HT)

Habit is defined as the extent to which people tend to perform behaviour automatically because of learning (Limayem et al., 2007).

Author's like, Kim et al. (2005) have associated habit with automaticity. The role of habit in technology use has identified as an important determinants which influence on technology use (Venkatesh et al., 2012). According to Kim and Malhotra (2005) related to operationalization, habit as prior use is found a strong predictor of future technology use. Similarly, Limayem et al. (2007) confirmed that an operationalization of habit had direct influence on technology use and technology adoption. In internet banking context we assumed that customers having automaticity in behaviours tends to adopt internet banking. Thus, we hypothesised habit as:

H7: Habit positively influences on user's intention to adopt internet banking.

2.2.8 Perceived technology security (PTS)

Perceived technology security is defined as the buyer's perception about a seller's inability and unwillingness to protect monetary information (Salisbury et al., 2001). Information security analyses the potential feelings of uncertainty in using a technology. Author's like Oliveira et al. (2016) stated that perceived technology security has positive influence on customer's intention to adopt mobile payment. In internet banking context we assumed that secured transaction on internet banking website will drive user's to adopt internet banking. Thus, perceived technology security is hypothesised as:

H8: Perceived technology security positively influences on user's intention to adopt internet banking.

2.2.9 Intention to recommend

Social networks are bringing several challenges and opportunities to companies, as they are free to express their experiences about product and service. Having good experience will drive customers to adopt new products or technologies. Customer's having positive intention towards online payment will have positive intention to recommends Internet services to others. Like in prior research it is confirmed that customers with higher intention to adopt a new technology are more likely to become adopters and to recommend the technology to others, (Miltgen et al., 2013). Similarly, it is suggested that consumers' high acceptance intention can influence on users intention to recommend the technology in social networks (Oliveira et al., 2016). In internet banking context we added a debate that customers with intention to adopt internet banking will recommend internet banking to others. Thus, user's intention to recommend is hypothesized as:

H9: User's intention to adopt internet banking has positive influence on user's intention to recommend internet banking.

2.3 Development of theoretical framework

Previous studies agreed upon the need for adding other variables in UTAUT2 to serve as determinants of the major construct since the original model lacked such determinants for instance perceived technology security (Oliveira et al., 2016). According to Samar et al. (2017) consumer acceptance of new technology is a complicated phenomenon that requires more than a single model. Thus, the proposed model is combined key factors of UTAUT2 with perceived technology security in order to

understand which factor influence on user's intention to adopt internet banking. The research model is presented in Fig.1.

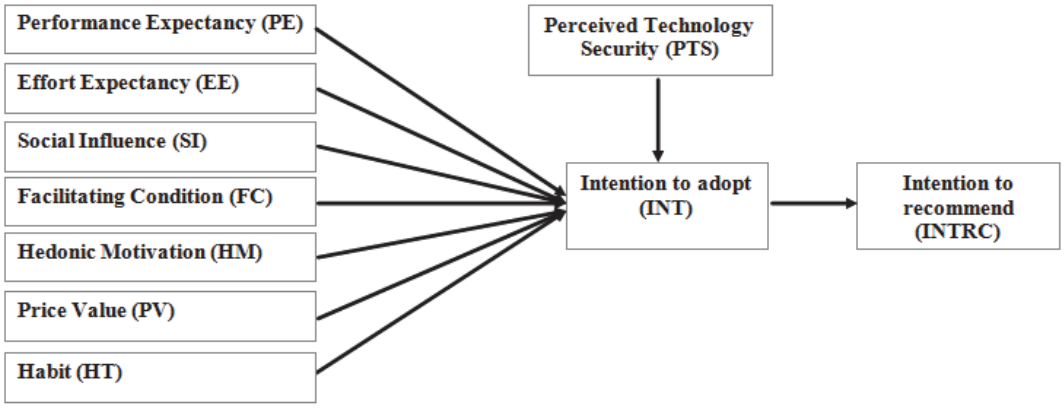

Fig. 1. Research Model

3. Research methods

3.1 Data collection and sampling

In order to collect internet banking user's data, we first required permission of commercial bank in Pakistan. After that, seven hundred and fifty questionnaires were distributed among internet banking users. The participation was voluntary, internet banking users were requested to fill the questionnaire and return to bank staff. The survey was conducted in two large cities of Pakistan namely: Lahore and Islamabad in order to have an appropriate sample representativeness of the population. Three hundred and ninety eight (398) valid questionnaires with a response rate of 53% were received for data analysis. Data was collected through convenience sampling. Convenience sampling is defined as a process of data collection from population that is close at hand and easily accessible to researcher (Rahi, 2017).

3.2 Instrument development

This study is followed positivists paradigm. Positivists believe in employing quantitative approach for data analysis and support objectivity to define their ontological statements (Mazuri et al., 2017). Thus, questionnaire was developed to measure the respondent's observation and perception towards internet banking technology. The survey questionnaire is divided into two parts. The first part of the questionnaire is about demographic profile of the respondents. While, the second part of the questionnaire comprises measurement items of performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, users intention to adopt internet banking and user's intention to recommend. Measurement items of performance expectancy, effort expectancy, social influence, facilitating condition and intention to adopt internet banking were adopted from (Rahi et al., 2018). Whereas, measurement items of perceived technology security and intention to recommend were adapted from Oliveira et al. (2016). Each item was measured on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire was created and administrated in English language.

3.3 Respondent's profile

Findings of our results suggested that majority of the respondents were females (58.5%) while males were (41.5%). The age of the respondents 8.5% is for less than 20 years, 38.4% that counts at age between 21 to 30 years, 24.4% for 31 to 40 years, 12.1% for those respondents who have age between 41 to 59 years, 11.1% was customers having age 51 to 60 and above 60 there were only 5.5%

respondents. Additionally, findings revealed that most of the participants had graduate level qualification (n=198, 49.7%) followed by those who had post graduate qualification (n=121, 30.4%). The number of the respondents who had qualification below high school were at the lowest level (n=11, 2.8%).

4. Data analysis and results

For the purpose of data analysis structural equation modeling (SEM) was employed. SEM is a technique to estimate causal relationship among variables. Following two-stage analytical procedure, measurement model is analysed first to assess the reliability and validity of the instrument and then hypotheses were tested through structural model. The detail descriptions of both measurement model and structural model are summarised in following sections.

4.1 Measurement model

The measurement model needs to be assessed for construct validity, indicator reliability, convergent validity and discriminant validity.

Table 1
Results of measurement model

Constructs	Loading	(α)	CR	AVE
Performance Expectancy	**PE**	0.802	0.871	0.628
Internet banking is useful to carry out my tasks.	0.801			
I think that using Internet banking would enable me to conduct tasks more quickly.	0.777			
I think that using Internet banking would increase my productivity.	0.811			
I think that using Internet banking would improve my performance.	0.781			
Effort Expectancy	**EE**	0.920	0.944	0.809
My interaction with Internet banking would be clear and understandable.	0.809			
It would be easy for me to become skillful by using Internet banking.	0.954			
I would find Internet banking easy to use.	0.935			
I think that learning to operate Internet banking would be easy for me.	0.893			
Social Influence	**SI**	0.890	0.923	0.750
People who influence my behavior think that I should use Internet banking.	0.912			
People who are important to me think that I should use Internet banking.	0.839			
People in my environment who use Internet banking services have a high profile.	0.941			
Having Internet banking services is a status of symbol in my environment.	0.761			
Facilitating Condition	**FC**	0.775	0.853	0.594
I have the resources necessary to use the internet banking.	0.847			
I have the knowledge necessary to use the internet banking.	0.774			
Internet banking is compatible with other technologies I use.	0.768			
A specific person is available for assistance of internet banking difficulties.	0.684			
Hedonic Motivation	**HM**	0.853	0.911	0.774
Using internet banking is fun.	0.838			
Using internet banking is enjoyable.	0.893			
Using internet banking is very entertaining.	0.906			
Price Value	**PV**	0.775	0.820	0.609
Internet banking is reasonably priced.	0.627			
Internet banking is a good value for the money.	0.735			
At the current price, internet banking provides a good value.	0.946			
Habit	**HT**	0.894	0.934	0.824
The use of internet banking has become a habit for me.	0.936			
I am addicted to using internet banking.	0.883			
I must use internet banking.	0.904			
Perceived Technology Security	**PTS**	0.899	0.930	0.768
I would feel secure sending sensitive information across internet banking.	0.915			
Internet banking is a secure means through which to send sensitive information.	0.854			
I would feel totally safe providing sensitive information about myself over internet banking.	0.864			
Overall internet banking is a safe place to send sensitive information.	0.873			
User's intention to adopt internet banking	**INT**	0.856	0.912	0.775
I intend to continue using Internet banking in the future.	0.867			
I will always try to use Internet banking in my daily life.	0.884			
I plan to continue using Internet banking frequently.	0.890			
User's intention to recommend	**INTRC**	0.968	0.979	0.941
I will recommend to my friends to use the internet banking service.	0.976			
If I have a good experience with internet banking I will recommend friends to subscribe the service.	0.958			
I will definitely recommend to my friends to use the internet banking service.	0.975			

Convergent validity is ascertained by examining indicator loadings. In this study, factor loading values are supported as recommended by Chin (1998), threshold level of 0.6. All indicators values were above 0.6 that indicates the validity of the construct. The convergent validity was also confirmed through estimation of average variance extracted (AVE) as recommended by Fornell and Larcker (1981), values must be greater than 0.5. Finally, composite reliability was assessed and all values exceeded 0.7 as recommended by Hair et al. (2011). Table 1 describes the results of measurement model. Discriminant validity assess the extent to which a concept and its indicators are differ from another concept and its indicator (Fornell & Larcker, 1981). Discriminant validity is measured by examining the correlation between the measures of the potential overlapping constructs (Fornell & Larcker, 1981). According to Compeau et al. (1999) the average variance shared between each construct and its measure should be greater than the variance shared between the constructs and other constructs. Table 2 showed the results of discriminant validity, all the diagonal values (square root of AVE) are greater than off-diagonal values (correlations between the construct) indicates that the measure is discriminant.

Table 2
Discriminant validity of measurement model

Constructs	BI	EE	FC	HT	HM	INTRC	PTS	PE	PV	SI
BI	***0.880***									
EE	0.434	***0.900***								
FC	0.149	0.108	***0.770***							
HT	0.404	0.216	0.040	***0.908***						
HM	0.707	0.351	0.087	0.405	***0.880***					
INTRC	0.783	0.281	0.030	0.282	0.524	***0.970***				
PTS	0.658	0.376	0.096	0.359	0.582	0.518	***0.877***			
PE	0.435	0.146	0.081	0.244	0.299	0.351	0.304	***0.792***		
PV	0.109	0.074	0.675	0.037	0.108	0.056	0.070	0.085	***0.781***	
SI	0.463	0.257	0.107	0.321	0.324	0.296	0.452	0.226	0.075	***0.866***

Note: Bold values indicate the square root of AVE of each construct

Table 3
Loading and cross loadings

	EE	FC	HM	HT	INT	INTRC	PE	PTS	PV	SI
EE1	***0.809***	0.095	0.312	0.129	0.381	0.374	0.138	0.353	0.078	0.14
EE2	***0.954***	0.112	0.325	0.232	0.43	0.228	0.151	0.346	0.073	0.287
EE3	***0.935***	0.087	0.337	0.231	0.411	0.24	0.115	0.342	0.053	0.262
EE4	***0.893***	0.094	0.281	0.175	0.327	0.162	0.122	0.308	0.062	0.227
FC1	0.072	***0.847***	0.073	0.025	0.143	0.053	0.063	0.058	0.507	0.101
FC2	0.145	***0.774***	0.131	0.068	0.103	-0.032	0.103	0.062	0.768	0.062
FC3	0.086	***0.768***	0.018	0.019	0.12	0.035	0.053	0.088	0.432	0.087
FC4	0.023	***0.684***	0.049	0.011	0.075	0.026	0.027	0.102	0.389	0.075
HM1	0.271	0.048	***0.838***	0.256	0.603	0.651	0.253	0.525	0.082	0.198
HM2	0.353	0.095	***0.893***	0.434	0.62	0.35	0.239	0.481	0.093	0.336
HM3	0.301	0.085	***0.906***	0.375	0.643	0.389	0.296	0.53	0.108	0.318
HT1	0.154	0.023	0.367	***0.936***	0.348	0.254	0.242	0.321	0.022	0.244
HT2	0.284	0.056	0.41	***0.883***	0.413	0.258	0.219	0.367	0.059	0.376
HT3	0.129	0.024	0.314	***0.904***	0.327	0.252	0.202	0.276	0.015	0.232
INT1	0.336	0.101	0.582	0.269	**0.867**	0.913	0.364	0.582	0.089	0.319
INT2	0.44	0.146	0.63	0.439	**0.884**	0.545	0.379	0.559	0.085	0.472
INT3	0.381	0.152	0.661	0.377	**0.890**	0.562	0.41	0.596	0.115	0.451
INTRC	0.286	0.041	0.505	0.284	0.765	***0.976***	0.328	0.537	0.047	0.299
INTRC	0.267	0.00	0.531	0.27	0.761	***0.958***	0.348	0.479	0.054	0.294
INTRC	0.264	0.046	0.487	0.265	0.754	***0.975***	0.344	0.491	0.061	0.269
PE1	0.166	0.066	0.255	0.262	0.36	0.291	***0.801***	0.254	0.074	0.146
PE2	0.157	0.056	0.214	0.212	0.336	0.283	***0.777***	0.272	0.096	0.126
PE3	0.061	0.044	0.262	0.194	0.337	0.293	***0.811***	0.222	0.034	0.197
PE4	0.077	0.092	0.216	0.103	0.346	0.244	***0.781***	0.216	0.065	0.249
PTS1	0.31	0.054	0.513	0.275	0.592	0.607	0.261	***0.915***	0.057	0.332
PTS2	0.39	0.147	0.53	0.386	0.586	0.32	0.289	***0.854***	0.086	0.495
PTS3	0.312	0.086	0.531	0.366	0.589	0.351	0.299	***0.864***	0.084	0.476
PTS4	0.305	0.045	0.463	0.222	0.538	0.545	0.212	***0.873***	0.012	0.273
PV1	0.089	0.519	-0.007	0.021	0.008	-0.041	0.018	0.033	***0.627***	0.067
PV2	0.031	0.53	0.038	0.049	0.053	-0.011	0.101	0.045	***0.735***	0.017
PV3	0.077	0.618	0.125	0.026	0.12	0.081	0.066	0.069	***0.946***	0.086
SI1	0.224	0.104	0.253	0.283	0.392	0.245	0.209	0.381	0.057	***0.912***
SI2	0.225	0.09	0.379	0.281	0.492	0.354	0.242	0.472	0.097	***0.839***
SI3	0.269	0.114	0.274	0.297	0.406	0.229	0.17	0.387	0.057	***0.941***
SI4	0.148	0.047	0.151	0.242	0.244	0.136	0.135	0.271	0.029	***0.761***

Another method to assess discriminant is the measurement of cross-loading. Cross loading can be done by comparing an indicator's outer loadings on the associated constructs and it should be greater than all of its loading on the other constructs. Table 3 demonstrates that all the loadings are greater than the correspondent cross-loadings. According to Henseler et al. (2015) discriminant validity can be assessed through multitrait and multimethod matrix, namely the Heterotrait-Monotrait Ratio (HTMT). Using HTMT criterion, if the values are greater than HTMT 0.85 value of 0.85 Kline (2011) or HTMT.90, Gold et al. (2001) indicate there was a problem with discriminant validity. As shown in Table 4 all the values are lower than the required threshold value of HTMT.85 by Kline (2011) and HTMT .90 by Gold et al. (2001) indicating that discriminant validity is valid for this study. Besides, the results of HTMT inference also show that confidence interval does not show a value of 1 on any of the constructs Henseler et al. (2015), which also confirms discriminant validity.

Table 4
Heterotrait-monotrait ratio (HTMT)

	BI	EE	FC	HT	HM	INTRC	PTS	PE	PV	SI
BI										
EE	0.490 CI:90 (0.387,0.597)									
FC	0.178 CI:90 (0.095,0.268)	0.125 CI:90 (0.064,0.214)								
HT	0.463 CI:90 (0.342,0.566)	0.227 CI:90 (0.131,0.332)	0.050 CI:90 (0.030,0.052)							
HM	0.829 CI:90 (0.750,0.921)	0.394 CI:90 (0.305,0.491)	0.108 CI:90 (0.052,0.163)	0.457 CI:90 (0.355,0.565)						
INTRC	0.840 CI:90 (0.787,0.879)	0.296 CI:90 (0.196,0.405)	0.054 CI:90 (0.026,0.066)	0.302 CI:90 (0.194,0.408)	0.580 CI:90 (0.508,0.658)					
PTS	0.748 CI:90 (0.670,0.827)	0.412 CI:90 (0.319,0.513)	0.120 CI:90 (0.059,0.190)	0.392 CI:90 (0.296,0.490)	0.664 CI:90 (0.562,0.758)	0.557 CI:90 (0.479,0.653)				
PE	0.526 CI:90 (0.427,0.609)	0.169 CI:90 (0.083,0.284)	0.106 CI:90 (0.040,0.145)	0.286 CI:90 (0.194,0.386)	0.361 CI:90 (0.263,0.455)	0.398 CI:90 (0.308,0.483)	0.356 CI:90 (0.262,0.441)			
PV	0.092 CI:90 (0.030,0.133)	0.098 CI:90 (0.044,0.182)	0.864 CI:90 (0.787,0.935)	0.054 CI:90 (0.018,0.070)	0.089 CI:90 (0.040,0.127)	0.063 CI:90 (0.022,0.091)	0.077 CI:90 (0.037,0.122)	0.094 CI:90 (0.033,0.126)		
SI	0.514 CI:90 (0.423,0.619)	0.274 CI:90 (0.170,0.384)	0.121 CI:90 (0.049,0.201)	0.347 CI:90 (0.249,0.442)	0.349 CI:90 (0.241,0.456)	0.300 CI:90 (0.203,0.383)	0.484 CI:90 (0.406,0.579)	0.258 CI:90 (0.146,0.366)	0.085 CI:90 (0.037,0.143)	

4.2 Analysis of structural model

Moving further with smart-PLS data analysis, a SEM was performed to assess the strength of proposed model for this study. In order to assess the structural model, lateral collinearity test (VIF), R^2 values and corresponding t-values were estimated. Findings of these analyses are discussed below.

4.2.1 Lateral collinearity assessment

Lateral collinearity was assessed with collineraity satatistics VIF. According to Kock and Lynn (2012) although vertical collinearity are met, lateral collinearity (predictor- criterion collineraity) may sometimes misled the findings. Diamantopoulos and Siguaw (2006) stated that, values of VIF 3.3 or higher, indicate a potential collinearity issue. Therefore, Table 5 showed the inner VIF values of the independent variables users intention to adopt internet banking that needs to be examined for multicollinearity are less than 5 and 3.3, indicating lateral multicollinearity is not a concern in this study (Hair Jr et al., 2014).

Table 5
Results of Lateral Collinearity Assessment

Constructs	Intention to adopt	Intention to Recommend
Behavioral Intention		1.000
Effort Expectancy	1.219	
Facilitating Condition	1.861	
Habit	1.285	
Hedonic Motivation	1.697	
Intention to Recommend		
Perceived Technology Security	1.815	
Performance Expectancy	1.155	
Price Value	1.852	
Social Influence	1.328	

4.2.2 Hypotheses testing

Next, we proceeded with the path analysis to test the hypotheses. Hypotheses were tested running a bootstrapping procedure with a resample of 5000, as suggested by Hair Jr et al. (2014). Table 6 demonstrates the PLS estimation results.

Table 6
Hypotheses testing

#	Constructs	β	S.E	t-values	P-value	Results
H1	PE→ INT	0.180***	0.041	4.399	0.000	Supported
H2	EE → INT	0.128**	0.045	2.820	0.002	Supported
H3	SI → INT	0.132**	0.040	3.300	0.001	Supported
H4	FC→INT	0.070	0.043	1.623	0.053	Not Supported
H5	HM→ INT	0.408***	0.061	6.736	0.000	Supported
H6	PV → INT	-0.035	0.041	0.842	0.200	Not Supported
H7	HT→ INT	0.037	0.049	0.764	0.222	Not Supported
H8	PTS → INT	0.241***	0.056	4.295	0.000	Supported
H9	INT → INTRC	0.783***	0.027	29.067	0.000	Supported

Note: Significance level where, *p < 0.05, **p < 0.01, ***p < 0.001.

Findings of the structural model results revealed that, the relationship between performance expectancy and user's intention to adopt internet banking is significant by H1: PE (β = 0.180, p< 0.000). Effort expectancy has significant influence on user's intention and supported by H2: EE (β = 0.128, p< 0.002), Social influence is positively related with user's intention and significant H3: SI (β = 0.132, p< 0.001). However, contrary to our expectations the relationship between facilitating condition and user's intention to adopt internet banking is not significant H4: FC (β = 0.070, p< 0.053). Next to this, the relationship between hedonic motivation and user's intention to adopt internet banking is significant and supported by H5: HM (β = 0.408, p< 0.000). However, the relationship between price value to user's intention is not confirmed H6: PV (β = -0.035, p< 0.200). Similar to this, the relationship between habit and user's intention to adopt is not significant H7: HT (β = 0.037, p< 0.222). Therefore, the relationship between perceived technology security and user's intention to adopt internet banking is significant H8: PTS (β = 0.241, p< 0.000), followed by user's intention to adopt and user's intention to recommend having significant relationship H9: INT (β = 0.783, p< 0.000).

4.2.3 Evaluating effect sizes

The results of structural model showed that R^2 values for user's intention to adopt internet banking was 0.664 which is acceptable as suggested by Cohen (1988). Similarly, R^2 values for user's intention to recommend internet banking was 0.614 which is also acceptable and has large impact as suggested by Cohen (1988).

Table 7
Evaluating effect size

Path	Constructs	R^2	Q^2	f^2	Decision
	Intention	0.664	0.490		
H1	PE → INT			0.083	Small
H2	EE → INT			0.040	Small
H3	SI → INT			0.039	Small
H4	FC → INT			0.008	Small
H5	HM → INT			0.292	Medium
H6	PV → INT			0.002	Small
H7	HT→ INT			0.003	Small
H8	PTS → INT			0.095	Small
	Intention to recommend	0.614	0.552		
H9	INT → INTRC			1.589	Large

Note: f^2: 0.02, small; 0.15, medium; 0.35, large

Table 7 presented that among all other constructs the effect size (f^2) of H5 and H9 have large effect sizes, whereas all other constructs have small effect sizes. The values of Q^2 is greater than 0, (0.490) for user's intention to adopt internet banking and (0.552) for user's intention to adopt internet banking which indicted that research model has good predictive relevance.

4.2.4 Importance performance matrix analysis (IPMA)

As an extension to the results of the study, we employed a post-hoc importance performance matrix analysis (IPMA) using intention to adopt internet banking as outcome variable. According to Hair Jr et al. (2016), IPMA builds on PLS estimates of the structural equation model relationship and includes an additional dimension to the analysis of that latent constructs. Importance performance matrix map as depicted in Fig. 2 show that, hedonic motivation had the highest importance in order to influence on user's intentions to adopt internet banking followed by perceived technology security. Therefore, price value was found the least important factor to predict user's intention. For managers, it is important to focus on hedonic motivation and perceived technology security in order to enhance user's intention towards adoption of internet banking.

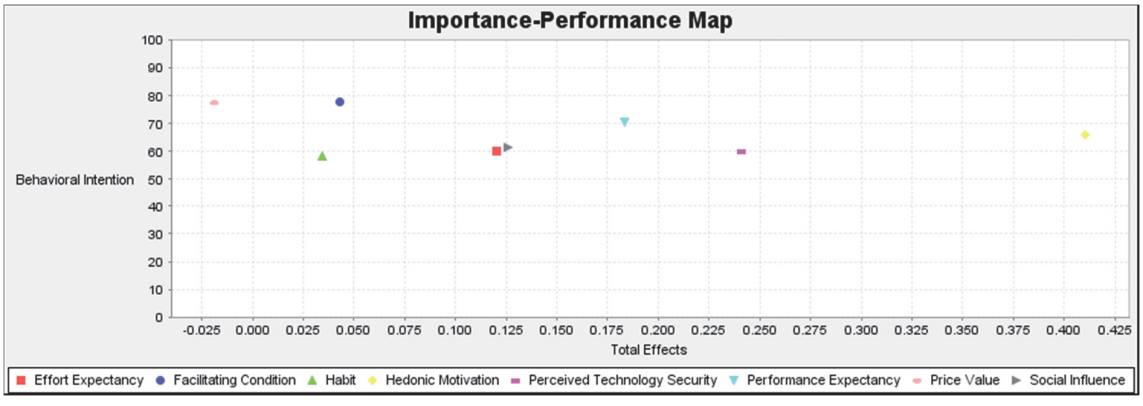

Fig. 2. Importance performance matrix analyses (IPMA)

5 Discussion & conclusion

The results of this study provide support for the research model presented in Fig.1 and regarding hypotheses directional linkage. The explanatory power of our model had an R-square of 66.4% for user's intention to adopt internet banking and an R-square of 61.4% for intention to recommend internet banking to others, suggesting that extension of UTAUT2 with perceived technology security is capable of explaining a high proportion of variation of intention to adopt internet banking and intention to recommend internet banking. Previously researchers have focused on the factors that impact on the adoption of information technology, there is a limited empirical research work that simultaneously captures technology factors and customer specific factors that help user's adopt internet banking. Thus, the study has aimed to develop an integrated technology adoption model with extended UTAUT and perceived technology security to predict and explain user's intention to adopt internet banking and intention to recommend internet banking in social networks. Convergence and divergence with earlier findings were found, confirming that performance expectancy, effort expectancy and social influence have significant influence in user's intention to adopt internet banking and these findings are consistent with previous study conducted by Rahi et al. (2018). Contrary to our expectation we found that facilitating condition, price value and habit linkage with intention to adopt internet banking were not valid, these findings are consistent with Oliveira et al. (2016). We extend the analysis and ran post-hoc analysis IPMA, findings showed that among all constructs hedonic motivation and perceived technology security have the highest impact on user's intention to adopt internet banking. For researcher this study provides a basis for further refinement of technology adoption model while for practitioner improving security factors may increase user's adoption.

5.1 Theoretical and managerial applications

In terms of theory building this study attempts to develop a new theory by grounding new variables in an integration of UTAUT2 and perceived technology security. It is important to note that new variable –perceived technology security- is compatible with UTAUT2 model. Thus, the proposed model makes an important contribution in emerging e-commerce literature, especially with regard to internet banking adoption.

In managerial context, the results of this study shed light on some important factors led to user's adoption intention. First, although other UTAUT factors such as performance expectancy, effort expectancy and social influence had significant impacts on user's intention therefore importance performance analysis has revealed that among all other factors hedonic motivation maintained the maximum impact on user's intention to adopt internet banking. Second, the most important contribution of this study is the study of user's recommendation. We have found that user's intention could lead to user's recommendation intention. Finally, the results also have revealed that perceived technology security was the second most important factor in determining user's intention.

Thus, we suggest that user's intention towards adoption of internet banking may enhance if policy makers focus on factors such as hedonic motivation and perceived technology security in order to increase user's confidence in internet banking services.

5.2 Limitations and directions for future research

This study has limitations that provide the impetus for further research in this field of investigation. First, our research is cross sectional and measures the internet banking user's intention at one point in time that may be less generalizable as compared with longitudinal study. Second, this study is predicting user's intention therefore future research may conduct on customer's actual usage behaviour. Finally, testing of this newly developed integrated technology model in other developing or non-developed countries may useful for the further generalization of the model.

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Appendix A Measurement items

Performance Expectancy
Internet banking is useful to carry out my tasks.
I think that using Internet banking would enable me to conduct tasks more quickly.
I think that using Internet banking would increase my productivity.
I think that using Internet banking would improve my performance.
Effort Expectancy
My interaction with Internet banking would be clear and understandable.
It would be easy for me to become skillful by using Internet banking.
I would find Internet banking easy to use.
I think that learning to operate Internet banking would be easy for me.
Social Influence
People who influence my behavior think that I should use Internet banking.
People who are important to me think that I should use Internet banking.
People in my environment who use Internet banking services have a high profile.
Having Internet banking services is a status of symbol in my environment.
Facilitating Condition
I have the resources necessary to use the internet banking.
I have the knowledge necessary to use the internet banking.
Internet banking is compatible with other technologies I use.
A specific person is available for assistance of internet banking difficulties.
Hedonic Motivation
Using internet banking is fun.
Using internet banking is enjoyable.
Using internet banking is very entertaining.
Price Value
Internet banking is reasonably priced.
Internet banking is a good value for the money.
At the current price, internet banking provides a good value.
Habit
The use of internet banking has become a habit for me.
I am addicted to using internet banking.
I must use internet banking.
Perceived Technology Security
I would feel secure sending sensitive information across internet banking.
Internet banking is a secure means through which to send sensitive information.
I would feel totally safe providing sensitive information about myself over internet banking.
Overall internet banking is a safe place to send sensitive information.
User's intention to adopt internet banking
I intend to continue using Internet banking in the future.
I will always try to use Internet banking in my daily life.
I plan to continue using Internet banking frequently.
User's intention to recommend
I will recommend to my friends to use the internet banking service.
If I have a good experience with internet banking I will recommend friends to subscribe the service.
I will definitely recommend to my friends to use the internet banking service.