Acceptance of mobile banking in Islamic banks: integration of DeLone and McLean IS model and unified theory of acceptance and use of technology

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Abstract: The aim of this study is to investigate the factors that influence on user intention to adopt Islamic mobile banking. Islamic mobile banking is relatively new area of research when compared with other traditional online banking services such as internet banking and conventional mobile banking. Thus, understanding the determinants that influence on Islamic banking user intention is important. The present study integrates two well-known theories; the unified theory of acceptance and use of technology and DeLone and McLean IS success model in order to investigate user's behaviour towards adoption of Islamic mobile banking in Palestine. Findings of the structural equation modelling depicted that factors underpinned UTAUT and D&M model explained R^2 61.3% variance in user intention to adopt Islamic mobile banking. IPMA analysis suggested that managers and policy makers should focus on system quality in order to boost Islamic mobile banking adoption among customers of Islamic banks.

Keywords: DeLone and McLean IS success model; D&M model; UTAUT; Islamic mobile banking; system quality; information quality; service quality; structural equation modelling; SEM.

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1 Introduction

In past few years, banking sector has devoted sufficient resources to adopt new technologies. Therefore, adoption of mobile technology is still a big challenge among customers of Islamic banks (Mohd Thas Thaker et al., 2018). Authors like Dahlberg et al. (2008) defined mobile banking as payment for products, services and bills with mobile

devices or smart-phone. More recently, Ghezzi et al. (2010) recapitulate the concept of mobile banking and defined as "a process in which at least one phase of the transaction is conducted using a mobile device (such as mobile phone, smartphone, or any wireless enabled device) capable of securely processing a financial transaction over a mobile network, or via wireless technologies." Islamic mobile banking is relatively new area of research when it is compared with other traditional online banking services such as internet banking and conventional mobile banking services. Although some researchers consider conventional mobile banking and Islamic mobile banking equivalent (Oliveira et al., 2016; Ghezzi et al., 2010). However, it is noted that Islamic mobile banking is quite different from conventional mobile banking (Mohd Thas Thaker et al., 2018). In conventinal mobile banking lottery payments are usually managed with mobile banking therefore, in Islamic law it is prohibited. Thus, the present study fills the research gap in this subject and investigated Islamic banking customer behaviour towards adoption of Islamic mobile banking in Palestine.

Earlier studies have emphasised on the importance of online banking (Chaouali et al., 2017; Dhingra, 2018; Oliveira et al., 2016; Rahi and Ghani, 2018b; Sakkthivel and Ramu, 2018). Authors like Oliveira et al. (2016) had investigated mobile banking trend among customers of commercial banks in a European country, Portugal. This study extends the unified theory of acceptance and use of technology (UTAUT) with diffusion of innovation (DOI) model and revealed that performance expectancy, compatibility and innovativeness were the most influential factors in order to investigate user behaviour towards adoption of mobile banking in Portugal. More recently, Chaouali et al. (2017) examined mobile banking users adoption behaviour with integration of theory of trying, general self-confidence and cynicism. Findings of this study revealed that general self-confidence and cynicism were the crucial factors to investigate user behaviour towards adoption of mobile banking. Although mobile banking is widely explored therefore some authors still believe that mobile banking research is it its infancy (Dahlberg et al., 2015; Oliveira et al., 2016; Slade et al., 2015). Therefore, the present study extends the body of knowledge in this subject and examined Islamic mobile banking with the integration of UTAUT and DeLone and McLean IS success model (D&M model). It is to the best of author's knowledge that this study is the first study that investigates Islamic mobile banking user's adoption behaviour in Palestine.

2 Literature review

2.1 Unified theory of acceptance and use of technology

UTAUT is an adoption theory and introduced by Venkatesh et al. (2003). This theory is based on eight models namely: technology acceptance model (TAM), extended technology acceptance model (TAM2), theory of planned behaviour (TPB), social cognitive theory (SCT), model of PC utilisation (MPCU), DOI, and decomposed theory of planned behaviour (DTPB). Venkatesh et al. (2003) realised that researcher are facing difficulty in the selection of TAM, TAM2, TPB, SCT, MPCU, DOI, and DTPB. Therefore, it was important to introduce unified model for the investigation of user behaviour in information technology domain. The UTAUT includes factors such as: performance expectancy, effort expectancy, social influence, facilitating condition, user intention and actual usage of technology.

Performance expectancy is explained as 'degree where an individual believes that using the system will help him/her to attain gains in job performance'. Effort expectancy is defined as 'the degree of ease associated with the use of the system'. Social influence is defined as 'the degree where an individual perceives that important others believe he/she should use the new system'. Finally, facilitating condition is seen as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). Several studies had used UTAUT model to investigate user intention and actual use of technology (Martins et al., 2014; Samar and Ghani, 2018b; Rahi et al., 2018a, 2018b). Authors like Samar and Ghani (2018b) had integrated UTAUT theory with DOI and confirmed that performance expectancy and effort expectancy had significant influence on user's intention to adopt internet banking in Pakistan.

Another study conducted by Martins et al. (2014) postulated that factors underpinned UTAUT had significant influence on users' intention to adopt internet banking in Portugal. In mobile banking context Oliveira et al. (2016) extended the UTAUT model with DOI theory and confirmed that performance expectancy had significant influence on user intention to accept mobile banking. Earlier studies had confirmed that performance expectancy, effort expectancy, social influence and facilitating condition significantly influence on users intention to adopt mobile banking (AbuShanab et al., 2010; Foon and Fah, 2011; Martins et al., 2014; Oliveira et al., 2016; Samar and Ghani, 2018b; Samar and Mazuri, 2019a, 2019b). Thus, we proposed following hypotheses:

H1 Performance expectancy has positive influence on intention to adopt mobile banking.

H2 Effort expectancy has positive influence on intention to adopt mobile banking.

H3 Social influence has positive influence on intention to adopt mobile banking.

H4 Facilitating condition has positive influence on intention to adopt mobile banking.

2.2 DeLone and McLean IS success model)

The DeLone and McLean model was introduced by DeLone and McLean (1992). The roots of this model are connected with mathematical theory of communication proposed by Shannon and Weaver (1949). This theory identified three types of information such as effectiveness level (impact on the receiver), sematic level (ability to transfer the intended message) and technical level (accuracy and efficiency of the system that produce it). After three decades, Mason (1978) adapted mathematical theory of communication into information system context. According to Mason (1978), effectiveness level could expand further into three categories namely: influence on the receipt, influence on the system and receipt of information. This extension was in the context of information system and includes both dimensions of IS information quality and system quality (Hannukainen et al., 2017; Mason, 1978). With the passage of time DeLone and McLean (1992) studied the extended mathematical communication theory and added six more factors in the context of IS. These factors are known as information quality, system quality, user satisfaction, organisational impact, system use and individual impact.

After reviewing information system literature researchers found that the original D&M model does not include service quality which is one of the most important factors in information system studies (Kettinger and Lee, 1994; Li, 1997; Pitt et al., 1995). Authors like Pitt et al. (1995) postulated that "commonly used measure of IS

effectiveness focuses on the products rather than the services of the IS function. Thus, there is a danger that IS researchers will miss measure IS effectiveness if they do not include in their assessment package a measure of IS service quality." Looking at criticism and technological advancement, Delone and McLean (2003) reviewed the information system literature and acknowledged that there is need to add another IS factor such as service quality in D&M model. Thus, the latest D&M model includes three core factors namely: information quality, system quality and service quality. This study has used Delone and McLean (2003) model for the investigation of Islamic mobile banking customer behaviour towards adoption of Islamic mobile banking in Palestine.

Earlier studies had confirmed that factors underpinned D&M model significantly influence on user behaviour and satisfaction (Ho Cheong and Park, 2005; Samar and Mazuri, 2019b; Urbach et al., 2010). Authors like Samar and Mazuri (2019b) have integrated D&M model with self-determination theory. Findings of this study revealed that system quality, information quality and service quality had significant influence on internet banking user satisfaction. In mobile banking context, Ho Cheong and Park (2005) revealed that system quality significantly influence on user intention to adopt mobile banking. Thus, by following above arguments and back up with earlier studies (Ho Cheong and Park, 2005; Samar and Mazuri, 2019b; Urbach et al., 2010), we drive the following hypotheses:

H5 Service quality has positive influence on intention to adopt mobile banking.

H6 System quality has positive influence on intention to adopt mobile banking.

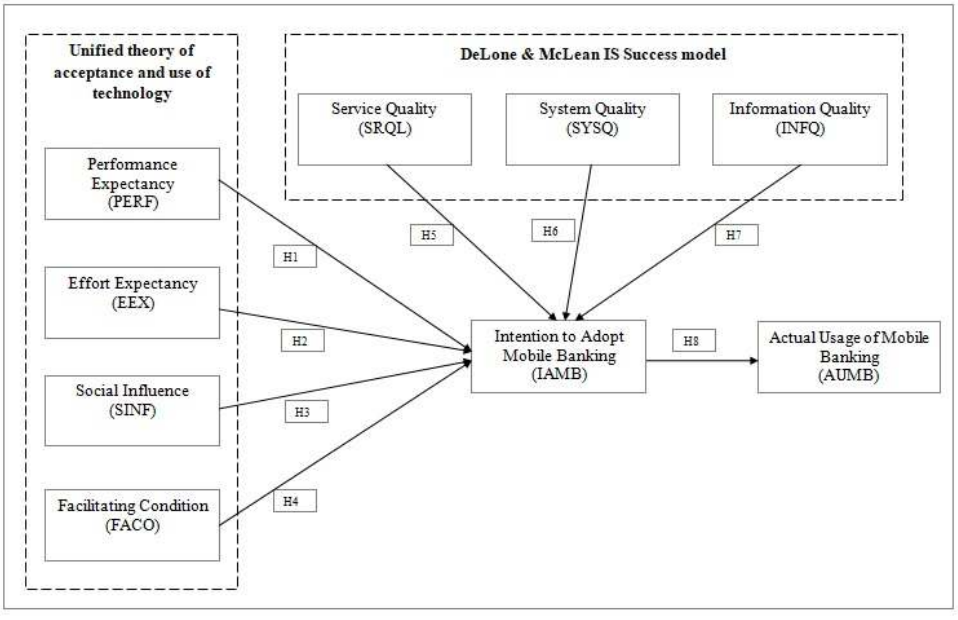
H7 Information quality has positive influence on intention to adopt mobile banking.

H8 Intention to adopt mobile banking has positive influence on actual usage of mobile banking.

2.3 Theories integration rational

After detailed literature review, this study combined the key factors of UTAUT (performance expectancy, effort expectancy, social influence, facilitation condition and behavioural intention) and D&M model (information quality, system quality and service quality) for the investigation of Islamic banking customers' behaviours towards adoption of Islamic mobile banking in Palestine. Integration of two theories is appropriate and in line with several researchers (Jackson et al., 2013; Oliveira et al., 2016; Samar and Mazuri, 2019b; Shen et al., 2010). According to Shen et al. (2010) "user acceptance of new technology is a complicated phenomenon that requires more than a single model." Similarly, Jackson et al. (2013) asserted that "an integrative perspective model provides a more complete account of the causal mechanisms underlying the relationships as well as unique insights that cannot be obtained with a single theory driven model." Thus, the present study integrated UTAUT and D&M model in Islamic mobile banking adoption context. The integrated model can be seen in Figure 1.

Figure 1 The proposed research model



3 Research methods

3.1 Scale development

In order to test the theoretical research framework, a survey questionnaire was developed. The first part of the questionnaire includes demographic information about respondents such as age, gender and qualification. Therefore, the second part of the questionnaire is based on constructs items adopted from previous literature. Items scale for performance expectancy; effort expectancy, social influence and facilitating condition were adopted from Rahi et al. (2018a). Therefore, items for constructs user intention to adopt mobile banking and actual usage of mobile banking were adapted from Venkatesh et al. (2003). Concerning with DeLone and McLean IS constructs, constructs items including information quality, system quality and service quality were adapted from Samar and Mazuri (2019b). All the constructs items anchored on a seven-point Likert scale (1 – strongly disagree to 7 – strongly agree). Overall this study is conducted under positivism paradigm by following quantitative research approach.

3.2 Sample and data collection

As the focus of this study is to observe customers behaviour to adopt Islamic mobile banking in Palestine, the sample consist of Islamic banks customers. In order to collect the data convenience sampling approach was adopted which is in line with earlier studies (Hulland et al., 2017; Rahi, 2015, 2016b; Rahi et al., 2017a; Samar and Mazuri, 2016). According to Rahi et al. (2018b) stated that "convenience sampling allows researcher to complete interviews or get responses in a cost effective way." In another study Rahi and

Ghani (2018b) suggested that convenience sampling approach may suffice in studies having exploratory model in the field of marketing. Sample size was selected by following guideline Comrey and Lee (1992) demonstrated that "sample size of 50 is very poor, while 100 is poor, 200 is reasonable, 300 is good, 500 is very good and 1,000 is brilliant for structural equation modelling." A set of 500 questionnaires was distributed among customers of Islamic banks in Palestine. Inclusion criterion was that respondents must be familiar with Islamic mobile banking and use of mobile application. Out of 500 respondents 421 questionnaires were returned with a response rate of 84.2%. Therefore, 35 questionnaires were discarded due to inappropriate answers (Rahi, 2016a, 2017a; Rahi and Ghani, 2016). Finally, 386 valid questionnaires were used for structural equation modelling (SEM).

3.3 Harman's single factor test

Authors like Podsakoff et al. (2003) pointed that studies that use single source strategy for data collection may affect due to common method variance (CVM) issue. In order to test CMV bias this study had used Harman's single factor test which is in line with several previous studies (Alnaser et al., 2017b, 2017c). Findings of Harman's single factor test revealed that the maximum co-variance explained by single factor was only 23.10% which is less than 50%, confirming that study is free from common method bias.

4 Data analysis

SEM approach was used to test the causal relationship between proposed hypotheses. SEM is a "statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions" (Rahi and Ghani, 2018b). There are two types of SEM:

a variance-based SEM

b co-variance-based SEM.

Both techniques have some advantages and disadvantages (Rahi and Ghani, 2018a). The present study has selected partial least square (PLS) approach which is variance-based SEM (Rahi et al., 2018a). PLS approach is appropriate to be taken when the study has complex research model (Samar et al., 2017b). Additionally, Hair et al. (2016) stated that when the aim of the research is toward theory development PLS approach may suffice for SEM. SmartPLS 3.27 software was used to analyse the data (Rahi, 2017b; Ringle et al., 2015).

4.1 Measurement model

SEM is further divided into two stages namely: measurement model and structural model (Anderson and Gerbing, 1988). Measurement model evaluates indicator reliability, convergent validity and discriminant validity of the construct therefore structural model assessed the hypothesised relationship (Samar and Mazuri, 2019b). In order to analyse the indicator reliability the factor loadings of each item should be greater than 0.60 (Chin, 1998). Construct reliability was measured with Cronbach's (α) and composite reliability

(CR), and criterion is the values should be greater than 0.70 as recommended by Henseler et al. (2009). Convergent validity was assessed with average variance extracted (AVE) following a criterion that values should be greater than 0.5 (Fornell and Larcker, 1981; Rahi et al., 2018b). Table 1 depicted factor loadings, AVE, Cronbach's (α), CR and confirmed the convergent validity of the constructs.

Once the convergent validity is achieved it is important to assess the discriminant validity of the constructs. In this study, the discriminant validity of the constructs was measured using Fornell and Larcker (1981) criterion. Discriminant validity is defined as "the extent to which observed constructs items measure distinct concepts" (Samar et al., 2017a). For adequate discriminant validity of the constructs, the square root of AVE should be greater than all correlations between each pair of constructs (Fornell and Larcker, 1981; Samar et al., 2017b). The square root of the AVE (in italics) is found greater than corresponding rows and columns demonstrating that the measure is discriminant. Table 2 showed the values of all correlations and square root of AVE.

Discriminant validity can be measured using cross loading method (Rahi, 2018). In order to achieve discriminant validity using cross loading method, the factor loadings of all indicators should be greater than other indicators outer loadings (Rahi, 2017a). Table 3 depicted that the indicator loading of each construct is greater than the corresponding constructs outer loadings confirming that the measure is discriminant.

Table 1 Measurement model

Constructs/items		*Loadings*	*(α)*	*CR*	*AVE*
Effort expectancy (EEX)					
EEX1	I think that learning to operate Islamic mobile banking would be easy for me.	0.847	0.775	0.853	0.594
EEX2	It would be easy for me to become skilful by using Islamic mobile banking.	0.775			
EEX3	My interaction with Islamic mobile banking would be clear and understandable.	0.768			
EEX4	I would find Islamic mobile banking easy to use.	0.684			
Facilitating condition (FACO)					
FACO1	Islamic mobile banking is compatible with other technologies I use.	0.809	0.920	0.944	0.809
FACO2	A specific person is available for assistance of Islamic mobile banking difficulties.	0.954			
FACO3	I have the knowledge necessary to use the Islamic mobile banking.	0.935			
FACO4	I have the resources necessary to use the Islamic mobile banking.	0.894			

Table 1 Measurement model (continued)

Constructs/items		*Loadings*	*(α)*	*CR*	*AVE*
Intention to adopt mobile banking (IAMB)					
IAMB1	I intend to use Islamic mobile banking in the next months.	0.866	0.856	0.912	0.775
IAMB2	I predict I would use Islamic mobile banking in the next months.	0.884			
IAMB3	I plan to use Islamic mobile banking in the next months.	0.891			
Information quality (INFQ)					
INFQ1	The information provided by Islamic mobile banking is understandable.	0.915	0.899	0.930	0.768
INFQ2	The information provided by Islamic mobile banking is complete.	0.854			
INFQ3	The information provided by Islamic mobile banking is up-to-date.	0.864			
INFQ4	The information provided by Islamic mobile banking is easy to understand.	0.873			
Performance expectancy (PERF)					
PERF1	Islamic mobile banking is useful to carry out my tasks.	0.867	0.881	0.927	0.808
PERF2	I think that using Islamic mobile banking would improve my performance.	0.929			
PERF3	I think that using Islamic mobile banking would increase my productivity.	0.899			
Social influence (SINF)					
SINF1	Having Islamic mobile banking services is a status of symbol in my environment.	0.912	0.890	0.923	0.750
SINF2	People who are important to me think that I should use Islamic mobile banking.	0.839			
SINF3	People in my environment who use Islamic mobile banking services have a high profile.	0.941			
SINF4	People who influence my behaviour think that I should use Islamic mobile banking.	0.761			
Service quality (SRQL)					
SRQL1	The responsible service personnel are always highly willing to help whenever I need support with the Islamic mobile banking.	0.801	0.802	0.871	0.628
SRQL2	The responsible service personnel have sufficient knowledge to answer my questions with respect to the Islamic mobile banking.	0.776			
SRQL3	The responsible service personnel provide services related to the Islamic mobile banking at the promised time.	0.811			

Table 1 Measurement model (continued)

Constructs/items		*Loadings*	*(α)*	*CR*	*AVE*
Service quality (SRQL)					
SRQL4	The responsible service personnel provide personal attention when I experience problems with the Islamic mobile banking.	0.781	0.802	0.871	0.628
System quality (SYSQ)					
SYSQ1	Islamic mobile banking is easy to navigate.	0.838	0.853	0.911	0.774
SYSQ2	Islamic mobile banking allows me to easily find the information I am looking for.	0.894			
SYSQ3	Islamic mobile banking is well structured.	0.906			
Actual use of mobile banking (AUMB)					
AUMB1	How often do you use the Islamic mobile banking each time? □ Certainly not □ almost never □ less than 2 hours □ 2–4 hours □ 4–6 hours □ 6–8 hours □ more than 8 hours	0.976	0.968	0.979	0.941
AUMB2	How often do you use the Islamic mobile banking? □ Certainly not □ less than once a month □ once a month □ a few times a month □ a few times a week □ about once a day □ several times a day	0.958			
AUMB3	What is your actual frequency of use of Islamic mobile banking services? □ Have not used □ once a year □ once in six months □ once in three months □ once a month □ once a week □ once in 4–5 days □ once in 2–3 days □ almost every day	0.975			

Table 2 Discriminant validity using Fornell and Larcker's criterion

Constructs	*AUMB*	*EEX*	*FACO*	*INFQ*	*IAMB*	*PERF*	*SRQL*	*SINF*	*SYSQ*
AUMB	*0.970*								
EEX	0.030	*0.770*							
FACO	0.281	0.108	*0.900*						
INFQ	0.518	0.096	0.376	*0.877*					
IAMB	0.783	0.149	0.434	0.658	*0.880*				
PERF	0.323	0.002	0.182	0.294	0.457	*0.899*			
SRQL	0.351	0.081	0.146	0.304	0.436	0.223	*0.792*		
SINF	0.296	0.107	0.257	0.452	0.464	0.273	0.226	*0.866*	
SYSQ	0.524	0.087	0.351	0.582	0.707	0.407	0.299	0.324	*0.880*

Note: Italics values indicate the square root of AVE of each construct.

Table 3 Discriminant validity using cross loading method

	AUMB	*EEX*	*FACO*	*IAMB*	*INFQ*	*PERF*	*SINF*	*SERQ*	*SYSQ*
AUMB1	*0.976*	0.041	0.286	0.764	0.537	0.306	0.299	0.328	0.505
AUMB2	*0.958*	0.000	0.267	0.761	0.479	0.315	0.294	0.348	0.531
AUMB3	*0.975*	0.046	0.264	0.753	0.491	0.319	0.269	0.344	0.487
EEX1	0.053	*0.847*	0.072	0.143	0.058	0.001	0.101	0.063	0.073
EEX2	0.032	*0.775*	0.145	0.103	0.062	0.032	0.062	0.103	0.131
EEX3	0.035	*0.768*	0.086	0.120	0.088	0.015	0.087	0.053	0.018
EEX4	0.026	*0.684*	0.023	0.075	0.102	0.011	0.075	0.027	0.049
FACO1	0.374	0.095	*0.809*	0.381	0.353	0.161	0.140	0.138	0.312
FACO2	0.228	0.112	*0.954*	0.430	0.346	0.156	0.287	0.151	0.325
FACO3	0.240	0.087	*0.935*	0.411	0.342	0.184	0.262	0.115	0.337
FACO4	0.162	0.094	*0.894*	0.327	0.308	0.152	0.227	0.122	0.281
IAMB1	0.913	0.101	0.336	*0.866*	0.581	0.332	0.319	0.364	0.582
IAMB2	0.545	0.146	0.440	*0.884*	0.559	0.413	0.472	0.379	0.630
IAMB3	0.562	0.152	0.381	*0.891*	0.596	0.473	0.451	0.410	0.662
INFQ1	0.607	0.054	0.310	0.592	*0.915*	0.224	0.332	0.261	0.513
INFQ2	0.320	0.147	0.390	0.586	*0.854*	0.287	0.495	0.289	0.530
INFQ3	0.351	0.086	0.312	0.589	*0.864*	0.347	0.476	0.299	0.531
INFQ4	0.545	0.045	0.305	0.538	*0.873*	0.164	0.273	0.212	0.463
PERF1	0.329	0.001	0.134	0.413	0.270	*0.867*	0.284	0.202	0.352
PERF2	0.279	0.016	0.187	0.421	0.272	*0.929*	0.239	0.213	0.397
PERF3	0.261	0.023	0.169	0.397	0.249	*0.899*	0.212	0.185	0.347
SINF1	0.245	0.104	0.224	0.392	0.381	0.201	*0.912*	0.209	0.253
SINF2	0.354	0.090	0.225	0.492	0.472	0.327	*0.839*	0.242	0.379
SINF3	0.229	0.114	0.269	0.406	0.387	0.231	*0.941*	0.170	0.274
SINF4	0.136	0.047	0.148	0.245	0.271	0.130	*0.761*	0.135	0.151
SRQL1	0.291	0.066	0.166	0.360	0.254	0.166	0.146	*0.801*	0.255
SRQL2	0.283	0.056	0.157	0.336	0.272	0.161	0.126	*0.776*	0.214
SRQL3	0.293	0.044	0.061	0.337	0.222	0.187	0.197	*0.811*	0.262
SRQL4	0.244	0.092	0.077	0.346	0.216	0.192	0.249	*0.781*	0.216
SYSQ1	0.651	0.048	0.271	0.602	0.525	0.296	0.198	0.253	*0.838*
SYSQ2	0.350	0.095	0.353	0.620	0.481	0.367	0.336	0.239	*0.894*
SYSQ3	0.389	0.085	0.301	0.643	0.530	0.408	0.318	0.296	*0.906*

While looking at the criticism on cross loading and Fornell and Larcker's methods, Henseler et al. (2015) proposed a new method to assess discriminant validity namely Heterotrait-Monotrait ratio (HTMT). This method evaluates the discriminant validity through multi-trait and multi-method matrix (Ghani et al., 2017). Discriminant validity could achieve if the value of HTMT is less than HTMT 0.85 as suggested by Kline (2011) or HTMT less than 0.90 as suggested by Gold and Arvind Malhotra (2001).

Therefore, in present study the values of HTMT are less than 0.90 indicating that the measure is discriminant. The results of HTMT criterion can be seen in Table 4.

Table 4 Heterotrait-Monotrait ratio (HTMT) criterion

	AUMB	*EEX*	*FACO*	*INFQ*	*IAMB*	*PERF*	*SERQ*	*SINF*	*SYSQ*
AUMB									
EEX	0.054								
FACO	0.296	0.125							
INFQ	0.557	0.120	0.412						
IAMB	0.840	0.178	0.490	0.748					
PERF	0.349	0.030	0.202	0.327	0.530				
SERQ	0.398	0.106	0.169	0.356	0.526	0.265			
SINF	0.300	0.121	0.274	0.484	0.514	0.289	0.258		
SYSQ	0.580	0.108	0.394	0.664	0.829	0.468	0.361	0.349	

Note: Heterotrait-Monotrait ratio (HTMT) discriminate at (HTMT < 0.9/HTMT < 0.85).

4.2 Structural model assessment

Measurement model confirmed that the constructs had adequate reliability and validity therefore for the testing of causal relationship among proposed hypotheses structural model is applied (Rahi and Ghani, 2018d). Thus, in following section we assessed the lateral collinearity of the constructs, hypothesis testing and coefficient of determination R^2 using bootstrapping procedure. The lateral collinearity of the constructs was tested using collineraity statistics VIF as suggested by Rahi and Ghani (2018c). In order to confirm that collinearity is not likely issue in this study we had followed Diamantopoulos and Siguaw (2006) criterion. According to Diamantopoulos and Siguaw (2006), if the values of VIF test are greater than 3.3 depicting a potential collinearity issue. In current study, it can be seen that lateral collinearity is not likely issue as all the VIF values are less than 3.3. Table 5 showed the results of VIF values.

Table 5 Lateral collinearity assessment using VIF

Constructs	*Actual usage of mobile banking*	*Intention to adopt mobile banking*
Actual usage of mobile banking		
Effort expectancy		1.025
Facilitating condition		1.218
Information quality		1.802
Intention to adopt mobile banking	1.000	
Performance expectancy		1.247
Service quality		1.152
Social influence		1.318
System quality		1.735

4.2.1 Hypothesis testing

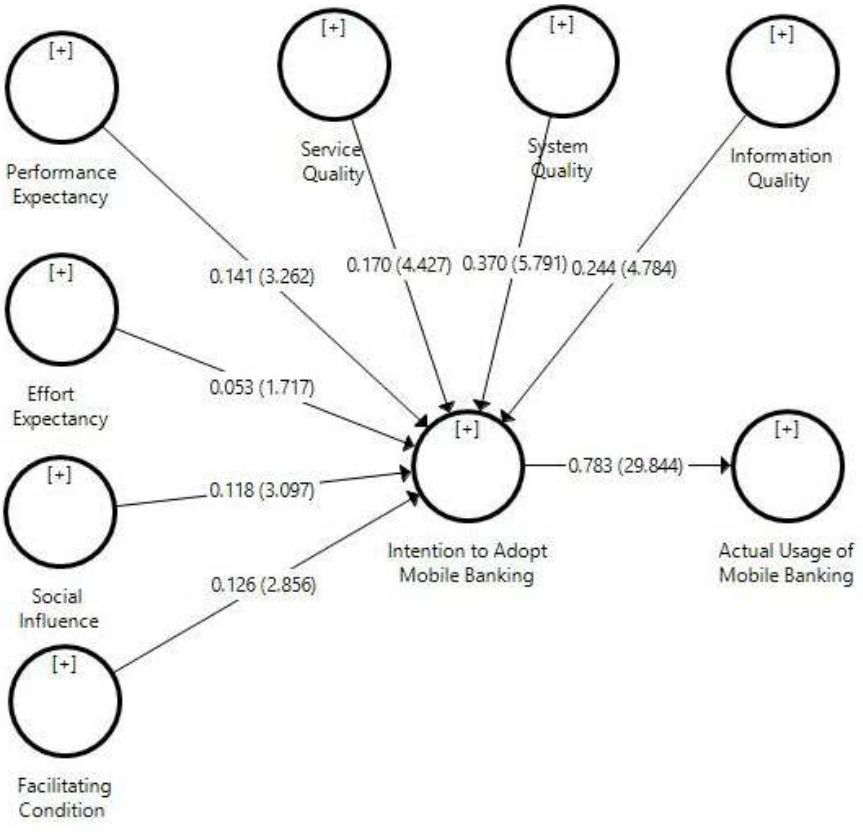
In order to test causal relationship between hypothesis, we followed the bootstrapping procedure with a resample of 5,000 (Alnaser et al., 2018a; Hair et al., 2016). The results of the bootstrapping including significance level of the path-coefficients and t-statistics can be seen in Table 6.

Table 6 Summary of hypothesis testing

Hypothesis	*Relationship*	*Direct effect (β)*	*SE*	*T-statistics*
H1	PERF -> IAMB	0.141	0.043	3.262**
H2	EEX -> IAMB	0.053	0.031	1.717*
H3	SINF -> IAMB	0.118	0.038	3.097**
H4	FACO -> IAMB	0.126	0.044	2.856**
H5	SRQL -> IAMB	0.170	0.038	4.427***
H6	SYSQ -> IAMB	0.370	0.064	5.791***
H7	INFQ -> IAMB	0.244	0.051	4.784***
H8	IAMB -> AUMB	0.783	0.026	29.844***

Note: *p < 0.05; **p < 0.01; ***p < 0.001 (one-tailed).

Figure 2 Path-coefficient and t-statistics for hypothesis testing



Findings of the structural model indicated that performance expectancy had significant influence on intention to adopt mobile banking and supported by H1: (β = 0.141, t-value 3.262, significance p< 0.01). The relationship between effort expectancy and intention to adopt mobile banking was found significant (β = 0.053, t-value 1.717, significance p < 0.05), and confirmed H2. The relationship between social influence and intention to adopt mobile banking was also significant and supported by H3: (β = 0.118, t-value 3.097, significance p < 0.01). Facilitating condition had significant influence on intention to adopt mobile banking and supported by H4: (β = 0.126, t-value 2.856, significance p < 0.01).

Concerning with DeLone and McLean IS success model, findings revealed that all three constructs had significant influence on intention to adopt mobile banking. Service quality had significant influence on intention to adopt mobile banking and statistically supported by H5: (β = 0.170, t-value 4.427, significance p < 0.001). System quality had showed significant influence on intention to adopt mobile banking (β = 0.370, t-value 5.791, significance p < 0.001), hence, confirming H6. Similarly, information quality had showed significant influence on intention to adopt mobile banking H7: (β = 0.244, t-value 4.784, significance p < 0.001). Finally, we tested the actual use of Islamic mobile banking. We proposed that users having intention to adopt mobile banking would prefer to use Islamic mobile banking. Results confirmed that user intention to adopt mobile banking had significant influence on actual use of mobile banking and statistically supported by H8: (β = 0.783, t-value 29.844, significance p < 0.001). Figure 2 depicted the values of path coefficient and t-statistics.

4.2.2 Assessing predictive relevance Q^2, effect size (f^2), and coefficient of determination R^2

In order to confirm whether the research model has enough predictive relevance to predict user intention to adopt mobile banking, we assessed the predictive relevance Q^2 of the research model using blindfolding procedure. Findings of the blindfolding procedure indicate that both user intention to adopt mobile banking and actual use of mobile banking had substantial predictive relevance Q^2 0.502 and 0.551. Additionally, the research model explained R^2 0.678% variance in user intention to adopt mobile banking was jointly predicted by factors underpinned UTAUT and DeLone and McLean IS success model. Therefore, actual usage of mobile banking was predicted by user intention to adopt mobile banking and explained R^2 0.613% variance in actual usage of Islamic mobile banking in Palestine. This study examined the effect size of the predictors using f^2 analysis. Findings revealed that system quality had medium level of effect size to predict user intention to adopt mobile banking. Therefore, in predicting actual usage of Islamic mobile banking, user intention to adopt mobile banking had showed substantial effect size. Table 7 depicted the results of effect size (f^2), coefficient of determination R^2 and predictive relevance Q^2 of the constructs.

4.3 Importance performance matrix analysis

This study highlights the importance and performance impact of outlined constructs using importance performance matrix analysis (IPMA). Earlier studies have confirmed the importance of IPMA analysis and suggested managerial implications using IPMA analysis (Alnaser et al., 2017a, 2018a). In views of Hair et al. (2016), IPMA analysis

helps managers to understand the importance and performance of the latent constructs and add an additional dimension in SEM. The results of the IPMA analysis can be seen in Table 8.

Table 7 Coefficient of determination R^2, effect size analysis (f^2) and predictive relevance Q^2

Intention to adopt mobile banking				
Construct	R^2	Q^2	(f^2)	*Decision*
Intention to adopt mobile banking	0.678	0.502		
Effort expectancy			0.008	Small
Facilitating condition			0.041	Small
Information quality			0.103	Small
Performance expectancy			0.050	Small
Service quality			0.078	Small
Social influence			0.033	Small
System quality			0.245	Medium
Actual usage of mobile banking				
Construct	R^2	Q^2		
Actual usage of mobile banking	0.613	0.551		
Intention to adopt mobile banking			1.583	Substantial

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

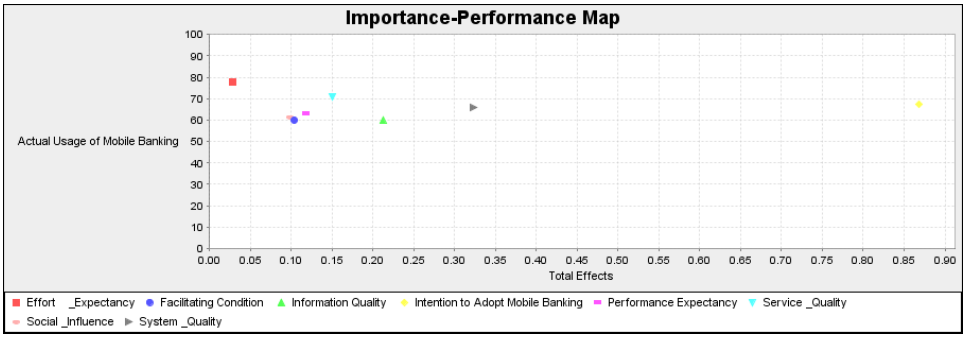
Table 8 Importance performance matrix analysis (IPMA)

Constructs	*Importance (Total effect of the latent variable actual usage of mobile banking)*	*Performance (Index values)*
Effort expectancy	0.028	77.759
Facilitating condition	0.104	60.026
Information quality	0.212	59.820
Intention to adopt mobile banking	0.868	67.460
Performance expectancy	0.118	63.214
Service quality	0.150	70.735
Social influence	0.098	61.407
System quality	0.322	65.872

In order to evaluate IPMA analysis, we selected actual usage of Islamic mobile banking as an outcome variable. Findings revealed that user intention to adopt mobile banking has the highest importance value among all other constructs. Similarly, system quality has the second highest importance value to predict actual usage of Islamic mobile banking in Palestine. Therefore, constructs like service quality, facilitating condition and information quality had intermediate level of importance to predict user behaviour towards use of Islamic mobile banking. Regarding performance index values, results showed that effort expectancy had the highest performance value, therefore, it is not important to be taken into managerial consideration. It is suggested that managers and policy makers should focus on constructs such as user intention to adopt mobile banking and system to enhance

the actual usage of Islamic mobile banking in Palestine. The results of IPMA are depicted in Figure 3 – IPMA map.

Figure 3 Importance performance matrix analyses map (see online version for colours)



5 Findings and discussion

Findings of the SEM revealed that factors underpinned UTAUT and D&M model had significant influence on user intention to adopt mobile banking. Results indicated that user intention to adopt mobile banking was jointly predicted by performance expectancy, effort expectancy, social influence, facilitating condition, information quality, service quality, system quality and explained 0.678% variance in user intention to adopt mobile banking. Therefore, actual use of mobile banking was predicted by user intention and explained R^2 0.613% variance in actual use of mobile banking. These findings confirmed that the integration of UTAUT and D&M model was appropriate to investigate user behaviour towards adoption of mobile banking.

Hypothesised results showed that, performance expectancy had significant influence on user intention to adopt mobile banking and in line with previous study Rahi et al. (2018a). Effort expectancy has also significant influence on user intention to adopt internet banking and consistent with previous studies (Samar and Mazuri, 2019b). These findings indicated that managers and mobile app developers should focus on the features that bring ease in use of Islamic mobile banking. Moreover, social influence indicated significant influence on user intention to adopt mobile banking. This is due to the fact that Palestine is a cultural ritualistic country and social circle matters a lot. Thus, it does make sense to have social influence on individual lives. Facilitating condition is also found significant relationship with user intention to adopt mobile banking and consistent with earlier studies (Martins et al., 2014; Rahi and Ghani, 2018b; Rahi et al., 2018a, 2018b).

This study had integrated DeLone and McLean model with UTAUT to investigate user intention to adopt mobile banking. Findings revealed that information quality, system quality and service quality had significant influence on user intention to adopt mobile banking which is consistent with previous research (Ho Cheong and Park, 2005; Samar and Mazuri, 2019b; Urbach et al., 2010). In addition to that, this study examined the effect size of the predictors using f^2 analysis. Findings revealed that system quality had medium level of effect size to predict user intention to adopt mobile banking. These findings also highlight the importance of DeLone and McLean model in predicting user

intention to adopt mobile banking in Palestine. As the current study integrates two well-known theories namely: UTAUT and DeLone and McLean model, hence, evaluating predictive relevance of the model is important (Rahi and Ghani, 2018d). This study confirmed the predictive relevance of the model using blindfolding procedure Q^2. Findings of the blindfolding procedure indicated that both user intention to adopt mobile banking and actual use of mobile banking had substantial predictive relevance Q^2 0.502 and 0.551. Thus, it is confirmed that integration of both model is appropriate in the context of user intention to adopt mobile banking.

Researcher has extended the findings of the SEM and applied IPMA in order to make sure which factor is important for further managerial implications. Findings of IPMA analysis revealed that user intention to adopt mobile banking has the highest importance value among all other outlined constructs. Therefore, system quality has the second highest importance value to predict actual usage of Islamic mobile banking in Palestine. Some other constructs such as service quality, facilitating condition and information quality had intermediate level of importance to predict user behaviour towards use of Islamic mobile banking. Therefore, it is suggested that managers and policy makers should focus on constructs such as user intention and system quality in order to enhance Islamic mobile banking adoption among customers of Islamic banks.

5.1 Theoretical and practical implications

From theoretical perspective, there are several implications which can be derived from the findings of the research. First this study integrates two well-known theories; UTAUT and DeLone and McLean model in Islamic mobile banking adoption context. Testing integrated model in Islamic mobile banking context enrich the e-commerce literature. Second, findings showed that user's intention to adopt mobile banking was jointly predicted by performance expectancy, effort expectancy, social influence, facilitating condition, information quality, system quality and service quality and explained model explained R^2 0.613% variance in user intention to adopt mobile banking. Thus, academic researchers can use this integrated model in other online domains such as online shopping website or in hotel booking context. In terms of managerial implications, IPMA suggested that managers and policy makers should focus on system quality in order to enhance Islamic mobile banking adoption among customers of Islamic banks in Palestine.

6 Conclusions

Advances in technology have enabled mobile applications to carry out financial transactions using mobile devices. In this essence mobile banking has become an eye-popping application in financial domain. This study is aimed to investigate factors influence on user intention to adopt Islamic mobile banking. The present study integrates two well-known theories; the UTAUT and D&M model in order to investigate user's behaviour towards adoption of mobile banking in Palestine. Findings of the SEM revealed that factors underpinned UTAUT and D&M model explained R^2 0.613% variance in user intention to adopt mobile banking. Similarly, actual use of mobile banking was predicted by user intention and explained R^2 0.613% variance in actual use of mobile banking. These findings confirmed that the newly developed model has

substantial power. This study examined the effect size of the predictors using f^2 analysis and revealed that system quality had medium level of effect size to predict user intention to adopt mobile banking. Moreover, we confirmed the predictive relevance of the model using blindfolding procedure Q^2 and results revealed that both user intention to adopt mobile banking and actual use of mobile banking had substantial predictive relevance Q^2 0.502 and 0.551. Finally, we assessed the importance of the constructs using IPMA. IPMA suggested that managers and policy makers should focus on user intention and system quality in order to enhance Islamic mobile banking adoption among customers of Islamic banks.

6.1 Limitations and future research directions

Like several other studies, our study has some limitations that provide further direction to academic researchers in the field of mobile banking adoption. First, this study integrates two well-known theories namely: D&M model and UTAUT to investigate user's intention towards adoption of mobile banking in Palestine. Therefore, we do not claim that this study outlined all the factors that influence on users behaviour to adopt mobile banking in Palestine. Thus, in future studies researchers may add some other technological factors in current research framework such as usefulness, ease of use, app design and expectation confirmation. This study has limitations in sampling as it includes respondents from only one Islamic bank of Palestine. Therefore, future studies can be conducted with combination of two or more Islamic banks sampling population. In terms of theories integration, this study does not comprise user satisfaction in the research framework. Therefore, examining user satisfaction and user intention to adopt mobile banking might disclose interesting findings. This study is limited to one country Palestine therefore testing this newly developed integrated model in other Arab countries may enhance the external validity of the research model. Moreover, the integrated model may use in other online domains such as shopping websites or hotel booking apps. Replicating this research framework in other online domain will enhance the generalisability of the research model.

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