PREREQUISITES AND PERCEIVED INFORMATION SYSTEM QUALITIES MODEL FOR MOBILE BANKING ADOPTION AMONG THE CUSTOMERS OF PRIVATE COMMERCIAL BANKS IN MYANMAR

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ABSTRACT

The research attempts to conjecture the prerequisites of perceived qualities of information system (IS) such as mobile banking (MB). The quantitative research was conducted and a total of 577 MB users of private commercial banks in Myanmar participated in the research. The results of the hypotheses were formulated by using partly exploratory factor analysis (EFA), partly confirmatory factor analysis (CFA), and structural equation modeling (SEM) techniques. The findings expose that device quality is an independent factor, and an antecedent of user interface design quality and system quality. The research also discloses that user interface design quality is a prerequisite of system quality and information quality. In the research, system quality and information quality are key factors affecting customers' intention to adopt MB. Further, the results confirm that system quality has a statistically significant effect on information quality. However, the effect of device quality on information quality is insignificant. It is expected that the research gives valuable insights for not only bank managers but also software engineers who are going to develop MB systems.

Keywords: *mobile banking, information system, qualities, private banks, Myanmar.*

INTRODUCTION

The inventions of advanced technology drive the retail banks to perform the rapid digital transformation of banking services and create a mobile environment that enables customers to perform financial transactions with minimum effort (Tam & Oliveira, 2017). Therefore, the usage of mobile technology devices and innovative financial technologies (Fin-

Tech) in financial institutions is inevitable. As a result of technological advancement, banks invent an information system (IS) based on the mobile app to assist their customers to interact with their services (Noh & Lee, 2016). Mobile banking (MB) provides customers with extensive benefits such as conducting their financial transactions at anytime and anywhere. Moreover, MB supports the potential of increasing the effectiveness of payment methods and expanding the accessibility of traditional banking services by those who currently lack them. Being originally independent of location and time, MB provides cost-effective banking services and can play a crucial role, particularly in emerging countries. MB has extra advantages compared to traditional banking which allow the banks for minimizing cost, maximizing revenue, more market shares, higher brand loyalty, greater customer retention, and better customer experience (Jeong & Yoon, 2013). Thus, banks are investing in developing MB continuously. However, the adoption rate is still under the expectation of banks since their customers still hesitate to use this technology.

The research attempts to disclose the underlying prerequisite qualities of the perceived IS qualities from DeLone and McLean (1992) information system success (ISS) model, which is one of the widely employed research models to verify the likelihood of the success of IS in the mobile commercial application landscape (Petter, DeLone, & McLean, 2013). This empirical research is a first-time endeavor to discover the prerequisites of perceived IS qualities in MB context (Sharma & Sharma, 2019; Damabi, Firoozbakht, & Ahmadyan, 2018; Myo & Hwang, 2017; Deventer, Klerk, & Bevan-Dye, 2017; Tam & Oliveira, 2017; Lokman et al., 2017; Zhou, 2012; Zhou, 2011; Lee & Chung, 2009). Therefore, the research focuses on a comprehensive set of potential IS qualities that influence MB adoption. Two factors adapted from the ISS model of DeLone and McLean (1992), system quality and information quality, and two factors based on prior studies, device quality and user interface design quality, are employed to investigate the intention of users to adopt MB. Furthermore, the major objective of the research is to contribute to both theoretical and managerial issues concerning the relationships among the different quality aspects and the influence on the individual intention in MB adoption. Thus, the following research questions are needed to answer in this study:

RQ1: What are the underlying prerequisite IS qualities?
RQ2: What are the relationships between prerequisite and perceived IS qualities?
RQ3: Which perceived IS quality is more important than others in MB adoption?

LITERATURE REVIEW

Myanmar, an ASEAN country, had been mainly a cash-based economy due to the prolonged over controlling of financial policy by the central government since 1960. As a result of the Financial Institutions Law in 1990, several private commercial banks emerged. Nonetheless, the era of rising private commercial banks was short due to the banking crisis occurring in 2003, so the financial sector became fragile (Tun, 2020a). As a consequence of reforming economic policy in 2011, financial inclusion enabled conditions for the endeavor of re-establishing private banks (Turnell, 2011). There are currently 27 privately-owned domestic banks in Myanmar which dominate 67% of total bank assets in Myanmar (Hofmann, 2018).

Among them, Kanbawza Bank (KBZ) is the largest private commercial bank which represents 41% of the private bank market share. Ayeyarwady Bank (AYA) is the second largest with 17% of the total, followed by Co-operative Bank (CB) with 11% of the total. Furthermore, only 25% of the Myanmar population has bank accounts according to the World Bank Report 2018. Besides, there are about 68,24 million mobile phone users in Myanmar and mobile network coverage is currently at 82%. The majority of mobile phone users (90%) are using the device with the android platform, while only 10% are using Apple IOS devices (Kemp, 2020). Therefore, the Central Bank of Myanmar (CBM) has granted private banks to operate mobile banking services since 2013. Although there are abundant facilitating conditions, MB adoption in Myanmar is relatively low compared to mobile phone users (Lwin, Ameen, & Nusari, 2019).

The growth of m-commerce technologies transforms the way of banks and their customers conduct financial transactions, and mobile banking (MB) is one of them (AlBalawi & Rehman, 2016). MB is a major mobile financial management service having similar functionality with internet banking (via computer) that is widely adopted by many customers to mainly check the account balance and process fund transfers (Gu, Lee, & Suh, 2009). Similarly, Mahad et al. (2015) defined MB as the use of mobile smartphone devices to access banking tasks not only for transferring funds and monitoring account balances but also making bill payments and locating automated teller machines (ATM). Furthermore, MB can be assumed as a subset of electronic banking (e-banking) that refers to the transformation of accessing financial services from wired networks to wireless networks through a mobile device (Clarke III, 2001).

According to Yeo and Fisher (2017), MB is a more advanced financial technology than online banking with unique features such as narrow costs for usage, mobility, customization, and a broader scope of utilities. Moreover, MB has evolved from short message service (SMS) based banking to mobile applications installed in users' smartphone devices (Deventer, Klerk, & Bevan-Dye, 2017). MB offers private commercial banks' customers a variety of advantages of conducting financial services easily, effectively, quickly, and conveniently compared to accessing physical banks. In addition, MB is an application of m-commerce and an innovative method which facilitates business transactions via telecommunication channels by using mobile devices (Kim, Shin, & Lee, 2009).

THEORETICAL BACKGROUND

DeLone and McLean (1992) proposed a model to measure IS success (Figure 1) based on the Theory of Communication by Shannon and Weaver (1949). The IS success model caught the concept of a communication system which is a mechanism of delivering and transferring information to the receivers. As a result, DeLone and McLean built a framework consisting of two major quality dimensions, system quality to measure technical success, and information quality to measure semantic success. Later, Seddon (1997) suggested modifying the D&M ISS model for clarification since the original framework is confusing, and the use construct in the model is ambiguous.

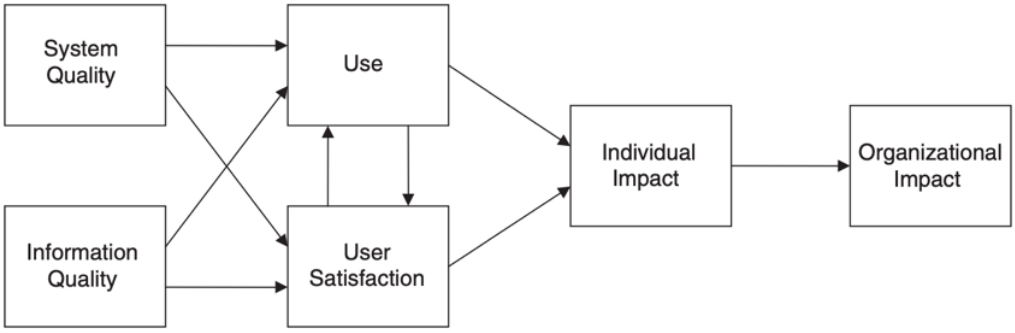

Figure 1 Information System Success Model (1992)

Consequently, DeLone and McLean modified their ISS model in 2003 by adding service quality factor into major quality components, system quality, and information quality, to enhance the measurement capability on the success of IS in e-commerce context (Figure 2). However, service quality is an insignificant determinant of behavioral intention (Brown & Jayakody, 2008; Kuo, Wu, & Deng, 2009). Tun (2020) also proved that service quality is not critical for mobile financial service adoption in Myanmar. Furthermore, Tam and Oliveira (2017) postulated that system quality and information quality could be the most significant quality dimensions to measure the success of an IS. Therefore, prior premise and research findings lead to exclude service quality construct in the research model.

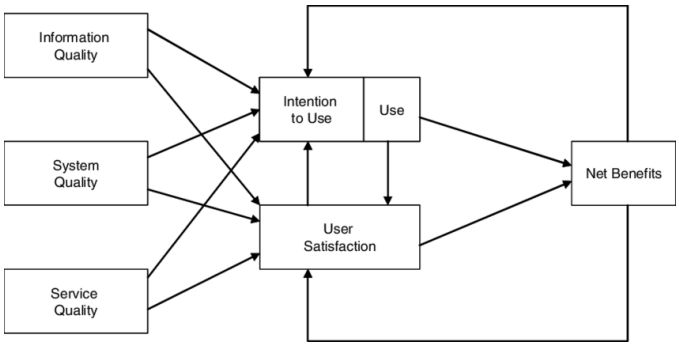

Figure 2 Updated Information System Success Model (2003)

Another significant modification in the updated D&M ISS model (Figure 2) is the separation of use and intention to use. Venkatesh and Davis (1996) argued that users show their intention to use the technology before they use it by modifying Technology Acceptance Model (TAM). Fishbein and Ajzen (1975) explained that certain behavior of users originated from the intention for engaging by developing Theory of Reasoned Action (TRA) which is the background theory of TAM. Subsequently, DeLone and McLean (2003) proposed to separate 'intention to use' and 'use', but they are stuck to each other and alternation. Alam (2014) explicitly stated that behavioral intention is an unavoidable antecedent of actual adoption which is the ultimate business goal of banks. Therefore, the intention to adopt can be referred to as the willingness and possibility of the user to adopt a specific information system. The research model is adapted from DeLone and McLean (1992) as it focuses on investigating potential IS

qualities that will lead to users' intention to adopt an IS, which does not predict its success. Moreover, none of the previous studies, as shown in Table 1, attempted to investigate the prerequisite of key IS quality factors of DeLone and McLean (1992).

Table 1 Summary of Relevant Previous Studies

Researchers	Context	Country	Sampling Size	Investigated IS Qualities
Sharma and Sharma (2019)	MB	Oman	227	SysQ, InfQ
Lee and Chung (2009)	MB	Korea	276	SysQ, InfQ
Myo and Hwang (2017)	MB	Myanmar	206	SysQ, InfQ
Deventer, Klerk, and Bevan-Dye (2017)	MB	South Africa	334	SysQ
Zhou (2011)	MB	China	210	SysQ, InfQ
Zhou (2012)	MB	China	240	SysQ, InfQ
Tam and Oliveira (2017)	MB	Southern European	354	SysQ, InfQ
Damabi, Firoozbakht, and Ahmadyan (2018)	MB	Iran	155	SysQ, InfQ
Lokman et al. (2017)	MB	Malaysia	146	SysQ, InfQ
Chemingui and lallouna (2013)	Mobile Financial Services	Tunisia	300	SysQ
Gao and Waechter (2017)	M-Payment	Australia	851	SysQ, InfQ
Routray et al. (2019)	M-Wallet	India	200	SysQ, InfQ
Koo, Wati, and Chung (2013)	MB and Internet Banking	Indonesia	141	SysQ, InfQ
Talukder, Quazi, and Sathye (2014)	Mobile Phone Banking	Australia	242	SysQ
Wilson and Mbamba (2017)	Mobile Phone Payment	Tanzania	260	SysQ
Noh and Lee (2016)	Mobile Apps-based Banking	Korea	520	SysQ, InfQ
Yoo (2020)	M-Commerce	Korea	283	SysQ, InfQ
Phuong and Trang (2018)	M-Commerce	Vietnam	427	SysQ, InfQ
Lee and Chen (2014)	M-Commerce	Taiwan	406	SysQ, InfQ
Yassierli, Vinsensius, and Mohamed (2018)	M-Commerce	Indonesia	230	InfQ

HYPOTHESES DEVELOPMENT

Device Quality

The advanced mobile services such as carrying out financial transactions, seeking information, playing games, and buying and selling products can be accessed by using modern mobile devices (Roy, 2017). Likewise, Middleton (2010) stated that advanced technology has enabled mobile devices to have higher computing performance and network connectivity through wireless technologies such as 4G, Wi-Fi and Bluetooth, which has led to the rise of mobile phone usage. Liu, Au and Choi (2014) explained that users can utilize mobile apps to perform desired functions by installing and running them on handheld devices such as tablets and mobile phones. The mobile device has unique features to influence users' beliefs and support special services for various businesses and information systems. Technically, the device quality could be investigated in three aspects: functionalities, compatibility, and

performance. These aspects may have an impact on the perceptions of users, which in turn might outcome in the overall feeling of using the device (Parveen & Sulaiman, 2008). Thus, previous literature leads to formulate the hypotheses:

H_1: Device Quality has a significant positive effect on User Interface Design Quality.

H_2: Device Quality has a significant positive effect on System Quality.

H_3: Device Quality has a significant positive effect on Information Quality.

User Interface Design Quality

A higher quality of user interface design enables users to use desired functions on an information system in different approaches while being allowed to perceive the quality of the system (Branscomb & Thomas, 1984). According to Jeong (2011), user interface design is referred as screen design, and Yoo (2020) considered it as visual quality. User interface design encompasses the whole visual appearance of information systems such as the font style, color usage, icons and buttons placement, and content layout (Graham, Hannigan, & Curran, 2005). On the other hand, Bharati and Chaudhury (2004) stated that user interface design quality is the manner of displaying and presenting the information. Therefore, user interface design quality will be investigated as a discrete factor in the research although it is the sub-dimensions of system quality factor in D&M ISS model (Seddon, 1997). The users will learn further about the information system based on their initial experience in user interface design (Everard & Galletta, 2005). Lee and Chung (2009), Damabi, Firoozbakht, and Ahmadyan (2018) also proved that user interface design is a critical factor in mobile banking context. Therefore:

H_4: User Interface Design Quality has a significant positive effect on System Quality.

H_5: User Interface Design Quality has a significant positive effect on Information Quality.

System Quality

System quality is an instant impression through the using device that leads to use of the system since users do not directly access service in the case of MB (Gao & Waechter, 2017). The extensive scope of system quality is obvious in the various ways measured by ease of use, functionality, usability, and response time of the specific system (DeLone & McLean, 2003). System quality captures the concepts of the productivity model to evaluate the degree of IS resource, which is crucial in the mobile environment (Lee & Chung, 2009). On the other hand, Kuan, Bock and Vathanophas (2008) stated that system quality is the technical perspective of the e-commerce system that produces information. Furthermore, Talukder, Quazi, and Sathye (2014) define system quality as the technological quality of the mobile system that reflects the quality of the information provided to users. Hariguna and Berlilana (2017), Sharkey, Scott, and Acton (2010), and Lin (2007) asserted that higher system quality has the capability to boost the intention of users to adopt it and lead to the rise of market share in the e-commerce landscape. Therefore, the hypotheses have been formulated:

H_6: System Quality has a significant positive effect on Information Quality.

H_7: System Quality has a significant positive effect on intention to adopt MB.

Information Quality

Nelson, Todd, and Wixom (2005) defined information quality as a motivation factor, the information results or content of IS processing. Information quality is output of the system which represents how the information is organized on the limited user interface of a mobile device (Lee & Chung, 2009). On the other hand, the measurements of information quality in e-commerce and traditional IS context are different because of their nature to reflect the objectivity, relevance, and reliability of the information (Yoo, 2020). Information quality can be considered as two dimensions: 1) intrinsic, where the information from the system represents the data of the real world, and 2) contextual, where the information is produced by the system after completing a specific process (McKnight et al., 2017). In addition, McKnight et al. (2017) stated that information qualities such as consistency, accuracy, and completeness can motivate the users to continue engaging the current services rather than the other services with inaccurate or incomplete information. Therefore, the following hypothesis can be proposed:

H_8: Information Quality has a significant positive effect on intention to adopt MB.

According to the prior research, theoretical background, and formulated hypotheses, the research model presented in Figure 3 with eight hypotheses and five constructs is proposed to validate in the research. Moreover, H_2, H_3, H_4 and H_5 are intended to answer RQ1, H_1 and H_6 are intended for RQ2, and RQ3 will be answered by H_7 and H_8.

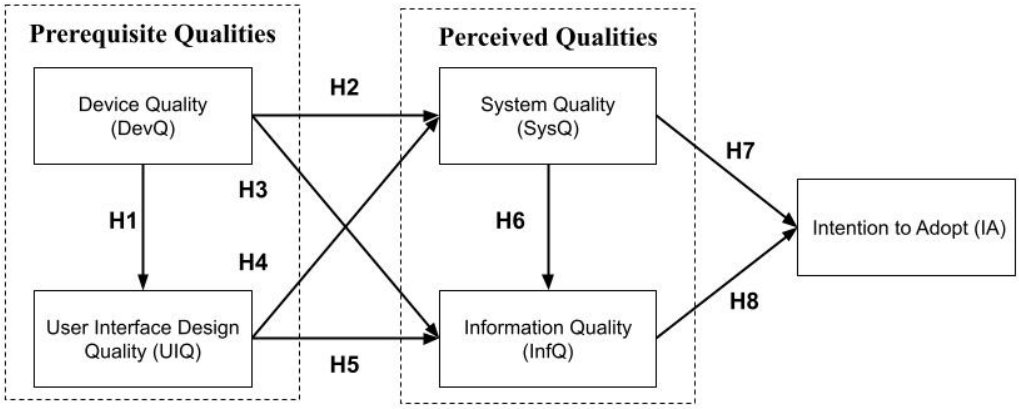

Figure 3: Proposed Research Model

RESEARCH DESIGN

Neuman (2006) recommended that the survey is an appropriate technique to understand attitudes and is suitable for quantitative research. Partly exploratory factor analysis (EFA) and

partly confirmatory factor analysis (CFA), and structural equation modeling (SEM) analysis are employed and used to test the proposed hypotheses. The survey questionnaire (Appendix A) is developed in the bilingual language (English-Burmese) by using Google Form to collect data. The questionnaire is reviewed by five highly educated people with strong experience in using MB. The survey is conducted through social networking sites, Facebook and LinkedIn. All the indicators of factors (Table 2) in the questionnaire use a 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree), except demographic variables. In the questionnaire, there is a filter question to ensure target participants are MB users of private commercial banks in Myanmar to reduce the rate of invalid dataset due to lack of knowledge regarding MB in general. According to SEM analysis, the widely accepted typical minimum sample size is 200. On the other hand, Kline (2011) suggested that sample size to the number of questionnaire items ratio (N:q) should be 20:1. Furthermore, Comrey and Lee (1992) recommend that the scale of sample size 500 is very good. Therefore, a minimum sampling size of 500 is required.

Table 2 Questionnaire Items of Factors

Factors	Items (q = 15)	Reference
Device Quality	DevQ1, DevQ2, DevQ3	(Lu & Su, 2009)
System Quality	SysQ1, SysQ2, SysQ3	(Ahn, Ryu, & Han, 2007)
Information Quality	InfQ1, InfQ2, InfQ3	(Kim, Xu, & Koh, 2004)
User Interface Design Quality	UI1, UI2, UI3	(Lee & Chung, 2009)
Intention to Adopt	IA1, IA2, IA3	(Talukder, Quazi, & Sathye, 2014)

ANALYSIS RESULTS AND FINDINGS

Demographic Profile of the Respondents

Total of 620 people in Myanmar responded to the questionnaire, 43 respondents (6.9%) answered that they do not have prior experience in using MB, thus only 577 respondents are available for further data analysis. After eliminating outliers (12%) from the remaining responses according to the value of standard deviation of each dataset, the valid dataset is down to 508. The final usable dataset consists of 41.3% male respondents and 58.7% female respondents, indicating that the result does not have gender bias. Most of the respondents (71.1%) are the age group of 24-39 years (generation Y), followed by 18.9% above 40 years (generation X), and 10% below 23 years old (generation Z). In the survey, 66.3% respondents have higher than a bachelor degree and 31.1% respondents have a bachelor degree. Only 2.6% of respondents have a diploma and lower education level. Furthermore, half of the respondents (50.2%) are civil-servant, 28% of participants are employees, and 10.8% are self-employed. Only 9.1% are students and 2.0% of respondents are unemployed.

Table 3 Analysis Result of Demographic Profile of Respondents

Demographic		Freq (N = 508)	Percentage
Gender	Male	210	41.3%
	Female	298	58.7%
Age	<= 23 year	51	10.0%
	24-39 year	361	71.1%
	>= 40 year	96	18.9%
Education Status	High School	5	1.0%
	Diploma	8	1.6%
	Bachelor Degree	158	31.1%
	Master Degree	286	56.3%
	Ph.D	51	10.0%
Occupation Status	Employee	142	28.0%
	Self-Employed	55	10.8%
	Civil Servant	255	50.1%
	Student	46	9.1%
	Unemployed	10	2.0%

Preliminarily Descriptive Analysis

First, preliminarily descriptive analysis is examined in SPSS software. All the questionnaire items of values of standard deviation, skewness, and kurtosis are between 2 and -2 according to the analysis results (Table 4). It indicates the normality of each questionnaire item and the contribution of respondents. Therefore, the dataset is suitable for the use of Maximum Likelihood (ML) estimation in SEM analysis (Kline, 2011). Table 4 shows that respondents strongly believe that their mobile phone has adequate features to perform well in conducting MB transactions and is compatible with MB (DevQ1, DevQ2, DevQ3). Furthermore, respondents have a positive belief that MB is easy to use (SysQ2) as it provides appropriate functionalities (SysQ1) for prompt financial transactions (SysQ3). Besides, the willingness of respondents to increase using MB (IA2) and to use MB whenever opportunities arising (IA3) are high.

Table 4 Preliminarily Descriptive Analysis Results

Items	Mean	Std. Deviation	Skewness	Kurtosis
DevQ1	4.44	0.649	-0.744	-0.491
DevQ2	4.48	0.626	-0.796	-0.376
DevQ3	4.56	0.605	-1,018	0.017
SysQ1	4.25	0.730	-0.617	-0.268
SysQ2	4.31	0.707	-0.748	0.186
SysQ3	4.07	0.707	-0.370	-0.118
IA1	3.90	0.979	-0.500	-0.666
IA2	4.14	0.827	-0.601	-0.444
IA3	4.21	0.794	-0.695	-0.203
InfQ1	3.82	0.773	-0.138	-0.495

Table 4 Preliminarily Descriptive Analysis Results
(Continued)

Items	Mean	Std. Deviation	Skewness	Kurtosis
InfQ2	3.75	0.783	-0.054	-0.55
InfQ3	3.85	0.780	-0.233	-0.406
UIQ1	3.84	0.766	-0.068	-0.630
UIQ2	3.97	0.760	-0.391	-0.173
UIQ3	3.94	0.800	-0.438	-0.212

Analysis Results of Factor Loading and Cronbach's Alpha

Exploratory factor analysis (EFA) is conducted in SPSS software. Principal Components Analysis (PCA) method with a Varimax rotation of factor analysis is used to confirm that all the correspondence indicators are associated with respective factors from the proposed research model (Figure 3). All the indicators are with a loading coefficient greater than 0.5 (Hair et al., 2010) and the factor analysis confirms five factors affiliated from 15 indicators (Table 5). Furthermore, the analysis results of Cronbach's alpha of factors are greater than acceptable value 0.7. The results indicate that internal consistency reliability is adequate (Table 5).

Table 5 Analysis Results of Factor Loading and Cronbach's Alpha

	Device Quality	Information Quality	Intention to Adopt	User Interface Design Quality	System Quality	Cronbach's Alpha
DevQ2	0.863	0.054	0.080	0.160	0.161	
DevQ1	0.809	0.212	0.121	0.045	0.100	0.833
DevQ3	0.799	0.041	0.183	0.158	0.209	
InfQ2	0.111	0.848	0.189	0.185	0.169	
InfQ1	0.087	0.772	0.191	0.195	0.266	0.851
InfQ3	0.159	0.751	0.186	0.294	0.165	
IA2	0.137	0.178	0.831	0.193	0.200	
IA1	0.190	0.146	0.816	0.172	0.077	0.828
IA3	0.091	0.226	0.769	0.179	0.236	
UIQ1	0.206	0.252	0.163	0.775	0.040	
UIQ2	0.099	0.211	0.218	0.760	0.296	0.813
UIQ3	0.101	0.204	0.202	0.747	0.273	
SysQ2	0.199	0.145	0.183	0.269	0.786	
SysQ3	0.117	0.352	0.171	0.212	0.710	0.779
SysQ1	0.361	0.206	0.219	0.111	0.629	

Correlations Among the Factors

The relationships between the factors are investigated by using the matrices of Pearson correlation coefficients in SPSS software. The results confirmed that all the factors have significantly positive correlation with each other at a 0.01 level. Further, correlation coefficient ranging from 0.344 (DevQ ↔ InfQ) to a maximum of 0.589 (SysQ ↔ InfQ). The shaded cells in Table 6 represent the eight causal relationships in the proposed research model (Figure 3). However, the significant correlations do not confirm that there are significant causal effects between the factors (Kline, 2011).

Table 6 Analysis Result of Factor Correlations

Factors	DevQ	SysQ	IA	InfQ	UIQ
Device Quality (DevQ)	1				
System Quality (SysQ)	0.503**	1			
Intention to Adopt (IA)	0.377**	0.524**	1		
Information Quality (InfQ)	0.344**	0.589**	0.499**	1	
User Interface Design Quality (UIQ)	0.381**	0.582**	0.512**	0.584**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed).

The Results of Convergent Validity and Composite Reliability

According to the procedures of CFA, reliability and convergent validity were examined by standardized regression weights, average variance extracted (AVE) and composite reliability (CR) by using AMOS software. The value of standardized regression weights for all indicators were greater than 0.691 and all the indicators are significant according to the suggestion of Hair et al. (2010). The acceptable threshold for CR value is > 0.7 and for AVE is > 0.5. All the constructs of CR and AVE values exceeded their respective minimum acceptable values. Thus, the results indicate that the dataset has good internal consistency reliability and adequate convergent validity (Table 7).

Table 7 Analysis Results of Convergent Validity, AVE and CR

Factors	Items	Std. Regression Weights	CR	AVE
Device Quality	DevQ1	0.732	0.837	0.632
	DevQ2	0.848		
	DevQ3	0.800		
System Quality	SysQ1	0.691	0.783	0.547
	SysQ2	0.778		
	SysQ3	0.747		
Information Quality	InfQ1	0.791	0.854	0.662
	InfQ2	0.854		
	InfQ3	0.794		

Table 7 Analysis Results of Convergent Validity, AVE and CR
(Continued)

User Interface Design Quality	UIQ3	0.776	0.817	0.599
	UIQ2	0.837		
	UIQ1	0.703		
Intention to Adopt	IA1	0.730	0.837	0.632
	IA2	0.840		
	IA3	0.811		

The Result of Discriminant Validity

Discriminant validity for the evaluation of the amount of difference among correlated constructs as defined by Hair et al. (2010) is always an important analysis to examine the validity of constructs. All the values of the square roots of the AVE are larger than the correlation estimates of each construct which demonstrate discriminant validity. In Table 8, all the values of the square root of AVE are bolded. According to the analysis results (Table 8), the proposed research model has satisfactory discriminant validity for further SEM analysis.

Table 8 Analysis Results of Discriminant Validity

Factors	DevQ	SysQ	InfQ	UIQ	IA
Device Quality	**0.795**				
System Quality	0.601	**0.740**			
Information Quality	0.385	0.704	**0.814**		
User Interface Design Quality	0.449	0.735	0.680	**0.774**	
Intention to Adopt	0.433	0.645	0.585	0.616	**0.795**

Model Fit Indices Analysis

Verifying model fit indices is part of the CFA and the statistics for considered in this study are goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), and comparative fit index (CFI). The fit indices of the measurement model obtained are as following: x^2/df = 2.055; GFI = 0.960; AGFI = 0.939; NFI = 0.958; IFI = 0.978; CFI = 0.978 and RMSEA = 0.046. The fit indices of structural model (research model) was further examined and the statistical results are: x^2/df = 2.126; GFI = 0.957; AGFI = 0.937; NFI = 0.955; IFI = 0.976; CFI = 0.976 and RMSEA = 0.047. The values of GFI, AGFI, NFI, IFI and CFI of both measurement model and structural model are greater than recommended value of 0.90 and RMSEA is lower than 0.05 and hence these verification results (Table 9) confirm that the research model of this research is good-fit with dataset.

Table 9 Analysis Result of Model Fit Indices

	x^2/df	GFI	AGFI	NFI	IFI	CFI	RMSEA
Good-Fit	< 3	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	< 0.05
Measurement	2.055	0.960	0.939	0.958	0.978	0.978	0.046
Structural	2.126	0.957	0.937	0.955	0.976	0.976	0.047

The Analysis Results of Hypotheses Testing

The hypotheses were examined as proposed in Figure 3. The results of hypothesis testing are presented in Table 10. Device quality positively affected user interface design quality (β=0.589, p<0.001) and system quality (β=0.364, p<0.001), which means that H_1 and H_2 are approved. User interface design quality positively affected system quality (β=0.487, p<0.001) and information quality (β=0.340, p<0.001). Thus, H_4 and H_5 are accepted. Furthermore, system quality (β=0.593, p<0.001) evidenced a positive effect on information quality. Therefore, H_6 is supported. System quality (β=0.731, p<0.001) and information quality (β=0.261, p<0.01) with regard to MB, showing a significant positive effect on the intention to adopt. Thus, H_7 and H_8 are consistent with the proposed hypotheses. However, the analysis result showed that the device quality has no significant effect on information quality which leads to rejection of H_3. All the analysis results of hypothesis testing are concluded in Figure 4.

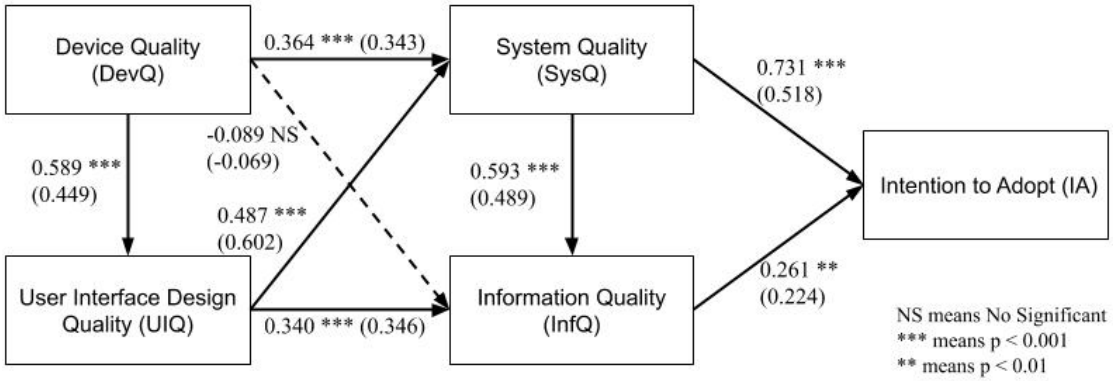

Figure 4 Research Model with Hypothesis Results

Table 10 Analysis Results of Hypotheses

Hypothesis	Relationship	Path Coefficient	Hypothesis Results
H1	DevQ → UIQ	0.589 *** (0.449)	Approved
H2	DevQ → SysQ	0.364 *** (0.343)	Approved
H3	DevQ → InfQ	-0.089 NS (-0.069)	Rejected
H4	UIQ → SysQ	0.487 *** (0.602)	Approved
H5	UIQ → InfQ	0.340 *** (0.346)	Approved
H6	SysQ → InfQ	0.593 *** (0.489)	Approved
H7	SysQ → IA	0.731 *** (0.518)	Approved
H8	InfQ → IA	0.261 ** (0.224)	Approved

Note: NS means No Significant, *** means p < 0.001, ** means p < 0.01

The Effects in the Research Model

The shaded cells in Table 11 are additional findings of the research. An exogenous variable, device quality, has a higher effect on user interface design quality than system quality. Although device quality has no significant direct effect on information quality, it has a medium indirect effect through user interface design quality and system quality. User interface design quality has a medium effect on both system quality and information quality, and it is an intervening factor between device quality and information quality. Also, system quality has a medium effect on information quality. System quality and information quality have a direct effect on the intention to adopt construct, an endogenous variable, and system quality has a larger effect than information quality. Furthermore, both device quality and user interface design quality have medium indirect effects on intention to adopt through system quality.

Table 11 The Effects in the Research Model

Variables			Endogenous			
			Intervening			Dependent
			UIQ	SysQ	InfQ	IA
Exogenous	Independent	DevQ	Direct	Direct	Indirectly Only DevQ → UIQ → InfQ 0.200***(0.155) DevQ → SysQ → InfQ 0.216***(0.168)	Indirect DevQ → SysQ → IA 0.266***(0.178)
	Intervening	UIQ	Nil	Direct	Direct	Indirect UIQ → SysQ → IA 0.356***(0.312)
		SysQ	Nil	Nil	Direct	Direct
		InfQ	Nil	Nil	Nil	Direct

THEORETICAL CONTRIBUTIONS

The investigation on device quality and user interface design quality as a prerequisite of D&M ISS model (1992) in the MB context is one of the novelties of this study. This study confirmed that underlying prerequisite qualities are existing and they are vivid requirements of information system success. The absolute qualities of the mobile device such as performance, functionality, and compatibility will help the users to interact with the MB comfortably through a user-friendly interface and learn the system quality effectively. Even experienced users are afraid that they will press the wrong buttons on complicated mobile applications during payment processes (Jarvenpaa & Lang, 2005). Parveen and Sulaiman (2008) also stated that the smaller the screen size of mobile devices, the less information displayed. They further stated that better interface design and higher mobile device ability will lead to a positive belief of an individual that specific technology has adequate functionalities, fast response, and also easiness. According to the findings of this study, device quality will not increase the accessibility of sufficient and accurate real-time information. However, higher quality mobile

devices are capable of delivering quality information through system quality and user interface design quality.

Further, the better quality of the mobile device is able to support the users to perceive the system quality of MB which will lead to the use of MB intensively. The comprehensive good design perspectives such as font, color, style, and shapes on the screen will allow users to access the full capacity of the MB system and acquire desired information from MB. Laukkanen (2007) also recommended larger screen size is required to display adequate financial information in the MB system. It can be implied that user interface design quality is a mediator between device quality and system quality. The appealing user interface design of MB will support users to have a good experience in system quality then it will encourage the users to keep using MB. The finding also indicates that system quality is able to deliver sufficient information whenever users need. In the banking industry, Ali and Ju (2019) advocated that a system with higher quality will provide more reliable and valid information for its users, in addition, if the system is easy to use and learn, the likelihood of users' adoption will high. Subsequently, perceived system quality and information quality will enhance the willingness of users to use MB frequently. Therefore, the findings are consistent with previous studies in mobile commerce and mobile banking context (Bahaddad, 2017; Noh & Lee, 2016).

MANAGERIAL CONTRIBUTIONS

Bank managers should note that relying on existing IS quality factors for formulating MB system improvement strategy is not adequate. According to the findings, the better mobile device quality can display better quality of the image and higher screen resolution. Therefore, the users with the latest mobile device can enjoy the full capacity of the interface design of MB rather than the users with outdated mobile devices. MB is at a nascent phase most notably in Myanmar, MB must be easy to access and compatible with widely used mobile devices in the current market. Since user interface design quality has significant positive effects on both system quality and information quality, MB developers ought to ensure the interface of MB is simple, less complex and easy to interact with users by avoiding convoluted structures on the screen. Particularly in Myanmar, every text in MB is required to display in the native language properly and clearly, emphasize graphical user interface, and provide user guides to use of MB.

Therefore, users will get the best experience in system quality of MB and accessing the financial information through user interface design quality then MB adoption will follow. Banks should learn first about their customers' current performance of mobile phones before developing or releasing the new features for MB, and ensure the forthcoming feature is compatible with the mobile phone the customers are currently using. Thus, it is imperative for software engineers to understand what improves system quality and information quality, how they are correlated, and how they drive the adoption of MB. Software engineers also should duly develop MB systems by strictly following the standardization of technical aspects of mobile technology because higher quality of system is still a competitive advantage in MB context notably in Myanmar.

CONCLUSIONS

The research attempts to identify the underlying quality factors in information systems for the first time in MB context by utilizing D&M ISS model (1992). The empirical findings suggest that IS qualities model incorporating additional prerequisite qualities, device quality and user interface design quality, is a stronger predictor for MB adoption among the customers of the private banks, thereby answering RQ1. Also, the research findings highlight essential quality factors for MB system development, upgrading features of MB, and MB users' needs. In MB context, prerequisites of system quality are device quality and user interface design quality, system quality, and user interface design quality for information quality, thereby answering RQ2. In addition, the research concludes that system quality has a higher effect than information quality on MB adoption among the customers of private commercial banks, thereby answering RQ3. MB systems should be in harmony with mobile devices in the market and provide sufficient information as users require.

LIMITATIONS AND FUTURE RESEARCH

The major limitation of the research focuses on MB users only, and the perception of all the customers of private commercial banks does not reflect. Moreover, the opinion of generation Y is dominant in this study and the results may not be the same in generations X and Z who are with different experiences in the mobile technology landscape (Lin & Theingi, 2019). These research findings are limited to a cross-sectional study, and a longitudinal approach incorporated with qualitative research is therefore recommended for future studies because the technology landscape is rapidly advancing and transforming over time. According to the contributions of the present study, future research can include device quality as a prerequisite of system quality, and user interface design quality is for information quality. Future researchers can extend the updated D&M ISS model (2003) by supplementing the emerging factors of this study and should endeavor to investigate the underlying prerequisite of service quality. It is also recommended to validate the research model of this study in different contexts such as mobile learning, mobile commerce, and mobile services. Moreover, this research model can be reasonably extended by adding the role of the major device platforms (Android and IOS) as moderating variables for a deeper understanding of IS success in the mobile environment.

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APPENDIX

Items	Statements
DevQ1	My mobile phone has adequate features to support MB.
DevQ2	My mobile phone performs well while conducting financial transactions with MB.
DevQ3	My mobile phone is compatible with MB.
SysQ1	MB provides a fast response and transactions processing.
SysQ2	MB is easy to use.
SysQ3	MB offers appropriate functionalities.
IA1	I plan to use MB frequently in my daily life.
IA2	I intend to increase my use of MB.
IA3	I intend to use MB when the opportunity arises.
InfQ1	MB provides me with information relevant to my needs.
InfQ2	MB provides me with sufficient information.
InfQ3	MB provides me with accurate information.
UIQ1	The screen colors used for MB are appropriate.
UIQ2	The presentation style of MB is easy to understand.
UIQ3	MB is easy to navigate.