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The Moderating Effect of Situational Factors and the Key Factors Influencing Mobile Banking Adoption

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Abstract
Technology is playing a great role in today's daily activities, making the life easier and human transactions faster. Business entities widely utilized the technologies for service delivery, efficiency, customer satisfaction and retention.
This study is aimed at investigating the factors that influence the adoption of mobile banking by using an integrated model developed based on the technology acceptance model, theory of planned behavior, service quality theory as well as relevant constructs to the context of banking adoption namely perceived trust and perceived risk.

Key Terms: Self-service technology (SST), Mobile banking, TAM, SERVQUAL, subjective norms, situational factors.

INTRODUCTION

There are several SSTs that implemented in different industries and have been given a considerable attention from the academic scholars. The popular SSTs types include airline ticket machines, Automated Teller Machines (ATMs), package tracking, car rental machines, hotel checkouts, automated telephone services, gambling machines, electronic blood pressure machines, pay-at-the-pump terminals, and internet based services (Nysveen & Pedersen, 2011). In the banking industry, ATMs, bank by phone, and online banking have been in existence for quite long time, facilitating the customers' engagement with the banks (Curran & Meuter, 2005), however, the current and most recent Self-service technology in today's banking industry is mobile phone banking (Hanafizadeh, Behboudi, Abedini Koshksaray, & Jalilvand Shirkhani Tabar, 2014; Shaikh & Karjaluoto, 2014).

Due to the technological advancements in mobile devices, there is an exponential growth of mobile phones adoption among world populations. Telecommunication industry and mobile phone service providers are one of the fastest growing industries and markets as large populations adopt mobile devices every year particularly in the developing countries. International Telecommunication Union (ITU, 2014) estimated world mobile phone users as4.6 billion. In addition, ITU recently announced that mobile broadband penetration is expected to reach 2.3 billion by the end of 2014, where 55% of them are coming from the developing countries. According to a recent report by ITU (2014)African continents is leading the world in terms of mobile broadband growth. Driven by the latest developments in the telecommunication sector such as fourth generation (4G) mobile telecommunication and wireless network technology, mobile banking is attracting the attention of scholars and practitioners in the information systems research stream.

With the advanced technologies and innovations, banking industry has been transformed and traditional banks had begun to offer additional services in order to be in line with the new developments and cater the increasing customer demands. Banks are competing each other to offer the customers the best services and products with the ease and little mental efforts (Aghdaie & Faghani, 2012) and business models are being changed with the emergence of the digital and sophisticated technologies (Capgemini, 2013b). Several factors contribute to the adoption of the new technologies in the banking industry. These factors include: 1) banks' willingness and readiness for enhancing their huge data of customers through big data technologies which can bring later customer satisfaction and loyalty; 2) banks are adopting analytical techniques in order to cope with the increasing customer demands and needs, improve their services and products, and create awareness and loyalty

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among their customers; 3) the emergence and popularity of digital technologies and channels (i.e., internet, mobile phones, tablets and social media) forcing the banks to adopt and converge with their systems for better performance. 4) banking environment had become too competitive which may compel the managements of banks to adopt the latest technologies and high quality systems in order to offer better services and products and reduce the costs (Capgemini, 2013b).

Mobile banking had become a necessity for almost all banks which is due to the rapid growth in the telecommunication industry. Mobile banking adoption which is referred as "a wireless service delivery channel providing increased value for customers' banking transactions" (Laukkanen, 2007, p.798) is determined by numerous factors including associated risk, perceived benefits, reliability, complexity of the systems involved, compatibility, and trust in the service provides (Al-Jabri & Sohail, 2012; Daud, Kassim, Said, & Noor, 2011; Dineshwar & Steven, 2013).

THEORETICAL BACKGROUND

The current study attempts to identify the influential factors that contribute to mobile banking adoption in the country. The study will highlight these factors in light with the information systems theories and service quality theory.

This study uses an integrated model based on three major models and theories in the information systems research. These are technology acceptance model (TAM), Theory of Reasoned Action (TRA), and service quality theory (SERVQUAL). TAM postulates that perceived ease of use and perceived usefulness are major determinants of adopting new technologies, whereas TRA posits that a behavior is mainly influenced by attitude of the people towards a behavior and subjective norms. SERQUAL concerns the major components of a highly quality services. Five dimensions were identified in the original model namely reliability, assurance, tangibility, empathy and responsiveness.

The rational for choosing TAM is because of its robustness and was widely supported by many empirical studies in different contexts and settings (Chuttur, 2009; Legris, Ingham, & Collerette, 2003; Shaikh & Karjaluoto, 2014). In addition, TRA was found to be a robust enough to predict a voluntarily setting (Davis, Bagozzi, & Warshaw, 1989). While SERQUAL is another robust theory which has been used to examine the quality of services provided by a certain organization or company (Aghdaie & Faghani, 2012). Although these theories are robust in its own sense, however, integrating with other models and theories can provide further predictive power about the adoption of the technology. Therefore, the current study integrates all these theories to investigate the adoption of mobile banking among consumers. It is expected that this study will provide a quick insight about the current stage of mobile banking adoption in the area of study. It also hoped that this study will motivate other telecommunication and banks to initiate like this service, as the study provides useful information about the potential factors contributing towards consumers' adoption.

Literature review

No.	Author/s	Year	Sample	Country	Model/theory	Influential factors
1.	Brown et al., 2003	2003*	162	South Africa	Extended DIT	Relative advantage, perceived risk, trialability, and banking needs
2.	Luarn & Lin, 2005	2005	180	Taiwan	Extended TAM	Perceived usefulness, perceived ease of use, perceived credibility, self-efficacy, and financial cost
3.	Amin, Baba, & Muhammad, 2007	2007	239	Malaysia	Extended TAM	Perceived usefulness, perceived ease of use, perceived self-efficacy, perceived credibility,
4.	Lee et al., 2007	2007*	306	South Korea	Modified TAM	Perceived usefulness and trust

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5.	Sulaiman, Jaafar, & Mohezar, 2007	2007	279	Malaysia	DIT	Personal characteristics
6.	Gu, Lee, & Suh, 2009	2009	910	South Korea	Extended TAM	Perceived usefulness, perceived ease of use, and trust
7.	Liu, Min, & Ji, 2009	2009	438	China	Extended TAM	Perceived usefulness and trust
8.	Amin & Ramayah, 2010	2010	115	Malaysia	Extended TRA	Attitude, subjective norms, and privacy and security concerns
9.	Koenig-Lewis, Palmer, & Moll, 2010	2010	263	Germany	TAM & DIT	Perceived usefulness, compatibility and risk
10.	Luo, Li, Zhang, & Shim, 2010	2010	122	USA	Modified UTAUT	Performance expectancy and perceived risk
11.	Püschel, Mazzon, & Hernandez, 2010	2010	666	Brazil	Integrated model	Subjective norms, attitude, and perceived behavioral control
12.	Riquelme & Rios, 2010	2010	681	Singapore	Extended TAM	Perceived usefulness, perceived risk, and subjective norms
13.	Schierz, Schilke, & Wirtz, 2010	2010	1447	Germany	Extended TAM	Attitude, perceived compatibility, and individual mobility
14.	Wessels & Drennan, 2010	2010	314	Australia	Extended TAM	Perceived usefulness, perceived financial cost, and compatibility
15.	Bankole, Bankole, & Brown, 2011	2011	231	Nigeria	Extended UTAUT	Power distance, utility expectancy and effort expectancy
16.	Daud et al., 2011	2011	300	Malaysia	Extended TAM	Perceived usefulness, perceived credibility, customer awareness
17.	Khraim, Shoubaki, & Khraim, 2011	2011	301	Jordan	Extended DIT	Self-efficacy, trialability, compatibility, complexity, risk, and relative advantage
18.	Min, Lu, & Yinjun, 2011	2011	278	China	Extended TAM	Perceived usefulness, perceived ease of use, compatibility, trialability, and perceived risk
19.	Tobbin & Kuwornu, 2011	2011*	298	Ghana	TAM & DIT	Perceived usefulness, perceived ease of use, perceived trust, and trialability
20.	Zhou, 2011	2011	210	China	TAM & ISS	Perceived usefulness and initial trust
21.	Akturan & Tezcan, 2012	2012	435	Turkey	Extended TAM	Attitude
22.	Al-Jabri & Sohail, 2012	2012	330	Saudi Arabia	DIT	Relative advantage, compatibility, observability and perceived risk
23.	Amin, Supinah, Aris, & Baba, 2012	2012	152	Malaysia	Extended TAM	Perceived credibility, perceived enjoyment, and perceived self-efficacy

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24.	Mashagba & Nassar, 2012	2012	162	Jordan	Extended UTAUT	Performance expectancy, social influence, security and reliability
25.	Safeena, Date, Kammani, & Hundewale, 2012	2012	53	India	Extended TAM	Perceived usefulness, perceived ease of use, perceived risk, and consumer awareness
26.	Sayid, Echchabi, & Aziz, 2012	2012*	100	Somalia	Extended TAM	Perceived usefulness, social influence, and attitude
27.	Yu, 2012	2012	441	Taiwan	UTAUT	Performance expectancy, social influence, perceived credibility, perceived financial cost, and facilitating conditions
28.	Zhou, 2012	2012	200	China	Extended TAM	Trust and follow experience
29.	Aboelmaged & Gebba, 2013	2013	119	UEA	TAM & TPB	Attitude, subjective norms,
30.	Ghalandari, Ghahremanpour, & Hasanluei, 2013	2013	385	Iran	Extended TAM	Considerable usefulness, social risk, performance risk, and considerable benefit
31.	Kazi & Mannan, 2013	2013*	372	Pakistan	Extended TAM	Perceived usefulness, perceived ease of use, perceived risk, and social influence
32.	Shambare, 2013	2013*	282	South Africa	Extended DIT	Relative advantage, complexity, and self-efficacy
33.	Ali & Dhaha, 2014	2014*	414	Somalia	Extended TAM	Perceived usefulness, perceived ease of use, and perceived trust
34.	Hanafizadeh, Behboudi, Abedini Koshksaray, & Jalilvand Shirkhani Tabar, 2014	2014	361	Iran	Extended TAM	Perceived usefulness, perceived ease of use, need for interaction, perceived risk, perceived cost, compatibility, trust, and credibility
35.	Karma, Ibrahim, & Ali, 2014	2014*	181	Sudan	Extended TAM	Perceived ease of use and perceived trust
36.	Oliveira, Faria, Thomas, & Popovič, 2014	2014	194	Portugal	Extended UTAUT	Performance expectancy and initial trust
37.	Shanmugam, Savarimuthu, & Wen, 2014	2014*	202	Malaysia	Exended TAM	Perceived usefulness and attitude

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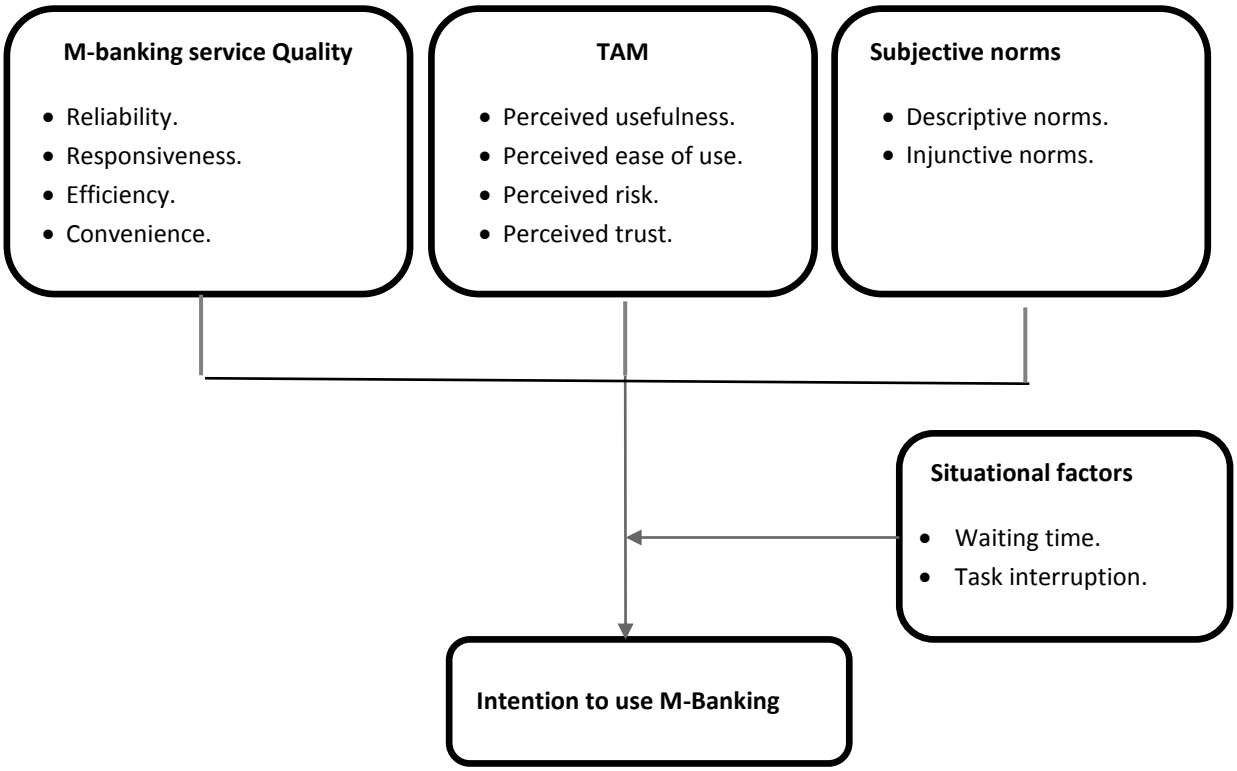
Conceptual Framework and hypothesis development



H1: There is a relationship between M-banking service quality and Intention to use M-banking

H1-a: There is a relationship between Reliability and Intention to use M-banking

H1-b: There is a relationship between responsiveness and Intention to use M-banking

H1-c: There is a relationship between Efficiency and Intention to use M-banking

H1-d: There is a relationship between convenience and Intention to use M-banking

H2: There is a relationship between TAM and Intention to use M-banking

H2-a:There is a relationship between Perceived usefulness and Intention to use M-banking.

H2-b: There is a relationship between Perceived ease of use and Intention to use M-banking

H2-c: There is a relationship between Perceived Risk and Intention to use M-banking

H2-d: There is a relationship between Perceived Trust and Intention to use M-banking

H3: There is a relationship between Subjective norms and Intention to use M-banking

H3-a: There is a relationship between descriptive norms and Intention to use M-banking

H3-b: There is a relationship between injunctive norms and Intention to use M-banking

H4: Situational factors moderate the relation between M-banking service qualityand Intention to use M-banking

H5: Situational factors moderate the relation between TAM and Intention to use M-banking

H6: Situational factors moderate the relation between Subjective norms and Intention to use M-banking

DISCUSSION

With the increasing customer demands, institutional banks started to utilize the new self-service technologies (SST)in order to provide efficient and convenient services. Among

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the new technologies, internet is a pioneering technology in the banking industry. In addition, among the latest technologies adopted by the banking industry include providing their services through standard mobile phones as well as smartphones. Through their devices, the customers do not need to come to the bank office to do their financial transactions; they can perform several financial transactions using their mobile phone devices.

Mobile banking usage is exponentially growing worldwide. A recent survey predicted that more than 60% of customers worldwide to use mobile banking in 2015 and more than 90% will likely be using online banking(Capgemini, 2013a). This is due to the highly competitive environments particularly in the developing countries which give special attention to the ICT innovations. Therefore, mobile banking is of great importance to both banking industry and unbanked populations.

Customers adopt these financial services based on several factors that shape their attitude, intention, and perception about the service and the service providers. Early studies in this context suggested that customers were driven by usefulness, associated easiness, credibility, cost, self-efficacy, trialability, associated risk, banking needs and relative advantage(Brown, Cajee, Davies, & Stroebel, 2003; Lee, Lee, & Kim, 2007; Luarn & Lin, 2005).

As a new phenomenon in the banking and telecommunication industries, scholars had paid a considerable attention to this issue, exploring it from diverse contexts and settings. Scholars were interested to examine the factors behind the people's adoption, acceptance, and usage of mobile banking services. As shown in table 1, there were numerous studies conducted to examine the driving factors for the acceptance and adoption of mobile phone among different segments of world populations. Diverse factors affecting mobile banking emerged from these studies (see table 2 for review) drawing on several theories and models. The most salient factors which were frequently reported in these studies and has been said to be the most adoption determinants, include perceived usefulness, perceived risk, perceived trust, social influence factor, perceived ease of use, perceived credibility, compatibility, relative advantage, and attitude towards adoption among others.

A recent meta-analysis conducted by Shaikh & Karjaluoto (2014) revealed an evolving body of knowledge about mobile banking phenomenon. Fifty five studies included in this met-analysis covering January 2005 to March 2014 period and were published in 33 international peer-reviewed journals and conference proceedings. Among the journals, *International Journal of Mobile Communications*had published most of the articles followed by *Computer in Human Behavior*, and *Journal of Internet banking and Commerce.*In addition, more than 60% of these articles were published between 2010 and 2012 and almost every year witnessed a publication on this topic except 2008 where reported no study published in the said journals.

Several theories were used to investigate the attitude, acceptance, adoption and usage of mobile banking among various profiles. As outlined by Shaikh & Karjaluoto (2014), eleven theories, models and frameworks from information systems usage and social psychological paradigms provided theoretical grounds for these studies. The studies used either specific theory, or its extension, or integration of two or more theories and models. Technology Acceptance Model (TAM) was the most cited model followed by Unified Theory of Acceptance and use of Technology (UTAUT), and Diffusion of Innovations Theory (DIT).

Although this meta-analysis (Shaikh & Karjaluoto, 2014) provided useful insights about the latest developments on mobile banking adoption literature, it is not comprehensive for the whole literature. The authors of this dissertation found several studies that were not covered in this meta-analysis and were published in the said coverage period. These studies were conducted in several countries in Africa and Asia (Ali & Dhaha, 2014; Karma et al., 2014; Kazi & Mannan, 2013; Sayid, Echchabi, & Aziz, 2012; Shambare, 2013; Shanmugam, Savarimuthu, & Wen, 2014; Tobbin & Kuwornu, 2011). Therefore, this study adds some further coverage on the development of the body of knowledge in this area.

As suggested by the discussed meta-analysis, there is an urgent call for studying certain issues highlighted by the meta-analysis article or it can be implied from it. First, there are few studies examined the adoption and acceptance of mobile banking from African perspective (Ali & Dhaha, 2014; Brown et al., 2003; Karma et al., 2014; Sayid et al., 2012; Shambare, 2013; Tobbin & Kuwornu, 2011) as well as from Arab countries' perspective (Aboelmaged & Gebba, 2013; Ali & Dhaha, 2014; Al-Jabri & Sohail, 2012; Karma et al., 2014; Khraim, Shoubaki, & Khraim, 2011). As such, the current study can contribute to this perspective if studied

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in a country that shares several social and cultural factors with the said countries.

Second, another meta-analysis conducted Nysveen and Pedersen (2011) a growing body of knowledge in the area of mobile banking adoption and usage. The meta-analysis included 31 articles published in ISI journals and available in IS web of science from 2000 to May 2010. This meta-analysis was confined only to those with title or elements of SST. Although the coverage is limited, however, it provided the trend of the current literature and directions for future research. Several dependent variables were examined in these studies namely adoption, attitude, usage, intention, satisfaction and loyalty.

Nysveen and Pedersen's (2011) review paper revealed that the potential of subjective norms is widely ignored and contended that "given the increased usage of mobile devices as platform for self-services, more consumers will conduct self-services in a social context. The importance of social norm as an antecedent for adoption may therefore be more relevant in the years to come" (p.17).As such, this study fills the gap in the literature by examining the impact of subjective norms in the conceptual model.

Third, Nysveen and Pedersen's (2011) meta-analysis also suggested that the potential of moderating effects such as situational factors has been ignored. They argued that these moderating factors have the potential to account for great variance in consumers' adoption of mobile banking. Therefore, the current study fills this gap in the literature by identifying the moderating effect of situational factors (such as waiting time and task complexity) between the mobile banking determinants and consumers' adoption.

Finally, previous studies were criticized for being concentrating on information systems theories and models (Shaikh & Karjaluoto, 2014), and neglecting the potential of management and business theories. Therefore, the current study integrates three main theories namely Technology Acceptance Model (TAM), and Theory of Reasoned Action (TRA) and Service quality theory (SERVQUAL) to provide better prediction on the endogenous variable in this study (adoption).The recent meta-analysis by Shaikh & Karjaluoto (2014) revealed no study adopting or incorporating the service quality theory. Thus, this study fills this gap in the literature by uncovering the potential of this theory in the context of mobile banking adoption. The reason of integrating TAM in this study is the model was considered a robust enough to gauge use behavior in information systems acceptance (Chen, Li, & Li, 2011; Chuttur, 2009)(Taylor & Todd, 1995b). However, TAM has some weakness particularly its simple structure and it can be overcome by incorporating other relevant construct (Chuttur, 2009). While TRA is another rigorous theory explaining a performing a behavior based on several elements (Taylor & Todd, 1995a).

Table 2: salient factors affecting behavioral intention of mobile banking

No.	Constructs used in the studies in Table 1	Frequency
1.	Perceived usefulness	20
2.	Perceived risk	11
3.	Perceived ease of use	9
4.	Perceived trust	9
5.	Subjective norms/social influence	8
6.	Perceived credibility	7
7.	Compatibility	7
8.	Attitude	7
9.	Performance expectancy	5
10.	Self-efficacy	5
11.	Trialability	4
12.	Financial cost	4
13.	Customer awareness	2
14.	Complexity	2
15.	Security	2
16.	Reliability	1
17.	Facilitating conditions	1
18.	Considerable benefit	1
19.	Need for interaction	1
20.	Perceived enjoyment	1
21.	individual mobility	1

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22.	Power distance	1
23.	Effort expectancy	1
24.	Follow experience	1
25.	Banking needs	1
26.	Personal characteristics	1
27.	Perceived behavioral control	1

MODEL JUSTIFICATION

Integrating TAM, TRA and SERVQUAL

Technology acceptance model (TAM) has been considered a parsimonious model for predicting users' intention to adopt and IT or information system. TAM has been used in many studies examining a range of technologies and provided empirical evidence that perception factors (perceived usefulness and perceived ease of use) were major determinants of consumers' intention to adopt a technology (i.e., Amin et al., 2007; Hanafizadeh et al., 2014; Marumbwa & Mutsikiwa, 2013; Min et al., 2011; Riquelme & Rios, 2010; Safeena et al., 2012). It has been found that TAM to be powerful in terms of predicting consumers' intention to use a technology. However, it was criticized being not enough to capture large variance in the intention factor and therefore, researchers extended the model with additional elements in order to overcome its limitations. Variables which were incorporated with TAM include perceived trust, perceived risk, social influence, interaction, system quality, satisfaction, and many others.

It has been suggested that using models individually and separately will be incapable to fully predict the behavioral intention, but integrating two or three models will give strong predictive power (Püschel et al., 2010). Therefore, the rationale of this study for adopting the basic TAM model variables (perceived usefulness and perceived ease of us) is based on their rigorousness and predictive power. The study will incorporate TAM with theory of reasoned action (TRA) and service quality to capture additional variance in the prediction of consumers' intention. In addition, the other two theories (TRA and service quality) are rigorous in their own stand, however, incorporating with other theories will give more emphasis and power for the prediction as it has been found in the incorporation of TRA with TAM (Taylor & Todd, 1995b).

To the best knowledge of the researcher, there is no single study incorporating elements from TAM, TRA and service quality to predict consumers' intention to adopt mobile banking technology. In addition, incorporating situational factors with the elements of the above models is also widely ignored in the literature. Hence, these situational factors will contribute towards our understanding on underlying factors influencing mobile banking service.

Moderating effect

Grounded in the theory of reasoned action, actual use is not only determined by intention but there are other factors and depend on the situation under investigation, indicating that there are moderating effects (Wang, Harris, & Patterson, 2012). This is particularly relevant in the context of Self-service technologies "where multiple service delivery options are offered. For example, a passenger who is not keen to use the self-check-in kiosk at the airport might actually use it if he or she was in a hurry to catch a flight and there was a long queue at the check-in counter" (Wang et al., 2012, p.58).

It has been suggested that moderating effect of situational factors are not addressed in the literature and there were few researches conducted about it (Dabholkar & Bagozzi, 2002)(Wang et al., 2012)(Nysveen, Pedersen, & Thorbjornsen, 2005). As such, the current study attempts to fill that gap in the literature by examining the moderating effect of situational factors such as perceived waiting time and task interruption on the relationship between adoption and major variables derived from TAM, TRA and Service quality theories.

CONCLUSION

There is a growing interest from academic scholars and practitioners to understand the issues and factors driving consumers to adopt and accept mobile banking services to their daily and normal transactions. Several studies were conducted in many countries in Europe, Africa, America, and Asia, looking at the different perspectives of the adoption, acceptance, attitude, and satisfaction with the service.

The findings of this study will provide several practical and theoretical contributions to the body of knowledge in the context of self-service technologies (SSTs) with special emphasis on mobile banking. First, this study, to the best of the researcher's knowledge, is the first study addressing the

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current status of mobile banking adoption in the country and drawing on several influential factors as suggested in the literature of information systems.

Second, this study will contribute to the growing literature on SSTs particularly mobile banking adoption factors. Specifically, this study extends the service quality theory to the context of mobile banking adoption. This theory had been paid little attention and it has the potential to contribute to this context. Therefore, this research will shed some light on the service dimensions and their contribution to adoption along with TAM and TRA constructs. In addition, this study tests, extends and validates the theoretical underpins and empirical relevance of several important constructs for understanding mobile banking adoption in Sudan.

Third, understanding consumers' needs and meeting their expectations had become today a major organizational role. The information provided by this studycan give useful insights to the relevant authorities and policymakers to take the right and relevant decisions and strategies. Furthermore, knowledge on the factors that affect consumers' adoption of a technology or service is important for managers in the banking sector and telecommunication industry in order to introduce effective strategies and approaches to develop a mutual relationship between consumer and service provider as well crating loyalty to the service provider. As a result, the gained knowledge from this studycontributes to key areas for future improvement in order to meet customer needs and expectations. Moreover, this study is important because it will give useful insights for other banks and telecommunicationcompanies who have not yet implemented mobile banking services but have the intention to introduce in the near future

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