

Mobile Banking Adoption Factors in Iraqi Banks: An Extended TOE Framework

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Abstract: Mobile banking (m-Banking), facilitated by various Electronic Commerce (EC) technologies has helped commercial banks to stay competitive through productivity gains, transaction cost reduction and customer service improvement. Despite its benefits, however, developing countries still lag behind developed countries in the adoption of mobile banking. To address the lack of studies on mobile banking adoption in developing countries, this study explores factors impacting mobile banking adoption in Iraq as an example of a developing country. A research framework developed based on technology-organizational-environmental theoretical framework and theory acceptance model is used to guide the study. The findings from this study involving one of the three provide banks complement the existing knowledge in this area to better understand the adoption and development of mobile banking in Iraq.

Key words: m-Banking, mobile banking, mobile banking adoption, consumers, Iraqi banks, customer service

INTRODUCTION

Mobile banking is rising in adoption because of the dramatically technological improvement that the mobile industry is seeing in the last decade (Salzman *et al.*, 2001). The amount of the population worldwide that uses mobile is around two billion. This number is on the rise the mobile phone has had a pervasive impact on the lives of people. There has been a significant effect economically. This impact is about twice as large in the developed countries (Kones, 2014). Mobile banking adoption means (refers to the usage of mobile banking services solution to facilitate micropayments in electronic and mobile commerce transaction and point of sale). Mobile banking and m-Commerce are very related to each other, to be more precise, researchers suggest that mobile is part of m-Commerce. The number of mobile devices users can be deducted from the number of employees using it. Dahlberg *et al.* concluded that the key elements that affect the satisfaction of users were risk, perceived usefulness and trust. Poverty alleviation has been a major objective in several applications. This is how pervasive the effect of mobile phones in the developed countries.

The transactions conducted by the users through the bank needs to maintain its security. This requires advance technologies processes to provide safe delivery channel. Lack of security is a major fear and ergo effect the adoption of mobile banking services. The users willingness to utilize mobile banking is enhanced by the decision makers experience and expertise (Kheng *et al.*, 2010).

Factors that explain and determine the adoption of m-Banking has been studied using different models. Rogers (1983) developed the innovation diffusion theory, its model is very well known to be utilized in studying innovation adoption. Five characteristic defines the adoption rate according to this model: complexity, relative advantage, compatibility, trial-ability and observability. These characteristics are positively related to each other except the complexity which relates negatively to the adoption rate. Technological advances require the examination of individual acceptance in the era of information systems research (Hsu and Lu, 2004).

Several studies have focused on the adoption of mobile banking in developing countries (Hanafizadeh *et al.*, 2014; Oliveira and Martins, 2010; Oliveira *et al.*, 2014; Shaikh and Karjaluoto, 2015). These studies, however did not focus on the adoption rate stages of m-Banking. Mobile banking is considered relatively emerging service, therefore, the technology has not been very widely adopted. Factors identification for the adoption is an important research attention. According to Gu *et al.* (2009), perceived ease of use and structural assurance has an effect on trust in mobile banking. The examination of innovation attributes effects and trust in knowledge-based m-Banking adoption has been studied by Lin (2011). It was drawn on trust theory and IDT. The attributes that were included in the study were: compatibility, ease of use and relative advantage. Integrity, benevolence, perceived competence are attributes of knowledge-based trust.

A report by Kim *et al.* (2009), highlighted that relative benefits, structural assurance and personal propensity has an effect on initial trust in m-Banking. The integration of task technology-fit theory and UTAUT was done by Zhou *et al.* (2010). This is to examine the m-Banking user adoption. Perceived risk and performance expectancy were found to significantly affect mobile banking services intention of use.

Socio-economic and individual's perceptions were found to have a link by some studies. Other factors can influence the adoption of mobile banking. According to Fall *et al.* (2015), mobile banking adoption degree can be limited by the infrastructure were the m-Banking services are implemented, example, wireless technologies are spread widely throughout the world even in poor countries, however, their distribution is always in equality. According to Hanafizadeh *et al.* (2014), the factors that determines the use of mobile banking in Iran were: ease of use, cost of use, trust, usefulness, the need for personal interaction, risk perception, compatibility and credibility.

According to Brown *et al.* (2003), mobile banking adoption was affected by the number of banking services required, perceived risk, relative advantage and trial-ability attributes. Their study limited the risk construct to information security and risk concerns. Awareness is an important factor in mobile banking adoption according to Delpoit (2010), Laukkanen and Kiviniemi (2010). Mobile banking in Finland is still in its "infancy stage" despite the great number of advantages it offers. conceptual model is a representation of a system, made of the composition of concepts which are used to help people know.

Literature review: In this study, literature survey has carried out in order to gather related information needed to determine successful determinants in mobile banking adoption. In addition, to review the related theories needed to construct the proposed model of this study.

Diffusion of Innovation Theory (DOI): The theory of Diffusion of Innovation (DOI) is one of the first and very widely studied theory in the field of technology adoption. Developed by Rogers (1960, 1983, 2003) a rural sociology professor whom have written a book about the theory itself in 1962. The very first studies that were conducted and utilizes the diffusion theory were done by Ratzel *et al.* in the studies of trans-cultural diffusion. Bureau, if Applied Social Research conducted a study about the voting behavior of the voting individuals. Ryan and Gross used the diffusion concept in studying the factors that influences seed corns diffusion in two communities in Iowa.

Table 1: Innovation attributes definitions

Innovation attributes	Definitions
Relative advantage	"The degree to which the innovation is perceived as better than the idea it supersedes"
Compatibility	"The degree to which the innovation is perceived as being consistent with the existing values"
Complexity	"Experiences and needs of potential adaptors"
Triability	"The degree to which an innovation is perceived as difficult to understand"
Experimented with on a limited basis	"The degree to which the innovation may be experimented with on a limited basis"
Observability	"The degree to which the results of an innovation are visible to others"

DOI mission is to discover and highlight the carious factors that can influence new technology diffusion in a society (Rogers, 2003). The main goal of the theory is identifying how and why a specific technology "diffuses" in an organization. Innovation adoption is a process of innovation diffusion. Roger defined the adoption in 1995 as the decision of an individual or organization to make use of innovation. In DOI context, innovation is defined as "an idea, practice or object that is perceived as new by an individual or unit of adoption. The adoption of m-Banking within banks in Iraq can be considered an innovation for those banks. DOI can serve as a theoretical frame-work for different innovations in various research disciplines, i.e., education, sociology, communication, marketing, etc (Alzaza, 2012).

According to the DOI, particular characteristics identify innovation. Those characteristics are user identified which determines the regular use of the technology. Innovation characteristics includes: complexity, relative advantage, absorbability, trial-ability and compatibility (Rogers, 2003). Each characteristic aids in the decrement of the doubt in a potential user regarding the benefits received from the innovation. Table 1 illustrates the definitions of each attribute.

These factors performed by Tehrani and Shirazi (2014) illustrated that complexity, relative advantage and compatibility were found to be of significance. Those attributes were also considered to be of significant impact in the IS adoption (Gollakota and Doshi, 2011; Tehrani and Shirazi, 2014; Tweel, 2012). Compatibility and relative advantage are positively related to these technologies while complexity correlates negatively.

The decision of innovation adoption is another important contribution by DOI. The adoption decision process is defined as the process that goes through the IT department and get the conformation of innovation adoption or reject the adoption decision. Figure 1 shows the stages required in the innovation decision process. Knowledge is the first step in the process. In this step the technology is exposed to provide a better view and understanding of it. Persuasion is the second step which reflects the attitude towards the decision making of

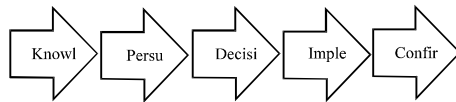


Fig. 1: Innovation decision process

innovation. After that comes the decision step which determines whether the innovation at hand to be adopted or rejected. Implementation is the step after decision step. It basically implements the innovation in the system. The last step is confirmation. At this step the innovation gets the conformation to be released and utilized as a service in the organization or gets the rejection and is dropped from the organization structure. This research focuses on the three primary steps: knowledge, persuasion and decision.

Creativity is another contribution by DOI. It can be explained as the relative advance by an organization to accept a current innovation over the others. DOI also exposes three main dimensions for adoption forecast: outer characteristic of an organization (system openness), the quality of the leader (his attitude and vision towards changes) and inner characteristics of the organization such as: organizational slack, size, complexity, centralization, etc.). Briefly, DOI focuses on the effect of the functions of inventions on future adopters. In a bank, DOI indicates that an invention enforcement is possible depending on the outer and inner features and also the mandate ones related to corporation. The mandate features are considered internal particular features to the corporation in Iraq. Innovation features can have an effect on the bank's adoption to an invention. All these features combined can have an effect over the technological invention's institutional adoption. TOE (Technology, Organization and Environmental Framework) supports the elements mentioned above.

Technology, Organization and Environment (TOE) framework: TOE framework developed by Tornatzky *et al.* (1990), TOE framework was intended as psychology theory for organizations. The framework has been used extensively in the literature. The framework context focuses on three parts. Those parts affect the decision of adopting and using a specific innovation in bank perspective. Figure 2 illustrates TOE framework and its structure. The main parameters that affect maintaining a specific innovation are: organization, technology and environment.

Tornatzky has written a book with the title "The process of Technological Innovation". The book explains the TOE framework with a main objective to describe the process of innovation at an organization level. The major

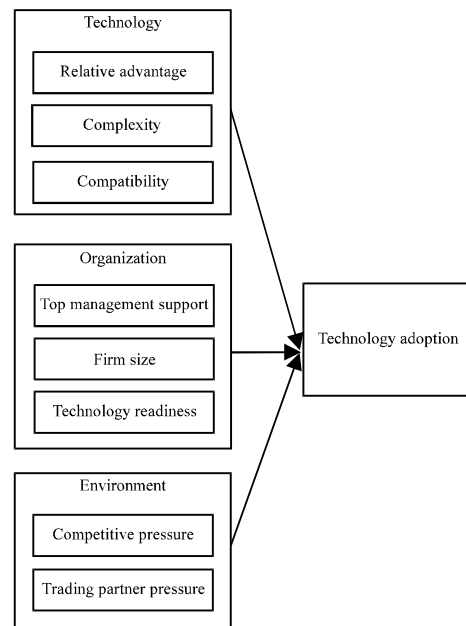


Fig. 2: TOE framework (Lutfi *et al.*, 2016)

difference between TOE and DOI is that TOE includes environmental characteristic as opposed to DOI. The variables that TOE depend on goes beyond the decision of adoption process. It includes also, innovation likelihood adoption, degree of adoption and the intention of adoption. Hsu and Lu (2004) reported that TOE relates to DOI by empowering it to explain the innovation diffusion intra-firm scale. Broad IT aspects can be described perfectly by utilizing this frame-work (Kpurugbara *et al.*, 2016; Lutfi *et al.*, 2016). Following these observations, it is possible to understand the usefulness of TOE in the innovation adoption process. TOE stimulates a smooth identification process of different variables categorization. It is possible to utilize this framework to address the issues relevant in this study.

Kurnia and Johnston (2000) reported that the primary context of an innovation is required to be updated with its structure and improvements. The framework of TOE has been chosen the theoretical base for this research. There were various considerations in the choice of this framework, the first is that different researches and the literature backs the framework and consider it well-established and it is possible to employ it in m-Banking adoption. The second, there are different contexts considered in TOE unlike DOI, TOE does not focus only on the technological aspects of each context, the framework considers the environmental context also. Different dimensions considered by a model ought to

enhance the exploration power versus a one dimension based model (Molla and Licker, 2005). The third is the instructiveness of TOE Model in its perspective. One of this framework main assumptions is that organization changes are not only individual dependent. They are also dependent on the operation characteristics of the organizations (Hameed *et al.*, 2012). This instructiveness in the model perspective allows the researchers to examine the factors and observe their interactions in a dynamic framework (Molla and Licker, 2005). With such consideration, researchers believe in this framework to aid in the explanation of ICT innovation adoption process in a very comprehensive manner (Ammar and Ahmed, 2016).

TOE framework has been utilized in various researches to study the adoption of a particular technology by an organization. Mishra *et al.* (2007), utilized TOE Model in the description of inter organizational systems adoption. Zhu *et al.* (2003), employed TOE in studying electronic business adoption as firm level. Ghobakhloo *et al.* (2011), employed the theory in the investigation and highlighting the factors that has an effect over e-Commerce adoption in SME enterprises. TOE Model provides high flexibility in varying the factors and measurements of a new research context. Factors of environmental, organization and technological has been studied in the literature. The factors that are considered to be relevant to m-Banking will be the ones of focus in this study.

Institutional theory: The definition of “institution” has been introduced in the literature, however has not been confirmed. Scott, considers an institution as a social construction with a resilience level that is considered high. The theory of institution focuses its perspective on the factors that has an effect in forcing a technology adoption at an inter-organizational level. The theory provides an evaluation of the tendencies for an institution to be responsive with institutional legitimacy (Liang *et al.*, 2007). Institutional legitimacy stands for “the expectations for appropriate organizational structures, behaviors and practices”.

Institutional theory brings to surface the different forces that motivates incorporating art technologies. Such forces can be produced by the appearance of new rivals, governmental departments, clients or even industries. Organizational isomorphism, DiMaggio and Powell (1983), represents the possible new systems and plans employment in different organization to a level where they become closer to each other in terms of operations environment similarities.

MATERIALS AND METHODS

Factors affecting m-Banking adoption within banks in Iraq: In Iraq, the adoption of mobile banking is affected by the following three factors, organizational, technological and environmental. Each factor will be explained in the following sections.

Technological context: External technologies and internal technologies together refer to the technological context. Making the right decision for the usage of technology is by identifying the changes existing with current technologies (Tornatzky *et al.*, 1990). The constructs that are frequently referred to are: relative advantage, privacy and security, ease of use, compatibility, connectivity. Innovation adoption in the literature envisage that different adopters can perceive innovation characteristics. A researcher must consider the perception which is based on innovation attributes rather than focusing on the feature as they are inherited from the technology and might not change across settings of organizations (Tam and Oliveira, 2016).

Relative advantage: The degree to which an individual perceives a technological innovation as having more benefits and greater effectiveness than that of other innovations that is greater performance benefits and usefulness from using a particular system (Van Deventer *et al.*, 2017) supports the importance of perceived relative advantage as a predictor of behavioral intention in different contexts (Ewe *et al.*, 2015). In the context of mobile banking, the advantage of location-free access is considered as the relative advantage of this service over other types of banking services (Laukkanen and Lauronen, 2005) but consumer resistance to mobile banking still exists due to the lack of mobile banking features (Siau *et al.*, 2004).

Privacy and security: The progress in technology can improve the banking services and their quality. Security, customer's details and privacy must be ensured in all aspects. Risks of information loss, fraud or theft can discourage people and results in repelling from the banks services. High reliability and security measurements must be taken in consideration when mobile banking is being adopted by customers. The main objective of mobile banking is to lower the transactional costs in banks. According to Ayadi, the flexibility of the organization is a significant factor that can improve profitability and productivity. The firm's financial resources are important assets and their management is a critical issue. New strategies need to be formulated and must be compatible

with the mobile environment. Investment is required in the development of a new technology, promotion, management and support. Therefore, the higher the resources that the firm has the easier it makes to adopt a new technology.

Ease of use: The degree to which m-Banking is perceived as easy to understand and operate. For using m-Banking services, users must not spend significant effort as the m-Banking services are user-friendly interfaces (Al Khasawneh, 2015). In this study, however, it is assumed that ease of use has an effect on m-Banking usage which encourages employees to use it in their financial transactions. Moreover as (Mohammadi, 2015) notes, perceived ease of use has been proven to have an effect on attitude through perceived usefulness. Therefore, perceived ease of use is expected to have an indirect effect on consumer's attitudes via perceived usefulness as well.

Compatibility: Which referring to "the degree to which participation in m-Banking with banks is perceived as being consistent with existing systems, tasks and the current needs and objectives of the organizations" (Giovanis and Athanasopoulou, 2017). Banking service can improve, if the technologies adopted are considered compatible with a working application system. The compatibility or incompatibility of an innovation can be with the sociocultural values of a person, the needs of a client for innovation or previous ideas that has been introduced. Users with a perceived innovation use and found that it does align with their values becomes more accepting in innovation use (Rogers, 2003).

Connectivity: It is a new, emerging capability which means being connected to the internet (Haythornthwaite, 2005). For instance, the connectivity in this study, refers to the internet capability to connect users with m-Banking in the Iraqi banks. Connectivity also refers to the speed of internet. Many researchers Bhalalusesa *et al.* (2013) and Nyerere *et al.* (2012) determine the potential of the internet connectivity on user's use of technology, especially, when it requires them to access and perform certain tasks online. For instance, bandwidth is the main source for operating IT related tools in the Iraqi bank's services.

Organizational context: The organizational context reflects the characteristics of the internals of the organizations. This context can influence the utilization of m-Banking. According to the literature, the organization can give a rich source of structures and processes. This either limits or improves the adoption process of new

technologies (Tornatzky *et al.*, 1990). The literature has explored different constructs of different organization such as: top management, technological competence, IT infrastructure, size, etc. (Agha and Saeed, 2015; Islam *et al.*, 2017; Tam and Oliveira, 2016). This context employs three important constructs, those are: support of top management, IT capability and technical support.

Top management support: The first construct in this context category. It reflects the commitment made by the administration of the firm to provide a suitable environment that can adopt mobile banking within the banks (Punyani and Sharma, 2017). If top management is assertive in their decision-making regarding m-Banking adoption and committed to it, the adoption is likely to take place. In addition with the top management support through the provision of the required resources, organization's inclination to adopt m-Banking or any new technology will be improved (Kurnia *et al.*, 2010).

IT capability: Define the extent to which an organization is equipped with IT infrastructure, IT skills knowledge and experience as well as effective IT operations utilization, IT experience in combination with other IT elements directly determines an organization's ability to rapidly develop and deploy more innovative techniques to enhance performance. Although, researchers agree that IT may support new product and process developments and employee empowerment proof of the direct positive impact of IT on firm performance has not yet been firmly established. Thus, in this study, we are interested in IT infrastructure or IT investments and focused on IT knowledge and IT utilization to support different business functions (Kmieciak *et al.*, 2012).

Technical support: It refers to the different ranges of services by which banks provide support to the users. In this study, technical support refers to the support the Iraqi banks that is provided to users while using m-Banking services. This includes providing sufficient troubleshooting, peer to peer support and software management. The employee's users ought to be supported on activities like troubleshooting, managing content, installing of software and configuring security and privacy related settings. Meanwhile, these users in most banks might need some standard skills to perform some troubleshooting in order to overcome typical technical problems when using m-Banking system.

Environmental context: It is reflecting the way users accept the technology presented to them and how they behave towards it. Users will consider the m-Banking

service as easy after they experience the system and notice that there are environmental conditions that can help them in the learning process of the m-Banking service usage, however, skillful they can become. Environmental factors have been less considered in the studies presented in the literature when it comes to the adoption of m-Banking. Environmental factor can be represented by the IT services. The IT Department needs to provide the service of m-Banking that meet the current requirements set by the organization without jeopardizing the possibility of future upgrades to the system in the future (Senge *et al.*, 2008). Social influence, policy and government support, can influence the users to adopt to m-Banking.

Social influence: People tend to build their knowledge about products through what they hear from others or what they see and read from different sources of information (Malaquias and Hwang, 2016). The most significant predictor is a social influence on the individual intention towards the adoption of mobile banking. Empirically, established the decision of a person aims to use mobile banking services is expressively affected by a community nearby him (Baabdullah, 2018). They found social influence as a strong predictor for intention to use mobile banking. Based on these findings the current study considered this critical factor may be effect the adoption of m-Banking.

Policy: A course of action or guidelines to be followed whereas a procedure is the policy, outlining what has to be done to implement the policy (Gray, 2014). In some countries, governments policy has taken steps towards the implementation of mobile banking in the form of policy regulation (Ketkar *et al.*, 2012). However, the implementation of mobile banking varies depending on who takes the lead.

Government support: It is provided through a multitude of policies at the local, regional and national levels. However, the role of governments should be facilitative, not dictatorial, to yield the intended results (Doh and Kim, 2014). Government can either directly or indirectly affect the adoption of e-Banking in terms of creating a favorable environment and impetus for banking institutions and their employees, so that, the services can be diffused with the community (Kurnia *et al.*, 2010).

Research framework: The available literature shows that any new system adoption, for example new technology, ideally entails developing a model (Yazdani, 2017). Utilizing the model is thought to support implementation

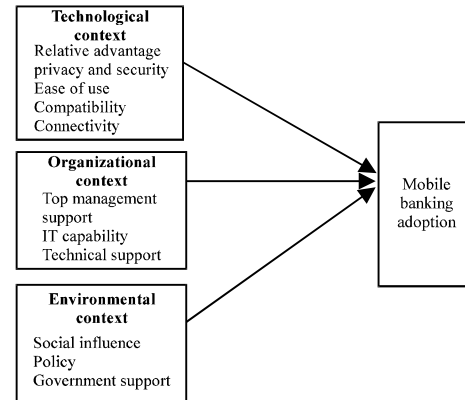


Fig. 3: Extended TOE framework

mainly because it tends to make the process more feasible and organized, increasing the likelihood regarding successful roll-out about a policy or perhaps a program (Khairi and Baridwan, 2015). Theoretical (or conceptual) model crucial to the conducted research. This model which can be utilized by other researchers to assist in the creation of a comprehensive opinion and a relationship theory for different contexts. This particular study, the theoretical model is suggested to make it possible for a researcher to prove the hypothesized relationships amongst several constructs identified as significant to which problem being studied, according to the chosen theories. Martins and Oliveira mentioned that it is very essential to combine within the study more than one model and theory to obtain a better understanding about the phenomenon regarding information technology adoption Fig. 3.

m-Banking adoption can increase business options and applications (Ahmed *et al.*, 2014). It is envisaged that m-Banking successful adoption can produce advantages that are competitive to the banks (Chaouali *et al.*, 2017). Technology adoption is the main focus of this study, therefore, the theories of interest will be the ones that have a focus area on technology adoption. This research utilizes the following four theories: DOI theory, TOE framework and institutional theory.

To summaries, this research is broad in the field theoretically. In this research, m-Banking is considered as a dependent variable. Banks can utilize the level of intention to be discovered in this study to improve its services. Independent variables will be categorized in three contexts technology organization and environment. The contexts mention and the affiliated variables were identified based on this study review of DOI theory, TOE framework and institutional theory. Figure 1 illustrates the conceptual model of this research.

RESULTS AND DISCUSSION

The study model has been designed depending on the factors resulted from the literature survey. From the literature survey, it can be noted that most factors identified were within the mobile banking context. Therefore, these factors must be taken into consideration some of these factors are related technological, organizational, environmental framework, technology context in terms of relative advantage, privacy and security, ease of use, compatibility, connectivity. Organizational context in items top management support, IT capability and technical support. Environmental context in items of social influence, policy and government support. These three aspects factors are found to influence mobile banking adoption. This research proposed to help examine the main influencing factors that possess an effect on the m-Banking adoption in Iraqi banking. This study was prompted by a real need to examine the requirements, challenges and gaps in utilizing this new trend technology. The proposed factors and domains can be seen relevant to the context of this study as it all supported by the previous literature. The construction of the study's model was supported by three well theories in which the combination of domains and the relationship between factors was supported by organization theory Diffusion of Innovation (DOI) theory and the institution theory. This research is a part of PhD research. The proposed model will be validated in the next research study that will use a quantitative research method and developing a questionnaire instrument to collect from the employee inside the banks about the proposed factors and finally, the collected data will be analyzed to verify the final model.

CONCLUSION

For a developing country like Iraq which has its own circumstances and issues, developing a conceptual framework about the adoption of mobile banking should rely own solid scientific bases and goes through a lot of investigation and validation by specialized IT expertise and employees. The conceptual model for factors affecting mobile banking adoption in Iraqi banks was derived upon deep and wide verity of related literature review and has its own bases and theories of adoption which should be accounted to assure the right adoption context for a new innovation technology. The construction of the study's model is based on three theories TOE framework theory, diffusion of innovation theory and institution theory. This help to combine and verify the relationship and effects among the proposed factors and domains in the model.

ACKNOWLEDGEMENT

This work is supported by the Universiti Teknologi Malaysia Grant (No Q.K130000.2763.03K15).

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