

# Investigation of the Role of Innovation Dimensions and Knowledge-Based Trust in Accepting Mobile Banking

Hossein Vazifehdoost<sup>1</sup>, Maryam Vaezi<sup>2</sup>, Somayeh Tavanazadeh<sup>3</sup>

<sup>1,2</sup> Department of Business Management, Science and Research Branch, Islamic Azad University, Tehran, Iran.

<sup>3</sup> Department of Business Management, Qazvin Branch, Islamic Azad University, Qazvin, Iran.

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## ABSTRACT

Abstract: mobile banking is one of the new technologies in banking industry which has many benefits both for customers and banking industry itself. Considering the special characteristics of this technology and risks which might be perceived by customers in using it, its acceptance and use is a concern for banking industry management. Therefore, the present research aims to investigate factors which influence innovation and knowledge-based trust in acceptance of mobile banking. The present research is an applied research in terms of goal and it is a descriptive-correlation study in terms of data collection methodology. A questionnaire was used for data collection. Sample members were selected from among customers who referred to different branches of Mellat Bank in Ardebil City, Iran. Structural equations modeling method was used for data analysis. Results showed that perceived relative advantage, perceived ease, perceived compatibility, perceived competency and perceived integrity have positive influences on attitude towards acceptance of mobile banking. On the other hand, the influence of perceived goodwill on attitude towards acceptance of mobile banking was not verified. Furthermore, attitude towards acceptance of use of mobile banking on behavioral intention to use mobile banking had a positive and significant influence.

**KEYWORDS:** mobile banking, innovation, knowledge-based trust, behavioral intention.

## INTRODUCTION

Within the recent years, customers' needs and levels of service quality have received a lot of attention. High levels of service provided for customers are considered as instruments for achieving competitive advantage. As customers' knowledge increases, banks and other credit institutes become more and more sensitive towards service quality. Banks should learn about how to provide high-quality services in order to be able to have long-term relationship with customers (Tavanazadeh & Aligholi, 2014). On the other hand, increase in customers' loyalty has received a lot of attention by managers and advisors and academics. Customers' loyalty is important because customers use it in buying services and products. Organizations which are successful in creating customers' loyalty are more successful in acquiring competitive advantage over their competitors (Haghighi et al, 2012). The present era is accompanied by unpredictable changes and companies are confronted with harsh competitive conditions due to factors like ambiguous borders between markets, fragmentation of markets, short lifecycle of products, rapid changes in customers' purchase models and customers' knowledge (Rahnama et al, 2012). Financial sector and banks in particular are confronted with unprecedented changes. These changes have had a lot of impacts on the nature and structure of competition in this sector. Financial institutes have to change their response to market so that they are more confronted on customers than services and have long-term viewpoints instead of short-term viewpoints (Harrison, 2008). Increasing attention of banks to e-banking instruments in developed countries which is normally aimed at facilitation of service provision process and reduction in banking costs has created a fierce competition in e-banking industry and most banks have to use new information technologies. Development of electronic systems like internet has affected financial institutes and banks. World Wide Web has changed customers' expectations from speed, exactness, price and services. Geographical distance is no longer important and accessibility and service distribution speed has created competitive advantage for organizations and especially banks. Companies have to provide the newest and most attractive services for customers. In order to survive in competition, banks have to change their traditional systems. New interests and tendencies of customers are based upon new forms of internet, competition based upon cost reduction, customer maintenance, customer persuading, customer behavioral acceptance (acceptability), security and ease of use in a wide range of products and services (Change, 2007). Considering the entrance of new technologies in data process, banking service provision has also changed. A glance at experiences of advanced countries and growth of electronic banking services can help predict the increasing trend of banking services needs in Iran. However, it must be noted that customers are used to traditional banking system and have more trust in traditional banking. The present research aims to investigate banks customers' needs and expectations in relation to e-banking in order to develop e-banking and contributes to designers and marketers to concentrate on preparation of marketing strategies. Therefore, the present research

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\*Corresponding Author: Somayeh Tavanazadeh, Department of Business Management, Qazvin Branch, Islamic Azad University, Qazvin, Iran. Email: Tavanazadeh.so@gmail.com, Tel: (+98) 28-33665275.

identifies the role of innovation and knowledge characteristics which are based upon trust in acceptance of mobile banking in banks of Ghazvin Province in Iran. the main problem is therefore as follows:

Whether innovation and knowledge-based trust is effective in acceptance of mobile banking?

## **Theoretical framework**

### **Mobile banking**

In any organization, whether production or service, the main factor in survival is "customers", and if the organization is not successful in attraction of satisfaction and loyalty, it will not have long-term growth (Vazifehdoost, Rahnama & Mousaviyan, 2014). Although e-banking has many levels, it is the presence of hardware and software and financial information process systems that differentiates between e-banking and traditional banking (Hassan and Kamel, 2007). In other words, e-banking is the optimum integration of all activities of a bank via new information technologies which facilitates service provision for customers (Blount et al, 2008). However, most experts and commentators unanimously agree that use hardware, software and network technologies and integration of all activities and customer orientation are elements of e-banking. Today, e-banking is considered mainly as a necessity rather than an advantage. This is because electronic banks are able to provide faster, more precise and more complete services for customers all over the world. Moreover, slowness of the traditional system results in loss of golden opportunities for attraction of customers and paper transaction of commercial document in the developed countries is more or less abolished. In e-banking, instruments like e-money, e-check, electronic purse, different types of cards like debtor card, creditor card, ATM and POS are used (Schneider, 2005). On the other hand, traditional banking via physical branches is still a common method for doing banking transactions in many countries. In spite of the fact that millions of dollars have been spent on creation of e-banking systems in many countries, reports show that potential users do not use them and this has become a great concern for banks. Therefore, there is a need for identification of factors which influence on individuals' tendency to using e-banking services so that banking industry can prepare marketing strategies for promotion of e-banking system for satisfaction of customers' needs (Wang et al, 2007). Considering the fact that users' attitudes towards acceptance of new information systems has a lot of impact on successfulness of acceptance of information systems (Davis et al, 1989), many studies have been conducted on information systems. These studies have different theoretical frameworks. TAM model (technology acceptance model) is the most common and most effective theory used for description of individuals' acceptance of information systems. Over the past 18 years, society of information systems has considered this model as one of the main models in information systems (Lee et al, 2006). TAM model was introduced by Fred Davis in 1989 for investigation of behavior towards use of computers. This model itself is based upon theory of rational action (TRA) of Fishbin and Ajzen. TRA theory makes use of different theories and predicts individuals' behaviors (Davis et al, 1989).

### **Innovation**

Mobile banking can act like a technological innovation because it enables customers to do banking transactions without temporal and spatial limitations and get connected with banking services by mobiles. The importance of innovation characteristics has been also documented in literature. many studies have been conducted on users' perception of the influence of innovation on generalization of its use for internet-based information systems. Innovation dissemination theory presents a collection of innovation features and influences on generalization of application. Innovation features include relative advantage (which can be resulted from innovation), ease of access, compatibility, ability to be observed and tested. Among these features, relative advantage, ease of use and compatibility are important factors in dissemination of internet-based technologies.

### **Perceived relative advantage**

Perception of usefulness of a technology refers to the level an individual thinks that use of a special technology helps do works better (Davis et al, 1989). Mour and Benbasat (1991) found that perceived relative advantage of innovation has a positive relationship with its acceptance. Therefore, mobile banking potential has some benefits like speed, appropriateness, and accessibility for customers. In general, when customers perceive clear advantages which are perceived by mobile banking, they are more probable to have positive attitudes towards mobile banking.

### **Perceived ease**

Perception of the fact that how psychological state influences consumer behavior is very important because consumers experience different psychological states. Individuals can make decisions based upon their feelings (Abdolvand et al, 2011). Perceived ease refers to the level an individual believes that learning to use a special technology requires a small mental attempt (Davis et al, 1989). In other words, ease of use is the level an individual believes that use of a special system does not involve many attempts (Vainio, 2006). Further, perceived ease of consumption is the level in which mobile banking is considered as an easy method for

perception and performance. In order to prevent from idle systems, customers do not need to do many actions for use of mobile banking. Because mobile banking services have easier interfaces, customers know about ways of using it and therefore have positive viewpoint towards it.

### **Perceived compatibility**

This refers to the level an individual believes that innovation is compatible with present values, past experiences and needs (Lin, 2012). Perceived compatibility is identified as the best index based upon attitude towards online transactions. Therefore, the present study expects that customers consider mobile banking as a kind of banking which is compatible with lifestyle and their preferences and therefore they have a positive attitude towards mobile banking.

### **Perceived competency**

In the field of mobile banking, competency refers to an individual's belief about the fact that banks which provide mobile banking have the ability and competency to understand their needs and control their personal financial affairs. In automatic systems, trust is based upon customers' understanding of capabilities of automatic systems. Customers form their beliefs about technical competency of websites based upon their understanding of main processes of online transactions. If customers believe that mobile banking companies have necessary abilities and competencies for provision of appropriate services, they will be more probable to evaluate mobile banking as desirable.

### **Perceived goodwill**

Goodwill is important for trust because it shows the level an individual is under care and control and is interested in doing good actions for reasons other than individual reasons. If a customer believes that mobile banking companies have goodwill, they will probably use mobile banking.

### **Perceived integrity**

Perceived integrity shows a relationship with a set of acceptable principles. Accuracy is very important because it causes trust and reduces instability and potential risks. In the field of mobile banking, rules which govern accuracy provide proper and on-time information and keep customers' commitment and maintain secrecy of personal information. Such proper rules persuade customers to select mobile banking organizations as organization with high levels of integrity. Mobile banking show more integrity when customers believe that mobile banking companies must have high levels of justice and honesty. Therefore, customers which believe in high accuracy in mobile banking companies have positive attitude towards using mobile banking.

### **Behavioral intention and attitude**

Attitude refers to positive or negative evaluation of special behavior and behavioral intention refers to the level of probability of using a system by an individual (Yao, 2003). Target-based models have been successful in investigation of attitude as media between beliefs and targets. Attitude towards a special system forms when the results are evaluated as acceptable. It is expected that individuals affect systems after using them. Presence of this relationship in different situations and especially work place has been verified by enterprise resource planning (ERP) and knowledge management plans and virtual collections using technologies like internet services. In this study, this relationship is expected to reflect favorable and unfavorable feeling towards mobile banking and therefore predicts specialized goals. Considering the above discussion, research conceptual model which is extracted from Lin model (2011) has been shown in figure 1.

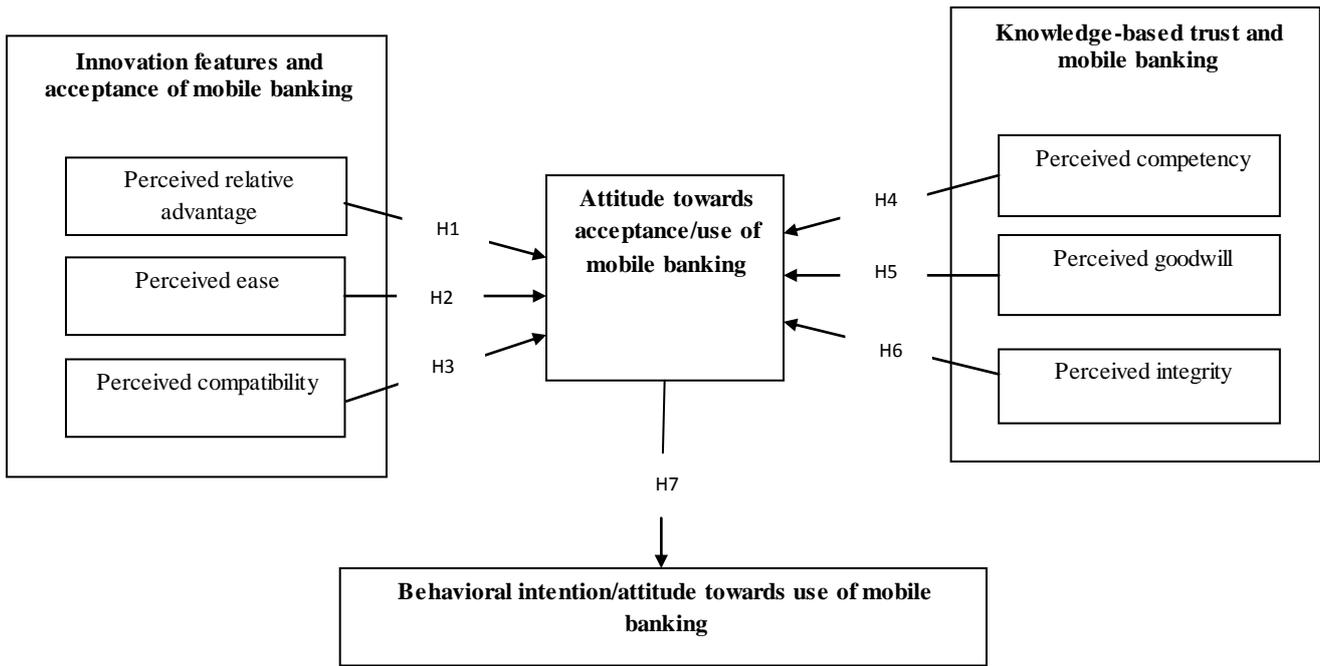


Figure 1. research conceptual model

Research hypotheses which have been developed based upon the research conceptual model are as follows:

1. perceived relative advantage has a direct influence on mobile banking acceptance.
2. perceived ease has a direct influence on mobile banking acceptance.
3. perceived compatibility has a direct influence on mobile banking acceptance.
4. perceived competence has a direct influence on mobile banking acceptance.
5. perceived goodwill has a direct influence on mobile banking acceptance.
6. perceived accuracy and integrity has a direct influence on mobile banking acceptance.
7. attitude towards acceptance of use has a direct influence on behavioral intention for use of mobile banking.

**Research methodology**

This research tries to investigate factors affecting attitude and behavioral intention of customers towards acceptance and use of mobile banking technology. It was conducted on branches of Mellat bank in Adebil Province. In terms of goal, it is an applied research. In terms of data collection, it is a descriptive study. Furthermore, it is a correlation study in terms of data analysis. Data were analyzed by means of structural equations modeling method.

**Statistical sample and population**

Statistical population of this research includes all customers who used mobile banking services in melli Bank in Ghazvin Province, Iran. Because population size was unlimited and multi-value variables are present, the following relation was used for determination of sample size.

$$n = \frac{Z_{\alpha/2}^2 \times P(1 - P)}{\epsilon^2} \qquad n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.06)^2} = 267$$

Z is standard normal value and alpha is error value, P is ratio of success and e is the researchers expected precision [3]. Certainty level was 95% and precision was 6% in this research. Considering the fact that there is no estimation for ratio of success, its value was considered to be equal to 0.5. sample size is maximized in this state.

**Data collection instrument**

A questionnaire was used for collecting necessary data. The questionnaire items were based upon 5-point Likert scale from “completely agree” to “completely disagree”. 30 questionnaires were distributed among customers and users of mobile banking services as a pretest and in order to evaluate the reliability of the questionnaire. Cronbach’s alpha was used for investigation of reliability. Results showed that Cronbach’s alpha coefficient for total questionnaire was above 0.7 (the calculated values for Cronbach’s alpha for all variables and total questionnaire have been summarized in table 1). Content validity of the research questionnaire was also verified by experts. Therefore, the questionnaire has enough reliability and validity to be distributed among sample members.

Table 1. Cronbach’s alpha coefficients

Calculated Cronbach’s alpha	questions	Research variables
0.737	1-4	Perceived relative advantage
0.881	5-8	Perceived ease
0.929	9-11	Perceived compatibility
0.929	12-14	Perceived competency
0.762	16,15	Perceived goodwill
0.757	17-19	Perceived integrity
0.767	20-22	Attitude towards acceptance/use of mobile banking
0.822	23-25	Behavioral intention towards acceptance/use of mobile banking
0.90	1-25	Total questionnaire

Considering the sample size and because some questionnaires might be unusable, 300 questionnaires were distributed. The questionnaires were distributed randomly over 4 weeks among customers who referred to branches of melli Bank and had used at least one time mobile banking services. 271 complete questionnaires were returned. Table 2 depicts demographic information of the respondents.

Table 2. Research demographic variables

Frequency percentage	frequency	dimensions	variable
0.69	186	male	gender
0.31	85	female	
0.41	111	21-30	age
0.32	87	31-40	
0.18	48	41-50	
0.09	25	51 and above	
0.29	79	High school	Education
0.13	36	associate	
0.45	122	Bachelor degree	
0.13	34	Master degree and above	

**Data analysis and hypotheses test**

In order to test the research hypotheses, regression analysis was used. To this end, we first investigate the impact of innovation dimensions and knowledge-based trust on attitude towards mobile banking acceptance.

As it can be seen in table 3, ANOVA analysis (F=55.4 and Sig=0) indicates the presence of a linear relationship between independent and dependent variables. On the other hand, Durbin-Watson statistic was used for measurement of independence of errors. Allowable range of this statistic is between 1.5 and 2.5. the value of this statistic is equal to 1.748 which indicates independence of errors. These results show that linear regression can be used for investigation of the influence of innovation dimensions and knowledge-based trust on attitude towards acceptance of mobile banking.

Table 3: ANOVA analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.104	6	12.017	55.400	.000
	Residual	57.267	264	.217		
	Total	129.371	270			

Table 4. Regression analysis for investigation of relationship between innovation dimensions and knowledge-based trust on attitude towards acceptance of mobile banking

Relationships among variables	Standardized Beta	Sig	result	
Perceived relative advantage—attitude towards mobile banking	.245	.000	supported	$R^2 = 0.547$ Durbin-Watson= 1.8
Perceived ease---- attitude towards mobile banking	.172	.002	supported	
Perceived compatibility--- attitude towards mobile banking	.242	.000	supported	
Perceived competency---attitude towards mobile banking	.151	.001	supported	
Perceived goodwill---- attitude towards mobile banking	-.016	.717	Not supported	
Perceived integrity---- attitude towards mobile banking	.230	.000	supported	

Results of the hypotheses test show that all variables influence attitude towards mobile banking except perceived goodwill. Results show that perceived relative advantage (standard beta value=0.245) has the greatest and perceived competency (standard beta value=0.151) has the smallest influence on attitude towards mobile banking. Furthermore, R-squared value indicates that 54.7% of attitude towards mobile banking variations can be predicted by dimensions of innovation and knowledge-based trust. In the next sentences, we investigate the impact of attitude towards mobile banking on behavioral intention towards mobile banking using regression analysis. As it can be seen in table 5, ANOVA analysis ( $F=192.637$ ,  $Sig=0$ ) indicates a linear relationship between independent and dependent variables. On the other hand, Durbin-Watson test was used for evaluation of independence of errors. The value of this statistic was equal to 1.967 and this indicates independence of errors. These results show that linear regression can be used for investigation of the influence of attitude towards acceptance of mobile banking on behavioral intention towards use of mobile banking technology.

Table 5.ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.267	1	75.267	192.637	.000
	Residual	105.104	269	.391		
	Total	180.371	270			

Table 6. Regression analysis for relationships between attitude towards acceptance of mobile banking and behavioral intention towards use of mobile banking

Relationships between variables	Standardized Beta	Sig	result	
<b>Attitude towards mobile banking----- behavioral intention towards mobile banking</b>	.646	0.000	<b>supported</b>	$R^2 = 0.415$ Durbin-Watson= 1.967

Results of the hypotheses test show that the influence of “attitude towards mobile banking” on “behavioral intention towards mobile banking” (standard beta value equal to 0.646) is significant. Furthermore, R-squared value indicates that 41.5% of variations in behavioral intention towards use of mobile banking can be predicted and explained by attitude towards mobile banking.

**Conclusion and discussion**

The present research aimed to investigate the influence of innovation features dimensions and knowledge-based trust on acceptance of mobile banking. Results of the research showed that all variables have positive and significant impact on attitude towards mobile banking except for perceived goodwill. This result conforms to the results of a study conducted by Lin (2011). Perceived relative advantage (beta value =0.245) has the greatest influence on attitude towards mobile banking. In other words, features like ease of use, mobile accessibility, ease of operation conduct by mobile and ... have positive impacts on the respondents’ attitude towards acceptance and use of mobile banking. From among dimensions of knowledge-based trust, perceived integrity has the greatest impact on attitude towards mobile banking. In other words, from respondents’ viewpoint, perception of bank honesty, fulfillment of obligations by banks and ... have positive impacts on attitude towards mobile banking. In the present research, the influence of attitude towards mobile banking on behavioral intention towards acceptance/use of mobile banking was significant and positive. In other words, as attitude

towards mobile banking is positive, customers will show more behavioral intention towards acceptance and use of mobile banking. The fact that customers' use of mobile banking can reduce workload in branches and customers do not need to be physically present in banks can result in customer satisfaction. Therefore, Mellat Bank management is proposed to inform customers on advantages of using mobile banking system. Furthermore, ease of use, high-quality services and up-to-date services should be increased. One of the concerns of customers in the field of electronic and mobile services within the recent years is security and trust. Therefore, customers must become certain about mobile banking security and protection of their personal information and they must trust in mobile banking.

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