

## A Novel Model for analyzing the Effective Factors on the Intention to Use Mobile Banking Apps, Case Study: Iran Mellat Bank

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### Abstract

*Mobile banking is considered a breakthrough for banks and financial institutes since it allows them to provide distance banking service. However, many customers still doubt mobile banking security. In the present study, technology approval was developed and perceived risk, social trust and image were combined into classic TAM model in order to determine what factors influence on the acceptance of mobile banking applications from customers. The TAM model, first developed by Davis and his colleagues, was validated using collected from questionnaires and structural equation modeling (SEM). Results showed that personal attitude is a determinant factor of mobile banking acceptance. Usefulness and perceived risk can directly improve the use of mobile banking applications. In conclusion, our study showed that appropriate management and recognition of certain strategies are essential for improving new businesses which involve modern technological breakthroughs.*

**Keywords:** *Information Technology; Mobile Banking; Application; style; Intention of use; Mellat bank*

### 1. Introduction

Banking system is the first structure which is affected by information technology and as a factor for integrating and expanding its range of influence, bases its activities on the updated technology of the world. Therefore, in order to attract more customers and diversify their services, banks have synchronized themselves with new information and communication technologies and their revolutions. In this regard, they have made structural changes in receiving and paying money and facilitating customer service (Joseph *et al.*, 2009). Mobile banking is one of the approaches to financial services through information and communication technology that provides the possibility of a widespread choice of mobile telephone services in low-income countries (Anderson, 2010). Applications and programs that are easy to use attract consumers to use them. In addition, there is a positive and significant relationship between expectation of effort and ease of use and ultimately, directly affects the consumers' perception of the usefulness of the application by the users who use them (Hew *et al.*, 2015). Perceived compatibility has a stronger effect on behavioral intention. On the other hand, credibility, performance expectations, expectations of effort and social influence have been significantly

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influenced by the attitude of mobile banking sector which, in its turn, considerably influences the behavioral intention (Harrison, 2015).

The advantage of online banking and mobile applications in terms of financial institutions is that they allow users to access their account at any time and place. Such Accessibility indicates a better advantage over traditional banks. Despite what is mentioned so far, the important and interesting thing is that a number of customers who operate online banking have not changed their expectations, as expected [30]. Indeed, mobile banking is a new way of delivering banking services and the banks can provide information and other services more easily to their customers through mobile devices [26]. Mobile banking is also available everywhere thus it leads to cost reduction and brings more comfort and peace for customers [28]. The other advantages of mobile banking include reduction of urban trips, reduction of air pollution and traffic [12]. Through mobile banking, banks are able to reduce the workloads in their branches, carry out working processes at a faster and more accurate at cost-effective level. Moreover, software systems can provide instantaneous and up-to-date statistics to bank decision makers. Moreover, mobile banking provides the possibility of using bank services at any time and place; thus, mobile banking can lead to stronger relationships between customers and banks [24]. In order to investigate the effective factors on the intention of using mobile banking, a conceptual model has been proposed that includes the main variables determining the relationship with the user's behavior concerning the adoption of new technology in online banking. Using TAM model as a framework and develop it, this paper seeks to find the behavior of mobile banking users through relationships between different variables such as social image, usefulness, trust, intent to adopt technology, and so on. The relation between these variables will be explained in next Section. This paper is organized as follow; Section 2 includes the literature review, Section 3 identifies the effective factors, in Section 4, the conceptual framework is presented. Section 5 presents the methodology, Section 6 includes data analysis method and finally Section 7 explains the main findings. Conclusion of the paper is provided in Section 8.

## 2. Literature Review and Theoretical Framework of the Study

Previous studies show that effective factors in accepting mobile banking services include easy accessibility to offered services regardless of time and place, maintenance of privacy and time-saving [23]. Alalwan *et al.*, [7] examined the effective factors on acceptance of mobile banking by Jordan Bank customers. The results showed that mainly behavioral intention has positive and significant effect on performance expectations, expectation of effort, motivation, cost value and trust.

Tseng *et al.*, [34] examined the effect of the intention by using mobile banking. The results showed that mechanism of protecting the privacy of individuals is important in protecting the privacy of personal information and their intention to use mobile banking. In other words, it was found that enablement of privacy is important and led to the use of mobile banking by customers Hanafizadeh *et al.*, [19] reviewed the acceptance of mobile banking by Iranian banks customers. The factors considered in this study are the utility, ease of use, demand for interaction, risk, and cost, compatibility with lifestyle, credibility and trust. In this study, the most influential factor was lifestyle and then trust. Yu [34] reviewed the factors affecting the acceptance of banking in Taiwan. He used the theory of integrated acceptance and the use of technology for review. The factors, whose effects were investigated in this study, are: expected performance, expected effort, social impact, facilitating conditions, perceived validity, perceived financial fee and perceived personal ability. Among these factors, the impacts of perceived personal ability and expected effort on the use of mobile banking were not confirmed. Studying the willingness to accept mobile banking in young people combined with TAM model with the advantages and risks of banking acceptance, Akturan *et al.*, [5] concluded

that the perceived use, social risk, performance risk and perceived advantages directly have considerable effect on the attitude of individuals; moreover, attitude is directly effective on the intention of its usage. In addition, no direct relation was observed between the perceived usefulness and the intention to use, between ease of use and attitude, as well as between financial risk, time risk, security risk, privacy, and attitude.

### **3. The Identified Defective Factors**

In this section, we will discuss the Identified Defective Factors. These factors are such as mobile banking, Perceived Convenience, Perceived usefulness, Social image and so on. These parameters are essential to deal with the mobile banking problem.

#### **3.1. Mobile Banking**

Performing banking operation through mobile devices such as mobile phone or personal digital devices is called mobile banking. It is a new method to access banking services through the channel whereby the customer has interaction with bank with a mobile device [17]. Through mobile banking, customers could access to bank accounts and financial services [28]. Maintaining the Integrity of the Specifications.

#### **3.2. Perceived Convenience**

Convenience has been defined as the rate at which the individual believes the use of a special system doesn't require much effort based on physical or mental effort and learning. Moreover, perceived convenience is the level at which the mobile banking is perceived as an easy method for perception and performance [19].

#### **3.3. Perceived Usefulness**

Perceived usefulness is the degree at which the individual believes the use of a certain system promotes his occupational performance in organization [31].

#### **3.4. Social Image**

Using the According to Goffman theory (1967), social image of a social value is desired which each individual creates through interaction with others. In this study, social image is important since innovation could help the users on unreliability about consumption consequences; thus, the users might decide to use others' opinion for consultation and personal experiences. Social image is along with factors such as respect, honor, status, reputation, credit, competency, social relation, loyalty, trust, feeling of honor/ shame and *etc.*, [9]. Thus, social image is able to affect the easy use of advanced mobile services [27].

#### **3.5. Perceived Advantages**

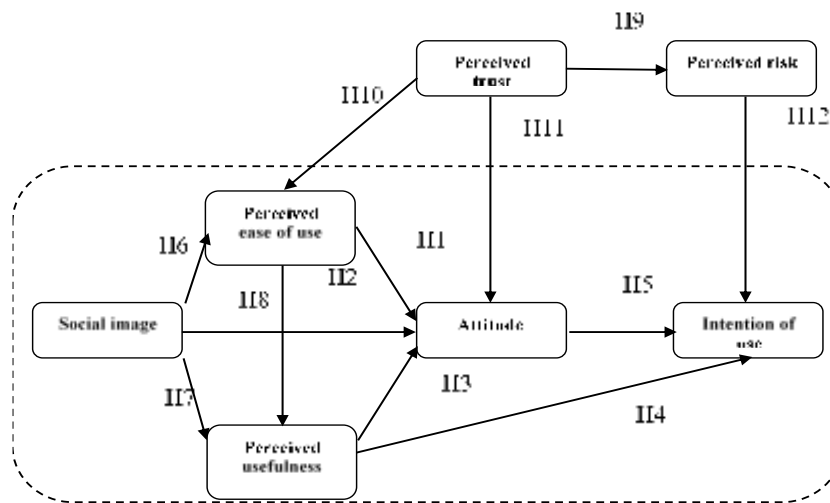
Perceived advantage of mobile banking is evaluation of emotional knowledge regarding the advantages and benefits related to its services. The perceived advantage is consumers' evaluation of the products' value; this value is based on the comparison of products' benefits for customer against the cost expend [5].

#### **3.6. Perceived Risk**

Gupta *et al.*, [16] believe that the perceived risk as the customers' perception of uncertainty and consequences due to transaction with seller. The perceived risk is a multifaceted structure made of various factors including risk associated with innovation, purchase or special service [6].

#### 4. Conceptual Model

The acceptance of Technology Model (TAM) is one of the most influential alternate designing methods for user acceptance of new information technology and systems. TAM was presented by Davis [10] and Davis *et al.*, [11], which is based on Fishbein and Ajzen [13] theory, which is a rational theory of action (TRA). In this theory, in general, the construct of behavioral intention is related to two other structures; *i.e.*, the attitude and the subjective norm. The aim of adopting TRA is that it can explain the technology acceptance factors that are generally able to explain the behavior of the user in a wide range of technologies. While, for end users and all users in any time, it is theoretically justified as being economic. Figure 1 presents the proposed model.



**Figure 1. The Conceptual Model of Research**

Considering the conceptual model of the study, the following assumptions are considered for the study of the subject:

H1: The ease of use of the applications provided by mobile banking has positive effect on users' attitudes.

H2: The ease of use of mobile banking programs has a positive impact on usefulness.

H3: Perceived usefulness has a positive effect on users' attitudes towards mobile banking programs and applications.

H4: Perceived usefulness has a positive impact on the intention to use of mobile banking applications.

H5: The people's attitude toward using mobile banking programs has a positive effect on the intention to use it.

H6: Social image has a positive effect on the ease of use of mobile banking applications.

H7: Social image has a positive impact on the usefulness of mobile banking applications.

H8: Social image has a positive effect on people's attitude towards mobile banking applications.

H9: Perceived trust in mobile banking applications has a positive impact on the user's perceived risk.

H10: Perceived trust in mobile banking applications has a positive effect on its ease of use.

H11: Perceived trust in mobile banking applications has a positive impact on users' attitude.

H12: Perceived risk of mobile banking programs has a negative impact on users' intention to use.

## 6. Research Methodology

The main aim of this study is to investigate the effective factors on the intention of using mobile banking applications of Mellat Bank by development of a model and inspired from ATM. In following, the methods and instruments used for data collection, the validity and reliability investigation will be examined.

### 6.1. Sample

The selected samples in this study were customers of Mellat Bank of Tehran, provided that each of them has a mobile phone capable of installing related banking software as well as Internet connection features. In this research, the respondents are among all clients of Mellat Bank, Vali-e-Asr Branch, who use mobile bank application. The bank customers were selected through random sampling and the selection of customers of Mellat Bank has been done through random sampling such that in total 250 people participated in this study; out of which 200 questionnaires have been accepted and analyzed. Moreover, data of this study have been collected from April to May 2017.

### 6.2. Questionnaire

The questionnaire includes three parts. The first part includes the respondents' profile, which is related to the respondents' demographic characteristics (sex, education, age and income). The second part of questionnaire includes questions related to satisfaction and responsiveness of customers of Mellat mobile bank toward their needs and expectations, how long they are using mobile bank and how much they would like to use mobile bank for their banking work (results are presented in Table 1 and 2). The third part of the questionnaire measures research variables of the research consisted of 23 questions for which five-point Likert scale has been used varying from very low (1) and very high (5).

**Table 1. Sample Statistics**

Item	Percentage	Item	Percentage
Gender		Employment status	
Female	0.87%	Student	15.5%
Male	113%	Employee of private sector	43.5%
Age		Employee of public sector	22%
Less than 30 years	35%	Self-employment	15.5%
Between 30-40	45%	Housewife	3.5%
Between 40-50	17%	Income status	
Above 50 years	3%	Less than 5,000,000 IRR	11%
Education		Between 5000,000- 10,000,000	8.5%
Associate degree	12.5%	10,000,000-15,000,000	17%
Bachelor of arts	39.5%	Above 15,000,000	63.5%
Master of Arts	46.5%	PhD and higher	1.5%

**Table 2. Descriptive Statistics**

Item	Percentage	Item	Percentage
Duration of using Mobile bank services		Satisfaction from transferring money to card and deposit	
Less than 1 month	31%	Very low	7%
Between 1-6 months	12%	Low	9.5%
Between 6-12 months	6.5%	Average	37.5%
Above 1 year	50.5%	High	25%
Satisfaction from mobile bank		Very high	21%
Very low	8%	Satisfaction from bill payment	
Low	6%	Very low	5.5%
Average	33.5%	Low	12%
High	35.5%	Average	34.5%
Very high	17%	High	25.5%
Banking work rate with mobile		Very high	22.5%
Very low	4.5%	Satisfaction of purchase facilities of credited CIM card	
Low	3.5%	Very low	12%
Average	13.5%	Low	12%
High	26.5%	Average	31%
Very high	52%	High	24%
Responsive of mobile bank to needs and expectations		Very high	21%
Very low	6%	Satisfaction of facilities on receipt and observation of last status of card and account	
Low	6.5%	Very low	7.5%
Average	32.5%	Low	14%
High	38%	Average	35%
Very high	17%	High	24.5
		Very high	19%
Satisfaction of facilities of Mellat mobile banking			
Very low	6.5%	Low	7.5%
Average	31.5%	High	37.5%
Very high	17%		

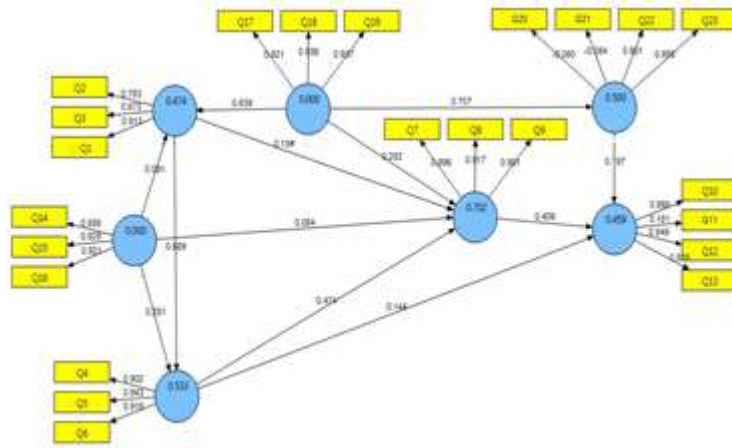
### 6.3. Validity and Reliability

Validity means that scale and content of scale or the questions included in the scale exactly evaluates the variables and studied subject such that the collected data are not extra to the study and also that part of required data concerning variable measurement is not eliminated from the content. Or in other words, it shows the reality [2]. The questionnaire used in this study has been extracted from the conceptual model of the research. Concerning relatively much work that has been done in terms of time on the indices and the manner of proposing questions of this study and also concerning the cooperation of the supervisor, the validity of mentioned questionnaire is confirmed. In the next stage, in order to determine the reliability of questionnaire, Cronbach's Alpha was used which confirmed up to 0.852% of the reliability of the questionnaire. Moreover, Cronbach's alpha percentage of each variable showed that the questionnaire has appropriate reliability. The structural reliability coefficient or combined reliability (CR) and average extracted variance (AVE) of each structure shows that the scale benefits from appropriate reliability. These indices measure the converging validity of research that confirms that high validity of structures. AVE measures the extracted variance by indices concerning measurement error. The value of this coefficient varies from 0 to 1 and the higher values than 0.05 are accepted [14]. Moreover, in combined reliability, when Goldstein and Dillon P value is bigger than 0.7, that block is uni-dimensional [1]. Moreover, if value of Cronbach's alpha, CR and AVE are respectively more than 0.6, 0.7 and 0.5 show that the structures benefit from appropriate reliability [14]. The results of calculations related to CR and AVE are presented in Table 3.

**Table 3. The Results of Reliability and Validity Tests**

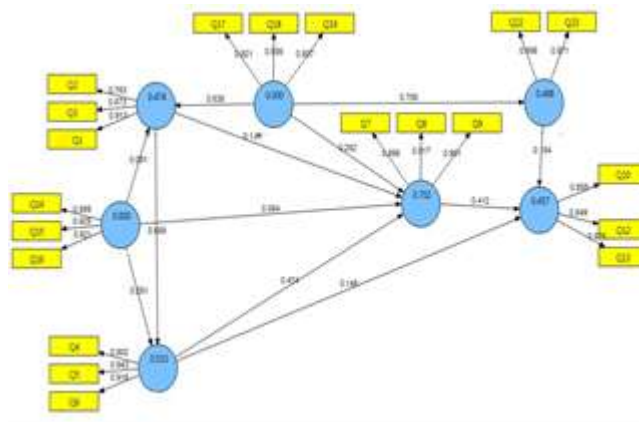
	<b>Cronbach's alpha</b>	<b>Combined Reliability</b>	<b>AVE</b>
Perceived ease of use	0.819	0.892	0.736
Perceived usefulness	0.910	0.943	0.848
Attitude	0.888	0.930	0.817
The intention for use	0.801	0.881	0.713
Social image	0.900	0.937	0.833
Perceived trust	0.923	0.951	0.867
Perceived risk	0.723	0.878	0.782

The divergent credit of questionnaire had been confirmed using the examination of correlation values between various variables indices in covariance matrix in Smart PLS output (Figure 2). In investigating Fornell-Larcker criterion, it is shown that the values in the main diameter of matrix (second root of explained variance values (AVE)) are bigger than all values in related low and column which indicates the correlation of indices with the dependent structure on them.



**Figure 2. The Output of Initial Measurement Model in SmartPLC Software**

Concerning the obtained results from the measured model in investigation of validity and reliability and the related explanations to acceptance threshold for mentioned indices, it is shown that by removing questions 11, 20 and 21, it has good reliability and validity. Thus, we conclude that the model benefits from appropriate fitness. Thus, the final model has been able to explain appropriately the relation between questions describing variable. The model revision in this method will be done through trial and error with investigation of variation in validity indices level. These modifications will continue with removing inefficient measures until achieving validity indices to desired level. The final revised model is shown in Figure 3.

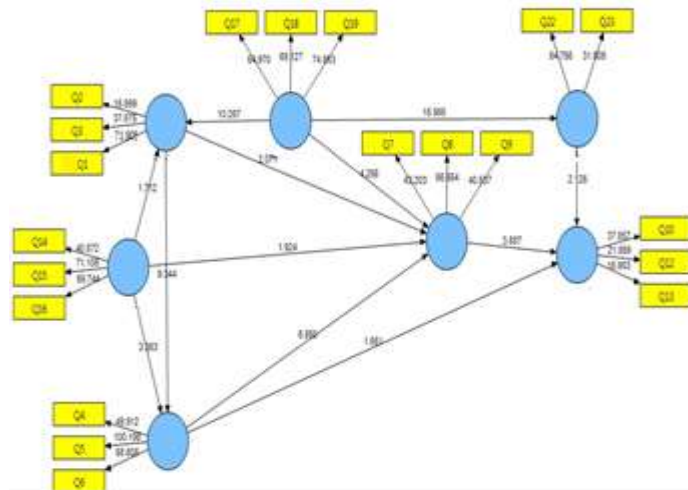


**Figure 3. The Output of Final Measured Model in SmartPLC Software**

## 6. Data Analysis Method

According to data analysis algorithm in PLS, after investigation of measured model fitness, it is time to fit the structural model. The structural model section has nothing to do with obvious variables despite measurement model; however, it just studies the hidden variables along with their relations. The structural model studies the relation between the structures. To this end, Bootstrapping function is used. The number of statistical sample in this study is 200 and about 1000 individuals have been considered as recommended in the Bootstrap test samples [18].





**Figure 4. The Output of Structural Model in Smart PLC Software**

The numerical value in relations indicates t-value statistics that is in fact the main criterion for confirmation or rejection of hypotheses. The accepted values for meaningfulness of path coefficients in reliability level 0.90, 0.95 and 0.99 should respectively be bigger than 1.64, 1.96 and 2.57 t-statistics (according to the [4]). Concerning these explanations, the main hypotheses for t-statistics is shown in Figure 4. Table 4 shows the results obtained from analysis of structural equations and the results of research hypotheses.

**Table 3. The Results of Reliability and Validity Tests**

Hypothesis	t-statistics	Path coefficients	Reliability level	Result
1 <sup>st</sup> hypothesis	2.071	0.134**	0.95 (p<0.05)	Confirmed
2 <sup>nd</sup> hypothesis	9.344	0.589***	0.99(p<0.01)	Confirmed
3 <sup>rd</sup> hypothesis	6.850	0.474***	0.99(p<0.01)	Confirmed
4 <sup>th</sup> hypothesis	1.551	0.148 <sup>ns</sup>	-	Rejected
5 <sup>th</sup> hypothesis	3.887	0.412***	0.99(p<0.01)	Confirmed
6 <sup>th</sup> hypothesis	1.712	0.091*	0.90(p<0.1)	Confirmed
7 <sup>th</sup> hypothesis	3.383	0.251***	0.99(p<0.01)	Confirmed
8 <sup>th</sup> hypothesis	1.924	0.084*	0.90( p<0. 1)	Confirmed
9 <sup>th</sup> hypothesis	15.986	0.706***	0.99(p<0.01)	Confirmed
10 <sup>th</sup> hypothesis	10.267	0.638***	0.95(p<0.05)	Confirmed
11 <sup>th</sup> hypothesis	4.258	0.282***	0.99(p<0.01)	Confirmed
12 <sup>th</sup> hypothesis	2.126	0.184	-	Rejected

## 6. Results

The first criterion for investigation of the fitness of structural model in a study is R2 coefficients for hidden dependent variables (endogenous). R2 indicates the effect of a dependent variable on an independent variable. Three values of 0.19, 0.33 and 0.67 are considered as the criteria values for weak, average and strong R2 values [3]. Concerning independent variable of intention of use, it could be said that 46% of variations of intention of use is defined by variation in risk, attitude and usefulness variables. Concerning the independent variable of attitude of users, it could be said that 70% of

variations of users' attitude variable is defined by variation in usefulness, ease of use, social image and perceived trust variables. Moreover, the results of study showed that the perceived usefulness has no effect on the intention to use of mobile banking programs. No negative effect was found on the perceived risk of mobile banking programs in respect to the intention of users to use mobile banking. In fact, it could be said that the experience in using this application improves the intention to use that is considered by the user as a technology of low risk and without determining factor in its approval. According to users, the ease of use of mobile banking, accessibility, ease of banking operation including payment and transfer by mobile phone has a positive effect on their attitude toward the intention to use mobile banking. From various factors related to social image, usefulness (3.383), it has the highest effect compared to ease of use (1.712) and attitude (1.924). Moreover, the factors related to perceived trust on the perceived risk (15,986), ease of use (10,267) and attitude (4,258) that shows that perceived trust is a main factor on acceptance of a new technology that could greatly influence the users. According to respondents, the perceived trust includes bank honesty, fulfillment of commitments of bank toward customer and etc. that have positive effect on the individuals' attitude toward using mobile banking. In investigation of negative effect of perceived risk on the intention of use of customers, it was specified that the perceived risk (2,126) has no negative effect on the intention of use of mobile banking by customers. Acceptance perception or perception of such cases is very significant in determining a strategy for attraction of new users. Perception of acceptance or acceptance of such items is significant in determining a strategy for attraction of new users. The banks should expand their communicative measures to explain the benefits of using this type of programs of mobile phone and create usefulness for users. The results showed that the individuals' incline and attitude is determining factor in using mobile banking and the perceived usefulness and risk which directly influence the users, improve this program. Finally, the study showed that the main consequences of management and identification of special strategies for enhancement of new business in new technologic advancement are required and necessary.

## 8. Conclusion

In this article we showed that, the ease of use of the applications provided by mobile banking has positive effect on users' attitudes, The ease of use of mobile banking programs has a positive impact on usefulness, Perceived usefulness has a positive effect on users' attitudes towards mobile banking programs and application, Perceived usefulness has a positive impact on the intention to use of mobile banking applications, The people's attitude toward using mobile banking programs has a positive effect on the intention to use it, social image has a positive effect on the ease of use of mobile banking applications, social image has a positive impact on the usefulness of mobile banking applications, social image has a positive effect on people's attitude towards mobile banking applications, perceived trust in mobile banking applications has a positive impact on the user's perceived risk, perceived trust in mobile banking applications has a positive effect on its ease of use, perceived trust in mobile banking applications has a positive impact on users' attitude and perceived risk of mobile banking programs has a negative impact on users' intention to use.

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