

Factors Affecting the Adoption of Mobile Banking: Sample of Turkey

Reihaneh Bidar*, Mani B. Fard**, Yucel Batu Salman***,

Mehmet Alper Tunga***, Hong-In Cheng****

* Information Technology Department, Bahcesehir University, 34353, Istanbul, Turkey

** Computer Engineering Department, Istanbul Technical University, Istanbul, Turkey

*** Software Engineering Department, Bahcesehir University, 34353, Istanbul, Turkey

**** Departments of Industrial and Management Engineering, Kyungshung University,
Busan 608 - 736, Republic of Korea

reihaneh.bidar@gmail.com, fard@itu.edu.tr, {batu.salman, alper.tunga}@bahcesehir.edu.tr, hicheng@ks.ac.kr

Abstract— Rapid developments in communication technologies make fundamental changes in the behaviour of people while performing basic tasks. Mobile banking (m-banking) as an innovative product of mobile industry is becoming more common to reduce and manage time-intensive banking affairs. Understanding the primary determinants of m-banking adoption is significant for banks and users. This study investigates seven factors that affect implementation and adoption of m-banking by Turkish customers. Perceived usefulness, perceived ease of use, security and privacy, compatibility, social influence, facilitating conditions and perceived cost were measured to identify their predictor roles for the use of m-banking. 128 valid data were collected in order to test our conceptual model. Seven hypotheses were tested. It was found that perceived usefulness, compatibility, and social influence have positive impact on m-banking adoption in Turkey.

Keywords— Mobile banking, Technology acceptance model, Information technology adoption, User acceptance, Turkey.

I. INTRODUCTION

Improvements in information systems are becoming an important core of electronic commerce and banking industry. Organizations are searching for innovative solutions in order to enhance business performances, gain more relative advantages and improve the quality of service by the recent technological developments. There is no doubt that people's inclination toward mobility is increased, simply because the value of time and distance barriers are getting more tangible. M-banking is developing with the strength of mobile market, besides, has permeated to the finance sector. By advent of mobile commerce in the banking sector, communication of customers and banks inevitably changed into a new perception of interaction. The banks transmitted their transactions with consumers from face to face to computer mediated environment. M-banking can be simply defined as a system which allows users to have control over their financial assets by the help of mobile phones.

While some studies believe enhancing technology does not assure a raise in customer usage, Dangolani believes that information technology allows the banking to become stronger by enhancing reliability and speed in financial operations [1], [2]. He also indicates that new technologies may be adopted by businesses for having a better relationship with customers.

Extensive work has been carried out recently with the aim of studying acceptance of m-banking and weighty factors in several countries. Hanafizadeh et al. [3] found compatibility and trust were the most effective factors on adoption of m-banking by Iranian customers. Also, Beiginia et al. [4] discovered that bank customers in Iran didn't understand yet the compatibility of mobile banking services with their lifestyle and their career type.

In China, it was revealed that although trust has a strong relation with perceived usefulness, the impact of perceived usefulness on intention to use of m-banking is much higher than trust. Also structural assurance was much more significant than other dimensions of trust in the model [5]. According to survey of Sheng et al. [6] on the acceptance of m-banking in China, perceived ease of use, perceived usefulness and compatibility were positively related to intention to use, while there was a negative relationship with perceived risk. In another study, performance expectancy, task technology fit, social influence and facilitating conditions are suggested as major constructs by integration of Task Technology Fit (TTF) model and Unified Theory of Acceptance and Usage of Technology (UTAUT) model [7]. Adoption of m-banking in Singapore is highly related to usefulness, social norms and social risk. Also ease of use for females plays an important role to interest them to use m-banking [8].

In Taiwan, credibility has a stronger impact on behavioural intention than perceived usefulness and perceived ease of use, while security and privacy is a concern for customers to accept m-banking [9]. System configuration safety and system fees cause ignorance for customers to use m-banking services

[10]. Compared to the other countries the most significant factors toward acceptance of m-banking in Korea are self-efficiency and structural assurance [11].

In this study, seven variables were assessed and a conceptual model was designed in order to identify the primary factors affecting the adoption of m-banking in Turkey. A survey was created and distributed online. 128 valid data sets were collected to test the hypotheses in our model.

II. RESEARCH MODEL

Technology Acceptance Model (TAM) is recognized as the most famous and norm model for examining the acceptance of a technology [12]. Recently extended TAM has become more popular in a way that introduces more contributing factors in examination of causalities between factors and the user acceptance of a specific technology. TAM is the base of our model designed for this study. The goal of this study is to seek the link between seven suggested factors and acceptance of m-banking for customers of Turkish banks. The research model is shown in Figure 1.

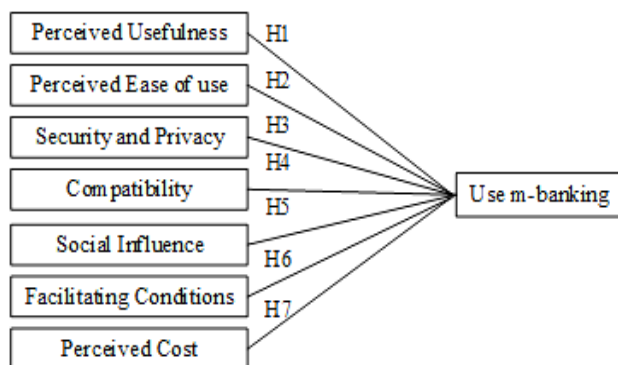


Figure 1. Research model and the hypotheses.

A. Perceived Usefulness (PU) & Perceived Ease of use (PEOU)

Perceived usefulness and perceived ease of use were determined as the fundamental variables of TAM [12]. They are defined as people's subjective judgment about performance and effort. In perceived usefulness, enhancement in the people's job performance is the primary goal to achieve while in perceived ease of use having a free of effort system is a considerable objective [12], [13]. When customers find m-banking useful, then they mainly try to use the service or application [3], [9], [13], [14]. The significant role of ease of use on consumer acceptance is demonstrated in prior studies [13], [15]. Therefore, we suggested the following two hypotheses:

H1: Perceived usefulness has a positive effect on acceptance of m-banking.

H2: Perceived ease of use has a positive effect on acceptance of m-banking.

B. Security and Privacy (SP)

Customers demand a secure environment for their personal privacy because of the high risk in the mobile context [14].

One of the people's significant concerns about the adoption of m-banking services is transferring their personal information without their permission. So, assuring them to have a secure transaction with protected privacy, influences the voluntarily usage of m-banking [9]. Security context has always been a concern for both customers and producers and it will be considered even more crucial in financial systems. The more people are ensured about the security of the system and their personal privacy, the more likely they get attracted to trust and adopt m-banking. Due to the fact that security is a sophisticated context and need to be more discussed in different dimensions, here we just focus on the aspect of security that penetrates people's concerns. Therefore, we suggest the following hypothesis:

H3: Security and privacy have a positive effect on acceptance of m-banking.

C. Compatibility (COM)

Compatibility is defined as the degree to which an innovation is consistent with the existing values and beliefs, past experiences, and current needs [16]. The more compatibility with lifestyle means the higher chance of attracting customers to use m-banking [3]. So, accordance of m-banking with user's lifestyle will lead to a preferable adoption of m-banking. Therefore, we suggest the following hypothesis:

H4: Compatibility has a positive effect on acceptance of m-banking.

D. Social Influence (SI)

Venkatesh et al. [17] defines social influence as a degree to which an individual believes that others' idea play an important role on the way of using a new system. This study also introduced this variable as one of the core factors which may affect the behavioural intention of technology [17]. Users have more inclination to use m-commerce when they are affected by trends, mass media, and peers [18]. Hence, we expect that:

H5: Social influence shows a positive effect on acceptance of m-banking.

E. Facilitating Conditions (FC)

Facilitating conditions are defined as believes that are organizational and technical infrastructures to support use of a system and make an act easy to accomplish [17]. Bryson and Atwal [19] believe that the facilitating conditions have an impact on perceived ease of use and usefulness. Gu et al. [11] also agreed on positive influence of facilitating conditions on ease of use. Lee and Chung [20] implied facilitating conditions have significant effect on m-banking adoption. Additionally, Venkatesh et al. [17] revealed the critical role of facilitating conditions on workers with less work experience. Therefore, we suggest the following hypothesis:

H6: Facilitating conditions has a positive effect on acceptance of m-banking.

F. Perceived Cost (PC)

Cost and service fees are mostly defined as an obstacle for accepting new technologies [3], [10], [18]. Electronic banking customers are commonly not attracted by focusing on cost benefits and product convenience [21]. The influential factor on persuading customers is an advancement of the level of system's performance. For instance, in China, people with lower income have great concern with the cost; however, in US expenses are not a main preoccupation [14]. Therefore, we suggest the following hypothesis:

H7: Perceived cost has a negative effect on acceptance of m-banking.

III. RESEARCH METHODOLOGY

A. Participants

An online survey was designed and released. The measurements and questions in the online survey were taken from different studies based on selected variables in terms of technology acceptance [22], [3], [23], [11], [7]. The data was collected from mostly university students and employees. Among 128 responses, 57.8 % were male and 42.2% were female. Most of participants had bachelor degrees (71.9%). Age of respondents ranged between 18 to 25 with 53.9% and 26 to 30 with 28.1%. Table 1 shows the demographic details of the sample.

TABLE 1. PROFILE OF THE RESPONDENTS

Measure		Frequency	Percent
Gender	Male	74	57.8
	Female	54	42.2
Age	18-25	69	53.9
	26-30	36	28.1
	31-40	18	14.1
	41-50	3	2.3
	51>	2	1.6
Education	Some college	6	4.7
	Bachelor	92	71.9
	Master	29	22.7
	PhD	1	0.8

B. Reliability

We measured the reliability of the collected data for each variable by testing the internal consistencies, using Cronbach's alpha. All reliability measures except security and privacy were over 0.6, which indicates they are acceptable [24]. The security and privacy factor (.45; 5 items) was removed from the analysis due to the low alpha value. The Cronbach's alpha values were .89, .79, .81, .69, .71, .85, and .85 for perceived usefulness (4 items), perceived ease of use (3 items), compatibility (3 items), social influence (3

items), facilitating conditions (2 items), perceived cost (3 items), and the m-banking use (3 items) respectively.

IV. DATA ANALYSIS

A. Correlation between Variables

Pearson correlation coefficient was used to identify the linear relationships between given variables. According to the correlation matrix (Table 2), there are positive relationships between all variables and the use of m-banking (USE) unless for the perceived cost which has a negative relation. While there is a strong relationship between perceived usefulness (.65), perceived ease of use (.64) and compatibility (.68) individually with the adoption of m-banking, no high relation has been observed with social influence, facilitating conditions and cost on use. The correlations between all variables can be seen in Table 2.

TABLE 2. CORRELATION MATRIX

	PU	PEOU	COM	T	SI	FC	PC	USE
PU	1.000							
PEOU	.747**	1.000						
COM	.671**	.729**	1.000					
T	.477**	.497**	.524**	1.000				
SI	.357**	.436**	.415**	.360**	1.000			
FC	.525**	.509**	.549**	.521**	.142	1.000		
PC	-.169	-.181*	-.356**	-.244**	.166	-.347**	1.000	
USE	.649**	.638**	.676**	.442**	.459**	-.381*	-.180*	1.000

Note: N=128 ** Correlations are significant at 0.01 level (P<0.01).

*Correlations are significant at 0.05 level (P<0.05).

B. Testing Hypotheses

In order to test our hypotheses, we applied regression analysis to understand the impact of variables on m-banking adoption. The statistics proved that three hypotheses of H1, H4 and H5 were supported to have positive impact on user acceptance of m-banking with significant levels between .001 and .016. It was found that perceived usefulness, compatibility, and social influence have a significant effect on the adoption of m-banking.

V. DISCUSSION

The results confirmed that three out of seven suggested variables have significant influence on the acceptance of m-banking in Turkey: compatibility, perceived usefulness and social influence. In addition, due to measurement issues identified by Cronbach's alpha analysis, the security and privacy factor was removed to enhance the accuracy of the final results.

The first hypothesis stated that perceived usefulness is positively related to adoption of m-banking in Turkey. This

claim is supported significantly by our findings ($\beta = 0.297$, $p < 0.01$). This further explains that the more customers realize m-banking services to be useful, the more they will be absorbed into the adaptation of m-banking. The findings of Amin et al. [25] and Dai [14] also prove that the greater the perceived usefulness of m-banking is, the more likely this novice technology will be adopted. Thus, if improvement of the acceptance is highlighted, banking organizations should pay more attention on providing more profitable services.

Perceived ease of use has higher but insignificant correlation value with m-banking usage ($\beta = 0.115$, $p > 0.05$). Since computer-based systems have become more common place these days and people have acquired more knowledge of using smart phones and new applications, there will be less concern about the complexity of the new systems. So, the second hypothesis is not supported. Liu et al. [5] also found out that perceived ease of use has no significant influence on the users' acceptance of m-banking.

H4, which predicted compatibility to have a positive effect on user acceptance of m-banking, was confirmed by our findings ($\beta = 0.337$, $p < 0.01$). Hanafizadeh et al. [3] stated, one way of experiencing growth in number of m-banking users is finding and covering people's needs in their daily life to help them feel compatible with the related services. In our study, the compatibility of the system with lifestyle is found to be the strongest predictor of m-banking acceptance among Turks and it directly affects the number of customers and retention.

H5 was also supported ($\beta = 0.177$, $p < 0.05$) where social influence was found to have a positive direct effect on m-banking acceptance. These findings are in parallel with the study of Zhou et al. [7] who found that social influence is a significant determinant of m-banking acceptance. High impact of social influence shows that Turkish customers are influenced by their peers, social networks, modern advertising methods and cyber spaces. These interactions can form their opinions and decisions.

According to the analysis, the influence of facilitation conditions ($\beta = -0.057$, $p > 0.05$) and perceived cost ($\beta = -0.039$, $p > 0.05$) on acceptance of m-banking were not significant. Thus, H6 and H7 were not supported by our sample dataset. It demonstrates that the essential requirements for use of m-banking such as supporter and primitive facilities are provided in Turkey. Also, similar to study of Dai & Palvi [14] in United States, costs and service fees are affordable for most people.

VI. CONCLUSION

IT adoption is one of the most analyzed fields in the literature. Adoption models are increasingly applied to determine the significant factors affecting the acceptance of a specific technology. Also there are not so many researches in explaining the adoption of m-banking in Turkey. Additionally, in our research we extended TAM to investigate people's attitude toward adoption by seven given factors. While it was found that compatibility, perceived usefulness and social influence were the most important in explaining user's intentions, the others were not deemed important to explain. Therefore, an advantageous system that is aligned with the

customers' daily needs would have more positive effect on m-banking acceptance of Turkish customers. In addition to these critical factors that need a special consideration, positive feedback from peers, friends and impact of advertisements would improve the customers' tendency toward usage of m-banking.

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Hong-In Cheng is an associate professor in Department of Industrial and Management Engineering, Kyungsoo University, Busan Korea. He received a BS from Pusan National University and earned his MS and PhD in Industrial and Manufacturing Systems Engineering, Iowa State University. His research interests include ergonomics, usability engineering, and human-computer interaction.



Reihaneh Bidar received her BS in software engineering from Iran Azad University of Lahijan, in 2008 and she earned her MS degree in information technology at Istanbul Bahcesehir University, in 2013. Her primary research interests are mobile computing and product design.



Mani B. Fard received his BS in software engineering from Iran Azad University of Lahijan. In 2013, he received his MS in computer science from Istanbul Technical University. His primary research interest is computer vision.



Yucel B. Salman is an assistant professor at Software Engineering Department of Istanbul Bahcesehir University. He received his M.S., degree in 2006. PhD degrees in 2006 and 2010 respectively. He worked as a visiting professor at Kyungsoo University, Busan between 2006 and 2010. His primary research fields are mobile interaction design, user interface design and human factors.



Mehmet A. TUNGA is an associate professor at software engineering department of Istanbul Bahcesehir University. He received his BS, MS and PhD degrees from Istanbul Technical University, Istanbul, Turkey in 1997, 1999 and 2006 respectively. His research interests are multivariate data modelling, data mining, and applied statistical analysis. He is also the member of Group for Science and Methods of Computing in Institute of Informatics, Istanbul Technical University.