

Extending UTAUT2 in M-banking adoption and actual use behavior: Does WOM communication matter?

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Abstract

Purpose – The purpose of this study is to investigate important factors that help explain customer willingness to adopt mobile banking (M-banking). To this end, the unified theory of acceptance and use of technology 2 (UTAUT2) was applied and to more accurately predict customer behavioral intentions, it was attempted to extend it.

Design/methodology/approach – The research data were collected from 396 customers of Iranian private banks who had the experience of using M-banking. The structural equation modeling technique was used to test the research hypotheses.

Findings – Findings suggest that performance expectancy, effort expectancy, social influence, facilitating conditions, habit, hedonic motivation, perceived value and trialability are endorsed as proponents of M-banking adoption intention. On the other hand, M-banking adoption intention has also had a significant positive effect on actual use behavior and word-of-mouth (WOM). WOM has also influenced actual use behavior and mediated the relationship between M-banking adoption intention and actual use behavior.

Research limitations/implications – The present study focuses on private banks, therefore, although it is sufficient, it is limited to private cases. This study contributes to the literature on M-banking services and actual use behavior. By appropriately focusing on M-banking adoption intention and the service quality provided, banks can strengthen their relationships with customers, thereby stimulating actual customer behavior such as actual use behavior and WOM.

Originality/value – From theoretical and managerial aspects, this study has particular value for the literature on M-services' intention in general and banking in particular. The present study provides a conceptual framework for M-banking adoption intention, which could be used in M-banking services. In



addition, this study sought to extend UTAUT2 and to examine the mediating role of WOM in actual use behavior motivation as well.

Keywords Mobile banking, WOM, UTAUT2, Actual use behavior, M-banking adoption

Paper type Research paper

Introduction

Traditionally, banks have used the Brick-and-Mortar approach to expand their geography and gain more market share (Tan and Teo, 2000). However, since the 1990s, the banking industry has attempted to shift from traditional financial services to autonomous media and self-service delivery channels (Pikkariainen *et al.*, 2004). Along with the development of the internet, this movement became faster and allowed banks to gain more market access (Tan and Teo, 2000). The competitive nature of banking services has also made it important to adopt new technologies in this industry (Luo *et al.*, 2010). Banks have been able to provide better services to their customers through the adoption of technological innovations (Afshan and Sharif, 2016). For example, ATMs, that facilitate transactions for customers, are the result of these technological advances (Adesuyi *et al.*, 2013).

Mobile banking (M-banking) is a new phase of technological advancement that provides even more convenience to end-users (Afshan and Sharif, 2016). M-banking is a new form of e-banking that enables customers to communicate with their bank directly and access their financial services through smartphones (Chawla and Joshi, 2017). Initial M-banking services have been about the payment of bills and information on their bank account balance (Laukkanen and Lauronen, 2005). Today, M-banking allows customers to access a wide range of banking services such as money deposits, account transfers and virtual payments (Gu *et al.*, 2009).

M-banking has similarities and differences to internet banking. While both offer relatively similar facilities and features to customers, M-banking can provide customers instant access at any time and place (Singh, 2014). M-banking applications can complete many services even in the absence of an internet connection while internet banking requires an internet connection (Khan and Khan, 2012). As mobile banking has no time and space constraints (Thakur, 2014), it is much easier for customers to use this service than their counterparts. As a result, M-banking not only increased the efficiency of banking services but also enhanced the customer relationship with their banks (Malaquias and Hwang, 2016). In addition, M-banking has expanded the range of financial and non-financial banking services by reducing the need for access to bank branches (Shaikh and Karjaluo, 2015).

However, mobile banking is still in the early stages of adoption today and this concept requires further research, especially in developing countries where the adoption rate of such technologies is slow (Laukkanen, 2007). This study intends to examine the adoption intention and actual use behavior of M-banking in Iran, where this service was introduced in late 2012 (Hanafizadeh *et al.*, 2014). As the researchers pointed out, the use of mobile phones for banking transactions and access to financial information was not as widely expected (Shaikh and Karjaluo, 2015), and even with technological advances and increased access to mobile banking in Iran, the number of users is not in line with the expectations of experts in the field (Hanafizadeh *et al.*, 2014), which can be a good reason to research in this area. As Mohammadi (2015) pointed out, the increasing need to encourage customers to use mobile phones for banking purposes coupled with the negative trend in adopting this technology in Iran, necessitates the study of M-banking adoption intention drivers.

Correspondingly, existing literature lacks a model that thoroughly explains the tendency of customers to M-banking adoption intention in developing countries (Farah *et al.*, 2018).

The existing literature emphasizes the need to study M-banking adoption intention across cultures, especially in developing countries such as Iran, which include a large number of rural areas (Tam and Oliveira, 2017). Furthermore, most studies focus on online banking and little attention has been paid to the adoption and use of M-banking (Chawla and Joshi, 2017). On the other hand, the vast majority of the existing literature focuses on external factors affecting M-banking rather than examine customers behavioral reasons (Goswami, 2017), highlighting the need to further study behavioral determinants on M-banking adoption intention.

Research on M-banking adoption intention is mostly based on different theoretical frameworks (Shaikh and Karjaluto, 2015). The substantial majority of M-banking adoption intention studies have used the technology acceptance model (TAM), which demonstrates the importance of applying other theories to cover any potential research gap (Tam and Oliveira, 2017); Moreover, they suggested that future research should use the updated unified theory of acceptance and use of technology 2 (UTAUT2) (Oliveira *et al.*, 2014). As well, most studies using UTAUT2 applied moderators factors such as age, sex, and experience (Baptista and Oliveira, 2015) and few studies have attempted to extend the theory itself to further its accuracy (Farah *et al.*, 2018). Correspondingly, M-banking adoption intention research focuses only on adoption intention (Farah *et al.*, 2018) while researchers, on one hand, underlined the importance of measuring the causal relationship between adoption intention and actual behavior (Koksal, 2016) and on the other hand, they emphasized the use of mediating variables such as word-of-mouth (WOM) (Lien *et al.*, 2018).

Therefore, in this study, it is attempted to explore the impact of each construct with M-banking adoption intention on the Iranian context by adopting UTAUT2 theory and its development with trialability construct and investigate the effect of M-banking adoption intention on actual use behavior while taking into account the mediating role of WOM. This study helps bank managers understand customer tendencies and perceptions about M-banking adoption intention, which, in turn, can lead banks to reach more customers and increase their overall income.

Research literature and hypotheses development

M-banking is the natural development of e-banking that allows customers to perform their financial and non-financial transactions through mobile devices such as mobile phones, smartphones or tablets (Oliveira *et al.*, 2014; Shaikh and Karjaluto, 2015). This form of banking is a revolutionary innovation that incorporates mobile technological advances with financial services (Farah *et al.*, 2018). M-banking is a type of self-service technology that allows customers to access a variety of banking services at any time and place through their mobile smart tools (Tam and Oliveira, 2017). These applications provide significant benefits for both customers and banks. The applications allow users to check their account balances, shopping at the store, check account information, transfer money, pay bills, access bank statements and even make stock investments (Farah *et al.*, 2018). On the other hand, these services are significant for the banking industry, as banks can extend their services to all geographical areas, increase their competitive advantage, offer value-added services to their customers and build a new communication channel to interact with customers (Mohammadi, 2015).

Furthermore, M-banking increases the chances of access to rural areas and the development of markets where access is difficult and costly (Ha *et al.*, 2012). However, customers showed a low acceptance rate in this regard, reminding the need to study to understand the behavioral causes of M-banking adoption intention by customers (Illia *et al.*,

2015). Hence, customers' attitudes and their tendency to use M-banking are of great importance to researchers, it helps banks gain a real advantage by providing a better understanding of the key factors affecting M-banking adoption intention (Mohammadi, 2015). Similarly, it is necessary to realize how M-banking adoption intention can trigger use behavior and whether there are any constructs that can facilitate this behavior.

Performance expectancy

Performance expectancy (PE) is defined as "how much the use of technology in specific activities will benefit consumers" (Venkatesh *et al.*, 2012) and in terms of consumers' beliefs is using a particular technology to enhance that person's overall performance (Tai and Ku, 2013). PE indicates to what extent does a person attributes the increase in performance of the received services to the technology used (Chiao-Chen, 2013). Many researchers have identified this variable as one of the most important determinants of behavioral tendencies (Fakhoury and Baker, 2016). Therefore, when a customer finds his/her services for banking transactions easier and faster than other banking facilities, he/she is more likely to accept M-banking services. As a result, the more one believes that M-banking adoption intention improves performance, the more likely to use the service. Thus, the first hypothesis of the research was presented as follows:

H1. PE has a significant positive effect on M-banking adoption intention.

Effort expectancy

Effort expectancy (EE) is defined as one's level of comfort with the use of a particular technology (Yu, 2012). Therefore, it determines how much effort is needed to learn to use technology (Tai and Ku, 2013). This construct is determined by various factors such as usefulness, flexibility and user-friendliness (Chiwara *et al.*, 2017). Researchers have shown that when EE is high, customers exhibit high levels of behavioral intentions (Chiao-Chen, 2013). Therefore, it is more likely to be accepted when the customer thinks the application is convenient and requires little effort, especially in M-banking, which requires customers to perform transactions on their own (Farah *et al.*, 2018). In addition, the convenience of navigation between pages is one of the most prominent advantages of M-banking applications, as it eliminates customers' need to perform banking transactions without going to the actual bank with minimal effort (Sampaio *et al.*, 2017). Accordingly, the following hypothesis was presented:

H2. EE has a significant positive effect on M-banking adoption intention.

Social influence

The extent to which the customer understands that other important people such as friends and relatives believe he/she should use certain technology is known as a social influence (SI) (Venkatesh *et al.*, 2012; Yu, 2012). This is based on concepts such as social image and subjective norms (Farah *et al.*, 2018), whereby individuals usually choose behaviors endorsed by their social bonds (Farzin and Fattahi, 2018). Depending on one's behavioral tendencies, social expectations are obviously influenced by subjective norms, as such expectations, on the one hand, shape the beliefs and behaviors of individuals and, on the other hand, reduce the uncertainty about accepting a new service (Illia *et al.*, 2015). In addition, studies have shown that SI is very important when it comes to technology adoption such as M-banking

(Mbrokoh, 2016). Thus, social and normative influences are likely to stimulate customer tendency about M-banking and thereby facilitate the acceptance of such services. So we put our hypothesis as follows:

H3. SI has a significant positive effect on M-banking adoption intention.

Facilitating conditions

Facilitating conditions (FC) refers to customers' perceptions of available resources and supports to perform the behavior (Venkatesh *et al.*, 2012). These conditions refer to the availability and accessibility of resources that promote the adoption of specific behavior (Siddik *et al.*, 2014). These conditions also give an individual sense of psychological control that affects his/her willingness to accept particular behaviors and is influenced largely by one's cultural, social and technological backgrounds (Mullan *et al.*, 2017). Chemingui and Hajer (2013) stated that people are unlikely to adopt M-banking unless it has a specific FC such as financial resources, the skills needed to work with these apps and mobile internet access. So, it was assumed that as follows:

H4. FCs have a significant positive effect on M-banking adoption intention.

Habit

Habit (HT) means that people tend to perform behaviors automatically because of the experience and knowledge gained over time (Alalwan *et al.*, 2015). When people learn something automatically, their behavior becomes a habit (Hussain *et al.*, 2019). The researchers showed that habit is a predictor variable for willingness to adopt (Venkatesh *et al.*, 2012). Customers learn using M-banking through the experience and their first experience of using this technology develops their learning that turns into a habit automatically (Hussain *et al.*, 2019). For example, some financial organizations have designed their mobile platform in a way that creates positive experiences for users to simplify the learning process and lead to habit (Johora and May, 2015). In addition, mobile service research identified habit as a decisive factor in the willingness to adopt a new platform (Morosan and DeFranco, 2016; Slade *et al.*, 2015; Hussain *et al.*, 2019). Accordingly, the next hypothesis presented as follows:

H5. Habit has a significant positive effect on M-banking adoption intention.

Hedonic motivation

The extrinsic motivation was the primary driver of individual technology adoption in mandatory settings such as organizations to improve the performance of the underlying task. Extrinsic motivation refers to performance of activities to achieve some objective distinct from the activities themselves (Tamilmani *et al.*, 2019). Such instances of extrinsic motivation include but are not limited to the use of smartphones to purchase goods and services through mobile commerce (Alalwan *et al.*, 2017) and accessing the internet to avail services such as e-government (Alalwan *et al.*, 2018). In addition, individuals perform certain activities for the activities themselves, to experience pleasure and satisfaction inherent to the activities. This second type of motivation is termed intrinsic motivation. Hedonic motivation (HM) is considered the most important theoretical addition to the UTAUT2 as it integrated the much-needed affective component into a largely cognition-based UTAUT (Tamilmani

et al., 2019). It shifted the focus from the extrinsic motivation of organizational users to the intrinsic motivation of consumer technologies.

HM refers to the level of fun or pleasure that comes from using technology (Venkatesh *et al.*, 2012) and is an important factor in the adoption of technology by the users (Baptista and Oliveira, 2015). The greater the entertainment values of the mobile service, the greater the likelihood of acceptance by consumers (Farah *et al.*, 2018). From the customer's perspective, it is largely argued that the importance of intrinsic utilities (fun, playfulness, enjoyment) is particularly important in shaping customer perception and the tendency to adopt new systems (Alalwan *et al.*, 2015). Most importantly, M-banking has been attributed to be a more modern and pioneering technology comprising further innovativeness and novelty seeking (Riffai *et al.*, 2012). Studies have also shown that the use of interactive services such as M-banking stems largely from hedonic needs and values (Malaquias and Hwang, 2016) and such incentives are a determining factor in the adoption of self-service technologies (Farah *et al.*, 2018). As a result, it was assumed that as follows:

H6. HM has a significant positive effect on M-banking adoption intention.

Perceived value

The price value of customers' cognitive trade-offs is between the perceived benefits of using M-banking and the cost of using it (Venkatesh *et al.*, 2012) and includes factors such as mobile internet costs, device costs, service costs and transaction costs (Baptista and Oliveira, 2015). However, this study uses perceived value (PV) rather than price value, as most bank customers in Iran own smartphones today (Mohammadi, 2015), most M-banking applications are free (Farah *et al.*, 2018) and PV can integrate monetary and non-monetary values (Gao and Bai, 2014). The PV is the individual evaluation of the total value of the product by comparing the expected benefits against the expected costs (Farah *et al.*, 2018). PV of M-banking service can include hedonic and utilitarian benefits such as functionality, enjoyment, interactivity, accessibility, service quality and overall usefulness (Arcand *et al.*, 2017). Accordingly, the next hypothesis presented as follows:

H7. PV has a significant positive effect on M-banking adoption intention.

Trialability

Trialability (TR) is the degree, which an innovation can be tested on a limited basis (Koksal, 2016). It is often assumed that trialability affects one's willingness to adopt a technology (Wang, 2014). TR reduces the risk of uncertainty for potential adopters and increases their trust (Wang, 2014). As a result, new products and services that can be tested before they are fully implemented, are usually adopted faster (Koksal, 2016). Studies have shown that TR is positively correlated with technology acceptance rates (Chen, 2013; Chemingui and Hajer, 2013). Therefore, if people can test M-banking programs, they are more likely to accept them. Hence, it was assumed that as follows:

H8. Trialability has a significant positive effect on M-banking adoption intention.

Adoption intention, word-of-mouth and usage behavior

The willingness to adopt the technology by customers can be very important, as it can stimulate the actual behavior of using technology on one hand (Yu, 2012), and on the other

hand, can generate positive recommendations from customers to their counterparts (Farzin and Fattahi, 2018). WOM often refers to the informal communication of people about specific products or services with others, and customers can disseminate information and experiences about products and services either in person or through communication media such as social media (Lien et al., 2018). This information helps other customers decide whether to use the service or not. WOM referrals provide useful information about a product/service that helps promote it (Lien and Cao, 2014), which can also be triggered use behavior. In addition, studies have shown that when people disseminate a positive WOM about a product or service, they are more likely to use it in the real world (Farzin et al., 2020). Studies have also presented that customers tend to adopt a technology when they are in a positive mood, and it can influence customers' willingness to engage in WOM and use behavior (Lien et al., 2018). In fact, the tendency to adopt indicates the possibility of doing a particular behavior by the person (Farah et al., 2018). Likewise, the tendency to use shapes customer beliefs and it is believed to precede the actual behavior of use (Arahita and Hatammimi, 2015). Also, researchers have shown that using technology is largely driven by people's behavioral tendencies (Venkatesh et al., 2012). Therefore, it was assumed that as follows:

- H9. M-banking adoption intention has a significant positive effect on WOM.
- H10. M-banking adoption intention has a significant positive effect on actual use behavior.
- H11. WOM has a significant positive effect on actual use behavior.
- H12. WOM mediates the relationship between M-banking adoption intention and actual use behavior.

Given the hypothesized relationships between research variables formulated by the above assumptions, the conceptual model of the research is presented as follows (Figure 1).

Methodology

Research design and measurement

A quantitative study was conducted to precisely understand how behavioral factors influence customers' tendency to adopt M-banking and use behavior. For this purpose, a structured questionnaire was designed to obtain a response from the target population,

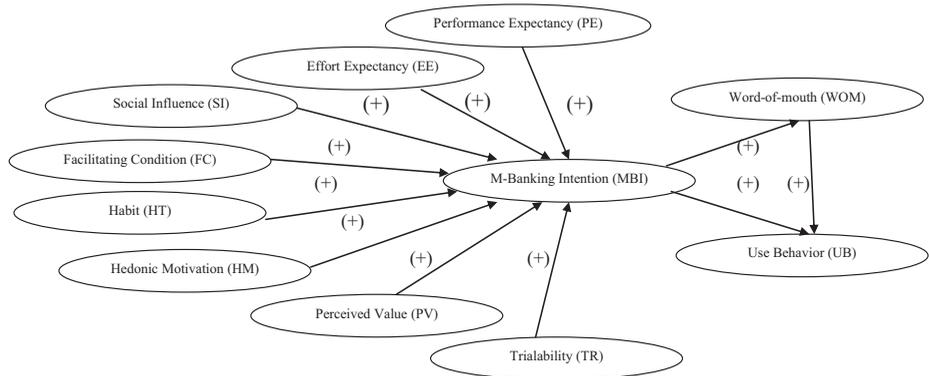


Figure 1.
Proposed model

which required 10–20 min to complete. The first part consisted of demographic questions and the second part was devoted to questions about the hypotheses and relationships between the research variables. Research constructs have been operationalized using proposed measures in the existing literature that have been modified to meet research objectives. A questionnaire was designed and adjusted based on five-point Likert scale that ranged from “very disagree” to “strongly agree.” The measurement of the study has been adapted and modified by Venkatesh *et al.* (2012), Hussain *et al.* (2019), Farah *et al.* (2018), Koksai (2016) and Lien *et al.* (2018). It should be noted that the questionnaire was distributed in the native language of the participants (Farsi) and subsequently translated into English for reporting in the article.

Statistical sample, method of data collection and data analysis

The statistical population of the study is all customers of Iranian banks using M-banking services. Due to resource and time constraints, the present research uses a convenience non-probability sampling approach that is consistent with other similar research (Farah *et al.*, 2018; Afshan and Sharif, 2016). In total, 420 questionnaires were distributed among bank customers who had the experience of using M-banking services and after removing the incomplete questionnaires, 396 questionnaires were used for analysis. The return rate of the questionnaire (0.94) indicates the representativeness of the sample under investigation. In this study, customers of private banks in Mazandaran province were used. The demographic characteristics of the research participants are presented in Table 1. Prior to collecting data, permission from bank managers was obtained to distributing questionnaires and access to customers. Bank customers were contacted in person and asked to fill out a self-administered questionnaire.

Cronbach’s α was used to measure the internal consistency reliability of the constructs. SPSS software was used to analyze the descriptive statistics and structural equation modeling (SEM) was applied to perform inferential statistics using SMART-PLS3 software. The partial least square (PLS) method has been used for statistical analysis in this study, as it is flexible in data distribution assumptions and suitable for the implementation of

Characteristic	Frequency	Percentage	CF (%)
<i>Gender</i>			
Male	217	54.80	54.80
Female	179	45.20	100
Total	396	–	–
<i>Age</i>			
Up to 20	119	30.05	30.05
21–30	153	38.64	68.69
31–40	88	22.22	90.91
41–50	25	6.31	97.22
Above 50	11	2.78	100
Total	396	–	–
<i>Duration of use (in year)</i>			
Less than 1	174	43.94	43.94
1–3	199	50.25	94.20
Above 3	23	5.80	100
Total	396	–	–

Table 1.
Demographic
attributes of the
respondents

formative prediction models and constructs with low measures (Hair *et al.*, 2012). In addition, this method allows latent constructs to be modeled both reflectively and formatively and is an established method for estimating causal models (Gudergan *et al.*, 2008).

Findings

In this study, in line with the existing literature (Navarro *et al.*, 2010), the PLS model has been analyzed and interpreted in two stages. First, the measurement model was evaluated and second, the proposed hypotheses in the structural model were analyzed.

Measurement model

The measurement model was developed, followed by the analysis of the structural model, which is consistent with other studies (Venkatesh *et al.*, 2012; Farah *et al.*, 2018). Indicator validity specifies, which part of the variance of an indicator is explained by the latent variable and loadings factors above 0.7 are acceptable (Hair *et al.*, 2012). As seen in Table 2 and Figure 2, all loading factors are above this value. The reliability of all model constructs measured by Cronbach's α is in the range of 0.744 to 0.902, which is higher than the proposed threshold of 0.7, so the internal consistency reliability of the model constructs is confirmed. To have good reliability of model constructs, composite reliability index of above 0.7 should be used. The composite reliability of the present model constructs is in the range of 0.851 to 0.932.

This section examines the convergent and discriminant validity of the research. The average variance extracted (AVE) for all research constructs is above the proposed threshold of 0.5 (Table 3) and indicates good convergent validity of the measurement model. As can be seen in Table 3, the square roots of AVE are significantly higher than the correlations below the original diameter, indicating discriminant validity at the level of the research constructs. In addition, the variance inflation factor (VIF) of all indicators in this study is in the range of 1.00 to 3.88 and as it is well below the critical level ($VIF < 5$), the validity of the composite measurement model is confirmed (Hair *et al.*, 2012) and common method bias was not a significant issue.

Structural model

The structural model was evaluated based on the hypotheses testing of the research model. Figure 2 shows the overall explanatory power and standard path regression coefficients, which show the direct effects of predictor variables on the model's predicted latent constructs. The R^2 value test indicates how much the model explains the variance in the dependent variables. In the present model, 43% of the M-banking intention variance, 74% of the WOM variance and 60% of the use behavior variance can be explained by R^2 values (Figure 2). In addition, the goodness-of-fit (GOF) criterion was used to check the GOF of the model and its value was 0.52, which confirms the goodness of the overall model.

The 1st to 11th proposed hypotheses were tested by PLS path modeling and the results are shown in Table 4. The results showed that all UTAUT2 constructs with trialability had a significant and positive effect (t -values > 1.96 , $p < 0.05$) on M-banking intention (Figure 3), accordingly the first hypothesis up to eighth is confirmed. Also, M-banking intention had a significant positive effect (t -values > 3.29 , $p < 0.001$) on WOM and use behavior. In addition, WOM had a significant positive effect (t -values > 3.29 , $p < 0.001$) on use behavior. Therefore, the 9th, 10th and 11th hypotheses are confirmed as well.

Additionally, to investigate the interaction of two variables affecting use behavior, the effects of direct, indirect and total M-banking intention on WOM and use behavior were

Constructs	Loads	Cronbach's α	CR
Performance expectancy (PE)	–	0.895	0.927
Using M-banking would improve my performance	0.887	–	–
Using M-banking would save my time	0.888	–	–
I would use M-banking anyplace	0.833	–	–
I would find M-banking useful	0.878	–	–
Effort expectancy (EE)	–	0.875	0.915
Learning to use M-banking is easy for me	0.837	–	–
Becoming skillful at using M-banking is easy for me	0.880	–	–
Interaction with M-banking is easy for me	0.809	–	–
I would find M-banking is easy to use	0.885	–	–
Social influence (SI)	–	0.891	0.923
People who are important to me think that I should use M-banking	0.867	–	–
People who are familiar with me think that I should use M-banking	0.906	–	–
People who influence my behavior think that I should use M-banking	0.756	–	–
Most people surrounding with me use M-banking	0.925	–	–
Facilitating condition (FC)	–	0.902	0.932
My living environment supports me to use M-banking	0.848	–	–
My working environment supports me to use M-banking	0.916	–	–
Using M-banking is compatible with my life	0.843	–	–
Help is available when I get problem in using M-banking	0.908	–	–
Habit (HT)	–	0.832	0.899
The use of M-banking has become a habit for me	0.838	–	–
I am addicted to using M-banking	0.902	–	–
I must use M-banking	0.854	–	–
Hedonic motivation (HM)	–	0.803	0.885
Using M-banking is fun	0.875	–	–
Using M-banking is enjoyable	0.871	–	–
Using M-banking is very entertaining	0.797	–	–
Perceived value (PV)	–	0.862	0.915
Compared to the fee I need to pay, the use of M-banking offers value for money	0.924	–	–
Compared to the effort I need to put in, the use of M-banking is beneficial to me	0.900	–	–
Compared to the time I need to spend, the use of M-banking is worthwhile to me	0.828	–	–
Trialability (TR)	–	0.744	0.851
Before deciding to use the M-banking, I was able to properly try it out	0.886	–	–
I was permitted to use the M-banking on a trial basis long enough to see what it could do	0.808	–	–
I've had a great deal of opportunity to try various M-banking capabilities	0.731	–	–
M-bank behavioral intention (MBI)	–	0.820	0.893
I intend to continue using M-banking in the future	0.862	–	–
I will always try to use M-banking in my daily life	0.865	–	–
I plan to continue to use M-banking frequently	0.846	–	–
Word of mouth (WOM)	–	0.826	0.885
I will be willing to recommend M-banking to others	0.831	–	–
I would be willing to tell the merits of M-banking to others	0.815	–	–
I would be willing to encourage others to transact with M-banking	0.809	–	–
I have positive things to say about M-banking	0.788	–	–
Use behavior (UB)	–	0.797	0.832
I would take advantage of M-banking for my banking activities	0.846	–	–
Given that I have access to a mobile phone, I would use M-banking	0.843	–	–

Note: CR: composite reliability

Table 2.
Research constructs
with factor loadings
and reliability

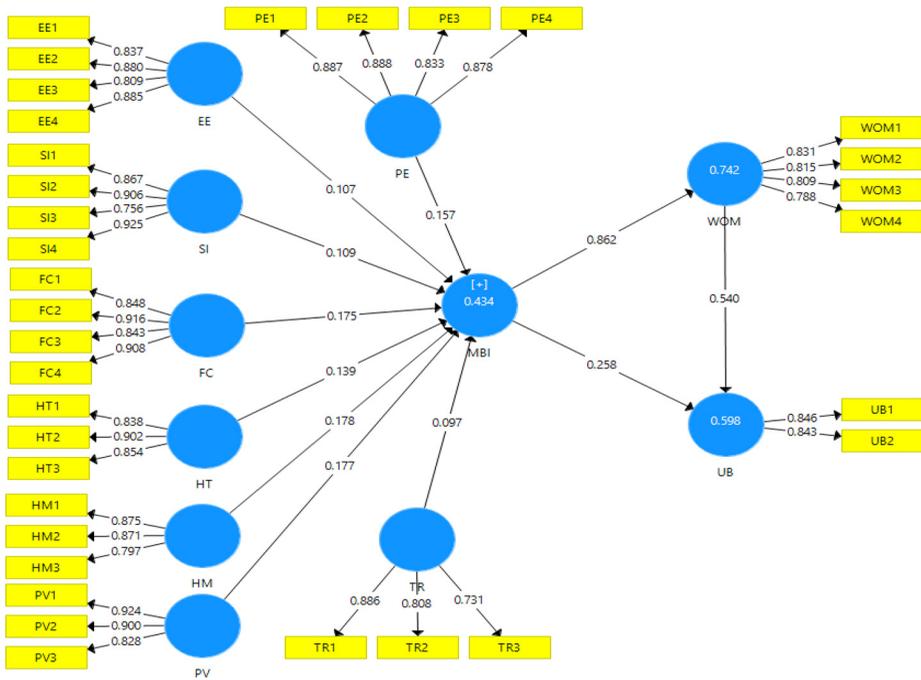


Figure 2.
Standardized
regression
coefficients of the
proposed model

Table 3.
Correlation between
constructs with
convergent,
discriminant and
composite
measurement model
validity

Constructs	AVE	VIF	EE	FC	HM	HT	MBI	PE	PV	SI	TR	UB	WOM
EE	0.729	1.373	0.854	-	-	-	-	-	-	-	-	-	-
FC	0.773	1.200	0.274	0.879	-	-	-	-	-	-	-	-	-
HM	0.719	1.272	0.331	0.271	0.848	-	-	-	-	-	-	-	-
HT	0.748	1.413	0.408	0.246	0.360	0.865	-	-	-	-	-	-	-
MBI	0.735	3.881	0.405	0.394	0.422	0.430	0.858	-	-	-	-	-	-
PE	0.760	1.299	0.369	0.234	0.277	0.394	0.387	0.872	-	-	-	-	-
PV	0.783	1.713	0.219	0.263	0.175	0.220	0.387	0.096	0.885	-	-	-	-
SI	0.750	1.057	0.151	0.015	0.176	0.157	0.208	0.140	0.020	0.866	-	-	-
TR	0.658	1.675	0.208	0.220	0.169	0.220	0.353	0.134	0.626	0.019	0.811	-	-
UB	0.713	3.881	0.345	0.345	0.407	0.390	0.723	0.241	0.311	0.253	0.354	0.844	-
WOM	0.657	1.000	0.421	0.354	0.396	0.448	0.712	0.371	0.336	0.258	0.298	0.742	0.811

Note: *AVE: The average of the extracted variance, the square root of the AVE constructs on the diameter and below the diameter of the correlation between the reported constructs

examined in [Table 5](#). The sum of the direct effect and all indirect effects between the two constructs in the path model should be calculated. According to [Sarstedt et al. \(2017\)](#) guidelines and our path model, M-banking intention has a direct effect (MBI -> UB) and an indirect effect (MBI -> WOM * WOM -> UB) via WOM on the endogenous construct use behavior. The total effect is equal to the sum of direct effect and indirect effect. Hence, the total effect of M-banking intention on use behavior is $0.258 + (0.862 * 0.540) = 0.723$. According to [Farzin and Fattahi \(2018\)](#), full mediation takes place if a non-significant

Hypotheses	Path coefficients	T-statistics	p-values	Result
EE → MBI	0.107	2.060*	0.040	Supported
FC → MBI	0.175	3.730***	0.000	Supported
HM → MBI	0.178	3.319***	0.001	Supported
HT → MBI	0.139	2.494**	0.013	Supported
MBI → UB	0.258	4.135***	0.000	Supported
MBI → WOM	0.862	63.697***	0.000	Supported
PE → MBI	0.157	2.584**	0.010	Supported
PV → MBI	0.177	3.154**	0.002	Supported
SI → MBI	0.109	2.609**	0.009	Supported
TR → MBI	0.097	2.019*	0.044	Supported
WOM → UB	0.540	9.370***	0.000	Supported

Notes: * 0.05; ** 0.01; ***0.001

Table 4.
Test of hypotheses

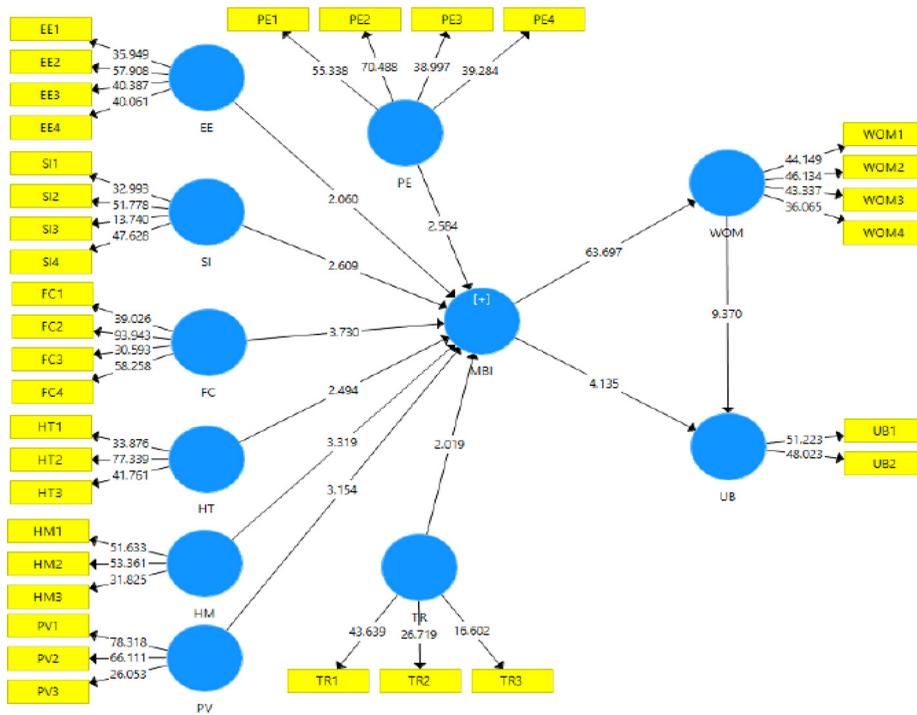


Figure 3.
T-value coefficients
of the proposed model

Independent variable	Dependent variable	Direct effect	Indirect effect	Total effect
MBI	WOM	0.862	0.000	0.862
MBI	UB	0.258	0.465	0.723
WOM	UB	0.540	0.000	0.540

Table 5.
Analysis of the
bivariate, mutual
direct, indirect and
total effects

relationship exists between the independent variable (M-banking intention) and the dependent variable (use behavior) and a significant relationship exists in the indirect path through the mediator (WOM). In contrast, a partial mediation happens if a significant relationship exists between the independent variable (M-banking intention) and the dependent variable (use behavior) and a significant relationship exists in the indirect path through the mediator (WOM). The results indicated that M-banking intention had a direct effect on use behavior (0.258) and the total effect of M-banking intention on use behavior was 0.723. Therefore, WOM mediates the relationship between M-banking intention and use behavior as a partial mediator and the twelfth hypothesis is confirmed.

Discussion

In this study, some important factors of M-banking intention have been investigated relying on UTAUT2. The important role of M-banking intention in the actual behavior use of M-banking was also examined considering the mediating role of WOM. Findings showed that UTAUT2 is an important framework that plays a significant role in improving and understanding the adoption process of technological phenomena such as M-banking. On the other hand, the findings indicate that M-banking intention has an impact on use behavior, especially when people recommend M-banking to others.

General discussion

The research findings show that customers' beliefs about M-banking performance can drive their willingness to use it in the real world. This study confirmed that PE has a positive significant effect on willingness to adopt, so that if PE is high, customers are more likely to use the service. In addition, PE can leave a positive image of these services in the minds of future customers (Tan and Lau, 2016). Also, the higher the PE in a person's mind, the greater the belief that M-banking can positively contribute to their daily lives and activities compared to other banking services (Alalwan et al., 2016). In fact, the ubiquitous nature of these services compared to other banking facilities, provides customers benefits such as immediate, fast and personalized services. Therefore, a client may accept M-banking because they believe it is a useful and convenient tool for conducting banking transactions.

This study showed that EE has a significant positive effect on M-banking intention. Studies have revealed that customers often look for technologies to simplify their operations with the least possible effort (Farah et al., 2018). Therefore, when a customer believes the new technology is easy to use, the chances of accepting it are significantly increased. Today, people around the world are increasingly using their cell phones in everyday life (Farzin and Fattahi, 2018) and becoming more dependent on them for many of their activities (Farah et al., 2018), leading to them becoming proficient at using mobile applications (Mortimer et al., 2015). Thus, as M-banking services require less effort, emphasis on user-friendliness and navigation facilities (Chiwara et al., 2017), EE can provide a particular advantage over this type of service compared to other forms of banking services.

The results also highlighted the fact that SI is a predictor variable for M-banking intention. Research has shown that when new technologies are endorsed by important people, customers are more likely to accept them (Fu and Elliott, 2013). In addition, people have a tendency to pay attention to the suggestions offered by their social circles when using the service (Mbrokroh, 2016). The growth of online communities through social media and checking online reviews by consumers to adopt technology (Farzin and Fattahi, 2018) are also a topic of discussion. Overall, the present study confirms that M-banking intention may be severely under SIs such as subjective norms. In addition, Iranian culture may be the cause of the overwhelming influence of social norms (Farzin and Fattahi, 2018) because this

collectivist nation prioritizes and values the opinions of one's family and group rather than one's own beliefs and preferences. To reduce the risk of using new technologies such as M-banking services (Hussain *et al.*, 2019), customers accept suggestions from people whose opinions are valuable to them.

Based on the findings in this study, FC has been an influential factor in M-banking intention. This finding is aligned with the results of other researchers in various technology adoption platforms such as the adoption of mobile wallet (Madan *et al.*, 2016), acceptance of mobile payment (Hussain *et al.*, 2019), mobile commerce (Shaw and Sergueeva, 2019), M-banking adoption (Alalwan *et al.*, 2017), telephone banking (Alalwan *et al.*, 2016) and internet banking (Alalwan *et al.*, 2018). This shows that customers are particularly interested in the facilities, resources and skills, which are needed to successfully and effectively apply M-banking. Also, the natures of the facilities required for M-banking are essential aspects to easy, convenient and secure access to this type of service such as internet access, smartphones, Wi-Fi, 4G services and secured applications.

The results also indicate that habit has a positive effect on a customer's M-banking intention, which means that the rate of using M-banking services is highest among customers who have previously developed habitual behavior with such technology (Alalwan *et al.*, 2018) and shows that the customer is likely to follow his previous habits when adopting new technology. Studies have revealed that habit formation requires the repetitive function of a particular action (Ye and Potter, 2011). Thus, habit is likely to play a role in everyday tasks. Guo and Barnes (2011) analyzed the purchasing process in the virtual world, which the results showed habit as the largest purchasing antecedent. Today, researchers stated that because of the widespread use of smartphones, many people's behavioral tendencies such as adopting new technologies, are influenced by behavioral habits (Ramírez-Correa *et al.*, 2019). Furthermore, M-banking enables customers to easily manipulate personal data and obtain financial information using mobile devices. As soon as a habit is formed, the intention to use M-banking is reinforced. Habit also enhances the usefulness of M-banking and its ease of use (Ramírez-Correa *et al.*, 2019), which, in turn, reinforces intention to use.

The results of this study indicate that HM is the strongest influencing factor on M-banking intention. The researchers stated that one of the major sources of customers' self-motivation is the adoption of new technologies such as M-banking applications (Alalwan *et al.*, 2018). People can show great interest in new and innovative ideas and technologies that appeal to their intrinsic pleasure (Farah *et al.*, 2018). Consequently, as such technologies are seen as sources of pleasurable motivation, customers tend to adopt them. In addition, customers tend to associate their mobile devices with pleasure. These emotions are further enhanced by applications' visually appealing layouts and colors (Malaquias and Hwang, 2016). Customers have also reported a level of entertainment and playfulness while using M-banking as a result of navigating these apps on their smartphones (Malik *et al.*, 2013), thereby providing additional value to the customer. Customers may perceive traditional banking as a stressful process due to its timing (Omar *et al.*, 2011) while M-banking tends to be associated with entertainment (Farah *et al.*, 2018), which can provide a more enjoyable experience to reduce the stress of traditional services.

In the present study, PV has been identified as one of the most important antecedents of M-banking intention. Customers prefer to use services that they think provides them more value and benefits than their alternatives (Dootson *et al.*, 2016). The mental judgment of customers about the value provided by M-banking services reinforces their attitude toward the services provided, in that way increasing one's willingness to use the services (Farah *et al.*, 2018). The researchers stated that if customers believe that M-banking services

provide them with the best performance and advantage over other alternative services, they will tend to use M-banking (Moorthy *et al.*, 2017). Hence, if consider M-banking as a new generation of banking that can provide relevant services at any time and place, it likely brings the most PV to customers. Similarly, studies have shown that M-banking can provide both monetary and non-monetary values to customers (Berraies *et al.*, 2017).

According to the present research outcomes, trialability had a significant positive effect on M-banking intention. Studies have shown that customers prefer to embrace new technologies when they have a full understanding of them (Koksal, 2016), indicating that customers tend to test platforms before adopting relevant technology. Research results indicate that trialability in a variety of areas such as mHealth Apps (Lin and Bautista, 2017), e-learning (Hsbollah and Idris, 2009), e-commerce (Seyal and Rahman, 2003), internet banking (Oly Ndubisi and Sinti, 2006) and M-banking (Koksal, 2016) have a positive and significant effect on audience acceptance decisions. In addition, new technology and innovations such as M-banking that can be tested, reduce the level of adopter uncertainty (Wang, 2014) and cause users to feel controlled in a new and possibly unfamiliar situation, which can lead the users to have a higher tendency to adopt and use M-banking services. The trialability of M-banking allows potential customers to see how this platform operates under its own terms and conditions without any expectation or need for continued use and helps reduce uncertainty about new services.

Finally, the present study showed that M-banking intention has a significant positive effect on WOM and use behavior. WOM also had a significant positive impact on use behavior and played a mediating role in the relationship between M-banking intention and use behavior. These findings are consistent with existing literature showing that the tendency to adopt is one of the earliest drivers of individuals' actual behaviors (Celuch *et al.*, 2014) such as WOM and use behavior. When people tend to adopt technology such as M-banking, they actually have a convinced attitude (Mohammadi, 2015) and a positive mood (Lien *et al.*, 2018) toward it. Consequently, these positive mental states (mood) can lead to loyalty and actual behaviors such as WOM and use behavior. Studies have also shown that many use behavior of consumers are influenced by the recommendations and opinions of their peers (Farzin and Fattahi, 2018), as people trust the WOMs in their social bonds more than other advertising channels (Lien *et al.*, 2018). Also, the role of WOMs has become more prominent today with the development of social networks that make access to information faster and cheaper (Farzin and Fattahi, 2018). This was also confirmed in the present study by highlighting the mediating role of WOM, as M-banking intention through WOM had a greater impact on use behavior.

Theoretical implications

The present study broadens our understanding of customers' tendency to adopt M-banking in the context of developing countries, thereby filling a major knowledge gap in the relevant literature. In addition, the traditional UTAUT model was extended to gain a more accurate and comprehensive understanding of the tendency of people to accept technology and their usage behavior. The study also emphasized the importance of using PV rather than price sensitivity in the M-banking intention for more accurate evaluation, as PV encompasses both monetary and non-monetary values. Using trialability as an additional factor in the model can also provide new insights for future studies on technology adoption.

The study also provides implications for existing knowledge in the field of M-banking intention by providing a better understanding of how these factors affect people's preferences in developing countries, which consists predominantly of rural and underdeveloped. In addition, this article highlights the importance of measuring the

tendency of customers to adopt technology in the service industry, as these tend to underpin actual customer behaviors such as WOM and use behavior. Last but not least, this study examined the role of WOM on customer use behavior in M-banking services and showed that both directly and as a mediator could influence the formation of such behavior. The findings of this research are strategically important to those researchers in the field of relationship marketing who seek to advance knowledge on the impact of relationship marketing practices on WOM behavior.

Practical implications

This research provides valuable insights into the process of customer thinking and decision-making regarding M-banking adoption intention and can serve as a practical guide for bank marketing managers. Service providers must focus on the rational benefits of using M-banking while providing services. Marketers and advertisers can create marketing messages that are based on the key advantages of using MB M-banking so that it is easily understood by all customers. For instance, customers who prefer to perform their transactions remotely, ads should be created that focus on convenience, speed and time reduction. Marketers can also seek to increase customer awareness and emphasize the value and performance of their services in advertising messages, which they create for their target customers; This should be done in a way that highlighting the simplicity of its use and its omnipresence in the advertising message so that it can influence PE and EE motivators of prospective customers.

Marketers must consider their target customer culture before formulating their marketing strategies. Banks and marketing managers can use buzz marketing to target opinion leaders, innovators and market mavens to use SI in collectivist societies such as Iran. As the public considers the opinions of such people as experts in their consumption decision-making processes (Farzin and Fattahi, 2018), they can have a powerful influence on shaping customer attitudes about M-banking intention. Hence, marketers and advertisers should use incentives and promotions for their target customers to recommend this service to their friends and relatives. On one hand, this approach can create subjective norms and social pressure for M-banking intention among consumers' social circles and on the other hand, increases the likelihood of their actual use increases when recommending technology to others as well.

With the popularity of a variety of smartphone apps in the era of M-commerce, a habit of using M-banking can become one of the most important determinants of M-commerce success. Studies have shown that customers who use mobile services frequently are more likely to use m-payments (Hussain *et al.*, 2019). For that reason, marketers should monitor the opinions that customers post in their social circles (e.g. social network sites) to anticipate the behavioral habits of customers related to using M-banking. In addition, marketers can use incentives such as special offers and discounts on services to attract potential customers and stimulate habitual behaviors.

M-banking apps should be designed in such a way to fit the life of customers. Therefore, to simplify and speed up the adoption process, these platforms must be designed in a way that is consistent with the beliefs, values, lifestyles and past experiences of customers. Additionally, banks should provide guidance to customers and consider arrangements for training on how to work with M-banking, and provide guidance and assistance to customers when there is a problem with using M-banking. For instance, banks can offer training courses to their customers or create clips that teach them how to work with M-banking. Furthermore, marketers in M-banking design also need to remember that these platforms must be visually appealing and use fun, enjoyable, interesting and multi-sensory elements to

influence customer HMs. So, marketers should not only emphasize the functional benefits of these services but also should highlight the hedonic features of using M-banking in their advertising messages.

Banks should keep in mind that one of the major barriers to M-banking intention involves perceived costs (Farah *et al.*, 2018). Thus, banks need to create apps that are free and can be also used offline. It is also important for the marketing and advertising managers of banks to emphasize the overall benefits and advantages of these services in enhancing customers' PV and alleviate customer concerns to encourage them to use such platforms. Banks can deliver customers a fun and interesting trial version to reduce uncertainty on the one hand, and on the other hand, influence customer HMs. This can help potential customers abandon their traditional banking habits and take habitual behavior to apply M-banking services as well.

As user-generated content is more trustworthy to customers than content produced by marketers (Farzin and Fattahi, 2018), WOM communication should be used among customers. Hence, marketers can create ads that customers tend to recommend M-banking to their peers. By tracking the customers' profile and finding out when and how they show or express willingness to engage in M-banking and using the variables involved in shaping their WOM behaviors (Farzin and Fattahi, 2018), marketers can provide the ground for establishing long-term, two-way relationship between customers and M-banking providers. In addition, another noteworthy issue concerns the M-banking platforms themselves; Providers of these platforms need to improve their interface features. Such improvement would stimulate trust-building among customers, which engage and induce them to WOM. Finally, the findings of this study, help policymakers in the field improve their existing policies for the widespread use of M-banking.

Conclusion

The study results have revealed implications for both researchers and practitioners. This research attempted to test the UTAUT2 constructs to further the understanding of M-banking adoption in Iran together with the trialability construct. Moreover, besides measuring adoption intention in this study, the actual behaviors of customers such as actual use behavior and WOM communication were examined and the role of WOM as a mediator variable was evaluated. The study showed that the UTAUT2 model can predict customers' tendency to adopt M-banking properly.

The results indicate that customers consider PE, EE, SI and FC as determinants of M-banking adoption intention, which are related to technological and environmental factors. The results also showed that the trialability construct can affect the customers' behavioral tendencies as a factor for reducing uncertainty. On the other hand, the results revealed that M-banking intention is significantly affected by habit, HM and PVs that are related to individual factors. In addition, the results indicate that M-banking intention influenced the actual behavior of customers such as WOM and use behavior. Similarly, WOM not only influences use behavior itself but also mediates the relationship between M-banking intention and use behavior. The widespread adoption of M-banking and its success among bank customers is critical for providers of this type of service. This study has important implications for banks and service providers seeking to expand their market share.

Limitations and future research

All empirical studies have limitations that must be taken into account when interpreting the results of this study as well. This study has limitations like other studies. Due to time and budget constraints, a convenient sampling method was used in this study and samples were selected from customers of private banks. In addition, the generalizability of the present

study is limited to Iranian society and further research is needed to assess the M-banking intention of customers using a cross-cultural approach. This study was also conducted among people who had at least one experience of using M-banking. Thus, longitudinal studies can be performed at different stages of the customer journey such as pre-admission or puberty and examine the impact of variables associated with customer maturity during this relationship. Moreover, applying mixed method approach can help explore other important constructs that are suitable for this context and explain the adoption process in greater detail. The mediating role of other constructs such as perceived image, concerning actual use behavior can also be examined. One of the most important issues in accepting technology is its security and safety. Accordingly, to extend the theory and model UTAUT2, it is necessary to study issues such as safety and security of using M-banking on the consumers' intention.

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