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Mobile-banking adoption by Iranian bank clients

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ABSTRACT

This study provides insights into factors affecting the adoption of mobile banking in Iran. Encouraging clients to use the cell-phone for banking affairs, and negative trends in the adoption of this technology makes it imperative to study the factors affecting the adoption of mobile banking. Accordingly, this study builds a comprehensive theoretical model explaining mobile banking adoption. By incorporating 361 bank clients in Iran, eight latent variables of perceived usefulness, perceived ease of use, need for interaction, perceived risk, perceived cost, compatibility with life style, perceived credibility and trust were examined. It was found that these constructs successfully explain adoption of mobile banking among Iranian clients. Adaptation with life style and trust were found to be the most significant antecedents explaining the adoption of mobile banking.

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1. Introduction

The growth of electronic communication has significant effects on every-day activities of human. The experts of this area try to apply this technology for facilitating daily affairs so that the owners of industries, service organizations, and other centers becomes able to communicate with their clients in the earliest time with lowest expenses and free from time and place limitations. In this way, they can offer their products and services and even buy and sell them. One of the newest activities using electronic services is offering banking and financial services through internet and cell-phone.

The adoption and diffusion of information and communication technologies (ICTs) greatly influence nations' economic growth. Studies reveal that postponing technology usage negatively affects per capita income, skills development and productivity (Szajna, 1996; Jorgenson, 2001; Ramayah, 2005).

Mobile-banking is considered as one approach for providing financial services through ICT which facilitates selection of mobile services in even low-incomes countries (Anderson, 2010).

Since the number of cell-phones is more than PCs, mobile-banking has become more popular than e-banking among bankers. Also, mobile phones enhance the quality of services because clients can perform their financial jobs in every time and place. Therefore, it is clear that use of cell-phones for banking affairs is useful for both clients and the bank. This leads to establishment of a stronger relationship between the financial institutions and clients (Laukkanen, 2007).

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Forrester's studies report that only 4% of the nearly 25 million users of American banking services actively use mobile-banking (Khan et al., 2008). Another study on German consumers revealed that only 12% use their cell phones for banking or shopping (Tanner, 2008). Younger people (aged 25–34) are particularly interested in mobile-banking (Sraeel, 2006). Also, young people, in comparison to other users, are more predisposed to adopt and use mobile-banking service, for these services are usually low-cost and fit more with their lifestyle (Bigne et al., 2005).

However, in spite of the increasing desire of business-owners for offering banking services via cell-phone, the number of users is less the level expected by the experts of this industry (Kleijnen et al., 2004; Laukkanen and Cruz, 2009; Lee and Chung, 2009; Riivari, 2005; Suoranta and Mattila, 2004). In such as situation, technological advances and increase in the accessibility of electronic services will not lead users to the adoption and use of third-generation technologies (Baldi and Thuang, 2002; Constantiou et al., 2003; Wang et al., 2008). In order to identify the reasons of avoidance from this technology, many studies have been conducted in different ways to tests the factors predicting or explaining the concept of adoption and use of M-banking (Laforet and Li., 2005; Kim et al., 2007; Luarn and Lin, 2005).

Primary research on mobile-banking and other banking technologies has revealed different types of risks. Firstly, M-banking must consider privacy and security of its customers (Luarn and Lin, 2005); for instance, some customers of e-banking services are concerned about security risks posed upon their financial information through their PIN code (a code entered into the cell-phone software to use M-banking services) (Kuisma et al., 2007). Studies indicate that the trust of clients in providing personal and financial information is one of the key factors of the success of M-banking (Brown et al., 2003), especially among more experiences users (Laukkanen, 2007).

The second important issue is the concept of reliability. According to Lee et al. (2003) reliability refers to the "degree to which people believing in a new technology can perform their jobs consistently and accurately using that technology". It is an extremely important risk-related factor in technology-based financial services (Lee et al., 2003). Mobile phones, for example, may be limited in computational power, memory capacity and battery life, limiting the use of mobile services (Siau and Shen, 2003).

In mobile-banking, the data input and output mechanisms might prevent individuals from trusting in those services, as some users appear to be afraid that they may make mistakes when doing their bank affairs via a cell phone (Laukkanen, 2007; Laukkanen and Lauronen, 2005). Nevertheless, despite the obvious and understandable advantages of M-banking for both banks and the clients, this service is not adopted in many societies such as Iran.

According to the formal reports until 2010, "only 9 governmental banks and financial institutions of the country offer M-banking services" (Itshenas.com, 2012), even these banks suffice to sending the bill via SMS. However, in 2011 some pioneering governmental and private banks encouraged customers to do their daily banking affairs through M-banking. In general, very few people use M-banking at present. According to the report of telephone-banking and mobile-banking department of ICT Services Company, the number of people who used M-banking and did their banking jobs through SMS until previous year reached 500, and this number has been doubled during the past year (Sephabank.ir, 2012).

Most Iranian banking affairs are now done through SHETAB system. SHETAB or the "information exchange network among banks" is a comprehensive electronic network focusing on banking affairs in Iran, which has been launched and managed by the Central Bank of Islamic Republic of Iran (http://www.cbi.ir/simplelist/2546.aspx, accessed on 2010-10-24). It is launched to organize a national switch in order to link different banks' payment gate to each other. It serves a various range of functions such as exchange, payment, electronic buying, money transferring, bill affairs, and account checking. It is designed to help clients use banks services even after daily work hours and in a 24/7 way.

Moreover, Iran Central Bank's Report States (http://www.cbi.ir/simplelist/2546.aspx, accessed on 2010-10-24), the number of IB clients at the end of the first quarter of 2009 was near to 6 million people (i.e. 8.7% of the population) who receive these services from eleven governmental and 6 private banks. In comparison to England with a population of 61.5 million people and 48.75 million Internet users it would be interesting Internet Word State (UK) (http://www.Internetworld-stats.com/eu/uk.htm, accessed on 2010-10-24), and according to the Association of Payment Clearing Services (Apacs) (http://www.ukpayments.org.uk/media_centre/press_releases/-/page/871/, accessed on 2010-10-24), the number of IB users in the first half of 2009 was over 22 million people (i.e. 35.8% of the population). Comparison of these two statistics clearly shows that Iran is lagging with respect to the application of IB. The problem of IB adoption by the customers in Iran is the key problem banks face in expanding these services (Hanafizadeh and Khedmatgozar, 2012).

According to Hanafizadeh and Khedmatgozar (2012(most people in Iran are using the precursor of M-banking like ATM, Bank branch and Telephone bank. This statistics shows that along with the adoption of new technologies the adoption of M-banking needs to discover the factors affecting its acceptance. Accordingly, this study is to find these factors in Iran. In this respect, providers of M-banking services need a true understanding of the factors affecting this new trend. The aim of the present study is to test the factors affecting M-banking adoption by the clients of Iranian banks.

2. Review of the literature

ICT has been used since 1970 at the same time as the expansive use of computers in business and managerial processes (Lesjak et al., 2011). Various studies have been conducted in the area of adoption of IT and ICT-based technologies. Table 1 presents some of recent studies in this area. Since the publication of these studies, the attention of many researchers has been directed to the adoption of modern technologies. While some studies have been conducted at international level on this area as mentioned below, there is no specific study in Iran.

Table 1
Outstanding studies in the area of adoption of modern technologies (adopted from Ahmad et al. (2010)).

Researcher	Independent variable	Dependent variable	Key findings
Ndubisi and Sinti (2006)	Attitude (importance to banking needs, compatibility, complexity, trialability and risk) internet banking features (utilitarian orientation and hedonic orientation)	Internet banking adoption	The results reveal that the attitudinal factors play a significant role in internet banking adoption. The findings show that attitudinal disposition and webpage features can predict internet banking adoption. Four attitudinal factors have strong influences on adoption namely importance to banking needs, compatibility, complexity, and trialability, whereas risks have a weak influence. Utilitarian orientation of the website rather than hedonic orientation has significant influence on adoption
Poon (2008)	Convenience of usage, accessibility, features availability, band management and image, security, privacy, design, content, speed, and fees and charges	E-banking adoption	Results indicate that all elements for ten identified factors are significant with respect to the users' adoption of e-banking services. Privacy and security are the major sources of dissatisfaction, which have momentously impacted users' satisfaction. Accessibility, convenience, design and content are sources of satisfaction. Besides, the speed, product features availability, and reasonable service fees and charges, as well as the bank's operations management factor are critical to the success of the e-banks. WAP, GPRS and 3G features from mobile devices are of no significance or influence in the adoption of e-banking services in this study. Results also reveal that privacy, security and convenience factors play an important role in determining the users' acceptance of e-banking services with respect to different segmentation of age group, education level and income level
Tan et al. (2009)	-	Internet-based ICT adoption	The results suggest that internet-based ICT adoption provides a low cost yet effective communication tool for customers. However, security continues to be a major barrier. Finding on cost as a barrier is mixed. The inferential statistics reveal that relative advantage, compatibility, complexity, observability, and security are significant factors influencing internet-based ICT adoption
Hsbollah and Idris (2009)	Perceived attributes of innovation (relative advantage, compatibility, complexity, trialability, observability) Demographical Information (gender, age, academic specialization, number of years in the organization)	E-learning adoption	This study indicates that the adoption decision as a dependent variable is well predicted by relative advantages and trialability. The research model showed a reasonably good fit with the data and empirical results confirm that only relative advantages, trialability and academic specialization positively influence the adoption decision. The findings have provided evidence of the importance of relative advantages, trialability and academic specialization in understanding the adoption decision before introducing new online technology and instructional delivery in education. The findings also indicated that there is no significant relationship between gender, age, and numbers of years in UUM with the adoption decision
Tong (2009)	Perceived usefulness, perceived ease of use, perceived privacy risk, performance expectancy, application specific self-efficacy, perceived stress	Behavioral intention to use	This paper has identified few key indicators to e-recruitment adoption, thus contributing to the existing knowledge in the human resources literature, particularly in recruitment. The PEOU construct indicates that the employed jobseekers could comprehend and become familiar with the operation of e-recruitment technology quickly over time. Employed jobseekers perceived usefulness (PU) in e-recruitment technology is more important and it indicates that detail job information would lead them to better decisions

The technology acceptance model (TAM) (Davis, 1989) is one of the acceptable and widely used models in the area of information technology (IT). This model explains the nature of belief-attitude-intention-behavior and their relationship with the level of adoption of information technologies. Numerous studies have applied TAM to analyze users' behavior, particularly during the application of different types of information systems (ISs) (e.g. Agarwal and Prasad, 1999; Lederer et al., 2000; Venkatesh and Davis, 2000).

According to Anderson (Anderson, 2010), M-banking has the potential to provide simple banking and electronic transaction services for unbanked customers in the development of markets. However, when activating mutual markets, the solutions of M-banking raise questions in the minds of the regulators of distant communication industry, particularly about the privacy of communication network (Anderson, 2010). Previous studies have revealed that some users select to use technology to avoid direct communications with the staff offering those services or with other clients (Meuter et al., 2000). No significant study has been conducted in the area of M-banking, especially in Iran, and only behavioral aspects and different factors of mobile services have been investigated by researchers in different ways. Laforet and Li (2005) investigated the factors affecting the adoption and use of internet banking in China. They studied the factor of gender and concluded that most users of internet banking in China are men. Also, security is among the factors affecting the adoption of M-banking, whereas, factors such as risk, computer, skills needed to use new technologies, and the culture are factors inhibiting the adoption of M-banking in that country.

Hanafizadeh and Khedmatgozar (2012) have an attempt to answer to the question that whether bank customers' awareness of the services and advantages of IB is effective in reducing the negative effect of customers' perceived risk on their intention of IB adoption. The results indicated that IB awareness acts as a factor reducing all dimensions of the perceived risk (including time, financial, performance, social, security, and privacy). In addition, they found that except for social risk, other dimensions of the perceived risk have significantly negative effect on the intention of IB adoption. Al-Somali et al. (2009) investigated the acceptance of online banking in Saudi Arabia. Findings of this study refer to the quality of internet connection. The awareness of online banking and its benefit, the social influence and computer self-efficacy have significant effects on the perceived usefulness and perceived ease of use of online banking acceptance. In this study, education, trust and resistance to change have also significant impact on the attitude towards the likelihood of online banking adoption.

Khalfan et al. (2006) investigated factors influencing the adoption of Internet banking in Oman. Findings of this study show that the issues of security and data confidentiality have been a major barrier in adoption of internet banking. Top management support was also an inhibiting factor in the adoption of electronic commerce applications. According to this study, banks in this region have been 'quite slow' to launch e-banking services. While they are convinced that online services reduce overheads significantly, a mixture of customer insecurities, technology investment costs and lack of market-readiness have all conspired to make e-banking 'unattractive'. Nasri and Charfeddine (2012) conducted a study about factors affecting the adoption of internet banking in Tunisia. They used the technology acceptance model (TAM) and theory of planned behavior (TPB). Their model employed security and privacy, self efficacy, government support, and technology support, in addition to perceived usefulness, perceived ease of use, attitude, social norm, perceived behavior control and intention to use Internet banking. These factors had various effects on internet banking adoption.

Riquelme and Rios (2010) investigated the moderating effect of gender in the adoption of mobile banking. This study seeks to test the factors that can influence adoption of mobile banking among current users of internet banking in Singapore and gender as a moderating variable. Findings of this study show that usefulness, social norms and social risk are respectively the factors that influence the intention to adopt mobile banking services the most. Ease of use has a stronger influence on female respondents than males, whereas relative advantage has a stronger effect on the perception of usefulness on male respondents. Social norms (or the importance of others in the decision) also influence adoption more strongly among female respondents than males. Abdul Hamid et al. (2007) conducted a comparative analysis of internet banking in Malaysia and Thailand. Results of study indicated that both nations are dissimilar in providing basic services offered by their commercial banks. Belief on lack of effort on educating the consumers about internet banking further affected the usability of internet banking in both countries.

Hinson (2011) conducted a study on banking for poor people using mobiles. This study argued that if the traditional financial setting does not allow the poor to access to the financial services like banking, the poor could be offered banking services through mobile technologies. This study therefore proposed a Mobile Banking Model that conceptualized the key ways by which mobile phone technology can be used to increase pathways to banking access for poor people. Singh and Kaur (2012) conducted a study to compare the pre-login and after login features of selected banks' online portals. This study found that selected banks' online portals differ on various features such as accounts information, fund transfer, online requests and general information. Sripalawat et al. (2011) investigated factors affecting M-banking acceptance, both on adoption side and barrier side, to explore the effects of those factors, to guide banks and financial firms to attract more customers, and to compare the differences and similarities of M-banking key success factors from different countries. The results revealed that the positive factors have more influence on intention to use M-banking than the negative factors.

Cruz et al. (2010) studied the factors inhibiting the adoption of M-banking among internet users in Brazil. According to the findings, they concluded that most users never use M-banking services. They identified risk, cost, complexity, and lack of understanding about the relative advantages of these services as the main barriers of using M-banking services. Laukkanen and Kiviniemi (2010) tested the factors affecting the adoption of M-banking in their study. They intended to find barriers of adoption of M-banking. These factors included use, value, risk, tradition, and image. The findings of this study indicated that providing information and guidance on the part of the bank have significant effect on reducing the barriers of use, image, value, and risk in M-banking, but do not reduce the barriers of tradition. Wessels and Drennan (2010) conducted a study to identify and test the key factors stimulating and hindering the adoption of M-banking, as well as the effect of user's attitude on the intention of use. They found out that perceived usefulness, perceived risk, cost, and compatibility have significant effect on the adoption of M-banking. In this study, attitude toward M-banking was considered as a moderating variable.

Koenig-Lewis et al. (2010) conducted as study entitled as predicting the continuation of the use of M-banking services by young users in England, aiming at investigation of barriers of M-banking adoption. Their findings revealed that compatibility, perceived usefulness, and risk are significant factors affecting the adoption of M-banking. Compatibility not only has a strong positive effect on the adoption of M-banking, it is also identified as one of the most important independent variables affecting perceived ease of use, perceived usefulness, and credibility. The variables of trust and credibility were identified as having significant effect on reducing the total perceived risk.

Zhou (2011) investigated the effect of trust on the adoption of M-banking. He concluded that fundamental guarantee and information quality are key factors influencing the initial trust, while information quality and system quality significantly affect perceived use. He also concluded that trust affects perceived use and both factors exert influence upon the intention of use of M-banking. Akturan and Tezcan (2012) studied M-banking adoption tendencies among young people. Combining TAM model and risks of M-banking adoption, they concluded that perceived use, social risk, performance risk, and perceived advantages have significant direct effect on the attitude of individuals. The attitude, too, has a direct effect on the intention of use. In addition, there is a direct relationship among variable of perceived usefulness and intention of use, ease of use and attitude, and financial risk, time risk, security risk/privacy, and attitude.

Sun et al. (2012) investigated the effect of religious beliefs and commitment on the intention to use Islamic M-banking. Their study indicated that Islamic M-banking is a novel service about which few users have information and experience (especially among non-Muslims). Religious beliefs and commitment were both two effective segmentation strategies, because there were differences between the inclination of Muslims and non-Muslims as well as true believers and seeming Muslims. In general, the true Muslims had socially-oriented criteria, while others trusted the pleasant features of M-banking. In this respect, the present study investigates the main factors affecting the adoption of M-banking, and presents a comprehensive model for it. Therefore, the research question is formulated as following:

Research question: which key factors in Iranian society significantly affect the adoption of M-banking by the clients of financial institutes?

3. Theoretical framework

3.1. Perceived usefulness

Davis et al. (1989) define perceived usefulness (PU) as the "subjective probability that using technology will increase the individual's performance". PU has been identified as having a significant positive correlation with both attitude and usage intention, for example, PU positively affects the adoption of mobile internet and M-services (Chiu et al., 2005; Nysveen et al., 2005). This factor is important not only in the adoption of information systems and computing (Venkatesh and Davis, 1996, 2000; Venkatesh and Morris, 2000), but also in mobile commerce (Wang et al., 2006). According to TAM, PU is considered as the degree to which using a particular system would enhance the individual's job performance (Al-Gahtani, 2001; Davis, 1993; Mathwick et al., 2001). PU refers to external factors such as efficiency and effectiveness (Ramayah, 2007). According to Tan and Teo (2000), PU is an important factor in determining the adaptation of innovations. Bhattacherjee (2002) has found that an individual's willingness to use a specific system for their transactions depends upon their perception of its use. Koenig-Lewis et al. (2010) investigated the effect of perceived risk on intention of using M-banking and found out that there is positive relationship between these two variables. The studies of Venkatesh and Davis (2000) and Agarwal and Karahanna (2000) revealed that perceived usefulness and ease of use have direct and indirect effect on behavioral intention. Szajna (1996) proved that perceived usefulness directly affects usage intention whereas ease of use indirectly affects it through perceived usefulness. This is in line with the findings of Chen et al. (2003) who argued that perceived usefulness have direct impact on usage intention. Thus, one can consider perceived usefulness as an influential construct in M-banking. In this respect, the following hypothesis is developed:

Hypothesis 1. Perceived usefulness has direct effect on the adoption of M-banking.

3.2. Perceived ease of use

Ease of use refers to the degree of user's willingness to use the system where they do not make any effort (Davis et al., 1989). Extensive research has been conducted on the effect of perceived ease of use of M-banking technology and attitude toward it (Davis, 1989; Luarn and Lin, 2005; Venkatesh and Davis, 1996, 2000; Wang and Liao, 2007). Also, many researchers argue that both perceived usefulness and ease of use are not only considered as important factors for the adoption of a technology, they affect long-term use of a technology, as well (Guriting and Ndubisi, 2006; Ignatius and Ramayah, 2005; Ramayah, 2005, 2006a,b, 2004; Ramayah et al., 2005). Primary studies on ease of use consider user behavior directly or indirectly through perceived usefulness. Some studies correlate perceived usefulness to success, quality of system information (Wang et al., 2001), and customer satisfaction (Seddon, 1997). Ease of use is usually related to innate features of IT (Ramayah, 2007). Brown (2002) found out that perceived usefulness mostly affects the group of external variables which are more likely to exert influence upon the perceived ease of use. On the other hand, perceived ease of use affects attitude toward and adoption of M-banking because it uses a highly complex system for performing banking transactions via a small

device (Riquelme and Rios, 2010). Studies reveal a positive relationship between ease of use and intention of using technology (Curran and Meuter, 2005), for ease of use significantly affects the attitude and finally intention to use (Wessels and Drennan, 2010). In this respect, the following hypothesis is developed:

Hypothesis 2. Perceived Ease of using M-banking directly affects M-banking adoption.

3.3. Need for personal interaction

The need for interaction is necessary to create and retain personal contact during the time individual uses personal services (Dabholkar, 1992, 1996). A major part of technology adoption occurs in the context of interaction of the user with that technology. Mobile service users are normally business customers who do their transactions in this way and remain business customers until the time they do so. There is therefore a continuous interaction between the mobile customer and service providers. Such interaction leads to increase in the adoption of mobile services on the part of customers (Al Hinai, 2009). Service encounters involve interpersonal interactions between customers and service providers (Curran and Meuter, 2005). Most customers consider this personal interaction as a value (Bateson, 1985; Dabholkar, 2000; Zeithaml and Gilly, 1987). In an influential attempt in banking literature (Wessels and Drennan, 2010) investigated the effect of the need for interaction on the intention to use. They found out that there is a negative relationship between interaction and usage intention. In this study, by need for interaction it is meant a personal tradeoff between the client and bank clerk. That is, if people need personal interaction to do their banking transaction or M-banking has filled this gap. Thus, those who need more personal interaction would use less M-banking services. In this regard, the following hypothesis is presented:

Hypothesis 3. Need for interaction has a diverse effect on M-banking adoption.

3.4. Perceived risk

The theory of perceived risk has been proposed since 1960 to define customer behavior and factors affecting their decision-making (Taylor, 1974). In recent decades, the definition of perceived risk has been changed due to change in customers' behavior and their inclination to online transactions. Initially, perceived risk was limited to fraud or product quality, but today perceived risk is defined in relation to financial, physical, psychological, or social risks in online transactions (Forsythe and Shi, 2003; Im et al., 2008). Perceived self-efficacy is presented as one of major risk factors predicting sustainability of a new technology (Ellen et al., 1991). Luarn and Lin (2005) consider it as a basic capability in using M-banking. It refers to the confidence of individual in their ability to use a specific technology (Agarwal and Karahanna, 2000). Some studies on the adoption a new technology indicate that an individual's perception of risk is important in the adoption of that technology (Laforet and Li, 2005; Yang, 2009). The risk factor is considered very important in mobile services, because mobility increase the threat to security. There is more risk in M-banking in comparison to other fixed devices due to distant connection (Corradi et al., 2001). Coursaris et al. (2003) found out that the risk associated with M-banking is high because of the high probability of theft and loss of a mobile device. Lovelock et al. (2001) argue that satisfaction and adoption of technology-enabled service are highest when the risk of using it is low. Wu and Wang (Wu and Wang, 2005) found that there is a significant relationship between perceived risk and intention to use mobile. Wessels and Drennan (2010) investigated the effect of risk on attitude toward using M-banking. They concluded that this variable has a significant negative effect on the attitude and using M-banking. That is to say, the higher the risk of using a new technology, the more negative is the attitude toward it, and the less is the willingness to its use. So, the following hypothesis is formulated:

Hypothesis 4. Perceived risk diversely affects adoption of M-banking.

3.5. Perceived cost of use

One barrier of adoption of new technologies is usually the cost of acquiring and using it. Besides, for determining the real costs and measuring the costs of acquiring and using new technologies, the adopters are usually faced with a range of relatively hidden costs which are likely to affect the costs of adoption of business via cell-phone (Hung et al., 2003; Wu and Wang, 2005). Previous studies have revealed that perceived costs can be a large barrier to adoption of M-banking (e.g. Dahlberg et al., 2008; Kleijnen et al., 2004). Wu and Wang (2005) found out that costs have a significant negative effect on behavioral inclination for using cell-phone for business. On the other hand, low costs can encourage customers to use e-banking (Sathye, 1999). Wessels and Drennan (2010), in their study on the effect of cost on usage intention, concluded that there is a negative relationship between perceived cost and intention to use M-banking. In other words, the higher is the costs of using a new technology such as M-banking, the less will be its use. In this regard, a hypothesis is formulated as following:

Hypothesis 5. Perceived cost of use adversely affects the adoption of M-banking.

3.6. Compatibility with life style and needs

Compatibility is one of the oldest and most important factors in determining the attitude of the customers toward electronic banking services and their use (Wu and Wang, 2005). It is also considered as one of the main sources for Rogers (1962) theoretical framework, called innovation diffusion theory (IDT). In this theory, compatibility is defined as the degree to which M-banking services are in line with consumers' lifestyle and current needs (Kleijnen et al., 2004; Wu and Wang, 2005). Research on mobile transaction services reveals that over two-third of the financial transaction services meeting the needs of clients fail because traditional channels do not offer the ubiquity provided by a mobile channel (Hourahine and Howard, 2004). Accordingly, it has been found that high compatibility leads to an increased chance of technology adoption (Chen et al., 2002; Wu and Wang, 2005) and raises the question as to whether this extends to M-banking. When the communication channel of the firm or organization is not compatible with the life style or needs of the customers, it is less likely to succeed in offering services and will lead to customer's avoidance from that service. Koenig-Lewis et al. (2010) studied the effect of compatibility on usage intention and found out that there is a positive significant relationship between compatibility and intention to use. Therefore, the high level of compatibility of a technology with the needs and wants of individuals would increase the possibility of its adoption. In this regard, the following hypothesis is developed:

Hypothesis 6. Compatibility with life style has a direct impact on the adoption of M-banking.

3.7. Trust

Many studies in the area of distribution channel connections define trust as the belief of a company in the honesty of its business partner and other factors relevant to this concept (Ganesan, 1994; Geyskens et al., 1998). In another study, trust has been defined as the tendency to trust in a business partner that is capable of being trusted (Das and Teng, 2001). Perceived risk and trust are interrelated concepts and have been frequently identified as key barriers to adopting online and mobile services (see Featherman and Pavlou, 2003; Gefen et al., 2003; Lee and Turban, 2001).

Trust of the customers need to be formed and retained in the long term, and understanding the risks perceived by the customers is very useful for the banks in identifying the barriers of adoption and removing them. Kim et al. (2009) proved that when M-banking is perceived as associated with higher risk compared to ordinary banking, the primary trust of the individual in services is expressed as the necessary factor for using M-banking. Koenig-Lewis et al. (2010) concluded that there is no direct relationship between trust and intention to use M-banking; rather, it indirectly and through variables of compatibility and perceived risk exerts influence upon usage intention. Therefore, investigating this variable and its effect on the attitude and usage intention seems necessary. In this regard, the following hypothesis is formed:

Hypothesis 7. Trust has a direct effect on the adoption of M-banking.

3.8. Credibility

Another factor affecting the adoption of IT services is credibility. Credibility is defined as the trustability of a system and its capacity in transferring and doing transactions (Erdem and Swait, 2004). Wang et al. (2003) define credibility as "the extent to which a person believes that the use of M-banking will have no security or privacy threats". Luarn and Lin (2005) indicated that lack of appropriate credibility on the part of financial service provider makes users afraid that their money and personal information might be transferred to a third party. Recent studies in the area of M-banking have revealed that perceived credibility has a significant relationship with the adoption of M-banking. In other words, lack of credibility decreases the possibility of adoption (Luarn and Lin, 2005; Wang et al., 2006, 2003). Koenig-Lewis et al. (2010) concluded that credibility has a significant negative effect on the risk, and therefore, on the intention to use M-banking. That is, the higher the credibility of a new technology, such as M-banking, the lower this risk associated with it, and thus, the higher the willingness of people to use it. Wang et al. (2003) found out that there is a positive significant relationship between perceived credibility and online banking services. Luarn and Lin (2005), also, point out that credibility and use of M-banking are positively correlated. Thus, the following hypothesis is developed in this regard:

Hypothesis 8. Credibility directly affects the adoption of M-banking.

4. The conceptual model

Based on the hypotheses presented in the theoretical framework of the study, the conceptual model is developed in Fig. 1. The factors of perceived usefulness, perceived ease of use, need for interaction, perceived risk, perceived cost, compatibility with life style, perceived credibility and trust are used to test in this model (see Fig. 2).
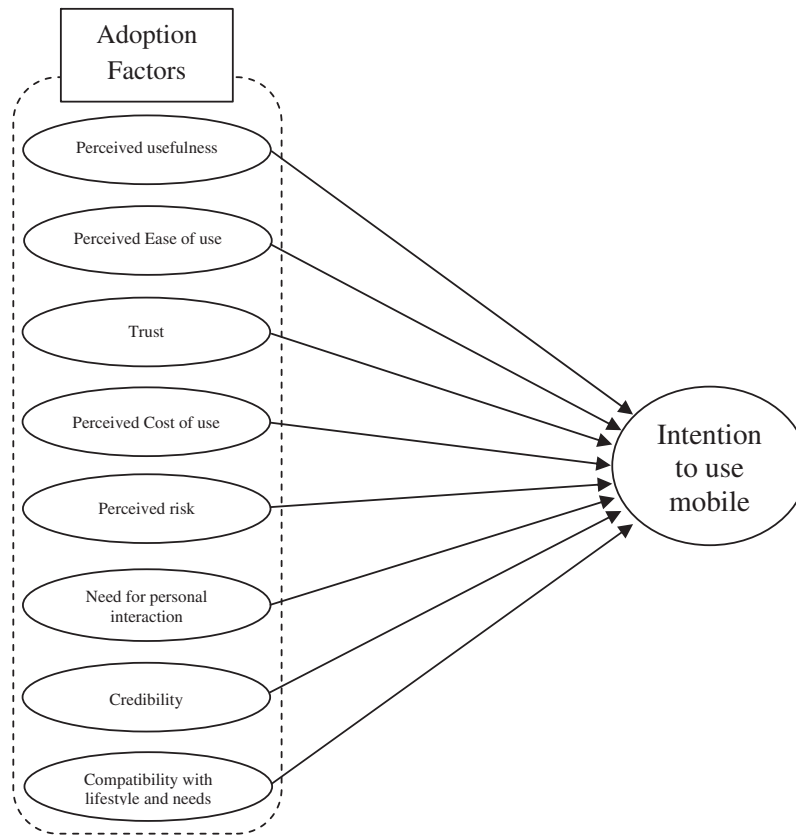
Fig. 1. Conceptual model.

5. Research methodology

5.1. Participants

The participants of this study were selected from among the students of management and accounting faculty and industry and mechanic faculty of Qazvin Islamic Azad University based on convenience philosophy. The participants had to have a cell-phone capable of installing the software of M-banking and connecting to Internet. Due to easy access to this group of population, the sample was taken from among these students. According to Davis (1989), students are the largest group of users of modern technologies. Thus, it can be predicted that a higher percentage of students are interested in ICT-related technologies and use them. So, the sample of the present study is a good representative of the society under consideration. Using stratified random sampling, these two faculties were selected and the students of every faculty were selected through systematic random sampling relative to sample size (Mirzaie, 2009). Totally, 403 individuals participated in this study from whom 361 questionnaires were accepted and analyzed. The data of the present study were collected in February 2012 to April 2012.

5.2. Validity and reliability

In order to estimate the validity of research instrument four types of validity were estimated; i.e. content validity, face validity, convergent validity, and discriminant validity. Lawshe proposed a useful method for estimating content validity. This method evaluates the agreement among raters regarding "the appropriateness or importance" of an item or question (Mirzaie, 2009). First, 12 questionnaires were administered among the experts of marketing and banking to estimate the content validity of the instrument. The aim of the questionnaire was testing the appropriateness and relevance of questions related to each variable. The respondents were to choose between two choices of "it is useful" and "it is not useful". In the next stage, the Lawshe coefficient of each question was calculated through the following formula:

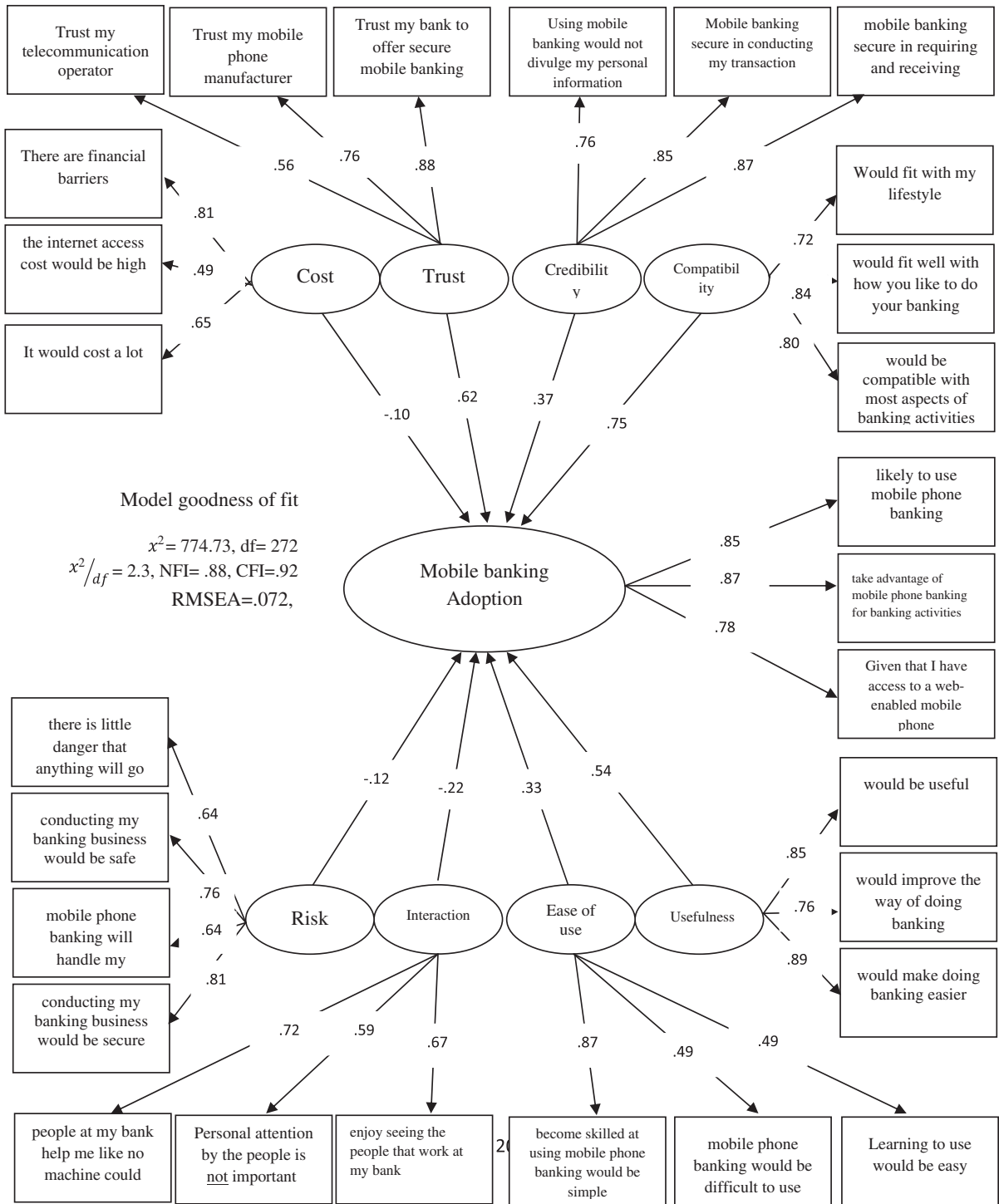$$\text{CVR} = \frac{(n_e - \frac{N}{2})}{N/2} \tag{1}$$

Fig. 2. The analytic model of study.

where, CVR is the content validity of each item, *N* is the number of experts or raters which was 12 in this study, and n_e is the number of positive answers of 12 experts to the given item. The obtained coefficients were compared with Lawshe content validity table indicating the acceptability of instrument content validity. In this regard, Lawshe coefficient was equal to 0.56 and coefficients of all research items were over this value. To confirm the face validity, 30 questionnaires were administered among the sample and the views of respondents about the research and quality of items were collected. After necessary

Table 2
Main statistics.

Latent variable	Items	N	Mean	CV	Loading factors	Cronbachs Alpha	AVE	CR
Perceived usefulness	Mobile phone banking would be useful for doing my banking	361	5.92	0.060	.85	.76	.70	.82
	I think that using mobile phone banking would improve the way in which I do my banking	361	5.76	0.065	.76			
	Mobile phone banking would make doing my banking easier	361	5.84	0.067	.89			
Ease of use	Learning to use mobile phone banking would be easy	361	5.88	0.077	.87	.80	.51	.76
	I think that mobile phone banking would be difficult to use	361	2.89	0.099	.61			
	I think it would be simple for me to become skilled at using mobile phone banking	361	6.27	0.050	.69			
Need for interaction	I enjoy seeing the people that work at my bank	361	4.31	0.080	.72	.80	.54	.72
	Personal attention by the people at my bank is not important to me	361	4.10	0.100	.63			
	The people at my bank help me with my banking like no machine could	361	5.37	0.080	.67			
Perceived risk	I feel that conducting my banking business on my mobile phone would be secure	361	4.86	0.071	.64	.77	.51	.72
	I know that mobile phone banking will handle my business correctly	361	5.01	0.071	.76			
	I feel that conducting my banking business on my mobile phone would be safe	361	5.20	0.060	.64			
	I think there is little danger that anything will go wrong if I use mobile phone banking	361	4.82	0.064	.81			
Perceived cost	It would cost a lot to use mobile phone banking	361	4.12	0.091	.81	.86	.54	.73
	I think that the internet access cost of using mobile phone banking would be high	361	4.78	0.087	.64			
	There are financial barriers (e.g. internet access cost) to me using mobile banking	361	4.65	0.095	.65			
Trust	I would trust my bank to offer secure mobile banking	361	5.40	0.064	.88	.75	.55	.67
	I would trust my mobile phone manufacturer to provide a mobile phone which is appropriate for conducting mobile banking	361	5.11	0.065	.76			
	I would trust my telecommunication operator to provide secure data connections to conduct mobile banking	361	5.02	0.079	.67			
Credibility	Using mobile banking would not divulge my personal information	361	5.17	0.075	.76	.75	.69	.77
	I would find mobile banking secure in conducting my transactions	361	5.27	0.067	.85			
	I would find mobile banking secure in requiring and receiving other information, e.g. bank statements	361	5.30	0.072	.87			
Compatibility with lifestyle	Using mobile phone banking would fit my lifestyle	361	5.65	0.079	.72	.76	.62	.70
	Using mobile phone banking would fit well with how I like to do my banking	361	5.44	0.075	.84			
	Using mobile phone banking would be compatible with most aspects of my banking activities	361	5.44	0.074	.80			
Intention to use mobile banking	When you have banking to do, how likely are you to use mobile phone banking?	361	5.98	0.060	.85	.74	.70	.83
	To the extent possible, I would take advantage of mobile phone banking for my banking activities	361	5.87	0.056	.87			
	Given that I have access to a web-enabled mobile phone, I predict that I would use M-banking	361	5.65	0.066	.78			

adjustments such as providing examples to clarify some items, the final questionnaire was developed to be distributed among the whole population. In the next stage, in order to confirm the reliability of the questionnaire, its internal consistency was measured through Cronbach Alpha. The alpha reliability was 87 confirming the reliability of the questionnaire. The alpha coefficients of individual variables refer to the appropriate reliability of the instrument. Thus, it was indicated that the questions enjoy appropriate internal consistency, that is, they all measure a common construct.

The composite reliability (CR) and the average variance extracted (AVE) of every construct refer to the acceptable reliability of the instrument. These indices measure the convergent validity of the instrument confirming with their high value. AVE measures the variance extracted by the indices in relation to measurement errors and must be more that 0.50 to justify using a construct (Barclay et al., 1995). The average variance shared between each construct and its indicator must be more that the variance shared between that construct and other constructs (Compeau et al., 1999). The values of CR and AVE, respectively more that 0.60 and 0.50 refer to the appropriate construct reliability and convergent validity (Fornell and Larcker, 1981). The values of AVE and CR are presented in Table 2 indicating the acceptable values of research constructs. Hair et al. (2006) introduced factor load of 0.7 as referring to the validity at the item level (Nunnally and Bernstein, 1994). The discriminant validity of the instrument was also confirmed by investigating the correlation of the

indicators of different variables in the covariance matrix of AMOS output. The main difference between convergent and discriminant validity is that content validity investigates the correlation of indicators that measure a construct and must be related to each other, while discriminant validity tests indicators that must not be related to each other (Martyn, 2009). Previously, it was believed that discriminant validity is confirmed when the correlation among two construct is not high. There is no standard value for it, but Campell and Fiske (1959) suggested that the value of correlation must be less than 85% (Sorensen and Slater, 2008). Therefore, in order to estimate discriminant validity, the correlation between the constructs must be less than 0.85. The correlation coefficient of more than this value indicates that the constructs measure the same concept. Based on the results, there is no similar concept in latent variables. Thus, all constructs have discriminant validity.

Measuring the variables: measurement indicators related to the variables of credibility and trust were extracted from Koenig-Lewis et al. (2010). The items related to other variables were extracted from Wessels and Drennan (2010). In this regard, before final revisions, items translated into Persian were again translated into English by two banking experts with advanced English knowledge. It was found out that the items enjoy good equivalence norm using back-translation method. Since most studies conducted on research variables used 7-scale Likert format (Sun et al., 2012; Wessels and Drennan, 2010), the instrument of the present study was also designed in 7-scale Likert format. The second reason for using 7-scale Likert format was the participants of this study who enjoyed higher level of education compared to other people.

6. Data analysis

Structural equation modeling (SEM) was used to analyze the data. The causal relations of latent exogenous variables and latent endogenous variables were measured through standard coefficients and significance value using AMOS. The hypotheses were confirmed and rejected according to the results of data analysis. In general, first-order and second-order factor analyses (measurement models) were employed. In this way, first, the first-order factor analysis was conducted for testing 28 main questions of the questionnaire, and then, second-order factor analysis was performed to test the effect of 8 exogenous latent variables on the endogenous latent variable. The statistics obtained in this study was 2.3 (χ^2 = 774.73, df = 272). As it is indicated in Fig. 1, the normed fit index (NFI) was 0.88, the comparative fit index (CFI) was 0.92, and the root mean square error of approximation was 0.072. Based on these measures, we are able to conclude that the model is fairly satisfactory.

7. Results

Measurement model and table of data: the main statistics (means, standard deviation, and confirmatory factor loads) are presented in Table 2 for all variables. As it was mentioned above, according to Nunally (1978) argues that in order to be valid, every indictor must have at least factor load of 0.6 with its construct. In addition, Cho and Cheon (2004) indicated that the final acceptance value is 0.55. All items of the questionnaire reached this value (see Table 3).

The second step in measuring the model is testing the hypotheses. As it was expected, the hypotheses of perceived usefulness (H$_1$), ease of use (H$_2$), need for interaction (H$_3$), perceived risk (H$_4$), perceived cost (H$_5$), compatibility with life style and needs (H$_6$), trust (H$_7$), and credibility (H$_8$) had significant effect on the concept of M-banking adoption. These factors can be prioritized according to their effect coefficient on the related variable. In fact, in previous studies, these factors were identified and tested with regard to their effect on the adoption of M-banking. However, it was tried in this study to identify the variables affecting the adoption of M-banking in Iran. Based on the results obtained from the analysis of structural model, compatibility with life style and needs (0.75) was identified as the most influential factor in comparison to trust (0.62), perceived usefulness (0.54), credibility (0.37), interaction (−0.22), perceived risk (−0.12), and perceived cost (−0.10). Thus, it can be concluded hat compatibility of innovation with the life style and needs of the clients of Iranian banks is the main reasons for its adoption. This issue is addressed more in discussion section.

Table 3
Standard coefficients and significance values for 8 hypothesis.

Hypothesis	Path		Standard coefficient	Result
H1	Perceived usefulness	Intention to use M-banking	.54	Accepted
H2	Perceived Ease of use	Intention to use M-banking	.33	Accepted
H3	Need for interaction	Intention to use M-banking	−.22	Accepted
H4	Perceived risk	Intention to use M-banking	−.12	Accepted
H5	Perceived cost	Intention to use M-banking	−.10	Accepted
H6	Compatibility with lifestyle and needs	Intention to use M-banking	.75	Accepted
H7	Trust	Intention to use M-banking	.62	Accepted
H8	Credibility	Intention to use M-banking	.37	Accepted

8. Conclusion and discussion

The necessity of investigating main factors affecting the adoption of new technologies is clear based on the numerous studies. In the present study, the factors affecting the adoption of M-banking, including perceived usefulness, ease of use, need for interaction, perceived risk, perceived cost, compatibility with life style and needs, trust, and credibility which were identified and tested in many studies, were tested in the context of Iran. According to the findings, all tested factors had significant effects on the adoption of M-banking and individuals adopt or do not adopt M-banking based on these factors. In this regard, the factors exerting the most influence were mostly related to conditions for which research centers of banks must prepare necessary infrastructures. For instance, compatibility with life style and needs (0.75) was identified as the most effective factor in the sample. In Koenig-Lewis's study, compatibility had the strongest positive influence on consumers' intention to adopt M-banking, followed by perceived usefulness. But in (Wessels and Drennan's, 2010) study, compatibility was the second strongest factor that influenced intention to use M-banking. Results of this study are also in line with the findings of other studies (Aldás-Manzano et al., 2009; Sivanand et al., 2004; Wu and Wang, 2005). This indicates that the extent to which consumers believe that M-banking can be integrated into their daily routine positively influences their intention to use M-banking. So, research centers must try to understand the life styles and needs of their major customers and attempt at providing banking services in line with their life styles and needs. Understanding how customers do their banking jobs, when they need to do it, which expectations they have of service qualities, in which way they use them more conveniently leads to offering appropriate facilities and services by the bank which in turn results in better and faster adoption of this technology. In measuring this factor, the indicator of compatibility with method of doing banking affairs (0.84) was identified as more effective that compatibility with the aspects of banking affairs (0.80) and compatibility with life style (0.74). Thus, since the method of doing banking jobs varies among individuals, it is recommended to try to differentiate services and offer banking services in accordance with individuals' preferences. Trust (0.62) was identified as the second influential factor in M-banking adoption. But in Koenig-Lewis's (Koenig-Lewis et al., 2010) study trust had no direct effect on M-banking adoption. However, trust influences it indirectly. Basically, as many studies suggest (e.g. Koenig-Lewis et al., 2010; Featherman and Pavlou, 2003; Gefen et al., 2003; Lee and Turban, 2001) the concern of most people when adopting new technologies is trusting technology for doing jobs.

In this study, the indicator of trusting bank for providing security (0.88) was identified as more effective than trusting cell-phone producers (0.76) and trusting telecommunication operators (0.67). Therefore, the bank, itself, must be more trustworthy in comparison to cell-phone producers and telecommunication operators, respectively. These three factors provide the infrastructure needed by the customer to trust. The approach that can be taken in this regard is experience marketing. In this approach, in order to prove the honesty of service provider, the customer is encouraged to use and experience the given service or good. When the bank enhances these three constructs, the best strategy can be experience marketing and using motivational policies.

The next factor is usefulness (0.54) perceived by the customers in relation to the potential advantages of the innovation for them. This factor has been investigated in many studies related to adoption of new technologies. This is consistent with previous literature, which has found perceived usefulness to have a strong positive relationship with behavioral intentions (e.g. Cheong and Park, 2005; Chiu et al., 2005; Curran and Meuter, 2005; Mathieson, 1991; Nysveen et al., 2005; Taylor and Todd, 1995; Wang et al., 2008; Koenig-Lewis et al., 2010). Furthermore, perceived usefulness has the strongest direct and combined effect on intention to use M-banking in Wessels and Drennan's (2010) study. The idea that this factor is the most significant motivator is also supported in the literature to some extent (e.g. Pagani, 2004). Luarn and Lin's (2005) study suggests that perceived risk has a greater influence than perceived usefulness on consumers' intention to use M-banking in Taiwan. As mentioned, M-banking has considerable advantages for both the bank and the clients. It is useful for the bank with regard to reducing costs, and is useful for the client with respect to 24-h use of banking services without the need for personal interaction. In this variable, the indicators of facilitating banking jobs (0.89) was identified as more influential compared to usefulness (0.85) and improving working methods (0.76). Thus, facilitating banking jobs is more important in M-banking adoption. It is recommended that enough information is provided for the customers regarding improvement of method, promotion of services quality, and its advantages.

The fourth factor in the adoption of M-banking is credibility (0.37). This finding confirms Luarn and Lin's (2005) study which found that credibility significantly affects M-banking adoption. But in Koenig-Lewis's (2010) study, the hypothesis that credibility significantly affects the intention to use M-banking has not been confirmed. In this variable, the indicator of perceived security in sending and receiving information (0.87) was identified as more effective than perceived security of M-banking in mutual interaction (0.85) and not-revealing personal information (0.76). The perception of the customer from security of transaction and sending and receiving information affects their use and reliance upon M-banking. So it is suggested that by enhancing the security of M-banking transactions the perception of customers from its security is promoted.

Another factor increasing the adoption of new technologies is their perceived ease of use (0.33) which was identified as the fifth factor in this study. This result confirms Curran and Meuter (2005), Dabholkar and Bagozzi (2002), Dabholkar (1996), Venkatesh et al. (2003), Luarn and Lin (2005), and Wessels and Drennan's (2010) studies that demonstrated a positive relationship between perceived ease of use and intention to use. However, different results has been also reported. For example, according to Koenig-Lewis et al. (2010), Pikkarainen et al. (2004) found in their study on online banking that ease of

use had no influence on usage intention whereas perceived usefulness has a significant effect. Wang et al. (2006) state that perceived ease of use will depend on an individual's expertise with more experienced users finding it easier to use. Other TAM studies (e.g. Davis, 1989; Davis et al., 1989; Venkatesh and Davis, 2000) have concluded that ease of use has less impact on technology acceptance than usefulness; this is because ease of use impinges on technology acceptance through perceived usefulness (Pikkarainen et al., 2004). This indirect effect can be explained from situations where all factors are equal; in Koenig-Lewis's study, the easier technology will be used (Davis, 1989; Venkatesh and Morris, 2000. The indicator of ease of acquiring skill of use (0.87) was found to be more effective than difficulty of use (0.69) and ease of learning (0.61) in accounting for ease of use. Thus, the easier the customers learn using M-banking, the more its adoption will increase.

In this respect, it is recommended that M-banking software is designed in a way so that they can be learned easily and can be used by different groups of the society. Also, necessary training should be provided at the time of delivering the software.

The sixth factor is the need for interaction (−0.22). But in Curran and Meuter (2005) and Wessels and Drennan's (2010) study, this hypothesis has not been confirmed. Some people do not like to use M-banking due to several reasons. These reasons are identified as indicators of this variable including the need for staff's help for doing banking transaction (0.72), enjoying from personal interaction (0.67), and importance of individual's attention in the bank (0.63). Among these indicators, staff's help was identified as the most effective indicator. The more people perceive the need for interaction, the less they are likely to adopt M-banking. Therefore, this factor has an adverse effect on M-banking adoption. It is recommended that banks encourage people to use this service by giving information about its use and employing motivational policies.

Perceived risk (−0.12) was identified as the seventh factor in M-banking adoption. This result confirms others studies (Aldás-Manzano et al., 2009; Sivanand et al., 2004; Luarn and Lin, 2005; Wu and Wang, 2005; Koenig-Lewis et al., 2010; L., 2010) that emphasize risk as the key barrier for the adoption of M-commerce. As a result, the extent to which a person believes that the use of M-banking will carry no security or privacy threats may be more significant in determining M-banking usage intentions in cultures that exhibit a high uncertainty avoidance tendency, such as Iran. This view is supported by Laforet and Li (Laforet and L., 2005), who argue that Chinese consumers are mostly concerned with security, hackers, and fraud given the high uncertainty avoidance characteristics of the Chinese culture (Wessels and Drennan, 2010). According to Corradi et al. (2001), there is more risk in using mobile banking services in comparison to fixed devices due to distant connection.

The indicator of safety of doing banking transactions (0.81), compared to correctness of the processes (0.76), lower risk of errors (0.64), and accurate management of banking affairs (0.64) was found to better explain the perceived risk. It is considerable that after people understand the advantage of something, analyze its associated risk, and then decide about using or not-using it. So it is recommended to prove security of financial transactions and employ guaranteeing and motivational policies to reduce customer perceived risk. Improving working processes, reducing potential transaction errors, and accuracy of transactions would be beneficial for reducing the risk and increasing customers' certainty. Also, electronic insurance companies can be helpful in this regard.

The perceived cost (−0.10) was identified as the last factor in M-banking adoption. This study validates the literature that has found a significant negative relationship between cost and intention to use M-Services (Khalifa and Ning Shen, 2008; Luarn and Lin, 2005; Pagani, 2004; Wessels and Drennan, 2010). In sum, according to the results obtained from the data, people having cell-phones capable of connecting to internet were more willing to use M-banking services in comparison to others. These cell-phones are not very expensive and people purchase high-tech cell-phones to meet their needs of using internet for mobile banking. That is why perceived risk was identified as the last factor affecting M-banking adoption. In this variable, the indicator of presence of financial barriers (0.81) was indicated to be more effective than high cost (0.65) and high cost of access to internet (0.64). Hence, banks can accept part of the total cost of using M-banking and even reduce the whole cost to zero to eradicate this barrier.

Very few studies have measured the effect of independent research variables on the dependent variable of attitude toward new technology and its effect of its use. Thus, future studies can be conducted in this area to provide a better understanding of the factors affecting M-banking. Also, the sample studied in this paper was limited to some faculties, and future studies can focus on larger populations with income, education, demographical, and psychological differences. Some of the limitations of this study include lack of national studies, limitation of international studies in this field, and avoidance of some respondents from answering the questions. Also, there is no considerable competition among banks of the country because their services are mostly similar. So only the banks which focus on the factors and barriers introduced in this study and develop strategies based on their understanding from target customers to get a larger share of the market will succeed in this area.

9. Managerial implication

The first contribution of this study is the development of a theoretical model which can be utilized to explain and predict consumers' behavior to use M-banking, particularly within Iranian banks. It is useful for understanding consumer willingness for adoption of M-banking. In addition, this study also builds a new valid measurement to predict and explain consumer acceptance of emerging technologies. Secondly, two additional constructs relevant to M-banking that are absent in the (Wessels and Drennan's (2010) models (Trust and Credibility) were identified and examined in Iran. Although prior studies have suggested that perceived cost and compatibility are the key factors affecting consumers' behaviors to use M-services

(Lee et al., 2003; Luarn and Lin, 2005; Wang et al., 2008; Wu and Wang, 2005), these constructs have been examined independently by researchers. Along with Wessels and Drennan (2010), it was found that both factors significantly increase the variance in consumers' adoption willingness explained by the model. Compatibility was also identified as a highly effective variable in M-banking adoption.

The present study has a number of implications for the banking sector. The findings of this study support the feasibility of using the proposed model to assist professionals in developing programs, communicating with, and attracting a sufficient number of customers to justify the costs of implementing an M-banking system. This is important since providing innovative value-added services is one of the traits that characterize successful commercial banks (Kaynak and Whiteley, 1999). Banks' managers should focus more on managing belief formation of consumers than on directly influencing behavioral intentions. These traits will then result in the intended behavior (Wessels and Drennan, 2010). Banks must increase consumers' awareness about the usefulness, convenience and advantages of M-banking. Significant effects of compatibility and ease of use on perceived usefulness have been observed. The observation that compatibility had significant direct effects on intention to adopt M-banking has a number of implications for banks. The results indicate that compatibility and trust were both found to have a strong positive influence on attitude and intention to use M-banking. Marketers should take advantage of the value adding characteristics of M-banking in promoting compatibility with consumers trust.

9.1. Limitations

As this study has shown, compatibility has an important effect on M-banking adoption. This research has a significant limitations shared by many studies of consumer adoption in that it only measured behavioral intention, rather than actual behavior. There is mixed evidence of a link between intention and behavior with some researchers reporting a close correlation (e.g. Fishbein and Ajzen, 1975; Venkatesh and Davis, 2000; Venkatesh and Morris, 2000), while others have reported a weak link, for example Wang et al. (2006) reported that "behavioral intentions are only partially useful as their correlation with actual behavior is low and mediated by many other variables".

In summary, this research has served to enhance the understanding of the factors influencing new technology adoption within a service paradigm and from a consumer perspective. It has demonstrated that there are multiple factors at work throughout the diffusion process and that some are more influential than others under given circumstances. The knowledge gained by this research into the motivators and inhibitors of M-Banking is useful for practitioners who aim to maximize consumer adoption of this self-service banking technology. In conclusion, this study furthers the understanding of the adoption of one of the innovative technologies that is driving service and technology convergence as an emerging service paradigm: M-banking (Kim et al., 2007). Importantly, this research also provides a model for examining future mobile digital technology developments in the financial services sector as "customers move out of the bank queue and into the electronic age" (Osbourne, 2008, p. 1).

In terms of future research, a larger scale study with a more representative sample could be conducted to validate the model of this study and to enhance the generalizability of the research conclusions. In addition, this study only examined the effect of the motivators and inhibitors on behavioral intentions, and as such, interrelationships between variables could be investigated. Furthermore, the model is cross-sectional, in that it measures perceptions and intentions at a single point in time. However, perceptions change over time as individuals gain experience (Mathieson, 1991; Venkatesh et al., 2003). This change has implications for researchers and practitioners interested in predicting M-banking usage over time and may warrant a longitudinal study.

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