

## **Factors Influencing Information Systems Adoption: A Review of the Literature**

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### ***Abstract***

*For the last two decades, a number of information systems are developed for various aims, depending on business' needs. There are a lot of organizations in the world which are using information systems in their environment, such as telecommunications organizations, universities and banks. Using information system has become crucial for most of organizations regarding with increasing the performance of work procedures and improve productivity and efficiency in general. There are many different models that have been designed and validated to explain the effect of constructs on the adoption of technologies. The aim of this research is to review the literature on information systems adoption and to analyze the different types of models which are frequently applied by researchers in their efforts to examine the factors that estimate the adoption of technologies. The research explores information systems adoption literature that focuses on development models.*

*Keywords: Mobile learning, mobile banking, adoption of information, technology adoption factors, proposed model*

### **1. Introduction**

In the domain information systems (IS), one of the most important research areas has been technology adoption. Although during two last decades many different models had been addressed to the rejection or adoption of information systems, there is still a lack of comprehensive researches regarding a review and classification of researches in the area [1]. Since the 1980s approximately half of all new capital organizations has been related on information technology fields [2]. In order to improve performance and productivity of the organizations which are using information technology environment is necessary that technologies must be accepted and used by people who are encounter with the technologies.

Therefore, understanding the constructs that have effect on technology adoption has become one of the interesting area of contemporary information systems (IS) for researchers and literature and resulting in the development of a number of theoretical models [3] can give a vast view in this field to researchers who are interested in examining the constructs. The purpose of this research is to provide a brief review of the literature

in information systems adoption and to show a number of models with different factors that have effect on users' technology adoption.

## **2. Information Systems Adoption: A review of the Literature**

In information systems, many competing models and theories have researched, designed and implemented to accessing IS user acceptance and adoption. These models and theories can guide researchers for study about the constructs that influence the adoption and use of technology. In continue some of these models and theories which are relevant with the research are defined.

### **2.1 IS Adoption Research Models**

In the domain of information systems (IS), technology adoption is one of the most important researched areas. Even though during two last decades different models are introduced to address the rejection or adoption of information systems, the lack of comprehensive researches regarding a review and classification of studies in this area still is clear. Following are the research models in the domain of IT adoption research, by addressing the achievements which can provide a comprehensive review on the current state of IT adoption research.

#### **2.1.1 Exploring Students' Awareness and Perceptions: Influencing Factors and Individual Differences Driving M-learning Adoption**

The purpose of this research is students' perceptions of mobile learning and investigate the constructs that have effect on students behavioral intention to adopt mobile learning, by using the model which is the integrate two models of UTAUT (Unified Theory of Acceptance and Use of Technology) with four core determinants of intention and usage which are performance expectancy, effort expectancy, social influence and facilitating conditions, and up to four moderators of key relationships have been theorized in formulating UTAUT with the aim of determining user acceptance and usage behavior on technology, and TAM (Technology Acceptance Model) which was the first model to mention psychological factors affecting technology acceptance, along with other constructs such as: mobile limitations and mobile learning. Moreover, moderator variables (frequent use of m-services, level of mobile usage and mobile capabilities,) and control (gender, study level, field of study) were verified the individual differences among users who are effect on constructs on adoption and usage of mobile learning. In this model the role of TAM is to investigate user acceptance and usage behavior of information technology [4]. TAM explains behavior of using computer and investigate the influence of external constructs related with the technology adoption on users' internal beliefs (Perceived usefulness and Perceived ease of use), attitudes, intentions, and technology use. The model posits that both Perceived usefulness and Perceived ease of use are the key determinants of individual's intention to adopt IT. However, some researchers think that TAM has not have a significant attention regarding with the real problem of technology acceptance [5]. In the research using UTAUT model shows effort expectancy, self-management, social influence, and perceived playfulness are important constructs which are examining the adoption of mobile learning, while indicated that only SM, PE, and EE have significant effects on students to use m-learning. Therefore, in this research TAM, UTAUT and two new independent constructs are integrated together, which are mobile-learning services and mobile limitation. Moreover, the research model investigates control and moderator differences among students and the effect of these variables on constructs and behavioral intention to use. In continue Figure 1 shows the conceptual research model of the research [5]:

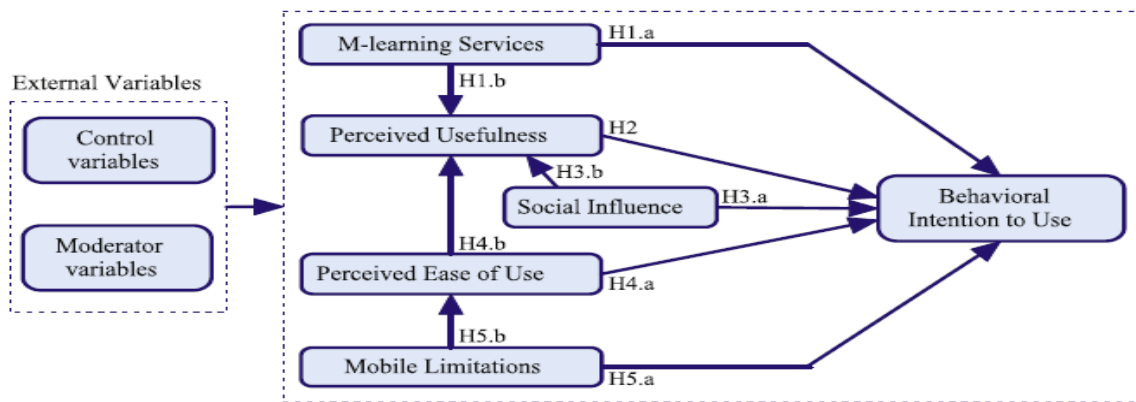


Figure 1. Conceptual Research Model [5].

The author of this research believes that the first step for designing and implementing a successful mobile learning system is Students acceptance. The surveys factors in the research is: perceived ease of use, Perceived usefulness, awareness of mobile limitations, awareness of mobile learning services, social influence and behavioral intention to use mobile learning.

**2.1.2 Extending the Understanding of Mobile Banking Adoption: When UTAUT Meets TTF and ITM (Initial Trust Model)**

The aim of this research is mobile banking adoption by proposing the research model for investigating the importance and relationship among the user perception of m-Banking, initial trust in m-banking services and the fit between the m-Banking technology characteristics and task characteristics with combining task technology fit model (TTF) model is more likely to have a positive impact on individual performance and can be used if the tasks that the user must perform could improve the work performance, unified theory of acceptance and usage of technology model (UTAUT) and initial trust model (ITM) which is the willingness of a person to take risks in order to fulfill a need without prior experience, or credible, meaningful information. Following Figure 2 illustrates the model of this study:

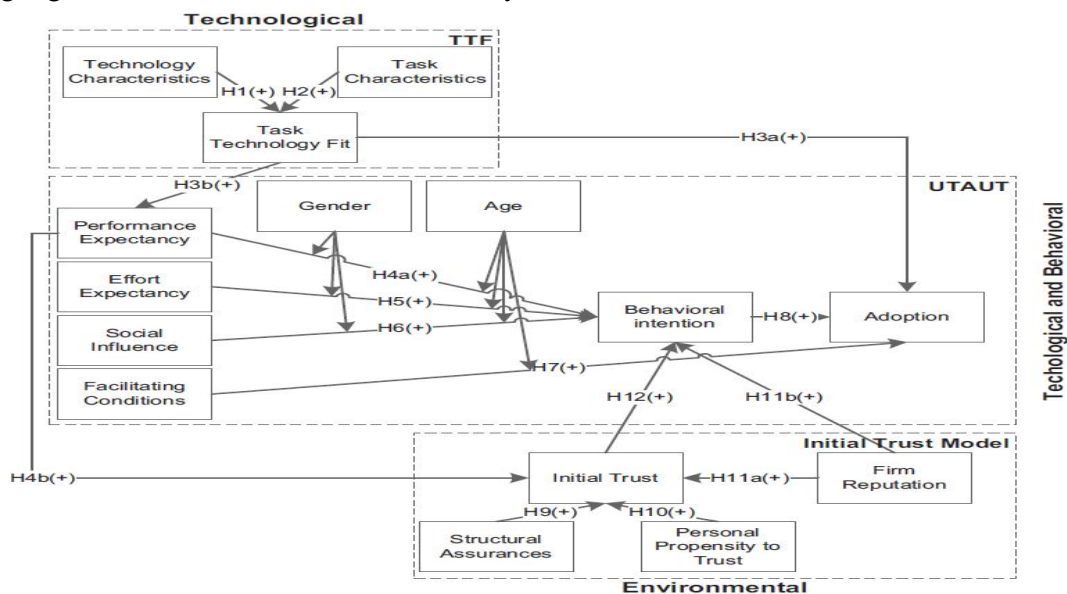
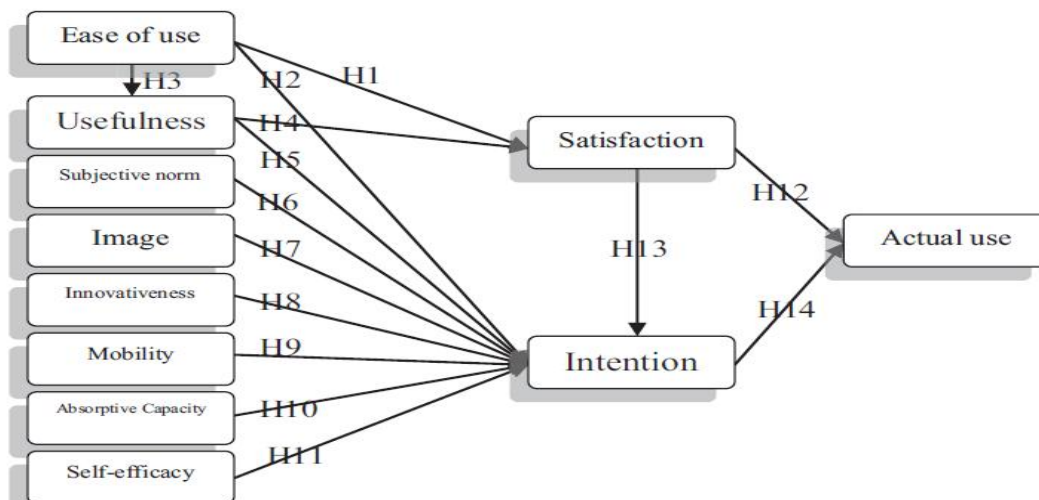


Figure 2. Research Model [6]

In this adoption model, TTF illustrates that the individual will adopt a new technology only if it is suitable to do the daily tasks efficiently. Therefore, the adoption of new information system mainly depend on the users' daily tasks [7]. For example adoption this model uses four constructs: technology characteristics, task characteristics, task technology fit, and use. Technology characteristics and task characteristics investigate the task technology fit which leads to the adoption and use of the information system. UTAUT also is a theory in the IS adoption context and used it to conceptualize a model to study information system adoption and Luo and his colleague (2010)[9], analyzed the impact of trust, risk, self-efficiency and performance expectancy in m-Banking adoption. Initial trust model (ITM) which is used in this research is the willingness of a user to take risks in order to fulfill a need in terms of improving performance without prior experience, or reasonable and meaningful knowledge. Convenience, flexibility, and perceived benefits such as the role of service usefulness contribute to the formation of initial trust [6]. According to this research m-banking also same as m-learning carry out activities that are relies on mobile technologies and communications protocols such as wireless applications protocols, WAP) for providing mobile services The surveys factors in the research is: Technology Characteristics, Task Characteristics, Task Technology Fit, Effort Expectancy, Performance Expectancy, Facilitating Conditions, Social Influence, Structural assurances, Initial Trust, Personal Propensity to Trust, Firm Reputation, Initial Trust, Behavioral intention.

### 2.1.3 Social and Individual Antecedents of M-learning Adoption in Iran

The goal of this research is investigate the effects of social and individual factors on m-learning adoption in Iran which are include of constructs would have effect on m-learning system in Iran. Moreover, the study searched about student's satisfaction for actual use of m-learning. in the research author combined two models of TAM and ECT (Expectation-Confirmation Theory) with together in order to m-learning antecedents, satisfaction and intention as well [10]. In following Figure 3 illustrates the conceptual model:



**Figure 3. The Research Model [10]** Author in this research tries to investigate existing social and individual existing factors in Iran which have effect on satisfaction and behavioral intention that have been affected on actual use of m-learning in Iran.

### 2.1.4 Mobile Learning Adoption Model: An Empirical Investigation from Learners Perspective

This research investigates constructs influencing the mobile learning adoption from perspective of students and behavioral intention. The aim of conceptual model measure students’ intention towards mobile learning. In addition, the model has been made base of integrating two models of TAM and UTAUT. Collecting data was conducted via online survey from 158 students at different levels of higher studying.

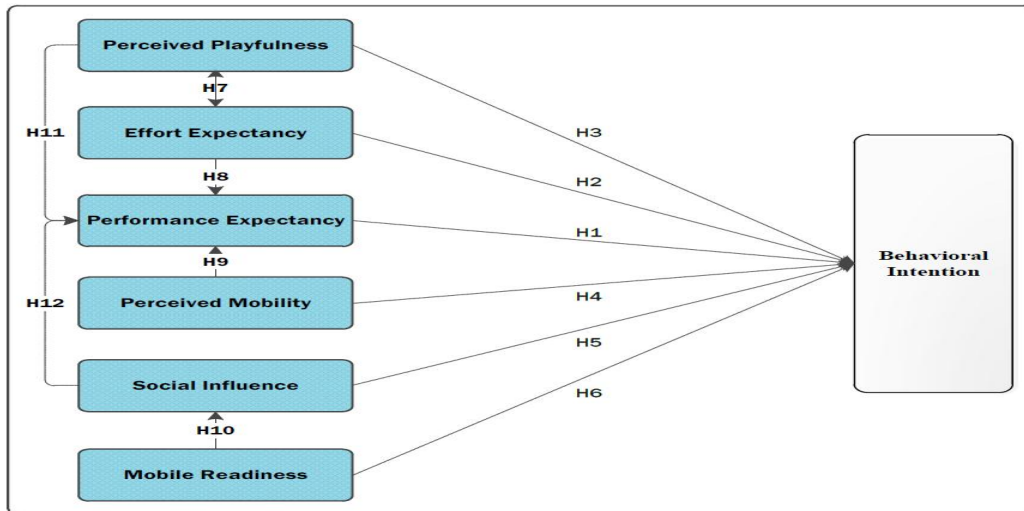


Figure 4. Proposed Mobile Learning Adoption Model [11]

The influential factors of the model are Performance Expectancy, Effort Expectancy, Social Influence, Perceived Mobility, Perceived Playfulness and Mobile Readiness on Behavioral Intention (BI). Figure 4 demonstrates that behavioral intention is dependent to factors that were mentioned above. In addition, other factors are independent variables for predicting the behavioral intention and adoption of m-Learning systems.

### 2.1.5 Understanding Mobile Learning Adoption in Higher Education: An Empirical Investigation in the Context of the Mobile Library

In this research, authors tried to investigate constructs affecting on individual’s behavioral intention to adopt mobile learning in higher education. The conceptual model is suggested based on the combination of attitude and TTF. The aim of this conceptual research the research the context of the mobile library. The study has investigated Compared with traditional library services and mobile libraries, the m-library offers more benefits for users. Measurements constructs of this research which have influence on behavioral intention are: Technology characteristics, Task characteristics, Task-technology fit, Attitude and behavioral intention [13].

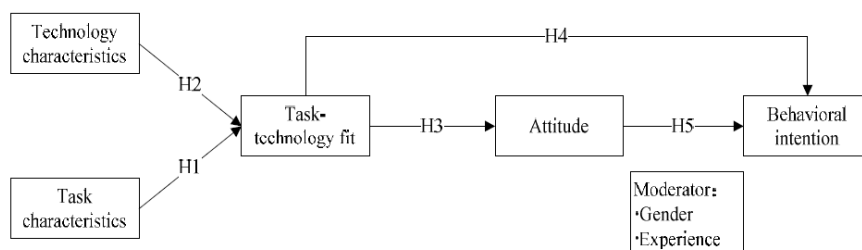


Figure 5. The Research Model [13]

### 3. Comparing of Conceptual Models

Following table 1 shows previous research models which are investigates users' adoption with technologies.

**Table 1. Comparing of Conceptual Models**

Author/Models	IS application	Factors	Results
(Sabah, 2016) (Conceptual Research Model)	m-learning	<ul style="list-style-type: none"> <li>-Perceived usefulness,</li> <li>-Perceived ease of use,</li> <li>-Awareness of m-learning services,</li> <li>-Awareness of mobile limitations,</li> <li>-Social influence,</li> <li>-Behavioural intention to use m-learning</li> </ul>	<p>The research adds new factors, which are including m-learning services and mobile limitations to the theories and investigates the willing to students adopt and use m-learning. Moreover, the research adds a set of individual differences into the proposed research model as control variables (gender, study level and field of study) and also moderator variables which are (mobile capabilities, level of mobile usage, and frequent use of mobile services) to investigate how the individual differences have affect students' perceptions of adopting and using m-learning.</p>
(Oliveira et al., 2014)	m-banking	<ul style="list-style-type: none"> <li>-Task Characteristics,</li> <li>-Technology Characteristics,</li> <li>-Task Technology Fit,</li> <li>-Performance Expectancy,</li> <li>-Effort Expectancy,</li> <li>-Social Influence,</li> <li>-Facilitating Conditions,</li> <li>-Personal Propensity to Trust,</li> <li>-Structural assurances,</li> <li>-Firm Reputation,</li> <li>-Initial Trust,</li> <li>-Behavioural intention,</li> </ul>	<p>The model explains the decision to adopt m-Banking at an individual level. This research shows Not only is the integration of TTF and ITM with UTAUT</p> <p>From the theory point of view the model is appealing, it should be also empirically significant, since it explains why much of the variation for intention to adopt and adoption itself is much higher than indicated by previous adoption research on adoption intentions</p>
(Mohammadi, 2015)	m-learning	<ul style="list-style-type: none"> <li>-perceived ease of use,</li> <li>-perceived usefulness,</li> <li>-perceived image,</li> <li>-personal individual mobility,</li> <li>-user intention</li> </ul>	<p>This research investigates users' perceptions of m-learning system, analysed the perceived usefulness, effect of perceived ease of use, personal innovativeness, subjective norm, perceived image, individual mobility, self-efficacy on users' intentions, absorptive capacity and satisfaction towards the use of mobile learning.</p>
(Rehman et al., 2016)	m-learning	<ul style="list-style-type: none"> <li>-Performance Expectancy,</li> <li>-Effort Expectancy,</li> <li>-Social Influence,</li> <li>-Perceived Mobility,</li> </ul>	<p>The model is proposed to measure students' intention towards mobile learning and identify factors influencing the mobile learning adoption from learners' perspective.</p>

		-Perceived Playfulness -Behavioural Intention	
(Gan et al., 2016)	m-library	-Task characteristics, -Technology characteristics, -Task-technology fit, -Attitude and behavioural intention	TTF has a positive influence on attitude, which helps determine the intention to adopt a mobile library.

Authors inclusively discussed about factors affecting on IS adoption. Due to various characteristics of each organizations there are many conceptual models for different environments. For example, Perceived usefulness, Perceived ease of use, Awareness of m-learning services, Awareness of mobile limitations, Social influence, Behavioral intention to use m-learning have influence on m-learning adoption. Task characteristics, Technology characteristics, Task-technology fit, Attitude and behavioral intention are effective factors in m-library and -Task Characteristics, Technology Characteristics, Task Technology Fit, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Personal Propensity to Trust, Structural assurances, Firm Reputation, Initial Trust, Behavioral intention are important factors for m-banking.

#### 4. Conclusion

Adoption of Information Technologies is a vital decision for productivity, the growth, competitiveness, and even survival markets in competitions. Organizations try to adopt IT innovations to stay in their competitive position as well as to create competitive advantage. Adoption models rooted on a diversity of theories such as TAM, UTAUT and TTF. This research presented the literature review on IS adoption theories and models where each model focused on the concept of information technology systems and different constructs which have effect on technology adoption, and finally, the research studied the effective constructs of each model and compared the proposed conceptual models.

#### References

- [1] M. Salahshour, R. Mehrbakhsh, and H. M. Dahlan, "Information technology adoption : a review of the literature and classification," *Univers. Access Inf. Soc.*, vol. 17, no. 2, pp. 361–390, 2018.
- [2] H. Patel, "Factors Influencing Technology Adoption : A Review Factors Influencing Technology Adoption : A Review," no. June 2007, 2007.
- [3] H. Taherdoost, "ScienceDirect ScienceDirect A review of technology acceptance and adoption models and theories A review of technology acceptance and adoption models Costing models for capacity optimization Trade-off between used capacity operational efficiency," *Procedia Manuf.*, vol. 22, pp. 960–967, 2018.
- [4] F. D. D. Viswanath Venkatesh, Michael G. Morris, "User Acceptance of Information Technology : Toward a Unified View Author ( s ) : Viswanath Venkatesh , Michael G . Morris , Gordon B . Davis , Fred D . Davis Published by : Management Information Systems Research Center , University of Minnesota," vol. 27, no. 3, pp. 425–478, 2011.
- [5] N. M. Sabah, "Computers in Human Behavior Exploring students ' awareness and perceptions : In fl uencing factors and individual differences driving m-learning adoption," vol. 65, pp. 522–533, 2016.
- [6] T. Oliveira, M. Faria, and M. Abraham, "Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM," vol. 34, pp. 689–703, 2014.
- [7] D. L. Goodhue and R. L. Thompson, "Task-Technology Fit and Individual," vol. 19, no. 2, pp. 213–236, 1995.
- [8] Q. Zhang, L. Cheng, and R. Boutaba, "Cloud computing: State-of-the-art and research challenges," *J.*

*Internet Serv. Appl.*, vol. 1, no. 1, pp. 7–18, 2010.

- [9] X. Luo, H. Li, J. Zhang, and J. P. Shim, “Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies : An empirical study of mobile banking services,” *Decis. Support Syst.*, vol. 49, no. 2, pp. 222–234, 2016.
- [10] H. Mohammadi, “Social and individual antecedents of m-learning adoption in Iran,” *Comput. Human Behav.*, vol. 49, pp. 191–207, 2015.
- [11] M. Rehman, M. Anjum, F. Askri, M. A. Kamran, and V. Esichaikul, “MOBILE LEARNING ADOPTION FRAMEWORK : AN EMPIRICAL INVESTIGATION FROM LEARNERS,” vol. XII, no. I, pp. 1–43, 2016.
- [12] C. Gan, H. Li, and Y. Liu, “Understanding mobile learning adoption in higher education: An empirical investigation in the context of the mobile library,” 2016.
- [13] Y. L. Chunmei Gan, Hongxiu Li, “Understanding mobile learning adoption in higher ed ucation: An empirical investigation in the context of the mobile library,” 2016.