

# An Extension of IDT model in the adoption of mobile message services; case of Iran context

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*Abstract:* The study of how and why consumers adopt mobile services may be relevant and critical for both mobile service providers and consumers. By considering the widespread use of SMS service in Iran, the purpose of this study is to propose a customized and localized model, on the basis of an extended model of innovation diffusion theory (IDT), to examine the factors that influence the adoption of MMS (Multimedia Message Service), which is pre-mature and in early stages of implementation in Iran. By using this extended model of IDT the Iranian mobile service providers could have a better perception of their consumers intention to use mobile messaging services (SMS and MMS). The results of this study will be useful for both researchers and mobile providers and may provide further insights into mobile messaging service, marketing strategies.

*Key-Words:* Mobile, Innovation diffusion theory, SMS, MMS, Adoption, Enjoyment, Cost, Customers

## 1 Introduction

Increased usage of mobile technology is an important reason for studying its adoption in recent years. The statistics indicate that the number of active mobile users in Iran has dramatically increased from 60,000 users in 1997 to nearly 20,000,000 in 2007 [1]. Among several available mobile services in Iran's market, such as GPRS, emailing, messaging services, gaming, payment and etc. the messaging service has gained the most widespread usage. Despite, many technical barriers and the simplest use of SMS in Iran, it was the most frequent used mobile service among mobile users from the beginning of mobile technology introduction. Reaching the peak of 50 million messages in one day is an approval for this claim, and as a result, messaging service has become the main revenues source for Iranian telecommunication companies.

Now, with the arrival of the mobiles third generation (3G), MMS usage is becoming more and more popular in the world. Unlike text-based SMS, MMS allows mobile phone users to exchange pictures with sound clips on their handsets or digital cameras.

MMS users send text messages as well as multimedia messages incorporating pictures, voice recordings, animated characters, and video clips to others. Users can enjoy more multimedia effects via colorful graphics and crisp sounds of MMS than text-based SMS. MMS users can also send multimedia messages to other users through Internet content providers (ICP). MMS has reshaped the landscape of mobile communication, making it more personal, more versatile, and more expressive than ever before [2].

Although there is a high potential demand among Iranian mobile users, for this value added service, but unfortunately it is not widely offered, and only one of the three mobile service providers (Irancell) has started to propose this service to a limited number of its consumers. According to statistics, the high usage rate of the simple prior messaging service SMS, among Iranian mobile users, made us to curiously study the reasons of this event from the customers insight, to gain a deeper understanding of their perception regard this issue.

The results of understanding the drivers of adoption can give an idea to the Iranian mobile service providers or designers on how to tailor next mobile particular services, especially MMS; so that it will be better adopted by the customers. It can also contribute to better and deeper understanding of consumers' needs and expectations. This in turn can have a positive effect on customer relationship management, customer satisfaction and loyalty. In this case, by arranging face to face interviews and focus groups with mobile users from different ages, occupations and educational levels we had extracted the main factors underlying their intention to use mobile messaging service in Iran context.

This paper is structured in the following way. The next section presents a brief review on Information technology (IT) technology adoption models, and particularly innovation diffusion theory, which is our picked up and most relevant model to Iran's mobile market. The third section describes the research approach. This is followed by a presentation of the empirical findings, based on a survey from the mobile users and several meetings by mobile industry and academic experts from Irancell Company, Mobile Telecommunication Company of Iran (TCI), Shahid Beheshti University and Tarbiat Modares University. Finally, our suggested model based on an extension of IDT model, with two additional factors enjoyment and cost followed by a brief description of each construct individually, will be proposed. The paper will be concluded with some final comments and suggestions on future researches.

## 2 Theoretical Frameworks

### 2.1 Innovation Diffusion Theory

Innovation diffusion theory has been extensively used for relevant IT and IS researches [3]. Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system and an innovation is an idea, a practice, or an object that is perceived as new by an individual or another unit of adoption. Innovation diffusion theory has been extensively used for relevant IT and IS researches [4].

Innovation diffusion theory has five significant characteristics: relative advantage, compatibility, complexity, trial ability and observables [3]. Relative advantage means that innovation brings greater benefits to users than do other products. Compatibility is the extent to which the value of the innovation, its experience in the past, and users' needs are consistent

with each other. Complexity is the degree of difficulty that users have understanding and applying the innovation. Trial ability means how often or how much the innovation can be effectively tested. Observability is the extent to which others can see the innovation. These characteristics are used to explain the users' adoption and decision-making process. However, previous studies found that only relative advantage, compatibility, and complexity are consistently related to innovation adoption [5].

Considering the diffusion of new end-user IT, Moore and Benbasat proposed some extended constructs such as image, visibility, result demonstrability, and voluntariness of use. Image emerged as a separate factor from relative advantage and was seen as social approval. Visibility and result demonstrability were developed from observability. Voluntariness of use was a new construct beyond Rogers classification. These perceived attributes of innovations are defined in Table 1 [6].

In the past decade, researchers have applied the IDT to examine IT usage. For example, Agarwal and Prasad found that relative advantage and result demonstrability were relevant in explaining acceptance of the World Wide Web [7]. Slyke et al. used IDT to investigate factors that may influence intentions to use groupware applications [8]. He found that relative advantage, complexity, compatibility, and result demonstrability were significantly related to intention. Chen et al. applied a technology acceptance model (TAM) and IDT to examine consumer behavior in the virtual-store context [9].

Although, IDT model has been successfully and widely used to explain intention to use Information technology systems, there are some established theories such as theory of reasoned action (TRA), Technology acceptance model (TAM), and theory of planned behavior (TPB) that can also be used to predict users' behavior. However, it is unknown how readily they can be applied to investigate the adoption of new innovations in mobile context like SMS and MMS. Furthermore, as use in mobile messaging service continues to rise in an exponential rate among Iranian consumers, understanding how and why people decide to use has become more and more important to Mobile service providers and diffusion researchers.

### 2.2 Conceptual adoption framework

As mentioned earlier, beside explaining intention to adopt to new technologies the main contribution of IDT model has also allowed researchers to study how new innovations spread among groups of people.

Therefore this study intends to propose a customized model, modified and localized for Iran context, based on the perception and opinion of frequent and active mobile users, telecom industry experts, managers and university professors as well.

A similar research on measuring the adoption of MMS service in Taiwan, was done by Chin-Lung Hsu and his colleagues, in 2006. Their proposed model was empirically evaluated through an online survey from mobile users in Taiwan, concerning their perceptions of MMS [3].

We tried to extend their model and add two more constructs, enjoyment and cost, in order to propose a relevant model which best suits Iran's mobile market. This additional task was conducted based on our findings through several focus groups with mobile users, meetings with experts and interviews with academic experts.

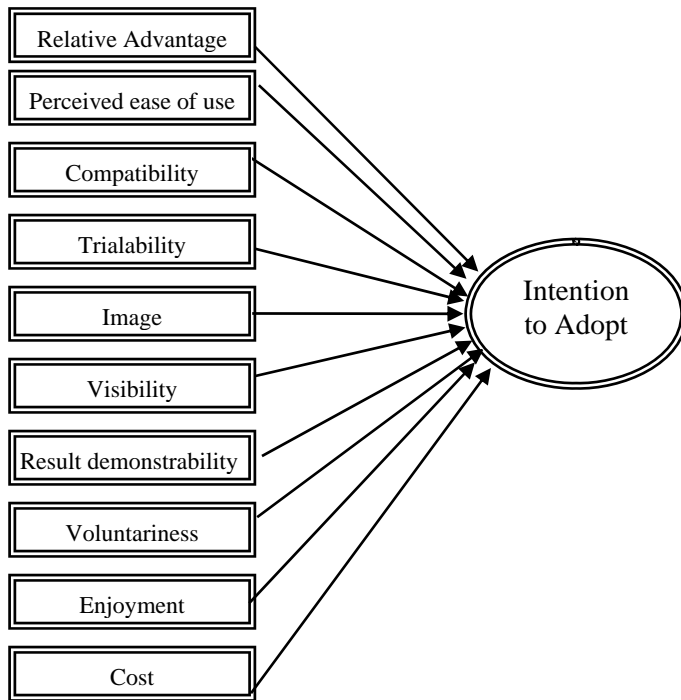


Fig. 1, Our Research Model

Enjoyment is defined as pleasant or the intrinsic reward derived through the use of the technology or service. This is the extent to which the activity is perceived to be enjoyable, apart from any performance consequences [10]. Cost is simply defined as the money gone in order to acquire something, and here refers to the money paid by consumers for mobile messaging services. Our proposed extended IDT framework consists of ten constructs in shown in Fig. 1.

### 3 Our contribution

In this section we try to briefly describe the process we had gone through, in order to reach the final model and add two more constructs, enjoyment and cost to the basic model.

For the first phase of the project, we started to arrange some focus groups with mobile users and telecom company consumers. These focus groups were arranged by the help of two Iranian mobile service providers, The TCI (Telecommunications Company of Iran) and MTN Irancell that enabled us to have access to their mobile consumers. Totally, we had talked face to face with 63 respondents, in group of three's, with different ages, occupations, level of education an etc. all selected from mobile consumers of TCI and MTN Irancell.

Next, we start to report our findings, assess and analyze them by the help of telecom and academic experts. Regard this issue, several meetings and interviews has been arranged with some managers and experts of Telecommunications Company of Iran, Irancell Company; also Shahid Beheshti University and Tarbiat Modares University professors as well. The academic professors were selected from the ones, who had researches and works in the field of communication and IT adoption before.

The results and statistics shown that, 87 percent of the whole respondents are using mobile messaging service for enjoyment, fun and exchanging ridiculous messages to their friends or family members. These amount agreed, if the MMS service be offered widely in Iran, for sure they will use it for fun purposes even more than what they had done in past. Because this service allows them to exchange messages containing picture, sound and video clips, which is a more enjoyable task in contrast with SMS which contains only text. The next important factor from these respondents point of view was the price they pay for these messaging services. 61 percent indicate that, if MMS service costs lot for them, they would not show high intention to use it, and despite interesting features of this service, they will not going to use it very often.

The other eight factors of IDT model, were also important to the respondents, but with less weight. For example, some were concerned, whether their cell phone supports this new technology, or they must buy a new model? Or some other worried, if learning how to use this service will be free of effort.

Finally, a complete report containing all statistics and descriptions of all collected data was generated, and presented to ITC, and MTN Irancell the two mobile

service provider companies in Iran. This report is available for further references.

A brief definition of each construct, included in our proposed model is summarized in table 1. In addition Table 2, contains sub-elements or items

representing each construct. Most relevant questions to these sub-elements, which are appropriate for preparing a questionnaire, are presented as well.

Construct	Definition
Relative Advantage	The degree to which an innovation is perceived as better than the idea it supersedes.
Perceived ease of use	The degree to which an individual believes that using a particular system would be free of physical and mental effort.
Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters.
Trialability	The degree to which an innovation may be experimented with before adoption.
Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system.
Visibility	The degree to which adopters see the innovation as being visible in the adoption context.
Result demonstrability	The degree to which the results of using an innovation are perceived to be tangible.
Voluntariness	The degree to which the use of the innovation is perceived as being of free will.
Enjoyment	The degree to which an innovation is enjoyable, pleasant or the intrinsic rewarded, apart from any performance consequences
Cost	The amount of money gone in order to use or acquire something.

Table 1, Summery definitions of the extended model constructs

Construct	Relevant questions
Relative Advantage	Using mobile messaging service improves the quality of work I do. Using a mobile messaging service enables me to accomplish task more quickly. Using a mobile message service enhances my effectiveness on the job.
Perceived ease of use	I believe that it is easy to get a mobile messaging service to do what I want it to do. Learning to operate a new mobile messaging service like MMS is easy for me. My interaction with a new mobile messaging service is clear and understandable.
Compatibility	I think that using a mobile messaging service fits well with the way I like to work. Using a mobile messaging service is compatible with all aspects of my work. Using a mobile messaging service fits into my work style.
Trialability	Before deciding whether to use any mobile messaging service, I was able to properly try one out. I was permitted to use a new mobile messaging service on a trial basis long enough to see what it could do.
Image	Persons who use a mobile messaging service like MMS have more prestige than those who do not. Having a mobile messaging service like MMS is a status symbol in my organization.
Visibility	I have seen what others do by using a mobile messaging service in my organization. Mobile messaging services are very visible in my organization.
Result demonstrability	I believe I could communicate to others the consequences of using a new mobile messaging service. I would have no difficulty telling others about the results of using a new mobile messaging service. The results of using a new mobile messaging service are apparent to me.
Voluntariness	My use of a mobile messaging service is voluntary. My colleagues/friends/family do not require me to use a mobile messaging service.
Enjoyment	I had fun using mobile messaging services. I found using a mobile messaging service to be enjoyable. The process of using mobile messaging service is pleasant. It is cool to use a mobile messaging service.
Cost	The amount of money I pay for a mobile messaging service has a direct affect on my intention to adopt it. I prefer not to use new mobile messaging services, if it costs me a lot; even if I could gain many facilities from using them.

Table 2, Extended model constructs and their relevant questions

## 4 Conclusion

Enjoyment and Cost shown to be more important to user's perceptions in Iran's mobile market, especially in the new offered ones, such as MMS. Therefore, Enjoyment and Cost may also be important considerations in the design of future mobile messaging systems and measurement of consumer's intention to adopt them.

So, it seems that mobile providers in Iran must provide more concentration and curiosity, to the factors like enjoyment as well as cost of the messaging services.

Although our findings in this study provides meaningful implications for the adoption of mobile messaging service technology in Iran, but further researches include empirical evaluation of our proposed model, can provide better insights into mobile messaging service marketing strategies, for Iranian mobile providers and researchers.

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