

Testing an Adoption Model for an Educational Environment (End-Users Perspective)

Hooshang Shajari*, Maziar Shajari, and Shadi Ebrahimi Mehrabani

Abstract— Users adoption to an innovation is very important for the researchers. It is essential for the implementers of new technologies that users intent to use their services, and moreover continue to use them. The goal of this study is to test a proposed model for the adoption of the users in an educational environment. End-users of the tested services were university students and the proposed model is consisted of four independent variable (perceived ease of use, perceived usefulness, observability, and compatibility) and one dependent variable (intent to use). Results show that the proposed model can be used to analyze the adoption of the users.

Keywords— adoption model, technology Adoption, educational environment adoption model

I. INTRODUCTION

Users' Adoption to a technology is becoming a critical issue in societies. This issue is becoming more important in developing countries as these countries have to use innovations that are not developed inside their countries and the cost of these technologies are not low (Carter & Belanger 2005). Therefore, organizations' managers must be careful when they want to implement new technologies. If they want to enjoy the benefits of new technologies, they must consider their users behaviors and they have to be aware about the factors that have impact on their adoption. Several adoption models has been introduced by the researchers all over the world but none of them has been known as a standard adoption model. User's behaviours are dissimilar as their environment, culture, and other conditions are different. Many adoption model comprising several factors were introduced by the researchers but we are still try to find better model for a specific technology.

Universities are implementing e-Services and they want to increase users' number of the e-Services, therefore they need to understand user's behavior and predict how they adopt to a technology. It is very important for an e-Service to have enough users and this is a key issue for a system to be successful (Davis, 1989).

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Biggest university in Iran is implementing several e-Services for both their students and staffs. This study is trying to find important adoption factors for the e-services of an education system. Moreover, by comprising these factors an adoption factor will be introduced. This study is trying to use only the most important factors and to present a parsimonious model.

Students and staffs are using e-Services in the university and several new e-Services are being implemented and developing inside the university. One of the issues that must be considered before implementation of the services is the usage rate of the services. Therefore, using adoption models to predict and explain the users behavior is important for the IT managers. This study uses TAM as a model that has been used and tested by many researchers and will integrate it with other important factors. These factors will be revealed by interviewees.

II. RESEARCH OBJECTIVE

The research main objectives are: (1) To test an adoption model for the educational environments; (2) To bring out important adoption factors in an educational environment. This is done by examining TAM and several related adoption factors, introduced in previous years.

III. BACKGROUND OF THE STUDY

While new technologies are rapidly introducing and these technologies have different characteristics and moreover every society has its own (and sometimes unique) situation, study about the users' needs and their behavior are very essential for the implementers of these new technologies. There is a need to introduce prudent adoption model for these technologies (Carter & Belanger 2005).

While introducing TAM, Davis proposed two factors as the factors that can explain the usage of a system (Davis, 1989) and these factors are perceived ease of use (PEOU) and perceived usefulness (PU). Many researchers have used TAM and other related models to examine adoption of new technologies (Orgeron, 2008). It has been proven that TAM is useful to explain users' intention to use a technology (Legris *et al.* 2003).

However, there are several theories used to explain the users adoption, Technology Acceptance Model (TAM) is one of the most used theory to predict users behavior (Shajari and Mehrabani, 2015). This model was proposed by Davis in 1989 with two main factors: Perceived usefulness and perceived ease of use (Figure 1). Perceived usefulness is "the belief that using a particular system would enhance one's job performance" (Davis, 1989). Perceived ease of use was

defined as "one's perceptions of the amount of effort required to use the system" (Davis, 1989, Venkatesh V. *et al*, 2003). TAM specify that these two factors directly will impact on the intention to use (ITU) a system.

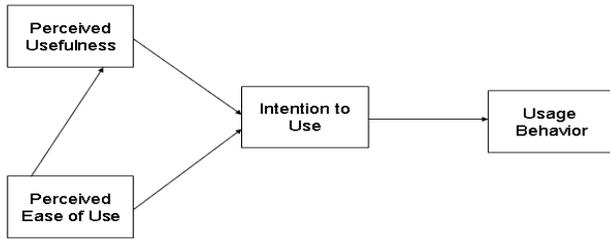


Figure 1. Technology Acceptance Model (Davis, 1989)

Another model which is used to specify adoption of a system was introduced by Rogers. He named it diffusion of innovation (DOI). DOI (Figure 2) have five constructs: Relative advantages, complexity, compatibility, trialability and observability (Venkatesh V. *et al*, 2003). Two first factors in this model show the same concept that has been used in TAM.

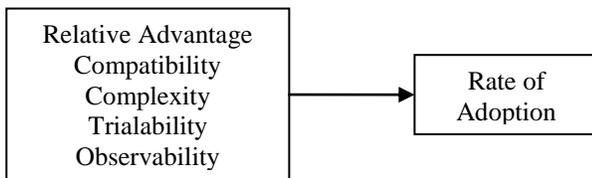


Figure 2. Diffusion of Innovation (Rogers, 2003)

In the year 2003 another adoption model was presented by Venkatesh et al. (Orgeron, 2008) which is the Unified Theory of Acceptance and Use of Technology (UTAUT) and consist of three factors (effort expectancy, performance expectancy and social influence) with direct effect on the usage intention (Figure 3). In this model there are two constructs with the same concept as TAM and DOI which are effort expectancy and performance expectancy.

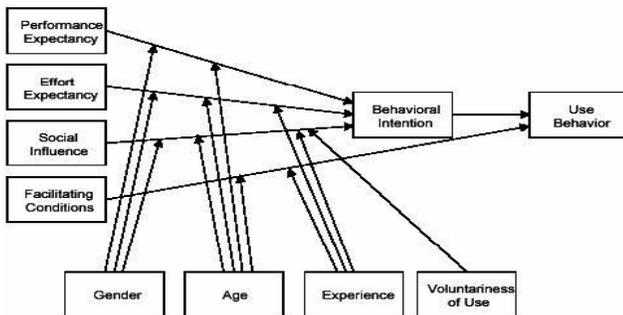


Figure 3. Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

IV. PROPOSED MODEL

Based on the literature review and an qualitative research an adoption model is proposed for Islamic Azad University as an educational environment in Iran (Shajari and Mehrabani, 2015). The model is presented in Figure 4. The model has a dependent variable (DV) which is intention to use and four independent variables from previous known adoption models. These factors are perceived ease of use, perceived usefulness, observability, and compatibility.

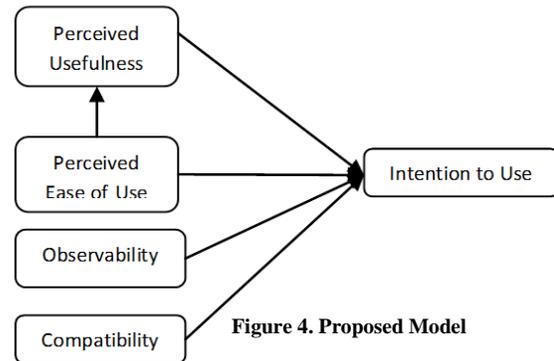


Figure 4. Proposed Model

The most important factors are: Perceived Ease of Use (Complexity, Effort expectancy), Perceived Usefulness (Relative Advantages, Performance Expectancy), Observability, and Compatibility. These four factors can be used to make the proposed adoption model. Complexity from DOI, "Perceived Ease of Use" from TAM and Effort expectancy from UTAUT determine a similar concept. Furthermore, Relative Advantages from DOI, "Perceived Usefulness" from TAM and performance expectancy from UTAUT present the same concept too. Therefore, these factors were put in the same category. One dependent variable (Intention to Use) and four independent variables (Perceived Ease of Use, Perceived Usefulness, Observability, and Compatibility). The definitions of these factors are presented in Table 1.

TABLE 1. FACTOR DEFINITIONS

	Variable	Definition
1	Perceived Ease of Use	The degree to which a person believes that using a particular system would be free of physical and mental efforts.
2	Perceived Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance.
3	Observability	The degree to which the results of an innovation are visible to others.
4	Compatibility	The degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopter.

These constructs influence one’s behavioral intention to use a system, which, in turn, determines actual system usage (Rogers, 2003).

V. RESEARCH METHODS

Quantitative research method is used to test the proposed adoption model. Data gathering has been done December 2013 to January 2014. After designing the measurement model, the constructs were tested for item analysis. The researchers were looking for any irrelevant items in the model. Therefore, each variable was tested separately to be prepared for the model fit analysis. There are diagnostic indicators in SEM, which can show the analyzer how to improve the model by improving the model fit indices. To test the model, this study used AMOS 8.0, which is provided as an additional software package for SPSS users.

VI. RESULTS

This study uses a tester model to examine the proposed model. The tester model (Figure 5) is regularly tested by Confirmatory Factor Analysis (CFA) (Teo, 2011). To test the model, this study used CMIN/df, AGFI, RMSEA, CFI, and TLI indices. The Model fit indices values can be seen in Table 2. Two factors needed modifications which were PEU and OBS.

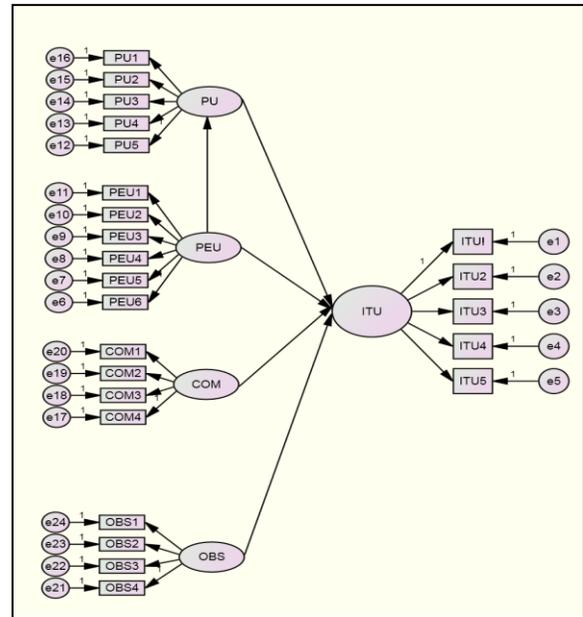


Figure 5. Tester Model

TABLE 2. MODEL FIT INDICES VALUES

	CMIN/df	P-Value	AGFI	RMSEA	CFI	TLI
ITU	1.658	0.141	0.965	0.049	0.989	0.978
PU	1.289	0.265	0.973	0.032	0.994	0.988
PEU	4.619	0.0	0.878	0.115	0.856	0.760
PEU (Modified)	0.629	0.678	0.986	0.0	1	1.029
COM	1.88	0.153	0.967	0.057	0.995	0.985
OBS	16.341	0	0.696	0.237	0.813	0.438
OBS (Modified)	0.382	0.537	0.993	0	1	1.023

For a good model fit values, it is recommended that the normal Chi-Square (CMIN/df) to be less than 3, and TLI, AGFI and CFI are all more than 0.9. Also, a good value for RMSEA is a value less than 0.08. The modified model is presented in Figure 6. This model is ready to be tested for the model fit values.

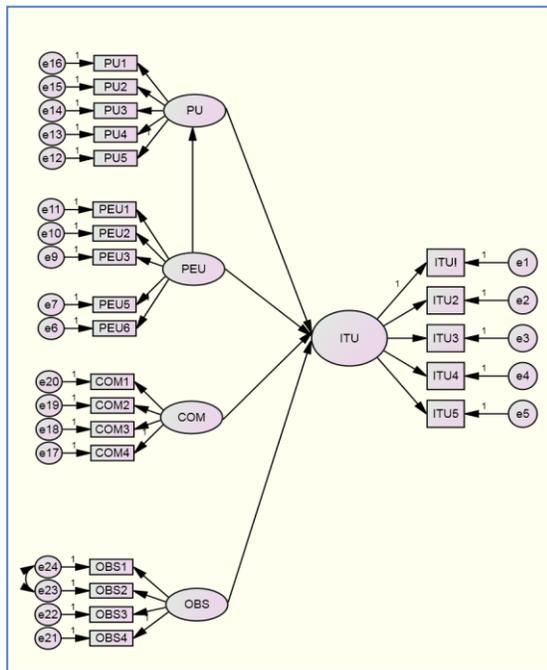


Figure 6. Modified Model

The values for the model fit are illustrated in Table 3.

TABLE 3. MODEL FIT INDICES AFTER MODIFICATION

RMSEA	TLI	CFI	P-Value	CMIN/df
0.069	0.819	0.843	0.0	2.323

As it is presented in Table 3, all model fit values are good, therefore the model is appropriate for the further analyses.

VII. CONCLUSION AND SUGGESTIONS

Introducing an adoption model for different environments is one of the key issues for the researchers. In this study, an adoption model for an educational environment was presented. This model was based on a qualitative study which was performed in advanced. As the second phase of a larger study, we tested our model and modified it. This model is ready for the final step of the analyses. It is recommended for the other researchers to use and test this model for electronic services in other educational environments.

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