

USERS' ADOPTION OF MOBILE SERVICES: A WORK IN PROGRESS STUDY ON MOBILE -SEAT-RESERVATION SYSTEM FOR RESTAURANTS

Emre Sezgin

METU, Informatics Institute
Ms.c.
E-mail: esezgin@metu.edu.tr

Sevgi Özkan

METU, Informatics Institute
Assoc. Prof. Ph.D.
E-mail: sevgiozk@metu.edu.tr

—Abstract —

Mobile platform is the popular field which enables users to be able to access information anytime, anywhere. This tempting feature also increased demand on mobile services. In this term, as a mobile service, a Mobile Restaurant Seat Reservation System (MSRS) provides a platform that helps users to search restaurants and makes reservations by mobile devices. However, like every other services in the market, a MSRS is needed to be able to serve accordingly to user needs. This paper presents a research investigating users' behavior towards MSRS, by employing Technology Acceptance Model that was adapted to measure user adoption of MSRS. The model was tested by conducting a survey on 45 participants. Results were statistically analyzed in terms of reliability and correlation. The findings of survey on MSRS acceptance were found promising. The next study will be including survey over higher sample size and elaborating analysis to find latent facts about factors affecting user adoption of MSRS. It is believed that this research would help mobile service providers to improve the MSRS applications considering affecting factors on users. In addition to that, this study would be valuable asset for researchers in the field of mobile service development.

Keywords: *Mobile service, Technology acceptance, Seat reservation, User adoption*

JEL Classification: O30, M15

1. INTRODUCTION

Today, mobile services became a major part of our life. Emergence of compact mobile computing devices like PDAs, smart phones and tablet PCs increased the demand for mobile services which enables users to maintain all activities without any reliance on PCs. Increasing accessibility to mobile services created a competitive new market which aims to satisfy user's need without compromising any feature that can be reachable through PCs. This new rapidly growing market increasingly accommodates new mobile services. In such environment, the researches about user behavior towards mobile services could be an advantage for improving mobile services (Chen, Yen and Chen, 2009). Regarding to this purpose, in this paper, a research was conducted about a specific mobile service in order to examine factors influencing user behavior towards this particular mobile service- Mobile Seat Reservation System (MSRS). The reasons for conducting research on MSRS adoption are scarcity of researches in this field and the high popularity of MSRS applications in the market. However, since MSRS presents variety of service branches like seat reservations for flights theatres and other live activities, it is difficult and trivial to involve all MSRS branches into a research study. Thus, this study focused on seat reservation systems specific for restaurants. Hereafter, "MSRS" will be referred to "MSRS for restaurants" in this paper. As the definition, MSRS is a mobile service that assists users to search restaurants on regional basis and enables to make reservations via mobile devices. On the application markets, MSRS applications keep their popularity (such as Foodspotting and Opentable) with average of million users for top applications. Considering this trend, in this study, it was aimed to investigate this branch to reveal factors influencing MSRS users.

About technological developments, the literature reviews presented that success of a service highly depends on the degree of user acceptance and adoption (Davis, 1989; Venkatesh & Davis, 2000). Thus, the degree of acceptance of mobile services by the end users is a significant aspect to measure. In the literature, assessment of human behavior towards particular technologies has been investigated in psychological studies for a long time. One of these studies was technology acceptance model (TAM) which was developed by F.D. Davis (1989). TAM aims for identifying factors influencing behaviors of users towards a technology. The theory argues that actual system use is affected by two main elements: perceived ease of use- PEOU ("The degree to which a person believes that using a particular system would be free of effort") and perceived usefulness-

PU (“The degree to which a person believes that using a particular system would enhance his or her job performance”)(Davis, 1989). However, by advances in technology, these elements were changed by the changing needs of users. Thus, it was inevitable that new factors would be effective in user behavior. In the studies, it was found that TAM theory has been successfully applied in variety of mobile service studies. In a study about mobile acceptance, Verkasalo et. al. (2010) identifies relations of technological barriers, behavioral control and enjoyment with particular mobile applications. Another study on mobile payment services emphasizes on compatibility, individual mobility and perceived security (Schierz et. al., 2010). Since mobile services provide a market for users, to assess users’ motivation on online transaction is important aspect. In this term, user motive became another factor to be considered about mobile service users (Lin, et al., 2010). Kim (2008) argues that cost of technology is also a fundamental factor in mobile appliances. In the study of Ha et. al (2007), perceived enjoyment, perceived attractiveness and perceived lower sacrifice are demonstrated as considerable factors being investigated in adoption of mobile services, specifically mobile games. In addition to those studies, complexity of service (Chen, et al., 2009), media influences and attitudes towards mobile innovations (Lopez-Nicolas, et al., 2008) and user context which aims to assess different mobile environments (Mallat, et al., 2009) are other factors that have been investigated as influential factors toward mobile services.

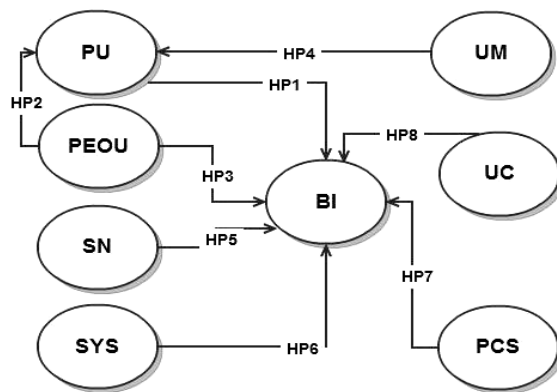
In this study, it was aimed to examine factors of users towards MSRS by employing Technology Acceptance Model of Davis (1989). The literature review assisted to determine the constructs (factors) affecting users intention to use mobile services. Considering these constructs, a model and hypotheses were developed and tested by survey method. Statistical analysis was used to validate correlation and reliability of the model.

2. METHODOLOGY

The first phase of study started with literature research to extract studies related to mobile services acceptance. Since the objective of study to assess user adoption towards MSRS by using TAM, the research refined with mobile services and TAM studies. “sciencedirect.com” and “scholar.google.com” are search engines which are being used to reach literature. The keywords being used are the variances of “mobile service, mobile, acceptance, adoption, Technology Acceptance Model, online”, “seat reservation”, “software”. In addition to that, it was aimed to include latest and emerging studies on mobile service adoption in

order to gain knowledge about influential factors, so publication date was limited between 2007 and 2010. To increase quality of the study, literature review was conducted within SCI, SSCI and SCI-EX indexed journals. In total, 21 papers were evaluated, and 8 papers were selected to be fully reviewed and involved in the study, With respect to significance levels of constructs within these papers, constructs which were being decided as influential factors for adoption of users of MSRS were extracted. The criteria in determining constructs were the degree of relevance between concept of studies and their degree of testability by survey. The constructs, their definitions and sources were given in Table 1. Primary resources represent the studies about acceptance of mobile services. Secondary resources are studies from literature that supports the constructs with alternative researches. For instance, Chen et al. (2009) used Behavioral Intention in assessing mobile services in logistics, and Davis (1989) supports to use of BI with his study. In other words, secondary resources are core studies that justify the constructs. By this way, it was aimed to base the study on verifiable constructs. But in addition to that, Social norms were added out of mobile service studies in order to search its effects on users. In Figure 1, the proposed model for user behavior towards MSRS was given. Considering this model the hypotheses and survey were developed.

Figure 1. Technology Acceptance Model for Users of MSRS



Hypotheses were developed based on proposed relations between constructs which were formed with respect to literature. In total 8 hypotheses were proposed considering the following form for each HP#: <Construct 1> towards using the mobile service positively influences <Construct 2>

Table 1. Constructs, definitions and the resources

Construct	Definition	Primary Resources	Secondary Resources
Behavioral Intention (BI)	“An individual’s performing a conscious act, such as deciding to accept (or use) a technology”	Lin et. al, 2010; Chen, 2009; López-Nicolás et. al, 2008	Davis, 1989
Perceived usefulness (PU)	“The degree to which a person believes that using a particular system would enhance his or her job performance”	Ha et al., 2007; Mallat et al., 2009; Schierz et al., 2010	Davis, 1989
Perceived ease of use (PEOU)	“The degree to which a person believes that using a particular system would be free of effort”	Ha et al., 2007; Mallat et al., 2009; Schierz et al., 2010	Davis, 1989
Perceived cost savings (PCS)	The degree of which a person believes that using a system will be cost saving including time, monetary and emotional effort.	Kim, 2008; Wang & Wang, 2010;	
Use context (UC)	“Factors representing the conditions that users meet when they use mobile services in different places and times”	Mallat et al., 2009	
User motive (UM)	“Internal and external factors that encourage consumers to act. Measured variables are personal interests and features of services”	Lin et al, 2010; Wang & Wang, 2010;	
Social norms (SN)	“The degree to which the social environment perceives particular technology as desirable”		Ajzen & Fishbein, 1980
System attributes (SYS)	“Objective factors in the environment that observers agree make an act easy to accomplish”	Wang & Wang, 2010	Chau & Hu, 2002; Thompson, et al., 1991

In the second phase, a survey was developed considering proposed model and hypotheses in order to test the model by mobile service users. The target sample was mobile service users and potential users who have access to mobile devices. SurveyMonkey.com was used to conduct survey via internet. Social network channels (Facebook, Google Plus and Twitter) were used to reach the participants. In total, 89 people were participated and 45 of them completed the survey.

In the survey, five point-likert type scaling was employed which ranges from (1) “strongly disagree” to (5) “strongly agree”. The survey consisted of 26 questions

which were divided into 2 parts. First part included demographic questions which aim to get information about gender, age, education level, mobile service experience, frequency of mobile service use, perceived skill in use and experience in MSRS. It consisted of 8 questions. Second part included 18 questions aiming to search for relations between constructs and to extract facts about factors that affect user behavior towards MSRS. About each construct minimum 2 questions was directed to users. In addition to that, one open-ended question was included to the survey for asking what users expect from a MSRS. It was aimed to get information about users expectations if, in any case, survey was insufficient to retrieve subtle details. A sample of survey was given in Table 2.

Table 2. Survey sample

Constructs	Item #	Survey questions (Items)
BI	BI1	I intend to use MSRS
	BI2	I plan that I would use MSRS
PU	PU1	I would find MSRS useful for restaurant reservation
	PU2	Using MSRS would enhance my effectiveness on restaurant reservations
PEOU	PEOU1	Learning to operate a MSRS would be easy for me
	PEOU2	My interaction with a MSRS would be clear and understandable
PCS	PCS1	Daily, I can avoid any unnecessary cost and time by using MSRS
	PCS2	MSRS is more cost effective than other technologies in making reservations
UC	UC1	MSRS should be helpful if I'm in a hurry or need to make reservation fast
	UC2	MSRS should be useful if I need to make reservation unexpectedly and have not prepared for selecting a place
UM	UM1	I prefer that MSRS can keep my personal preference for restaurant reservations
	UM3	I prefer to have trust to MSRS about secrecy of personal data
SN	SN1	Media and social networks encourage me to use MSRS

3. RESULTS

The survey was conducted via internet and distributed by social networking channels. Demographic results of survey were as followings. Number of participants who joined to the study was 45 whose age varies between 23 and 39, and there were 64% male and 36% female. The sample group mostly consisted of students who have bachelor's degree or master's degree (86%). The remaining

participants had graduated from secondary school, high school or college. The participants were experienced (3-5 years) in mobile service use and all of the participants use MSRS at least 2-3 times in a week. In addition to that, more than 79% of them stated that their skill level in using mobile services good or moderate. The participants' experience in using MSRS varies between "less than 1 year" and "3-5 years".

3.1. Reliability Analysis

This analysis was conducted in order to measure internal consistency of constructs. The reliability of the constructs has been measured by calculating the Cronbach's Alpha values by the software of PASW Statistics 18. The results, given in Table 3-a, indicate that total reliability is significantly high by .88. Although the system seems reliable according to reliability results in total, each construct should be evaluated individually in order to understand their reliability level. However, reliability results in construct level showed that there are no values lower than 0.7, which is the threshold value to accept construct reliable (Steel & Torrie, 1960).

Table 3. Tables of constructs' reliability (a) and Problematic items (b)

(a)	Constructs	C.Alpha Value	(b)	Items	SN1	Items	UM3
	BI	0.81		BI1	.344*	BI1	.115
	PU	0.82		PU1	.513**	BI2	.382*
	PEOU	0.94		PEOU1	.667**	PEOU2	.245
	PCS	0.76		PCS1	.494**	PCS2	.416**
	UC	0.83		UC1	.561**	UC1	.811**
	UM	0.77		UM1	.512**	UM1	.775**
	SN	0.71		SN2	.543**	SN2	.130
	SYS	0.91		SYS1	.674**	SYS2	.622**
	Total	0.88		SYS2	.657**		

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

3.2. Correlation Analysis

This analysis presented that if the items (survey questions) were correlated with other items within the construct or if they correlated with other items from other constructs. It is important for items to correlate within constructs in order to provide consistency and accuracy within the model. The correlations between

survey items have been tested by using Pearson Correlation test. The significance of correlation levels checked for survey items in order to detect allocation of items under expected constructs. The results revealed that the items in the same construct category were usually correlated. However, there were two exceptions (Items of SN1 and UM3). They demonstrated multiple correlations with other constructs, and they were eliminated. Table 3-b presents the correlation of SN1 and UM3 items with other items of constructs.

4. DISCUSSION AND CONCLUSION

In this study, it was aimed to develop a model to assess user intention towards MSRS. Study started with a literature review over adoption of mobile services with the theory of TAM. The findings assisted to determine factors, to develop the model and to form hypotheses. Survey study was conducted to reach users. 45 users participated to study, and results were statistically analyzed. Demographical results presented that participants consisted of young and middle aged people who was mostly educated and experienced in mobile services. Reliability analysis demonstrated that constructs were consistent within the model. It implies that the assessment of model was found reliable. Correlation analysis presented the correlation between items of constructs. Mainly it proved that items in each construct were allocated correctly, which means items serves to their purposes. However, some items (SN1, UM3) presented multiple correlations with irrelevant constructs. They were eliminated in order to accurately assess the factors. To sum up, the model explained intention of users towards MSRS sufficiently in terms of reliability and correlation at the first step. Analysis showed that Perceived usefulness, Perceived ease of use, System attributes, Perceived cost savings, User Context, User motives and Social norms are effective constructs which helps to assess user intentions to use MSRS. This data constituted important input for the next step of the study which will include higher sample size.

The open ended question supported constructs with enabling to get variety of feedbacks from users. Considering the feedbacks, findings about the study presented that users expect to get specific, simple tasks to complete by the possible easiest and fastest way. Preliminary implications provided that MSRS enhance users' expectations from the system. It was also preferable if the system provide cost effective ways and options in terms of money and time. The system which is helpful in unexpected conditions and adaptive in today's condition was appreciated. It was including security of system and customization by personal

interests. As social entities, users were affected by their environment. Thus, social networking in MSRS was found significant. In addition to that, it was expected that the service should be running without problem in every operating system platform and even in smart phones with low system specifications. On the other side, according to the feedbacks, joyful user interface and customizability were preferable features that are expected from a MSRS.

Since this study was a preliminary step for assessing intention towards MSRS, the next step will be conducting a broader survey on higher amount of samples which enables to make advanced analysis that helps to reveal latent facts about user intention towards the MSRS. In addition to that, further studies can be conducted to apply the model on different mobile services by comparing effective factors among the services. It is believed that this study will be valuable resource for developers of mobile service in order to comprehend user needs for MSRS.

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