Factors Affecting Social Network Sites Usage on Smartphones of Students in Turkey

Fethi Calisir, Levent Atahan, and Miray Saracoglu

***Abstract*— Recent developments in technology make it possible to be able to connect to the Internet from anywhere, anytime through smart phones. This study aims to identify the factors that affect social network use on Smartphones of students. An extended version of Technology Acceptance Model (TAM) is shown. A questionnaire was created and applied to students from Turkey in order to examine the proposed model. Analysis of 155 participants results showed that behavioral intention to use, perceived enjoyment, perceived ease of use, perceived usefulness and social influence has either direct or indirect effects on use of social networks on Smartphones among students.**

***Index Terms*— mobile internet, perceived enjoyment, Smartphones, social web sites, technology acceptance model (TAM)**

I. Introduction

In the last few years, there has been a huge growth of user generated Internet content, through the use of tools that have generally been defined as online social media [1]. These social networking sites have become a part of many individual's daily life very quickly and created important social platforms for computer- mediated communication [2]. Social network sites can be defined as web-based services that allow individuals to create a profile that can be either accessed by everyone or a limited number of other users; construct a list of other users with whom they have a shared connection and view and traverse their list of connections and those made by others within the organization. The nature of these connections and their context varies from site to site [3]. There are many different successful examples that serve different purposes, (i.e. Facebook for general social interactions with friends, Twitter for microblogging, LinkedIn for professional acquaintances, Flickr and YouTube for photo and video sharing) though they offer something in common: a new method of communication.

Smartphone is a term used for defining phones with extra features compared to a regular feature phone. Even though, there isn't a generally accepted definition for smartphone. It is possible to simply define it as a combination of a regular telephone set with an organizer that has features like camera, touch screen, WI-Fi and 3G capabilities, portable media players and runs on a mobile operating system [4]. Nowadays, mobile browsing through Smartphones consist a big share of total internet traffic. With major mobile phone companies releasing Smartphones which sell millions of units, the majority of the people in developed and developing countries possesses the capability of constantly being connected to the Internet. According to the International Telecommunication Union of the United Nations, there will be more than2 billion mobile Internet users in the world by the end of 2013, which includes 75% of the population in developed countries. Mobile-broadband subscriptions have grown from 268 million in 2007 to 2.1 billion in 2013. This reflects an average annual growth rate of 40% [5].

Innovative social network services are concentrating their efforts on making it easier for users to participate and to engage in providers' services more freely. There has been a big increase in the number of people who feel they are benefiting from social network services. The most famous social network service, Facebook is currently the most visited websites in the world according to alexa.com, a website specialized on web traffic statistics [6]. Despite the services' perceived impact, the amount of research conducted on identifying the psychological process of using social network services are not high [7]. There are studies that question the purposes behind using social network websites and Smartphones individually, while there isn't a broad discipline that combines these items [1] -[7]. With an expected 30% of growth over mobile users from 2012 to 2013, it becomes crucial that social networks try to attract mobile users to their websites [5]. This study aims to fill this gap by investigating the factors bearing on social network usage on Smartphones. It also focuses on a specific demographic, students. Statistics indicate that a large majority of the social network users is teenagers and young adults [8].

This study aims to examine the components that bear on social network usage on Smartphones among students in Turkey. An extended version of Technology Acceptance Model was used to analyze the affecting factors. The following section includes the review of the existing literature about the field. This is followed by the methodology and results of the conducted survey. The paper concludes with a discussion of the findings and suggestions for future research.

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II. Technology Acceptance Model

The Technology Acceptance Model (TAM) is based on the Theory of Reasoned Action (TRA) originated by the Theory of Planned Behavior (TPB). According to Theory of Reasoned Action, humans are rational enough to their attitudes and subjective norm affect behavior intention, which in turn induces a high correlation to actual behavior. This theory has been useful to explain the user's acceptance for using information systems [7]. TAM was proposed by Davis et al. as a way to explain and predict technology acceptance of an information system by its end users. It proposes six constructs; actual system use, behavioral intention to use, attitude towards using, perceived usefulness, perceived ease of use and external characteristics. Many studies have demonstrated that without the mediating attitude toward the behavior explanatory power of the model is equally good [9]. Reference [10] added subjective norms as a part of social influence as a direct determinant to both intention and perceived usefulness in an extension to TAM.

The basic TAM explains and predicts use intention and usage by two main constructs, perceived usefulness and perceived ease of use. These two factors are easy to understand and implement. However, in this study, based on extensions of the TAM approach, other constructs have been included in the model which may turn out to be important in the context of mobile social networking. These are perceived enjoyment, social influence and perceived mobility value.

III. Proposed Model and Hypotheses

This study will identify factors that may influence students' use of smartphones to access social networks. For this purpose an extended version of technology acceptance model is applied. Along with perceived usefulness, perceived ease of use behavioral intention and actual behavior, which are included in the original formulation of TAM, proposed extension includes perceived enjoyment, social influence and perceived mobility value. Dependent variable of the model is the actual usage of Smartphones to access social networks.

A. Perceived Mobility Value

Mobility enables users to receive and impart information regardless of their location via mobile devices. The perceived mobility value represents the importance of mobility to individuals. This value expands the usage of the system by making it independent from location and consequently affects perceived usefulness [11]. Thus we hypothesize:

H1: Perceived mobility value has a positive impact on perceived usefulness.

B. Perceived Enjoyment

Perceived enjoyment is defined as "the extent to which the action of using the technology is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" [11]. It is supported by other studies that perceived enjoyment has both a direct effect, and an indirect effect via having a positive effect on perceived ease of use, on behavioral intention [11] -[13]. Individuals deem it easier to use a technological system if it is enjoyable to do. Another study among students in Malaysia showed that perceived enjoyment has a strong effect on social network usage [14]. The nature of social networks also allows users to engage in different activities for entertainment. Therefore we hypothesize:

H2: Perceived enjoyment has a positive effect on perceived ease of use.

H3: Perceived enjoyment has a positive effect on perceived usefulness.

H4: Perceived enjoyment has a positive effect on behavioral intention to apply.

C. Social Influence

Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system. It is divided into 3 parts; subjective norm, social factors, image: Subjective norm is the person's perception what that most people who are important to him think about the behavior in question. Social factors consider the incorporation of the group's culture and relationships the individual has with others in specific social situations. Image is the positive result of the usage of technological system of perception of one's social status [15]. By acting in a way that is consistent with group norms and approved by the group, an individual achieves acceptance of the group as well as the social reinforcement that accompanies such a membership of a social group [10]. Therefore, even though it is indirect, social influence is thought to have an effect on perceived usefulness and behavioral intention and we hypothesize:

H5: Social influence has a positive effect on perceived usefulness.

H6: Social influence has a positive effect on behavioral intention to apply.

D. Perceived Usefulness

Perceived usefulness is the degree to which a person believes that using a particular system would enhance his performance. This variable has been used extensively by many studies through the years since the technology acceptance model was first proposed and its effects on behavioral intention to use is supported by many studies [16]. Thus we hypothesize:

H7: Perceived usefulness has a positive effect on behavioral intention to apply.

E. Modeling the determinants of perceived ease of use

Perceived ease of use is the degree to which a person believes that using a particular system would be free of effort. Extensive research on the subject has provided evidence that perceived ease of use has a significant effect

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on intention to use, directly or indirectly through its effect on perceived usefulness [17], [18]. Thus we hypothesize:

H8: Perceived ease of use has a positive effect on perceived usefulness.

H9: Perceived ease of use has a positive effect on behavioral intention to apply.

F. Behavioral Intention to Use

Behavioral intention to use represents the intention one carry to use a particular arrangement. Both original and extended versions of technology acceptance model, intention to use is the only variable that has an effect on actual usage. The role of intention as a predictor of usage is critical and has been well established in the literature [10]. Thus we hypothesize:

H10: Behavioral intention to use has a positive effect on actual usage.

IV. Methodology

In the present study, a 21-item questionnaire was created from literature for examining the factors influencing students' social network usage through smartphones.

Actual usage was measured by a single item, the time participants spend on social networks on their Smartphones [12]. Intention to use, perceived ease of use and perceived usefulness were each measured by 3 sub-items [11], [15]. Perceived mobility value was measured by 2 items [11]. Percieved enjoyment was measured by 4 items [11], [12]. Social influence was measured by 5 items [10], [15].

Excluding the demographic questions which were asked at the beginning of the questionnaire, all of the items were measured by a 7 point Likert-type scale (ranging from 7 indicating strongly agree to 1 indicating strongly disagree). The questionnaire was posted online, and was sent to a sample of students from universities in Turkey. A total of 155 surveys were deemed to be suitable for analysis after eliminating the surveys that does not meet the criteria of being a student and using a smartphone. Among 155 students 81 were females and 74 were males. The participants had an average age of 22.26 with youngest being 16 and oldest being 31 years old. The statistics regarding their social network and Smartphone usage can be found in Table I.

TABLE I
Demographic Characteristics and Internet / Smartphone Usage of Respondents

Measure	Items	Values
Gender	Male	81 (52.3%)
	Female	74 (47.7 %)
Age	Average	22.26
	Maximum	31
	Minimum	16
	Std. Dev.	2.66
Used Social Networks	Facebook	98.7%
	Twitter	67.1%
	LinkedIn	39.4%
	Google+	29%
	Tumblr	14.8%
	Last.fm	14.2%
	deviantART	10.3%
	Flickr	6.5%
	Myspace	3.9%
	Pinterest	2.6%
	Others	8.4%
Internet Usage Frequency on Smartphones	Never	2.6%
	1-3 hours per month	24%
	1-3 hours per week	29.9%
	1-3 hours per day	32.5%
	more than 3 hours per day	11%

TABLE II
Internal Reliability using Cronbach's Alphas

Item	A
Actual usage	0.867
Behavior intention to use	0.802
Social influence	0.859
Perceived usefulness	0.741
Perceived ease of use	0.815
Perceived Enjoyment	0.813
Perceived Mobility Value	0.736

V. Results

SPSS was the principal instrument used for the statistical analysis of the data for this study. Reliability of the ingredients used in the questionnaire was calculated using Cronbach's Alpha procedures in SPSS. The results are summarized in Table II. Reliability of the items change from 0.736 to 0.867 and all values are in the accepted range of 0.70 and higher, therefore all of the constructs are used in the analysis without eliminating any of the items originally proposed in the model.

To test the robustness of the hypotheses, regression analysis was utilized. Results are presented in Table III.

Out of the 10 proposed hypotheses, 7 were supported by the data analysis and 3 were rejected.

According to the results, the intention to use is a determinant of actual usage. Whereas perceived ease of use, perceived usefulness and perceived enjoyment are important determinants of intention to employ. It is also found that perceived enjoyment has a significant effect on perceived usefulness. In rejecting hypotheses it was found that perceived mobility value doesn't have a significant effect on perceived usefulness; social influence doesn't have an effect on intention to use and perceived ease of use doesn't have a significant effect on perceived usefulness. While these results are generally in line with the literature, the differences will be discussed in the next section.

In terms of explanatory power, the model explains 13.9% of the variance in actual usage (R^2 = 0.139), 55.4% of the

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variance in intention to use (R^2 = 0.554), 17.2% of the variance in perceived ease of use (R^2 = 0.172) and 41.3% of the variance in perceived usefulness (R^2 = 0.413).

TABLE III
RESULTS OF THE REGRESSION ANALYSIS

Path	t-value	Sig.	β	Hypothesis
Intention to use → Actual use	4.976	0.000	0.373	H10 (Supported)
Perceived enjoyment → Intention to use	5.056	0.000	0.364	H4 (Supported)
Social influence → Intention to use	-1.336	0.184	-0.085	H6 (Rejected)
Perceived usefulness → Intention to use	4.772	0.000	0.331	H7 (Supported)
Perceived ease of use → Intention to use	3.600	0.000	0.217	H9 (Supported)
Perceived mobility value → Perceived usefulness	1.597	0.112	0.124	H1 (Rejected)
Perceived enjoyment → perceived usefulness	4.762	0.000	0.414	H3 (Supported)
Social influence → Perceived usefulness	2.930	0.004	0.216	H5 (Supported)
Perceived ease of use → Perceived usefulness	0.841	0.060	0.402	H8 (Rejected)
Perceived enjoyment → Perceived ease of use	5.642	0.000	0.415	H2 (Supported)

VI. CONCLUSION AND DISCUSSION

In this study, factors affecting social network usage on Smartphones were investigated. The majority of the hypothesized relationships was supported by the data collected.

In the proposed model, perceived enjoyment was considered to be an antecedent to perceived ease of use, perceived usefulness and intention to use. Data analysis confirmed this hypothesis and a positive relationship was found between these constructs. These findings are similar to those in the literature. [11]-[13]. As one of the main purpose of using social networks are personal enjoyment, it is not surprising to discover a strong relationship between perceived enjoyment and perceived usefulness. Enjoying the use of a particular system helps the perception that it is more useful and easier to use. Consequently, it raises the intention to use the said system.

It is found that social influence has a positive effect on perceived usefulness, whereas it does not have an effect on intention to use. The effect of social influence on perceived usefulness is in line with the literature. Social norms and image, which are the precursors of social influence, have a positive effect on the usefulness [10]. Considering the popularity of the social networks and their social implications among younger people, it is surprising to see that social influence does not have an effect on intention to use. This could be explained by the notion that it is automatically expected for people to use the social networks, especially considering the fact that of the 153 of 155 participants use Facebook which is by far the largest and most renowned social network website.

The results also showed that, perceived mobility value does not have an effect on perceived usefulness. This is a different result compared to previous studies in which such an outcome was observed [11]. However, this difference could be explained by the current level of mobile technology. It is possible that the current generation of students considers social networks as mediums that should be able to be passed from anywhere, anytime due to their accession to the immense number of advanced technological devices. Therefore, it can be stated that mobility has become a necessity for internet sites, rather than a feature that helps usefulness.

According to the analysis, there was no relationship between perceived ease of use and perceived usefulness. As this relationship is a fundamental role of TAM, there are many previous studies that showed that there is a relationship between these constructs [12] -[15]. While this is a significant difference with previous findings, it could be explained by the demographic characteristics of the subject group participated in this study. As the ages of the participants ranged from 16 to 31 with an average of 22 years, it could be claimed that adapting to the new technologies are easier for young people, thus they do not consider ease of use as an important factor.

The results indicated that perceived usefulness and perceived ease of use had also a positive effect on intention to use. Effect of perceived usefulness on intention to use is a well-documented relationship since the first studies of Davis et al. regarding TAM [9]. Other works on Smartphones and social networks also confirmed this relationship [4], [14]. The effect of perceived ease of use on intention to use is also supported by previous studies [10], [13].

A positive relationship between the intention to use and actual usage was also found. Even though it is a relatively weak relationship, it should be taken into account that there are many social and economic factors other than intention when it comes to using a Smartphone to access social networks and in reality intention may not always be enough to actually access the technological system.

These survey findings indicate that young people consider their entertainment a big factor when it comes to using social networks on Smartphones. From a managerial standpoint, this implicates that social networks should put entertainment ahead of other features they offer in order to gain the best attention of scholars.

Like in every field, there are a number of restrictions attached to this research. As the questionnaire was a self-applied one, it is possible that the responses of the subjects may be subjective to their moods and feelings or other

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factors at the time the survey was completed. Therefore, the results are limited by the accuracy of the responses gathered. For future research, different constructs could be added to model to better explain the purposes of using social networks on Smartphones. Also different demographic characteristics could be taken into account, as the consequences would be potentially different for different demographic groups.

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