REVISITING TAM TO EXPLAIN SOCIAL MEDIA USAGE BEHAVIOR- THE CASE OF FACEBOOK

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ABSTRACT

Given the widespread popularity of social media, such as Twitter, Facebook, Google+, and LinkedIn, theorizing and understanding the user attitude and usage behavior of social media site is fundamental in developing future understandings and deployment of these new technologies. One approach to such studies on drivers of social media usage behavior would be to revisit the technology acceptance model (TAM) proposed by Davis (1986). The influences on the intention of using social networking based on perceived ease of use, the user's critical mass, social networking site capability, perceived playfulness, trustworthiness, and perceived usefulness is empirically examined with a primary data set of 398 users of Facebook gathered from a web-based questionnaire survey.

Keywords: TAM, Facebook, social media

INTRODUCTION

Social media, such as Twitter, Facebook, Google+, and LinkedIn, have been defined as a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated contents (Kaplan ad Haenlein, 2010). In particular, *channels* (e.g., email) and *platforms* (e.g., intranets) are two categories of social media widely used within an organization (McAfee, 2006). Based on a social presence/media richness and self-presentation/self-disclosure, Kaplan and Haenlein (2010) classified social media into *blogs (*e.g. Open Diary, Technirati, and LiveJournal, etc.), *social networking sites* (e.g., Facebook, MySpace, Google+), *virtual social worlds*(e.g., Second Life), *collaborative projects* (e.g., Wikipedia), *content communities* (e.g., YouTube, Flickr), and *virtual game worlds* (e.g., World of Warcraft).

Besides the individual users, the social media phenomenon is becoming equally important and exciting for businesses as it opens new channels for interacting with consumers, and other important stakeholders such as suppliers and employees. For businesses, social media is being integrated with the various aspects of business processes and operations. What is causing such widespread usage of social media by the billions of users is fundamental to understanding and advancing any future theories in the area of social media. The widespread popularity of these social media sites suggests that these online technologies are successful because of the acceptance and usage in the personal, social, and professional life of individual users. If the usage behavior of social media by the individual users is primarily *voluntary*, then the causes of

these behaviors have to be rooted in the personal intentions and motives. According to Fishbein and Ajzen (1975) and Doll and Torkzadeh (1988), such affective attitude and intentions lead to actual usage of the system.

The overall purpose of this study is twofold. First, it aims to test the TAM (Davis, 1986) that has been evaluated in various types of context in the past. In order to benefit professionals in developing best practices and researchers who are interested in developing theories related to social media, we revisit TAM (Davis, 1986) to explain social media usage behavior. However, TAM was developed with an original emphasis on the design of system characteristics and fails to take into account some salient characteristics of social media. For example, TAM theory does not address the roles of other users in influencing an individual's attitude towards social media, and consequently the usage behavior. The beneficiaries of positive externalities that a social media site such as Facebook has to offer are the hundreds of millions of its users- with each user having its own social media network. Therefore, the mass of users in social media connected to a user could be a critical component to explain the social media usage behavior. Therefore, a second objective of our study is to revise the TAM model with additional constructs, such as critical mass of a user that past literatures have recognized as important factors influencing usage behavior of a technology.

To empirically investigate the new dimensions of TAM for a social media user proposed in the current study, we use primary data collected from the users of Facebook. Based on our review of existing scientific literatures on social media, few empirical studies have been conducted to scientifically evaluate and explain the usage behavior of social media using Facebook. A validated instrument of usage behavior of social media can provide usability experts and practitioners with a validated tool to assess social media acceptance and usage behavior. This can help us gain a better understanding of "who is and who is not using these sites, why and for what purposes" (Boyd and Ellison, 2007).

THEORY DEVELOPMENT

TAM was developed by Davis (1986) to theorize the usage behavior of computer technology. TAM specifically explained the determinants of computer acceptance that are general and capable of explaining user behavior across a broad range of end-user computing technologies and the user population (Davis, Bagozzi, and Warshaw, 1989). Davis (1989) proposed that behavioral intentions to use a mainframe e-mail system (called "*Profs*") and a data editing system (called "*XEDIT*") were the result of two beliefs, '*perceived usefulness*' and '*perceived ease of use'* of the different systems. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived ease of use has been defined as "the degree to which a person believes that using a particular system would be free of effort" (Venkatesh and Davis, 2000). Perceived usefulness and perceived ease of use influences the individual's attitudes towards using technology (*intention*). According to TAM, intentions to use technology will determine whether a person will use the technology or not (*behavior*).

According to the most popular social media site, Facebook, the number of its *active* users in 2011 has crossed 800 million. Official statistics of Facebook (Facebook, 2011) also reported that more than 50% of its active users log unto its site each day and interact with more than 900 million objects (pages, groups, events, community pages, etc.). Such intense and hyperpersonal communication (Walther, 1996) is indicative of an overall positive attitude users have. Further, the positive attitude toward social media should be a result of an overall favorable social media usage experience. Continual voluntary usage and engagement with social media related activities will continue if and only if the perceived benefits from such usage behaviors lead to a positive attitude towards social media. In the current study we define *perceived usefulness* as the extent to which the social media user believes that using a particular social media site helps to meet the related goal-driven needs of the individual. Each social media application offers certain primary services, and accordingly offers various types of tools and applications to add utilitarian value to its audiences. For example, Flickr is for photo sharing and LinkedIn is for building professional networks. Perceived usefulness represents advantageous results derived from attributes of the technology being used. The benefits can be physiological, psychological, sociological or material in nature (Gutman, 1982).

Pew Research (Madden, 2010) points out, the use of Facebook and LinkedIn by adults aged fifty to sixty-four grew by 88% between April 2009 and May 2010. Similarly, another report (Carmichael, 2011) suggests that about 40% of users of Facebook are 35 years and above. The growing diversity of people signing up with social media suggest that it should be relatively easy to create an account and begin using and enjoying the services. We define *perceived ease of use* as the degree to which the social media site is free of effort. The concept of ease of use relates to Zipf's (1949) principle *of least effort* that states that each individual will adopt a course of action that will involve the least average work from the person. To support such wide demographics of users on these social media sites, the design of modules, applications, and tools, needs to be user-centric. Most studies about TAM assume also that perceived ease of use is directly linked to perceived usefulness (Davis, 1989; Davis et al., 2002; Nysveen et al., 2005a; 2005b). Based on TAM, we propose the following hypothesis for social media:

H1: Perceived ease of use of social media site is positively related to perceived usefulness.

The value proposition of social media in terms of perceived usefulness must be tied to other users in the network and the information that is produced and shared among these members. Users belonging to a social media user's network are labeled as "*Friends*", "*Contacts*", "*Fans*", "*Followers*", etc. We define *critical mass* of social media users as the extent of the membership of people that matters most in a user's social media network. Extending the economic theory of positive externalities, the theory of critical mass states that once a certain number of users (critical mass) have been attracted (or achieved), use and usage should spread rapidly throughout the community (Cameron and Webster, 2005).

This user's group or the critical mass is responsible for collectively generating and exchanging information. Lampe, Ellison, and Steinfield (2006) found that Facebook users engage in "searching" for people with whom they have an offline connection more than they "browse" for complete strangers to meet indicating the support for the construct of critical mass. According to Ellison, Steinfield, and Lampe (2007), Facebook is used to maintain existing offline relationships,

instead of trying to meet new people. Social media users frequently communicate with those people who are already a part of their extended social networks offline and, thus, are the people in the user's online network that are more closer. Social media related activities, for example, sharing pictures and news, providing updates, etc., defines the social media usage behavior. These behaviors help to meet the needs of the user, which impact the attitude formed toward the social media site by a user. We therefore propose,

H2: Critical mass of a social media user is positively related to perceived usefulness.

The growing usage of social media sites can also be attributed to the availability and effectiveness of tools and features to meet a user's need for connecting people and helping them share information. We define social media *capabilities* in terms of the site's features, applications, and social media tools to benefit the user's need for social media activities. The capabilities of Facebook includes editing walls, postings, and comments, automatic news feeds, customizable modules, event creation and messaging, groups and community page development tools, chat, etc. According to the Facebook website, more than 70 international languages are available for communication and more than 7 million applications and websites are integrated with Facebook. Further, each month more than 500 million people use an application on Facebook or experience a Facebook platform on another websites including smart phones and mobile devices (Facebook.com). This is also true for other social media sites such as YouTube or LinkedIn, each providing relevant tools and features that enhance the user's experience and utilitarian value of social media related activities. Exchanges of diverse and rich media content and the availability of applications enabling high levels of interactivity at social media sites also provides support to the media richness theory of Daft and Lengel (1986). The social media site's capabilities coupled with applications serve its users with a greater social presence therefore benefitting its users. Hence,

H3: Capability of social media is positively related to the perceived usefulness.

Literature in consumer behavior and social psychology identify that mixing work and play can improve productivity and performance (Stephenson, 1967). Extending the definition provided by Davis et al. (1989), we define *perceived playfulness* of social media to be the extent to which the social media related activities are perceived to be fun and enjoyable apart from any performance consequences that may be anticipated. Davis et al. (1989) found that while perceived usefulness emerged as the major determinant of computer acceptance in the workplace, enjoyment and fun had a significant effect beyond perceived usefulness. Perceived playfulness of technology has also been conceptualized as the hedonic value of a technology (Van der Heijden, 2004). These pleasure oriented experiences and consumption or the hedonic value of a technology is expected to be motivated by the desire for pleasure, fantasy, and fun by the users (Strahilevitz et al., 1998). The perceived utilitarian value of a technology can be further enhanced if the users find such a technology to perceive hedonic value. Empirical and field studies on the perceived value of computer applications, such as video games (Hsu et al., 2005; Chen, 2007) and information systems (Van der Heijden 2004) have identified a simultaneous presence of varying degrees of utilitarian value and hedonic value in technology usage behavior (Davis, 1989). In their study of e-commerce, Wolfinbarger and Gilly (2001) contended that when hedonists are satisfied, the frequency of visiting a website increases.

One of the greatest benefits of using social media is because of the interactive social activities among the users who use text, image, hyperlinks, and videos while communicating with one another. Such interactivity and features added with fun and enjoyment can further enhance the tangible benefits of the social media site. Therefore,

H4: Perceived playfulness of social media for its user is related positively with the perceived benefit.

TAM assumes that beliefs or attitudes about the perceived usefulness determine the intention to use the technology which, then, leads to actual usage (Davis 1989; Venkatesh and Davis 2000). For our current study on social media, we operationalize *intention to use* as the continued intention to perform social media related activities using the social media site (Fishbein and Ajzen, 1975). Further, we define *actual use* in terms of the frequency of social media used by the user. The TAM model based the relationship of perceived usefulness, intention to use, and actual use from the Theory of Reasoned Action model (TRA) (Ajzen and Fisbein, 1980). Based on the TRA, we argue that a social media user's behavior to use social media is determined by their intention to perform the behavior and that this intention is, in turn, a function of his/her perceived benefit from the social media. Davis (1989) suggested revising the original TAM by removing the "attitude" construct, and the study results supported that the revised TAM model was a powerful model for predicting and explaining user behavior on only three theoretical constructs of ease of use, perceived usefulness and intention to use.

There is also extensive empirical evidence accumulated over a decade that has examined the belief-intention-behavior causality in the context of usage of various technologies (Davis et al, 1989; Davis 1989; Igbaria et al., 1996), including the online environment (Chen et al., 2002; Limayem et al., 2000). We therefore conclude that a user engages in a social media related activity, experiences the benefits, and develops a future intention to use the activity. The future intention leads to further engagement with the social media site; in a manner that is consistent with the intentions formed from the past experience. This causality helps to explain the heavy usage of social media sites such as Facebook and Twitter. Based on the TAM, we hypothesize:

H5: Perceived usefulness of social media is related positively with the intention to use the social media site.

H6: Intention to use the social media site is related positively with the actual use of social media.

Based on our literature review, we revise the TAM (Davis, 1986) to represent our research model of Figure 1. In the following section we report the empirical study of our proposed model which is proposed to explain the social media acceptance and usage behavior of its end user.

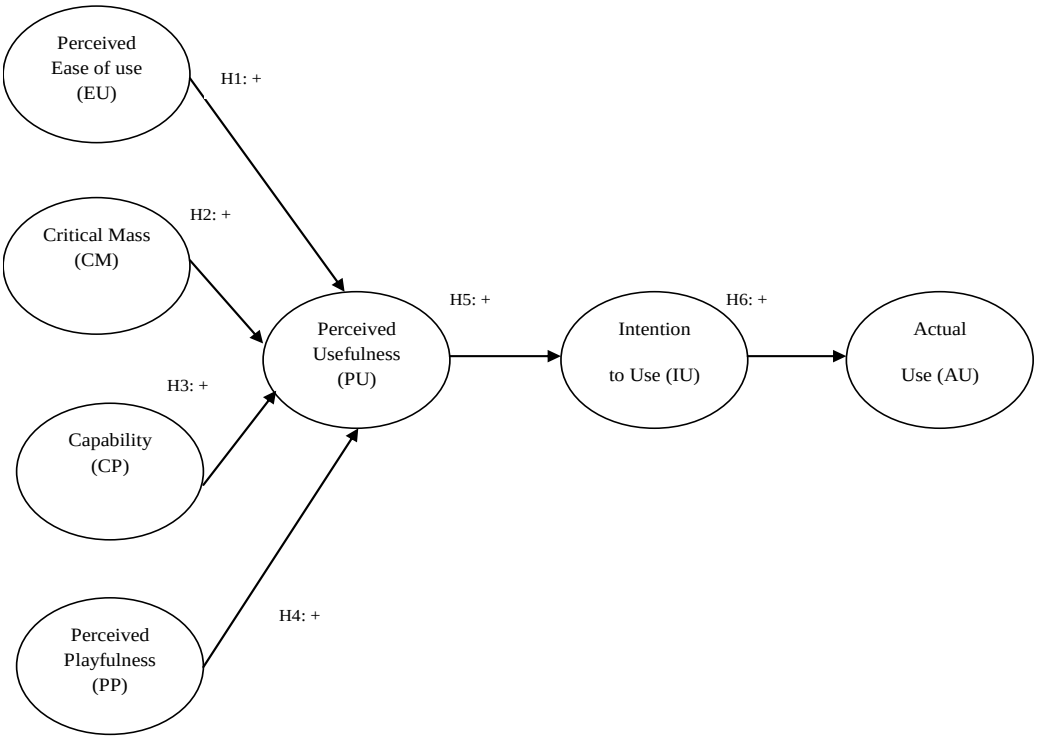

Figure 1: Revised TAM for social media

RESEARCH METHODS

For our empirical study, a total of 900 full-time students from two business schools (one public university and one private university) in the US were simultaneously requested to participate in an online survey. These students were enrolled as full-time students in either undergraduate or graduate level business programs. Our online survey asked respondents to answer the survey regarding their experiences as regular usage of Facebook. A total of 405 responses were received from the initial announcement. In order to minimize bias, no incentive was provided to the students for their participation. Approximately two weeks after the first announcement, an e-mail reminder was sent which collected 35 additional responses. Out of total 440 responses collected during the two waves of survey request, 51 incomplete responses were dropped. The final sample size was 389 resulting in a response rate of 43.2% (389/900). To evaluate early/late respondent bias of the sample, a χ^2 –test of differences between the observed and expected (population) frequencies for gender (male and female) was analyzed. The χ^2 –test showed that the distribution of our sample fits very well with the distribution of population (calculated $\chi^2 <$ critical χ^2).

The constructs of our proposed research model in Figure 2 were developed based on the following procedures. First, an extensive literature review was performed which included theoretical and empirical literature in the areas of TAM, TRA and TPB and other related works in the area of e-commerce and end user computer satisfaction (Doll and Torkzadeh, 1988, DeLone and McLean, 2003). Second, structured interviews with one corporate social media manager responsible for the corporate accounts on Facebook, Twitter, and LinkedIn, and three students who use social media sites (Facebook, YouTube, LinkedIn, Flickr, and Twitter), and

one university professor teaching e-business related courses in a large Midwest US university helped us define the domain of constructs and facilitated in item generations.

Of the finalized 29 items, five items measure perceived ease of use (EU), five items measure perceived usefulness (PU), three times measure critical mass (CM), three items measure social media capability (CP), four items measure perceived playfulness (PP), four items measure trustworthiness (TW) of social media site, three items measure intention to use (IU) the social media site, and two items measure actual use (AU) of social media. The descriptions of finalized items can be found in Table 1. A five-point Likert scale was used, where 1 = strongly disagree and 5 = strongly agree, to identify the responses for each item..

Variable	Item Description		
Perceived Ease of Use (EU)			
EU2	Facebook is flexible to interact with.		
EU3	I find it easy to get Facebook to do what I want to do.		
EU4	It is easy to become skillful at using Facebook.		
EU5	I find Facebook easy to use.		
EU6	Interaction with Facebook is clear and understandable.		
Perceived Usefulness(PU)			
PU2	Using Facebook enables me to get re-connected with people that matter to me.		
PU3	I find Facebook useful in my personal life.		
PU4	Using Facebook enhances my effectiveness to stay in touch with others.		
PU5	Using Facebook makes it easier to stay in touch.		
PU6	Using Facebook makes it easier to stay informed with my friends and family.		
Critical Mass (CM)			
CM1	Facebook is popular among my friends in the US.		
CM3	A good number of my friends are on Facebook.		
CM6	People from my work are on Facebook.		
Capability (CP)			
CP1	Facebook provides clear instructions for posting.		
CP2	Images and videos can be easily downloaded or uploaded on Facebook.		
CP3	Applications and capabilities of Facebook meet my social networking needs.		
Perceived Playfulness (PP)			
	For a social networking website, Facebook features and applications are:		
PP1	Delightful	(1 to 5)	Not delightful
PP2	Exciting		Dull
PP3	Thrilling		Not thrilling
PP4	Fun		Not fun
Intention to Use(IU)			
IU1	I intend to use Facebook for communicating with others.		
IU5	I intend to use Facebook to get reconnected with people that matter to me.		
IU6	I will continue to use Facebook for social networking.		
Actual Use			
AU2	How often per week do you visit your Facebook account? (Never, Rarely, Occasionally, Often, Frequently)		
AU3	How many hours do you used your Facebook account every week? (0 to 2 hours, 2 to 4 hours, 4 to 6 hours, 6 to 8 hours, more than 8 hours)		

Table 1: Construct, Item Code, and Item Description

Table 2 reports the correlation among the constructs of our revised TAM for social media and the descriptive statistics of these constructs based on our sample. All the correlations were significant at $p<0.01$ level. The negative correlation sign in Table 2 indicates that these constructs were reversed coded in our survey. The mean of our sample data varied from 3.37 to 4.49; and the standard deviation varied from 0.70 to 1.23.

Variables	CM	CP	EU	PP	PU	IU	AU
Critical Mass (CM)	**alpha=0.83** **AVE=0.62**						
Capability (CP)	*correlation* =0.55	**0.8** **0.58**					
Perceived ease of use (EU)	0.62	0.62	**0.93** **0.72**				
Perceived playfulness (PP)	-0.21	-0.48	-0.28	**0.89** **0.68**			
Perceived Usefulness (PU)	0.55	0.61	0.54	-0.39	**0.9** **0.64**		
Intention to use (IU)	0.57	0.59	0.6	-0.29	0.69	**0.86** **0.68**	
Actual use	0.37	0.34	0.41	-0.37	0.48	0.54	**0.73** **0.58**
Mean	4.49	3.82	4.08	2.48	3.98	4.06	3.7
Standard deviation	0.70	0.83	0.78	0.93	0.79	0.87	1.23

Table 2 . Composite factor reliability (alpha), average variance extracted (AVE), and correlation

Discriminant validity is demonstrated when a measure does not correlate very highly with another measure from which it should differ (Venkatraman, 1989). We followed the test of discriminant validity of our constructs based on the recommendations made by Segars (1997). To do so, we calculated the average variance extracted (AVE). These values are reported on the diagonal of Table 3. The AVE for all variables exceeded the suggested value of 0.50 implying that the variance captured by the construct was significantly greater than that attributable to error. Additionally, AVE measures for all constructs were much larger than the square of the correlation between them providing overall evidence of discriminant validity (Fornell and Larcker, 1981). Finally, to further establish discriminant validity, the difference of chi-square was compared from the restricted and freely estimated models. All comparisons had a highly significant difference at $p<0.001$ which suggested that the constructs were distinct and that their underlying scales exhibited the property of discriminant validity.

Future Data Analysis: Measurement and Structural Model

As we continue data analyses, structural equation model (SEM) method would be conducted to analyze the measurement and structural models using AMOS 5.0 (Arbuckle, 2003). Although we will use the SEM methodology, the study should still be considered as exploratory in nature. Following Gerbing and Anderson's (1988) paradigm of testing SEM models, the measurement model would be tested first followed by the complete structural model of Figure 2. We intend to report different fit-indices such as relative chi-square (or the normed chi-square) or CMIN/df or χ^2 / df, TLI, CFI, and RMSEA for both the measurement model and the structural model.

CONCLUSION

This paper proposes a revised TAM framework for enhancing our understanding of a social media user's attitudes toward usage. While we are yet to complete the complete analyses of our proposed research model, the current study on its completion will suffer few limitations that need to be recognized. First, since the survey was conducted among a group of students from US based universities, the results should be interpreted with caution, particularly with respect to the generalization of research findings of social media users as a whole. Next, our total sample population invited to participate (n=900) in our survey still represents a very tiny fraction of the millions of Facebook users. Future research needs to focus on a larger, cross section of Facebook users and a more diversified random sample to verify the findings of the current study. Facebook is the most popular social media site and accordingly we used the data collected from Facebook users. Future studies can include data analysis from other social media sites, such as Google+, YouTube or Twitter. There are many variables in the behavioral theories that need to be investigated to improve the prediction of social media acceptance and usage behavior suggested by our revised TAM model. Future studies can help in determining other factors and extending our research model. We believe that there are many research questions regarding the user and usage behavior on social media sites and we therefore encourage future researches to contribute in developing a better understanding of social media. Despite these limitations, we remain confident that the current empirical study on the revised TAM model can be helpful for future researchers, practitioners, and educators in the area of social media.

REFERENCE

References available upon request from Rupak Rauniar, rauniarr@uhv.edu .