Predicting the usage intention of social network games: an intrinsic-extrinsic motivation theory perspective

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Abstract

Social network sites (SNSs) are new communication channels with which people can share information. Social networks are also connected to gaming. Hence, gaming is quickly becoming one of the most popular categories of applications on SNSs. The goal of this project is to gain insight into the factors that affect user intention to use a social network games. The present study uses an extended technology acceptance model and focuses on combining personal innovativeness, personal involvement, intrinsic motivation (i.e., perceived enjoyment) and extrinsic motivation (i.e., perceived ease of use and perceived usefulness) to explain usage intentions for social network games. A multiple regression analysis and MANOVA analysis were then conducted to identify the key causal relationships. It is expected that personal innovativeness and personal involvement will have positive effects on intrinsic and extrinsic motivation and ultimately influence usage intentions with regard to social network games. These findings may be generally applicable to service providers, current users, and potential users. Practical and research implications are also offered.

Keywords

Social Network Game, Personal Innovativeness, Personal Involvement, Intrinsic-Extrinsic Motivation, Usage Intention

Introduction

Facilitating connections and displaying user profiles are key functions of social networks sites (SNSs). Furthermore, SNSs clearly display a user's social contacts, enabling people to view each other's social networks and search for common friends or interesting content. Today, websites such as Facebook, MySpace and Orkut are at the forefront of online social networking, attracting millions of Internet users. The social network Facebook is one of the largest of these social communities, and there, people convene online to post messages and pictures, chat and play games. In this context, the accessibility of social networks is an important issue, and a remarkable level has been reached (Ossmann and Miesenberger, 2010).

As mentioned above, social networks are also connected to gaming. For instance, casual games are quickly becoming one of the most popular categories of applications on Facebook. The most famous game on Facebook is Farmville (Facebook Statistics, 2010). However, social network games have garnered many different definitions. In this study, we define social network games as games that are relatively simple to begin and end at the players' leisure. The players should be able to get a sense of the entire game without committing excessive amounts of time to it, and the game should be easy to understand, even for players who have never played other games like this. In addition, messages between friends allow players to quickly broadcast their latest game successes and can also be used to invite others to join in a new game. Message boards allow friends to write notes for one another during the game.

The Technology Acceptance Model (Davis, 1989) is one of the most widely used models for predicting use intentions for information and communication technology systems. Davis *et al*. (1989) develop the TAM by adapting the Theory of Reasoned Action (TRA) (Fishbein

and Ajzen, 1975; Ajzen and Fishbein, 1980) to examine the causal chain linking external variables to IT usage intentions and actual use in the workplace. In other words, TAM suggests that antecedents like innovativeness and involvement, which directly affect perceived usefulness and perceived ease of use (Dimitriadis and Kyrezis, 2010; Meuter *et al*., 2005), can be reflected in external variables (Benbasat and Barki, 2007; Lee, Cheung and Chen, 2005). In addition, the concept of motivation as a key predictor of the use of technology-based products and services is theoretically well-supported in the literature (Barczak, Ellen and Pilling, 1997). Especially in social network games, users tend to be motivated mostly by intrinsic interests (Huang and Cappel 2005; Kim *et al*. 2002) and extrinsic motivation (Teo, Limb and Lai, 1999). We infer that both intrinsic and extrinsic rewards are important in influencing social network game usage intentions. Thus, this study focuses on combining TAM and intrinsic and extrinsic motivation to determine usage intentions in social network games. The model presented in this paper will include a unique combination of factors that have not been combined previously combined.

Literature review

Intention

Intention is an individual's subjective likelihood of performing a specified behavior and is the major determinant of actual usage behavior (Ajzen, 1985; Ajzen and Fishbein, 1980; Yi *et al*., 2006). Service providers should encourage usage when users are willing to use social network application services and utilize them. Thus, it becomes necessary to probe users' behavioral intentions with regard to social network games. In addition, this project, unlike previous research on the subject, distinguishes between user behavior and user intention.

Intrinsic motivation

Intrinsic motivation is defined as "the performance of an activity for no apparent reinforcement other than the process of performing the activity per se" (Teo, Lim and Lai,

1999, p. 26). Thus, perceived enjoyment is a form of intrinsic motivation.

Perceived enjoyment

Past research has suggested that when individuals' intentions or behaviors are prompted by intrinsic motivations such as enjoyment, they will be more willing to persist in such intentions or behaviors in the future (e.g., Deci *et al*., 1999). Enjoyment can be defined as the degree to which an activity is perceived as providing pleasure and joy in its own right, apart from its consequences (Davis *et al*. 1989; Venkatesh, 2000).

The previous literature has examined the impact of enjoyment on intention in the context of instant messaging (Li *et al*. 2005) and online shopping (Koufaris, 2002) but not social network gaming. We can therefore postulate the existence of a positive relationship between perceived enjoyment and usage intention. H1 was stated as follows:

H1: Perceived enjoyment is positively related to social network game usage.

Extrinsic motivation

Extrinsic motivation is defined as "the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself" (Teo, Lim and Lai, 1999, p. 26), such as perceived usefulness or perceived ease of use.

Perceived usefulness and perceived ease of use

According to the TAM, the intention to use is determined by two beliefs: perceived usefulness and perceived ease of use. Perceived ease of use refers to the degree to which a person believes that using a particular system will not require effort, whereas perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320).

Extending the TAM, past research has also confirmed the direct effect of "perceived ease of use" on "behavioral intention" (e.g., Luarn and Lin, 2005; Wu and Wang, 2005) and the causal relationship between "perceived usefulness" and "behavioral intention" (e.g., Moon

and Kim, 2001). On this basis, it would seem that a user who perceives a social network game to be easier to use and more useful will have stronger usage intentions. The following corresponding hypotheses emerge:

H2: Perceived ease of use has a positive influence on usage intentions of social network games.

H3: Perceived usefulness has a positive influence on usage intentions of social network games.

Personal innovativeness

According to Rogers (1995), personal innovativeness refers to one's willingness to adopt an innovative technology and reflects the degree of individual interest in trying new things, such as innovative products or services. A number of empirical studies have found a significant relationship between personal innovativeness and behavioral intention (e.g., Hung and Chang, 2005; Lian and Lin, 2008; Lu et al., 2005; Thompson et al., 2006). In the e-commerce context, most researchers have observed a positive relationship between the degree of respondents' innovativeness and the use of e-channels (Blake et al., 2003; Chang et al., 2005). Fang et al. (2009) used the term "personal web innovativeness" to describe the level of a person's willingness to try out a new web service. Moreover, referring to TAM, van der Heijden (2003) pointed out that intrinsic-extrinsic motivation plays mediating roles between the external variable (i.e., personal innovativeness) and usage intentions. Therefore, we investigate the effects of personal innovativeness on intrinsic-extrinsic motivations and usage intention and propose that:

H4: The higher the level of personal innovativeness is, the higher the level of the intention to use a social network game is.

H5: The higher the level of personal innovativeness is, the higher the level of (a) perceived enjoyment, (b) perceived usefulness, and (c) perceived ease of use of a social

network game is.

Personal involvement

Involvement is a motivation factor that determines attitude strength and the probability of consistent behavior. Gabbot and Hogg (1999) further defined involvement as "a motivational variable reflecting the extent of personal relevance . . . to the individual in terms of basic goals, values and self-concept" (p. 160). Therefore, we expect that a higher level of personal involvement will lead to a higher level of intention to use micro-blogging. In addition, TAM theorizes that external variables like personal involvement (Amoako-Gyampah, 1999, Rouibah and Hamdy, 2009) are fully mediated by perceived enjoyment, perceived usefulness and perceived ease of use (van der Heijden, 2003). Therefore, we hypothesize that:

H6: The higher the level of personal involvement is, the higher the level of the intention to use micro-blogging is.

H7: The higher the level of personal involvement is, the higher the level of (a) perceived enjoyment, (b) perceived usefulness, (c) and perceived ease of use of micro-blogging is.

Methodology

Participants

A total of 498 undergraduate and graduate students at a university in eastern Taiwan volunteered to participate in the study. All participants signed an informed consent form at the beginning of the survey. Student subjects were selected for this study because the focus of the survey, social network games (and in this case, a Facebook game), is relevant for college students. Also, college students are important market targets for service providers. Fifty-six percent of the participants were male, the ages varied from 18 to 27, and the educational level was Bachelor's degree or higher. Given the current status of micro-blog services in Taiwan, the reported descriptions of the participants indicated a representative sample (Facebook

Statistics, 2010). According to Gangadharbatla (2008), a student sample is a relevant and significant group, as college students fit the demographic of SNS users, so we are confident that the sample used in this study has well-formed beliefs about micro-blogs and its services and applications in general.

Measures

Facebook is the most popular online social networking site in the world (eBizMBA, 2010), so this research narrows its scope to the game of Facebook. A questionnaire survey was conducted over a Facebook game to ask participants' for their perceptions and opinions toward using a Facebook game. The questionnaire consisted of six major sections that assessed (1) personal innovativeness, (2) personal involvement, (3) perceived enjoyment, (4) perceived usefulness, (5) perceived ease of, and (6) willingness to play a Facebook game. All the variables were measured on 5-point Likert-type scales. Responses were in the form of agreement, with 1 = strongly disagree to 5 = strongly agree. Personal innovativeness as it relates to a Facebook game was defined as "the tendency to learn about and use a Facebook game," a measure adapted from Goldsmith and Hofacker's (1991) domain-specific innovativeness. Personal involvement with a Facebook game was defined as "an individual's perception of the relevance of a Facebook game based on inherent needs, values, and interest," a measure adapted from Zaichkowsky's (1987) revised personal involvement inventory. Perceived enjoyment was adapted from Davis *et al.* (1992) and defined as the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use. Perceived usefulness was "the degree to which a person believes that using a particular system would enhance his or her task-related performance," while perceived ease of use referred to "how easy the person perceives using the system to be." The original scale developed by Venkatesh and Davis (1996, 2000) was modified to fit the specific context of this study. Finally, the

intention to use a Facebook game refers to a user's willingness to perform the Facebook game. The measure for the intention to use a Facebook game taken from an updated TAM model (Venkatesh and Davis, 2000). In addition, to test for internal consistency, Cronbach's alpha coefficients were calculated for each of the resulting scales. In this survey, the overall Cronbach's α was 0.87, with the six constructs ranging from 0.84 to 0.92. Each construct achieved an alpha coefficient over 0.70, which means that the instrument has good internal consistency (Churchill, 1979).

Results

Hypothesis testing

A multiple regression analysis tested the relative explained power of the predictors that are commonly used to test for moderating effects (Neter et al., 1990). Hence, the intrinsic-extrinsic motivations' mediations on usage intention were performed in a multiple regression analysis, indicating that the explanatory power of the model may be considered satisfactory ($R^2 = 0.79$) and that the model fits the data and is appropriate to test the hypotheses (Table 1).

Equation (1) was applied to test the hypotheses:

$$Y = \beta_0 + \beta_1 N + \beta_2 V + \beta_3 J + \beta_4 U + \beta_5 E + e, \qquad (1)$$

where Y is the usage intention, N is the personal innovativeness, V is the personal involvement, J is the perceived enjoyment, U is the perceived usefulness, E is the perceived ease of use, and e is the error term. The effect of multicollinearity was examined by using the variance inflation factor (VIF) values for each of the regression coefficients. VIF values for all the observed variables were close to 1.00, which indicated that there were no significant multicollinearity problems (Neter et al., 1996).

Insert Table 1 about Here

The regression results indicate that the $\beta_3, \beta_4, \beta_5$ coefficients were positive and significant for predicting the usage intention ($\beta = 0.13,0.12,0.44$; $p < 0.05$). That is, perceived enjoyment, perceived usefulness, and perceived ease of use mediate the relationship between external variables (i.e., personal innovativeness and personal involvement) and usage intentions. The F test for the R^2 increment between the reduced model and the full model pointed out the significant effects of perceived price fairness ($R_{reduced}{}^2 = 0.793$, $R_{full}{}^2 = 0.722$, $F_{3,492} = 376.97$, $p < 0.001$). Therefore, the observed level of significance for the value of the increment was 0.071, so the mediating factors appeal the increase the explanatory power in explaining the usage intention, supporting H1, H2, and H3. In addition, the significant coefficient of β_1 supports the hypothesized influence of personal innovativeness on usage intentions, so H4 is supported. What's more, the positive mediating effect implies that the impacts of personal innovativeness on intrinsic-extrinsic motivations (i.e., perceived enjoyment, perceived usefulness, and perceived ease of use) are significant ($p < 0.05$) . Conducting MANOVA analysis with the value of Wilks' λ test indicates that both personal innovativeness and personal involvement have significant effects on perceived enjoyment, perceived usefulness, and perceived ease of use ($p < 0.001$) (Table 2). Thus, H5a, H5b, and H5c, are supported. Similarly, the positive coefficient of β_2 indicates the hypothesized relationship between personal involvement and intention to use micro-blogging, so H6 is supported. The positive mediating effect also reflects the influences of personal involvement on usage intentions, supporting H7a, H7b, and H7c.

Discussion and implications

Based on our findings, this study's theoretical contribution is three-fold. First, the proposed conceptual model is largely supported by the empirical data. The positive finding on H1, H2 and H3—indicating that higher levels of perceived enjoyment, perceived

usefulness, and perceived ease of use lead to higher levels of the usage intention in the setting of using a social network game—strongly supports the suggestions by van der Heijden (2003) that the intention to use micro-blogging is affected by intrinsic motivation and extrinsic motivation. The combination of the TAM and intrinsic-extrinsic motivations can be applied in the context of using micro-blogs. Second, individual perception factors, including personal innovativeness and personal involvement, have direct and significant effects on extrinsic-intrinsic motivations and intention to use micrio-blogs, which finding is line with Wang et al. (2010), who pointed out that consumers' innovativeness and involvement levels dominate their intention to use a technological system. These findings can be extended to another industries or technological systems and products in future research. Third, an extension of the TAM model with external variables (i.e., personal innovativeness and personal involvement) is verified in our study, which shows that different external variables, such as individual differences and system characteristics, can be applied and investigated using the TAM model. Future research can extend the concept of TAM to provide new insights and opinions about users' perceptions of technological products and services.

Our results also show that perceived ease of use is a key driver in explaining usage intention, which is consistent with Maditinos (2007) and Venkatesh (2000). Whether micro-blogs are easy to use is a critical determinant for users and potential users (Table 1). Understanding users' intentions to use micro-blog services remains a priority in practical management, as leading marketers have widely embraced SNS as a useful tactic in the online environment. As a result, this study's practical implications may lie in the importance of designing an easy platform mechanism for social network games. The findings also reveal that, since the success of social network games relies heavily on the number of users who are characterized by personal innovativeness and involvement with the platform, executives may target those users who are most likely to use the social network game early and on a regular

basis, which is consistent with Wang et al.'s suggestions (2010). However, in the context of social network games, the differentiations between social network games are not distinct. Therefore, understanding what factors facilitate users' innovativeness and involvement would be helpful in improving micro-blogging services. It would be useful if the service provider continuously planned new and innovative services in order to attract users who are both innovative and involved in order to enhance their competition advantages.

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Table 1
Results of regression analysis examining the influence of intrinsic-extrinsic motivations related on the intention (comparison between the reduced model vs. the full model).

Independent variable	Coefficient	Usage intentions			
		Reduced model		Full model	
		β	*p* Value	β	*p* Value
Perceived innovativeness	β_1	.36	.00***	.12	.00***
Perceived involvement	β_2	.52	.00***	.13	.02*
Perceived enjoyment	β_3			.12	.01**
Perceived usefulness	β_4			.12	.01**
Perceived ease of use	β_5			.44	.00***
F-value		644.28	.000***	376.97	.00***
R^2		.722		.793	
Adjusted-R^2		.722		.793	

Standardized regression coefficients are reported.

***** $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2
MANOVA analysis of perceived innovativeness, perceived involvement associated with intrinsic-extrinsic motivations.

Factors		Source of variation	Wilk' λ vale	*p* value
Perceived innovativeness	Perceived enjoyment	Perceived innovativeness	.86	.00***
Perceived involvement	Perceived usefulness	Perceived involvement	.65	.00***
	Perceived ease of use	Interaction	.90	.00***

* $p < .05$; ** $p < .01$; *** $p < .001$.