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WE "LINE" BECAUSE WE'RE HAVING FUN

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Abstract

As smartphones become more and more popular, uses of social media on mobile devices have grown explosively. Previous studies have investigated usage behaviors of social networks in various ways, but few of them emphasized the activities on smartphones and social applications. In this study, we develop a research framework based on the network externalities and cognitive absorption to explain users' actual utilization and satisfaction of a popular social mobile messaging app in Asia: LINE. Two different contexts - information sharing and game playing were examined in this research. We tested our research model using 331 data collected via online survey and we found that (1) network externalities (the number of peers) had a positive effect on an individual's actual usage; (2) cognitive absorption positively affected an individual's actual usage of and satisfaction toward LINE; (3) LINE users' actual utilization had a significant impact on their satisfaction; (4) LINE users' intrinsic motivation (measured by cognitive absorption) is more important than extrinsic motivation (measured by network externalities); and (5) tasks with higher hedonic motives such as game playing may be a stronger trigger of LINE users' actual utilization.

Keywords: Smartphone, Social application, Network externalities, Cognitive absorption

1 INTRODUCTION

With the rapid technological advances on smartphones, a variety of mobile apps (abbreviation for 'applications') are available for users to download to satisfy their needs and desires. One of the most popular and fastest growing applications on Google Play is social mobile messaging apps. Besides being a cost-effective way to send messages to friends and family (they are free to use), social mobile messaging apps have become increasingly popular (especially with young generation) because they also provide many extra features including stickers, emoticons, and even free games so that users can have fun while using their smartphones.

LINE, owned by a Korean corporation, is now one of the most popular messaging apps in Asian countries, such as Japan, Thailand and Taiwan. LINE has currently more than 310 million users worldwide and is used in over 231 countries. In 2013, LINE made a huge success by generating over $ 330 million in revenue (TECHINASIA 2014). To drive more revenues, LINE has been working hard to engage users, such as providing LINE games which allow users to play games with their friends via the LINE app. LINE Pop, one of LINE's most popular games, was estimated to attract 1 million downloads in just one day and a total of 1.75 million over its first three days, and was believed to have brought in $1 million in revenue in the first 12 days alone (Distimo report 2013).

Despite the important role social mobile messaging apps have played in our daily life, user behavior research in the context of social mobile apps is still scarce. Just like social networking sites (SNS) which emphasize user's interaction and involvement, users are the key to a successful mobile application (Sledgianowski & Kulviwat 2009). From services marketing perspective, "what motivate mobile app users' actual usage and their consequent impacts on user satisfaction" becomes an important issue. Based on the motivation theory, both internal and external motivations (perceived benefits) influenced individual's behavior of using information technology (Kim, Chan, & Gupta, 2007). That is, when an individual perceives the possibility of obtaining utility and enjoyment from a technology, he/she will be more likely to use it (Kim et al. 2007; Lin & Bhattacherjee 2008; Lin & Lu 2011).

Therefore, the primary purpose of this study is to examine the factors that motivate an individual to use social mobile messaging apps (i.e., LINE in this study) and the consequent impacts of these factors on user satisfaction. To achieve such goal, we developed a research model by integrating network externalities (including external perceived benefits such as utility) and cognitive absorption theories (including internal perceived benefits such as enjoyment). A secondary objective is to confirm the nature of the causal relationships (cognitive absorption → social app usage → user satisfaction) in the context of social mobile messaging apps.

2 LITERATURE REVIEW

Several theories have been applied to analyzing the use and user satisfaction of information systems, including the motivation theory, network externalities, and cognitive absorption. They are reviewed below.

2.1 Motivation Theory

Motivation theory has been applied in previous research to explain individual's continued intention to use information technology (Lin & Lu 2011). The motivation theory (Deci 1975) argues that individual's behaviour is driven by extrinsic motivation (external reinforcement such as perceived usefulness) and intrinsic motivation (individual's interest in an action itself such as perceived enjoyment). These two motivations have been found to affect individual's intention to use information technology (Kim et al. 2007; Lin & Bhattacherjee 2008; Lu & Su 2009; Moon & Kim 2001), which can further lead to their actual usage of such technology (Davis 1989). Therefore, the first factor to be examined is the motivation of the user. Motivations such as social influence and perceived playfulness

were used to explain users' voluntary acceptance of a new technology (Davis et al. 1992). As the technology we study here – LINE, is a new popular social messaging app, we examine an individual's actual use of LINE from two perspectives: external influence (network externality) and internal interest (cognitive absorption). Extrinsic motivation here refers to the external influence from the perceived benefits gained by network externality, and as cognitive absorption composed of the dimensions of temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity, it actually represents different forms of intrinsic motivation (Shang et al. 2005).

2.2   Network Externalities

Network externalities have been widely applied to IS technology studies, especially those dealing with the characteristics of network goods, such as interactive information technologies (Lin & Bhattacherjee 2008) and communication technologies (Strader et al. 2007). The theory of network externalities suggests that the value of a technology increases when more people use the same technology (Katz & Shapiro 1985). In other words, more users are attracted to use a product or service once the number of users reaches the critical mass because of the potential increase of perceived values (Lin & Bhattacherjee 2008). The sources of network externalities can be *direct* and *indirect* (Katz & Shapiro 1985). Direct network externality comes from the increase in the number of users, while indirect network externality derives from the increase of related complementary products that the users obtain. For example, when the number of mobile phone users increases up to a certain level, more related businesses (e.g., mobile app developers) will be attracted to join because of the potential benefits they anticipate. As such, more businesses further bring in more mobile phone users because the users have more available products and related services. Since mobile messaging apps have the same connectivity feature as mobile phones, network externalities may play a major role for a user to use the product.

2.3   Cognitive Absorption

Cognitive absorption is "a state of deep involvement with software" (Agarwal & Karahanna 2000, p.673), which represents an intrinsic motivation related variable where a behavior is performed for itself in order to experience pleasure and satisfaction inherent in the activity (Deci & Ryan 1985). Cognitive absorption is important to the study of technology usage behavior because it serves "as a key antecedent to salient beliefs about an information technology" (Agarwal & Karahanna 2000, p.666). While TAM focuses on the behavior of an individual towards using IT, the holistic approach emphasizes on the individual's experience when using the technology, such as the individual's level of enjoyment while interacting with the technology (Saade & Bahli 2005).

Cognitive absorption derives its theoretical bases from three research streams: (1) The trait of absorption: an individual's state of deep attention, that is, the state of being totally absorbed with the activity he/she is involved; (2) the state of flow: the state in which people are so involved in an activity that nothing else seems to matter, and (3) the concept of cognitive engagement, which relates to the state of playfulness (identical to flow experience). Engagement can encompass multi-dimensions such as intrinsic interest, curiosity, and attention focus (Agarwal & Karahanna 2000). LINE, as a social networking tool, also provides many social games and other entertainment related features. Hence, cognitive absorption may be a reason for a person to use the product.

3   THE RESEARCH MODEL AND HYPOTHESES

Drawing upon motivation theory, network externalities and cognitive absorption, we propose a research model which considers network externalities and cognitive absorption to be key factors that affect individual's actual usage, and ultimately lead to user satisfaction. We examine cognitive absorption in two different contexts of using mobile social apps, namely, information sharing and game playing. For network externalities, we consider two types of direct sources, that is, number of members and number of peers.

The relationships among these constructs are depicted in Fig. 1 below. The basic rationale is that user satisfaction of social messaging apps is determined by users' actual usage, which is a function of cognitive absorption and network externalities.

3.1   Actual Usage and User Satisfaction

Building on the traditional model of user involvement and its outcomes (Baroudi et al. 1986), we develop our research model to hypothesize that user involvement (measured by cognitive absorption) will lead to both system usage and user satisfaction; and as system usage increases, so is the user satisfaction. The causal relationship between system usage and user satisfaction is based on the belief that system use allows users to be more familiar with the system and to discover new uses for it, which will in turn lead to enhanced user satisfaction with the system. This rationale is also consistent with the utilization-focus research (Goodhue & Thompson 1995) which implies that increased technology utilization will lead to positive performance impacts (measured by user satisfaction in this study). Therefore, we posit the following:

> *H1: Higher usage of a social messaging app has a positive effect on user's satisfaction.*

3.2   Network Externalities and Actual Usage

Research has considered network externalities an important factor directly affecting customer's usage of information technology (Gupta & Mela 2008; Kim & Lee 2007; Yang & Mai 2010; Wattal et al. 2010; Zhao & Lu 2012). For example, when SNS users reach a significant number, the users' intention to use increases (Sledgianowski and Kulviwat 2009). Therefore, in order to attract more users, SNS provides users with the supporting tools such as social games and message functions (Lin & Lu 2011). These new functions allow users to interact with each other actively using the supporting tools provided by SNS. Because social mobile apps have features identical to SNS, the increases in the number of members should provide users with more perceived utilities, and this will in turn, lead to increased app usage. Therefore, we hypothesize:

> *H2a: The number of members of a social messaging app positively affects a user's actual usage.*

In the case of instant messaging, the more friends that join the community, the more users can maintain or develop their individual social networks, thereby increasing the utility for users (Zhou & Lu 2011). Similar to SNS, social mobile app is also a pleasure-oriented information system that the individual becomes more willing to use as more friends or peers join (Powell 2009). Thus, in the context of a pleasure-oriented information system (i.e., LINE), peer network externality is one of the key factor for usage. Therefore, we posit the following:

> *H2b: The number of peers on a social messaging app positively affects a user's actual usage.*

3.3   Cognitive Absorption, Actual Usage and User Satisfaction

The impact of user involvement on system usage and user satisfaction has been tested in previous research (Baroudi et al. 1986). The assumption that user involvement will increase system usage and user satisfaction is consistent with the theory of participative decision making (PDM). Ives and Olson (1984) argue that user involvement, a special case of PDM, may lead to improved system quality and increased user acceptance, which is reflected in increased use of and satisfaction with the system. As cognitive absorption is defined in this study as "a state of deep involvement with LINE", it can be an indication of the level of users' experienced pleasure or enjoyment, which reflects that users feel the enjoyment when they use mobile apps (Zhou & Lu 2011). In other words, when individuals use LINE on their smartphones, they not only communicate with each other, but also enjoy themselves while using it. Besides, because LINE also provides users with a variety of free games, which ensure that users can be totally engaged in using it because they are having so much fun in playing games with their peers. Prior research has found that perceived enjoyment is an important factor that affects

perceived usefulness of mobile apps (Zhou & Lu 2011). Based on TAM, perceived usefulness leads to users' intention to use, and their actual usage. Therefore, we hypothesize the following:

H3: Cognitive absorption has a positive effect on actual usage.

In addition, prior literature indicates that cognitive absorption also has positive impact on user satisfaction. For example, Deng et al. (2010) found that cognitive absorption positively affects user satisfaction with mobile Internet services. Zhou and Lu (2011) also found strong effect of perceived enjoyment on user's satisfaction of a mobile instant messaging platform. Thus, we posit the following:

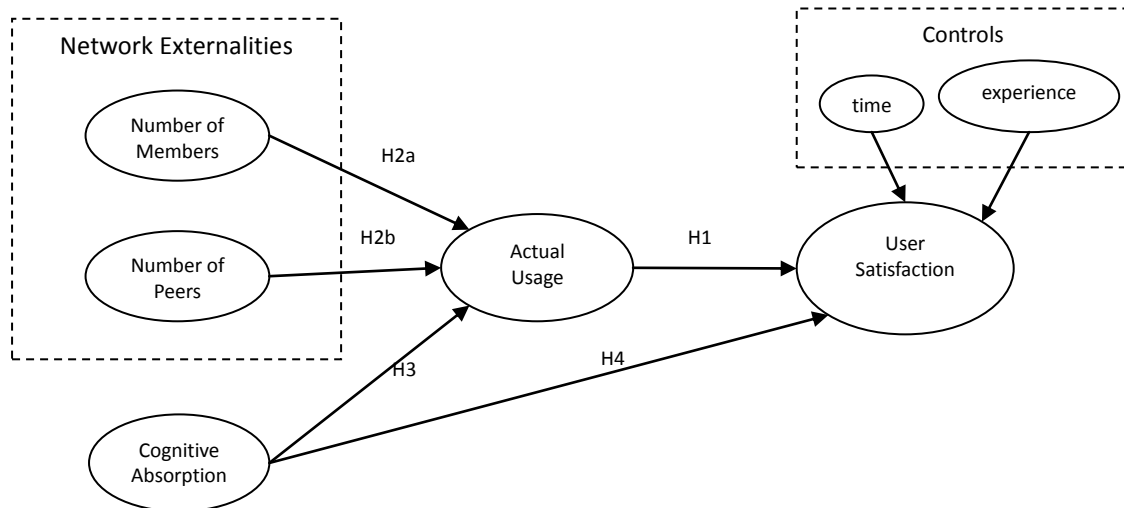*H4: Cognitive absorption has a positive effect on user satisfaction.*

Figure 1.   The proposed research model

4   RESEARCH METHODOLOGY

The proposed research model was evaluated via a web-based survey. The data collection and the questionnaire items for each of the constructs are presented in the following sections.

4.1   Data Collection

A web-based survey was conducted. The questionnaire was distributed via the Qualtrics Survey System of a major southern university in Taiwan. To recruit the participants, we first posted invitations to members of the most popular BBS (Bulletin Board System) community in Taiwan. In exchange for their participation, we awarded the participants chances for winning prizes (purchase voucher with value from US$7 to US$70). We used a filtering question at the beginning of the survey to identify respondents who matched our targeted profile of mobile users with prior and current experience of using LINE. After removing those with incomplete responses, a sample of 331 respondents was used for the final data analysis. The majority of participants are less than 30 years old (90 percent) and hold a college or university degree (68 percent), and the male-to-female ratio is 58 percent to 42 percent.

4.2   Measurement

The measures were mainly adapted from relevant prior studies. All items were measured using a five-point Likert-type scale with anchors from "Strongly disagree" to "Strongly agree". Items for cognitive absorption were adapted from Roca et al. (2006). The scale of network externality was measured by

the items obtained from Lin and Lu (2011), and the scales of user satisfaction and actual usage were adapted from Kim et al. (2010). The measurement scales are summarized in Table 1.

Construct	Indicator (Loading)	Measures
Cognitive Absorption (Information sharing context) *Cronbach's α = 0.949*	CAI1 (0.92)	Time flies when I am using LINE to browse/share updated news on my smartphone.
	CAI2 (0.89)	Most times when I use LINE to browse/share updated news on my smartphone, I end up spending more time than I had planned.
	CAI3 (0.87)	When I am using LINE to browse/share updated news on my smartphone, I am able to block out most other distractions.
	CAI4 (0.87)	While using LINE to browse/share updated news on my smartphone, I am absorbed in what I am doing.
	CAI5 (0.90)	I have fun interacting with LINE when I am using LINE to browse/share updated news on my smartphone.
	CAI6 (0.91)	I enjoy using LINE when I am using LINE to browse/share updated news on my smartphone.
Cognitive Absorption (Game playing context) *Cronbach's α = 0.962*	CAE1 (0.92)	Time flies when I am playing LINE's games on my smartphone.
	CAE2 (0.91)	Most times when I play LINE's games on my smartphone, I end up spending more time than I had planned.
	CAE3 (0.90)	When I am playing LINE's games on my smartphone, I am able to block out most other distractions.
	CAE4 (0.90)	While playing LINE's games on my smartphone, I am absorbed in what I am doing.
	CAE5 (0.92)	I have fun interacting with LINE when I am playing LINE's games on my smartphone.
	CAE6 (0.94)	I enjoy using LINE when I am playing LINE's games on my smartphone.
Network Externalities (Number of members) *Cronbach's α = 0.836*	NM1 (0.98)	I think a good number of people use LINE on their smartphones.
	NM2 (0.67)	I think most people are using LINE on their smartphones.
Network Externalities (Number of peers) *Cronbach's α = 0.766*	NP1 (0.71)	I think most of my friends are using LINE on their smartphones.
	NP2 (0.98)	I anticipate many friends will use LINE on their smartphones in the future.
Actual Usage *Cronbach's α = 0.851*	USE1 (0.74)	I frequently play games on my smartphone.
	USE2 (0.88)	I frequently browse/share updated news on my smartphone.
	USE3 (0.82)	I frequently play LINE's games on my smartphone.
	USE4 (0.88)	I frequently browse/share updated news using LINE on my smartphone.
User Satisfaction *Cronbach's α = 0.888*	SAT1 (0.72)	I'm satisfied with LINE's performance when playing LINE's games on my smartphone.
	SAT2 (0.80)	LINE comes close to my ideal medium when I play games in virtual communities on my smartphone.
	SAT3 (0.77)	Overall, LINE satisfies my needs of playing games on my smartphone.
	SAT4 (0.83)	I'm satisfied with LINE's performance when browsing/sharing updated news using LINE on my smartphone.
	SAT5 (0.85)	LINE comes close to my ideal medium when I browse/share updated news in virtual communities on my smartphone.
	SAT6 (0.83)	Overall, LINE satisfies my needs of browsing/sharing updated news on my smartphone.

Table 1.   Summary of measurement scales

5   DATA ANALYSIS

We utilized the latest version of SmartPLS 2.0 to validate both the measurement and structural properties of our research model (Chin 1998). Partial least squares (PLS) analysis can test the psychometric properties of the measurement items while simultaneously analyzing the direction and strength of each hypothesized relationship (Wixom and Watson 2001).

5.1   The Measurement Model

The psychometric properties of the scales are assessed in terms of internal consistency, item loadings, and discriminant validity. Internal consistency was evaluated using reliability and convergent validity criteria. Cronbach's alpha and item loadings greater than .70 are considered acceptable (Fornell & Larcker 1981). As shown in Table 1, all values were above the recommended level of .70, with only one exception for the scale of number of members (0.67). To access discriminant validity (Chin 1998), the square root of the average variance extracted (AVE) should be larger than the inter-construct correlations. As shown in Table 2, the square root of the AVE (diagonal element) is larger than all the other cross-correlations, which indicates acceptable data validity.

Construct	CA	NM	NP	SAT	USE
CA	NA*				
NM	0.16	0.85			
NP	0.05	0.56	0.86		
SAT	0.68	0.03	0.11	0.80	
USE	0.74	0.09	0.07	0.72	0.83

Table 2.   Correlations of latent variables (* second-order construct using repeated measures)

5.2   The Structural Model

In a PLS structural model, loadings of measures of each construct can be interpreted as loadings in a principal components factor analysis. Paths are interpreted as standardized beta weights in a regression analysis (Chwelos et al. 2001). The path coefficients and explained variances for the research model are shown in Figure 2 below. To rule out rival explanations of user satisfaction other than actual usage, we added the average time user spent on their smartphones and their experience of using smartphones and social apps as control variables affecting their satisfaction of using LINE on smartphones. The results showed no significant impact of user experience on satisfaction, but time did have significant impact on users' satisfaction of using LINE on their smartphones.

Cognitive absorption and actual usage together explain 56.9% of the variance in user satisfaction, while cognitive absorption and the number of peers explain 56.7% of the variance in actual usage. The standardized path coefficient from cognitive absorption to actual usage is 0.723 and to user satisfaction is 0.322. The effect of actual usage on user satisfaction is 0.485. All coefficients are significant at an alpha protection level of 0.001. Therefore, it is clear that the effect of cognitive absorption is substantive. Moreover, the results showed that the number of members did not have a significant impact on LINE's users' actual utilization, while the number of peers did influence their actual use of LINE on smartphones.
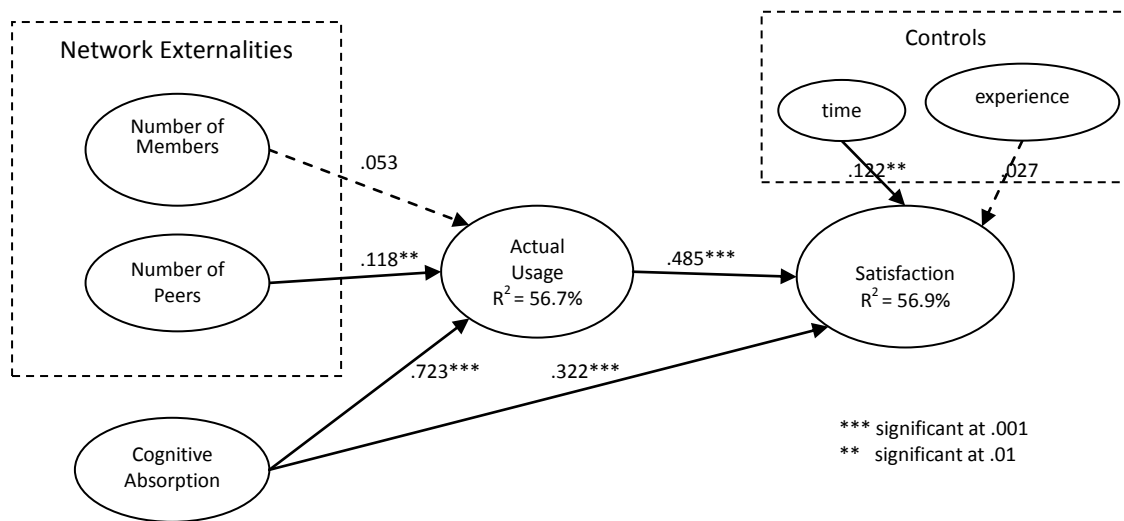
Figure 2.   *PLS results of the research model*

6   DISCUSSION AND CONCLUSION

In this study, we examined the role of network externality and cognitive absorption in the usage of a popular social mobile messaging app: LINE. We have developed and tested a research model incorporating both extrinsic factors such number of members and number of peers as well as intrinsic factors such as cognitive absorption (an indication of perceived enjoyment of users) in two different contexts of social app use, that is, information sharing and game playing. Our results offer several interesting insights to managers and academics alike on individual's actual usage of social mobile apps.

First, our results partially support what was found in Wattal et al. (2010) that network externalities play an important role in driving technology usage. Consistent with what was found in Lin and Bhattacherjee (2008) and Zhou and Lu (2011), the number of peers did have small impact on actual usage, which supports that the number of people in a user's social circle has the social influence on user's actual behavior of using a social media. However, the critical mass of members did not contribute to more usage of LINE. In other words, the utility for social mobile app users, at least partially, comes from social effects. Similarly, the social influence theory of media (Fulk et al. 1990) also suggests that individuals' perception of a medium is influenced by salient others.

Second, our results support that the intrinsic motivation (measured by cognitive absorption) is more important than extrinsic motivation (measured by the number of peers) of using LINE. This finding is consistent with the findings from prior studies (e.g., Lin & Lu 2011), which implies that the perceived enjoyment gained from sharing information and/or playing games has more influence on individual's actual usage of and satisfaction toward using LINE than the influence obtained from network externalities. In addition, the significant role of cognitive absorption in leading to the actual usage and user satisfaction, especially the weight of game playing, implies huge revenues derived from engaging individuals to have fun while using the apps on their smartphones. This finding can also be evidenced by the explosive success of LINE. Therefore, social mobile app developers should work on developing applications and free games with novel, pleasure experiences to reinforce user's enjoyment to strengthen their satisfaction.

This study contributes to the research base by integrating network externalities and cognitive absorption in the context of social mobile messaging apps, the most popular and fastest growing

technology nowadays. This study concludes that in the environment of using social mobile messaging apps such as LINE, social effect that comes from the social circles of individuals, and their involvement when using such apps have significant positive impact on their actual usage of and user satisfaction toward the technology. While profitable performance of new technology depends on understanding factors affecting users' usage behavior and satisfaction, few studies have investigated these factors in developing social mobile messaging apps. The findings of this study could serve as a reference for social mobile messaging apps providers for the enhancement of the services they will offer in the future.

The research is not without limitations. The first limitation is that we did not take culture into consideration in our study. LINE is popular in Eastern Asia, which has a culture different from regions such as North America or Europe. We need to be careful when we generalize the findings to other regions. The second limitation is that data used for deriving our findings were self-reported data from a group of young volunteers. It is also uncertain whether the findings would hold in other groups of users. Nonetheless, our findings have shed much insight into how different theories may be used to interpret the usage behaviour of mobile messaging software.

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