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Abstract

Social network game (SNG) is attracting more and more players and becoming a promising market for game providers. Competing game providers are also constantly providing substitutes to attract SNG players to switch among SNGs. In prior IS literature few studies have tried to investigate the switching behaviour. In order to explore IS user's switching behaviour in SNGs, we examine the determinants of individuals' switching intention to alternative SNGs and their discontinuing use of the current SNG. We propose and test a research model with 541 responses from Chinese SNG gamers collected via an online survey. The research model suggests that satisfaction, subjective norm, alternative attractiveness and variety-seeking behaviour have significant effects on individuals' switching intention. Finally, we made a discussion on these findings as well as limitations and future study.

Keywords: Social network game, Switching intention, Satisfaction, Alternative attractiveness.

1 Introduction

The success of social network game (SNG) such as Farmville or Cityville, has made it one of the most popular entertainment services attracting tens millions of gamers, especially through social network sites (SNS) (Shin & Shin, 2011). According to a report released by China Internet Network Information Centre (CNNIC), by the end of June 2012, there were about 33.1 million online game players in China (CNNIC, 2012). As reported by iResearch, 17 percent of Chinese online game players have played SNGs (iResearch, 2012). Though the SNG market is thriving, the competition in SNG market is also fierce. Bhattacharjee et al. (2012) stated that online game players can easily find information about and switch to a substitute via downloading or registering to another game. Survey results from Playnomics (2012) indicate that 85 percent of SNG gamers play a SNG only once and then never return.

Clearly, there is a high switching rate in the field of SNG use. Keaveney (1995) claimed that customers' switching behaviour resulted in a loss of future revenue for SNG providers. Hence, for practitioners, it is of importance to understand what motivates individuals' switching behaviour.

Ye et al. (2006) indicate that user switching behaviour represents a form of post-adoption behaviour. In prior studies, IS use continuance was the dominant explanation for long-term user behaviour. These studies mainly apply IS acceptance theories to explore post adoption behaviour, such as Technology Acceptance Model (TAM) (Davis, 1989), Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1973), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and suggest that users' perceptions of and attitude toward IS use are the main factors determining individuals' IS continuance.

Recently, IS users' switching behaviour has attracted IS researchers' attention, as switching has become a common as well as an important phenomenon for businesses in the virtual market. Prior IS research has attempted to explore factors determining individuals' switching intention in various contexts mainly by integrating the existing IS acceptance and IS continuance theory with theories from other disciplines (Bhattacharjee et al., 2012; Hou et al., 2011; Kim et al., 2006; Zhang et al., 2012). However, Bhattacharjee et al. (2012) argued that "despite the increased incidence and relevance of such switching phenomenon, our understanding of it has remained scant" (pp.327). Therefore, there is a need for research on individuals' switching behaviour which can help explain the switching behaviour phenomena in different contexts (Bhattacharjee et al., 2012).

Based on the gap identified above, this study proposes a research model to examine the switching behaviour of IS users by integrating key determinants of switching intention from existing IS theories and relevant concepts from marketing disciplines. The research model is empirically tested in the context of SNG. This study sheds light on the switching behaviour of SNG users, and helps to explain the key determinants of switching intention of SNG users. For practitioners, the study offers some suggestions for SNG game providers to appreciate the importance of key determinants of switching intention and to understand how to make right strategies in customer management.

The rest of this paper is arranged as follows. Firstly, we introduce the research background with a brief literature review on SNG and switching behaviour in both IS and marketing field

in section 2. Then we present our research model and hypotheses in section 3. In section 4, the research methodology is discussed, including measurement development, data collection as well as validity and reliability. In section 5, the hypotheses test results are presented. In section 6, we conclude our findings and provide implications for both researchers and practitioners. Finally, discussions of limitations and future research are presented.

2 Research Background

2.1 Social Network Game

Social network game (SNG) refers to a type of browser game, which is distributed mainly through social networks, such as Facebook (Järvinen, 2009; Shin & Shin, 2011). SNG provides ample opportunities for players to mainly play with people within the players' existing network via social network sites. This trait of SNG distinguishes it from other digital games (such as games designed for players to play offline, or games which are played with online friends outside of the players' offline networks) (Lee et al., 2012). Players of SNGs can use their existing social network friends as resources (Shin & Shin, 2011). The more friends SNG players' social network has, the higher possibility the players will get to make progress in the SNGs. Meanwhile, many SNG are asynchronous. For example, corps keeps grow in Happy-farm and interaction among players continues in SNG even the player is offline (Consalvo, 2012). This trait distinguishes SNG from other types of online game which only proceeds when gamers play them online.

Prior research on SNG mainly attempted to explore the factors motivating individuals' use of SNG (Shin & Shin, 2012; Lee et al., 2012) as well as SNG design (Järvinen, 2009). Hou et al. (2011) conducted an empirical study in massively multiplayer online role playing games (MMORPG), and argued that though switching in online games is common, few studies have tried to examine players' switching behaviour in online games.

2.2 Switching Behaviour

For individuals, there are always various optional, competing information systems, such as in our research case SNGs, users are provided with various SNGs with similar functionality. Individuals may continue using an IS after they have used it for some time, or switch to an alternative IS that meets their needs or desires (Keaveney & Parthasarathy, 2001). Bhattacharjee et al. (2012) suggested that users' IS switching behaviour involves a complete or partial replacement of the IS use with a substitute that serves similar needs. Similarly, Ye et al. (2006, pp.1943) defined information technology user switching as "users' termination or significant reduction in usage of one technology product while replacing it completely or in large part with an alternative product that satisfies identical needs".

3 Research Model and Hypotheses

As there are few models specially designed for investigating switching behaviour in SNGs, we build a tentative, simple model on switching behaviour to explore users' switching intention in the research context of SNG. In this light, we shall below define and give grounds for the following key elements of switching antecedents being of importance: satisfaction,

subjective norm, need for variety, alternative attractiveness, which are suggested to explain the variation in switching intention among SNG gamers.

3.1 Subjective Norm

Subjective norm refers to the perceived social pressure surrounding the performance of the behaviour (Ajzen, 1991). In current study, the subjective norm refers to the perceived social pressure towards the performance of switching behaviour. Subjective norm is included as a direct determinant of behavioural intention in TRA (Fishbein & Ajzen, 1975) and subsequently the Theory of Planned Behavior (TPB) (Ajzen, 1991). The rationale for a direct effect of subjective norm on intention is that people may choose to perform the behaviour, if they are motivated to comply with important references who think the person should perform the behaviour (Venkatesh & Davis, 2000).

Previous research suggests that subjective norm directly impacts customer's attitude toward switching behaviour and switching intention (Bansal et al., 2005). Lee (2009) pointed out that many Internet users play online games only because their friends are playing online game and recommend them to play it. Hence, it is also reasonable to assume that players are more likely to switch to another SNG if their friends suggest them to perform the behaviour. Therefore, the following hypothesis is proposed :

H1. Subjective norm is positively associated with switching intention in SNG.

3.2 Satisfaction

Satisfaction refers to an individual's evaluation and affective response to his or her overall experience with a service or product (Oliver, 1980). Based on the Expectation Confirmation Theory (ECT) (Oliver, 1980), individuals have expectations toward certain service before using it. After having used the service, satisfaction or dissatisfaction will occur by evaluating the comparison of the actual performance of the service and their expectations, i.e. there emerges a discrepancy between the expected and experienced. Satisfaction occurs when actual performance is better than expected. Conversely, dissatisfaction occurs when actual performance is less than expected.

The predictive power of satisfaction to switching intention has been widely examined in different e-services, such as email (Kim, et al., 2006), blog (Zhang et al., 2012), online game (Hou et al., 2011), cloud computing (Park & Ryoo, 2012). Hou et al. (2011) concluded that comparing with satisfied users; unsatisfied users usually have a stronger intention to switch to a substitute. Dissatisfied users are more likely to switch to alternatives instead of continuing using the current one. Bhattacharjee et al. (2012) support this argument and claimed that users' intention to continue or to discontinue IS usage is determined by satisfaction with their current IS usage. Thus, it is reasonable to assume that players with high satisfaction of current SNG would have a lower intention to switch to a substitute, and the following hypothesis is proposed:

H2. Satisfaction is negatively associated with switching intention in SNG.

3.3 Need for Variety

Need for variety is defined as one of the major individual psychological traits towards high tendency to switch (Vázquez-Carrasco & Foxall, 2006). Physiological evidence indicates that once individuals' reactions to attributes of a stimulus reach 'optimum stimulation level', the individual may feel satiated, and then choose to consume a different attribute next time (Coombs & Avrunin, 1977). In purchase behaviour, the tendency of variety-seeking is a driver for seeking newness, which usually leads to choices of unknown or untried products/brands (Hoyer & Ridgway, 1984). Steenkamp and Baumgartner (1992) suggest that switching behaviours may occur among satisfied customers due to their attempt to try something novel or different for fun or thrill. In other words, customers may be satisfied with their choices; they may still switch to perceived alternatives to satisfy a desire for novelty or complexity in consumption or because of curiosity, or because of getting bored, fed up, on repetitively doing the same thing (Herrnstein & Prelec, 1991). Previous study in online game also confirms the predictive power of the need for variety in explaining switching intention (Hou et al., 2012). Therefore, we propose the following hypothesis in the SNG context :

H3. Need for variety is positively associated with switching intention in SNG.

3.4 Alternative Attractiveness

Rusbult and Farrell (1983) suggested that the intention to continue/switch is a function of the attractiveness of the existing service versus that of alternatives. Users are more likely to migrate to a substitute service if they perceive the new one better, or different, at fairer prices and more enjoyment by expectation (Hou et al., 2011). Besides, SNGs are usually provided for free and are aggressively marketed in social media, or informed by word-of-mouth of the peer players, which enhance the attractiveness of alternatives. As a result, players can be attracted by alternatives and make the decision to switch easily without monetary attachment. Thus, the following hypothesis is proposed:

H4. Alternative attractiveness is positively associated with switch intention in SNG.

The regret theory (Lommes & Robert, 1982) has been applied to study satisfaction and evaluation by considering the performance of alternatives. The regret theory suggests that people feel regret when the evaluation of the outcome of a perceived alternative is better than present choice. In marketing literature, customers' perceptions of good performance of an alternative will result in a decrease of their post-purchase evaluation, such as satisfaction towards the chosen brand (Inman et al., 1997). Thus, we proposed the following hypothesis:

H5. Alternative attractiveness is negatively associated with satisfaction of current SNG.

This leads us to propose as simple as possible a research model below for studying switching intention of the gamers of SNGs (See Figure 1).

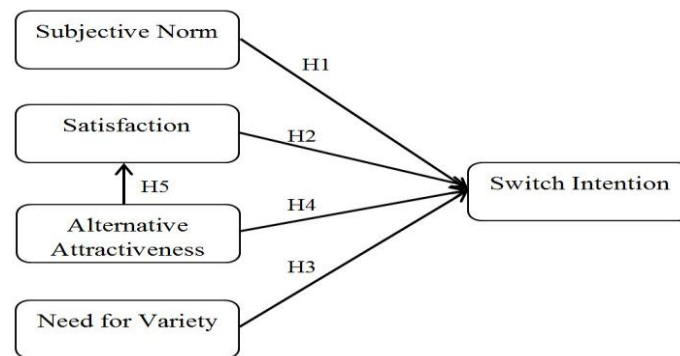


Figure 1: Research model

4 Research Methodology

4.1 Measurement Development

The five constructs in current research model were: need for variety, dissatisfaction, subjective norm, alternative attractiveness and switching intention. All constructs were measured by using multiple-item perceptual scales, which are adapted from prior research. Items were modified slightly from previous studies in order to fit our research context. All items were measured using a 5-point Likert scale ranging from 1 (disagree) to 5 (agree). The instrument is presented in appendix A.

The questionnaire was initially developed in English and then subsequently translated into Chinese by one of the manuscript's authors, a native Chinese speaker. A pilot test was conducted among 7 respondents; including 3 IS researchers, a manager of the SNG investigated in this research and 3 current game players. The purpose of this pilot test is to evaluate the validity of the questionnaire. According to their opinions, some revision has been done to improve the questionnaire quality.

4.2 Data Collection

A popular SNG in China has been chosen to be our research target, and for reasons of confidentiality, the name of the SNG will not be publicized in the study, which is hereafter called as "The SNG". The SNG is designed for Chinese players in Chinese language and ran by one of the big social network companies with multi-million users in mainland China. The SNG has been running for over 6 months before our data collection. It is mainly marketed and distributed via the social network sites of the company.

With the help of the company, an online survey was conducted to collect data for studying continuous use and switching behaviour in SNG respectively. The two segments were identified via self-selected questions in the questionnaire. Players were identified by questions towards whether they have been playing the SNG or switched to play other SNGs in the recent one month. In this research, the SNG manager suggested that if a player hasn't played the SNG for one month, the player was identified as potential switching or discontinuous player.

The company sent out 220, 000 electronic questionnaires to a random selected sample from registered players of the SNG during Nov. 23rd and 27th, 2012. All responses were provided voluntarily without rewards. In the survey, no personal information about the respondents has been collected. The electronic questionnaire was implemented with a pop-up that has been added to the SNG homepages and the selected 220,000 players are invited to answer the questionnaire. If and when the players clicked the pop-up, they were lead to the questionnaire webpage to answer the questionnaire.

7769 responses were received, including: (i). Registered users who claimed have never played the SNG before (2128); (ii). Discontinuous players who claimed that they quit (1181) from any online games; and (iii). Continuous players (4123) of the SNG; 4. Switching players (542) of the SNG. Finally, 4460 valid responses including continuance players and switching players were collected. According to the SNG manager, this is a typical response rate for such a questionnaire in their SNG population. Among 4460 valid responses, 541 responses were valid regarding switching behaviour and used as the valid data base in this study. The description of the data is presented in Table 1.

Type	Total cases	Invalid cases	Valid cases	Included in this study
Non-players	2128	0	2128	NO
Discontinuous players	1181	0	1181	NO
Continuous players	4123	204(missing data)	3919	NO
Switching players	542	1(missing data)	541	YES
Total	7974	205	7769	

Table 1: Responses Distribution.

According to iResearch (iResearch, 2012), 67.8 per cent of Chinese online game players are male in their research sample, and 32.2 per cent are female. In our study (including continuous and switching users), 59.1 per cent of respondents are male and 40.9 per cent are female. In addition, according to iResearch (2012), 61.4 per cent of online game players are below 24 years old, and 20.1 per cent are 25 to 35 years old. In our study, 64.8 per cent of respondents are below 24 years old, and 30 per cent are 25 to 35 years old. The sample (switching user) included in this study also largely fits to iResearch sample's demographic information in China. The sample demographic information is presented in Table 2.

Measure	Items	Frequency	%
Gender	Male	277	51.2
	Female	264	48.8
Age	Under 15	236	43.6
	16-18	178	32.9
	19-24	92	17
	25-30	17	3.1
	31-35	16	3
	Over 36	2	0.4

Table 2: Demographic Information

4.3 Validity and Reliability

This study tested the research model by examining both the measurement model and the structural model with AMOS 20. A confirmatory factor analysis was conducted to test the reliability, convergent validity, and discriminant validity of all the constructs. The values of factor loading, composition reliability, average variance extracted (AVE) and Cronbach's

alpha of all the five constructs satisfied recommended levels of 0.70, 0.80, 0.50 and 0.80 respectively (See Table 3). The results indicate a good internal consistency and reliability of our research instrument.

Construct	Minimal factor loading	Cronbach's Alpha	Composite reliability	AVE
Need for variety (3 items)	0.80	0.86	0.86	0.67
Subjective norm (3 items)	0.88	0.86	0.94	0.85
Alternative Attractiveness (3 items)	0.86	0.91	0.92	0.78
Satisfaction (3 items)	0.87	0.94	0.94	0.83
Switch intention (2 items)	0.94	0.95	0.95	0.90

Table 3: Confirmatory Factor Analysis Result

Discriminant validity is used to evaluate whether the measurements of two distinct theoretical constructs are empirically distinct (Williams & Clippinger, 2002). As presented in Table 4, each square root of the AVE is greater than the correlations with other constructs. A good discriminant validity is supported in this study (Hair et al. 2006).

	NFV	SN	SAT	AA	SI
NFV	0.821				
SN	0.685	0.921			
SAT	-0.447	-0.554	0.911		
AA	0.689	0.715	-0.599	0.885	
SI	0.642	0.718	-0.556	0.718	0.901

Table 4: Inter-construct Correlations

4.4 Model Fit

Several common used model-fit indices were used to estimate the measurement model and structural model fit (Hair et al., 2006; Bagozzi & Yi, 1988): (1) Chi-square/degree of freedom (X^2/df); (2) the Goodness-of-Fit Index (GFI), the Adjusted Goodness-of-fit Index (AGFI); (3) Root Mean Square Error of Approximation (RMSEA); (4) Normed Fit Index (NFI); and (5) Comparative Fit Index (CFI) as seen in Table 5. All the indices indicate a good model fit of the current study.

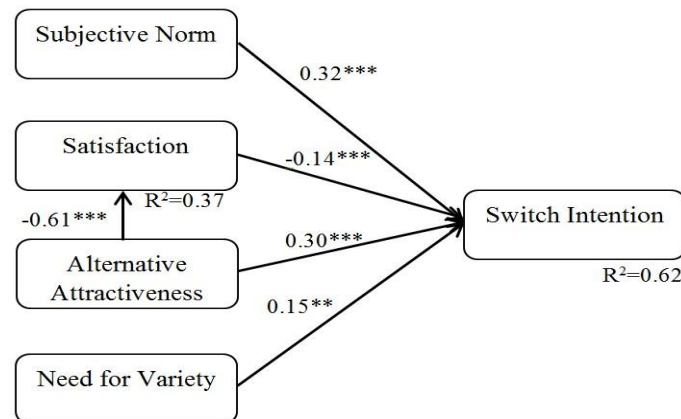
Fit statistics	Measurement model	Structural model	Recommended value
X^2/df	2,903	3.125	<5
GFI	0.953	0.948	>0.90
AGFI	0.926	0.921	>0.90
RMSEA	0.059	0.063	<0.08
CFI	0.982	0.980	>0.90
NFI	0.973	0.971	>0.90

Table 5: Fit Indices for Measurement Model and Structural Model

5 Research Results

In this study, all the seven hypotheses were supported as shown in Figure 2. Subjective norm ($\beta=0.32$), satisfaction ($\beta=-0.14$), alternative attractiveness ($\beta=0.30$) and need for variety ($\beta=0.15$) are found to be the significant factors determining individual SNG players' switch

intention. Alternative attractiveness ($\beta=-0.61$) significantly relates to individual SNG players' Satisfaction. The proposed research model explained 62 percent of variance of switch intention.



Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Figure 2: Research model results

6 Discussion and Conclusion

The data analysis of our model shows that satisfaction, subjective norm, alternative attractiveness and need for variety are all significantly associated with switch intention. The research results are consistent with prior studies (Bhattacharjee, 2012; Zhang et al., 2012). Surprisingly, subjective norm and alternative attractiveness are more strongly associated with switch intention compared to that of satisfaction and need for variety. In other words, subjective norm and alternative attractiveness are the prime determinants of switch intention in SNG.

SNG players' switching intention is strongly correlated with the favourable subjective norms towards switching behaviour. According to our definitions, this finding implies that positive suggestions from SNG players' social network (such as friends, families or colleagues) towards switching to substitute SNGs play a key role in individuals' switching decision making process, confirming H1. Therefore, subjective norm does not only have influence on intention of IS adoption and continuance in prior studies, but also has significant effect on switching intention in current study. This study broadens the explanatory power of the conceptual relationship from subjective norm to behavioural intention.

The research result implies that alternative attractiveness has a strong and significant effect on SNG players' switching intention. If the alternative SNG is more attractive than the current SNG, the players are very likely to switch to the alternative one (strong support to H5). Comparably speaking, the predictive power of satisfaction on switch intention is not as strong as that indicated in the prior research. Our interpretation is that individual SNG players will have intentions to switch to alternative SNG if their social networks recommend them to switch and the alternative SNG is perceived more attractive, even though their satisfaction to the current SNG might not be so low yet. The finding also consists with prior studies which pointed out that under the situation of high competitive attractiveness, a user continues the

relationship with current service provider only when satisfaction is very high (Sharma & Patterson, 2000). Thus, individuals' switch intention in SNG context is related to not only the SNG service itself, but very much on the alternative SNG of the competitors and on the social networks of individual players.

In addition, alternative attractiveness is correlated with satisfaction significantly. The result suggests that in a situation of high competitive substitutes, when players perceive a better entertainment and customer services provided by the alternatives, the satisfaction towards current SNG will decrease. This finding leads us to believe in the low elasticity of substitution in SNGs.

Based on the above discussion, some practical implications can be arrived at. Firstly, it is crucial for SNG providers to understand the competition and development trends in SNG market and to update their SNG in order to keep their users from switching, or to attract other SNG users to switch. In the latter case employing social networks seems helpful in attracting new customers from the other SNG competitors.

7 Limitations and Future Study

There are some limitations in our study. First, as we use the Chinese SNG players as the research sample, we cannot be sure, whether the findings are applicable to other digital services, too. Therefore, future study can explore other types of online games and collect data in an international cross-cultural background. In addition, the elements of our simple model may be elaborated further in future studies, especially in terms of decomposed subjective norms and temporal perceived amelioration of present services.

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Appendix A. Instrument

Construct	Item	Measurement	Reference
Satisfaction	SAT1	Very dissatisfied ... Very satisfied	Oliver & Swang (1989)
	SAT2	Very displeased ... Very pleased	
	SAT3	Very frustrated ... Very contented	
Subjective Norm	SN1	Most people who are important to me support my switching from this game to other SNGs.	Liao et al. (2007)
	SN2	People who influence my decision wanted me to switch from this game to other SNGs.	
	SN3	People whose opinions I valued preferred that I should switch from this game to other SNGs.	
Need for Variety	NFV 1	I would rather stick with current SNG other than try a SNG I am not very sure of.	Bansal et al. (2005)
	NFV 2	If I like my current SNG, I rarely switch from it just to try something different.	
	NFV 3	I am very cautious about trying out new and different SNGs.	
Alternative Attractiveness	AA1	I believe that alternative SNGs offer much better entertainment than this game.	Bansal et al. (2005)
	AA2	I believe that alternative SNGs offer much better customer service than this game.	
	AA3	I believe that alternative SNGs have better reputation than this game.	
Switching Intention	SI1	I consider switching from this game and play other SNGs instead.	Hsieh et al. (2012)
	SI2	The likelihood of me switching from this game to other SNGs is high.	