

Understanding Individual Adoption of Social Networking Services: An Empirical Investigation

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Abstract—Social networking services (SNS) have become a hot topic both in Information Systems area and research community for its powerful influence among a large number of users. People are curious about the reasons why SNS users are so passionate with SNS sites. In this study, the decision to continually use SNS is examined under an extended Technology Acceptance Model. Renren (renren.com) is the largest SNS sites in China and becomes the research object of this paper. An empirical study of Renren users (n=183) found that behavioral intention to use SNS is determined by both perceived usefulness and perceived enjoyment. Perceived enjoyment and information sharing impact perceived usefulness directly while social connection and self presentation impact perceived enjoyment directly. Some implications for theories and practice are given and limitations with directions for future research are also listed.

Keywords- Information Systems, Social Networking Services, Adoption of Information Technology, Human Factors

1. Introduction

Social networking services (SNS) sites such as Facebook have gained huge attention during recent years. More and more people join the social networking world and become dependent on it to some degree. Social networking sites offer people a totally new way to communicate and share information. As reported, the number of registered users in Facebook has surpassed 600 million. Renren which is the largest SNS site in China also reports huge user base which reaches the benchmark of 100 million.

In addition to the great success of SNS in business, the researchers also hold great enthusiasm toward SNS. Boyd & Ellison (2008) [1] summarize that present SNS researches mainly focus on four aspects: impression management, network and network structure, bridging online and offline social networks, privacy. However, there lacks enough research focusing on exploring the motivation of users to continually use social networking services.

This paper intends to explore the reasons why people are so interested in using SNS continually. As the largest SNS site in China, Renren has nearly 100 million active users and represents the features of SNS sites in China. It is the research object of this article. The article has developed and empirically validated a research model on individual adoption of social networking services. In this study, TAM model was employed as the basis of the applied research model. Cheung & Lee (2010) [2] explored SNS users' intention mainly from social influence perspective, while this paper will mainly start from the uses and gratification angle. Joinson (2008) [3] researched the motives and use of Facebook mainly through qualitative questionnaire, while this paper depends more on quantitative empirical study through survey method.

The rest of this paper is in the structure as follows. The following second section states the theoretical background and presents the research hypotheses. The third section introduces a survey study of SNS sites

(Renren in this case) users. The fourth section discusses the results of the empirical study. Finally, the paper gives the implications for both theory research and practice and lists the limitations and directions for future study.

2. Theoretical Background and Research Model

2.1. Technology Acceptance Theories

There exist several classic theories in the technology acceptance field, such as the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). However, another theory called Technology Acceptance Model (TAM) receives most repeated employment from researchers in different fields to study users' motivations of computer and Internet applications for it's very suitable to explain the profound reasons. TAM [4] assumes that the determining variables for user's intention to use an application are respectively perceived usefulness and perceived ease of use. Perceived ease of use had great explaining power in the early years of computer and Internet applications development, however, as ordinary people are more and more familiar with computer and Internet use and application designers emphasizes more on the feature of ease of use, perceived ease of use loses its significant correlation with intention to use [5].

In this paper, perceived ease of use is replaced by perceived enjoyment. There are three reasons: firstly, SNS is hedonic application[6] which is different from office tool application, perceived enjoyment is a critical element in hedonic systems; secondly, perceived usefulness and enjoyment are respectively extrinsic motivation and intrinsic motivation[7], the former one is to explain the system's practical utility and the latter one is to explain the internal joy brought by the system; thirdly, the enjoyment derived from SNS will affect an user's perception of the usefulness of SNS to support relationship maintenance[8].

H1: Perceived usefulness is positively associated with behavioral intention. H5 H1

H2: Perceived enjoyment is positively associated with behavioral intention.

Li et al. (2005) [9] found that in instant messaging application perceived enjoyment had really significant effects on perceived usefulness. As SNS and instant messaging services share a lot of similarities, they are also mainly hedonic systems, thus the paper believes that the perceived enjoyment also influences the perceived enjoyment in the SNS context.

H3: Perceived enjoyment is positively associated with perceived usefulness.

2.2. Uses and Gratification Theory

Uses and gratification theory [10] is originally applied to explore how individuals use the media and what gratifications they get from a certain media. This theory has been extended to study the motivations of Internet applications use and can help identify the antecedent variables of perceived usefulness and perceived enjoyment.

Richter & Koch (2008) [11] point out that the SNS sites are not only a platform just for people to connect with each other, it is also becoming an important information sharing platform. The information on SNS sites is mostly recommended by the user's friends and will be more helpful for the reader because the user and his or her friends may have more similar information demands.

The feature of information sharing will make the users think the sites are more helpful [12]. And besides the useful information, some funny videos, photos and logs can also improve users' perception of enjoyment.

H4: Information sharing is positively associated with perceived usefulness.

H5: Information sharing is positively associated with perceived enjoyment.

Joinson (2008) [3] identifies that the most influential use and gratification in SNS sites is social connection which means that people primarily use the SNS to communicate with acquaintance they already know offline. The SNS sites can help people to connect with acquaintance in a more efficient and funny way. This feature will influence the users' perception of the enjoyment of the SNS sites [13].

H6: Social connection is positively associated with perceived enjoyment.

Another main use and gratification in SNS sites is self presentation. Walther (2007) [14] points out that users engaged in computer-mediated communication care about the function of presenting themselves very much. The users care about their profile very much and try to present a best self to the friends. The most popular ways are uploading photos and updating status because the users know their friends will frequently check the photos and profiles [15] which bring much fun.

H7: Self presentation is positively associated with perceived enjoyment.

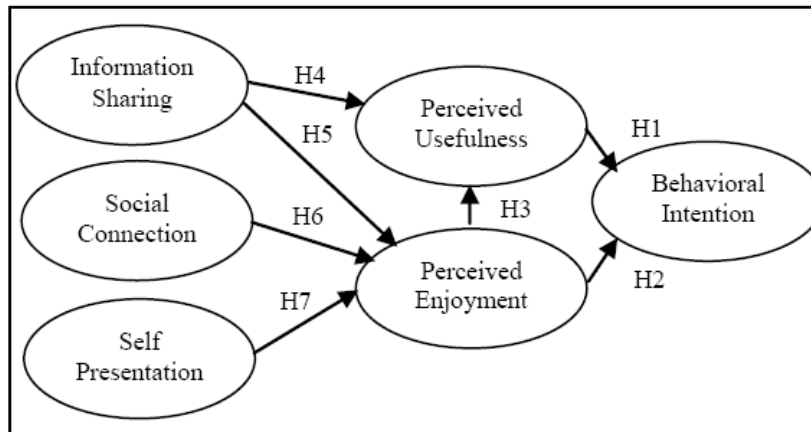


Fig 2. Structural Model

2.3. Research Model

According to the above comprehensive literature review and considering the actual features of SNS sites, the paper proposes the research model with 7 hypotheses displayed in Fig.1.

3. Method

In this study, Renren (<http://www.renren.com>) as an online social networking site is used to examine users' behavioral intention to use SNS. This is mainly because Renren is most influential SNS site in China with a huge number of users and can represent the SNS users' features.

3.1. Data Collection

The study uses convenience sampling. The survey was published in one of China's leading online questionnaire websites. The link (<http://www.sojump.com/jq/640097.aspx>) with a sincere invitation was sent to the researcher's classmates and friends who are also very familiar with online social networks and was then distributed through friends' network to attract new answerers.

There exist two screening questions in the beginning of questionnaire in order to ensure the respondents are actual active users of Renren. There are also instructions to help the respondents remind their experience and feelings about Renren in a short time.

3.2. Measures

The study contains six constructs of interest which are separately Behavioral Intention, Perceived Usefulness, Perceived Enjoyment, Social Connection, Information Sharing and Self Presentation.

All measures of these constructs come from previous influential literatures and have been adapted slightly to be more suitable for SNS context. The questionnaire is finally in Chinese, so the measures have been translated from original English version through a strict translation process with several translators to make sure the accuracy of Chinese version. All constructs are measured using multi-item perceptual scales which mean every construct is measured by a few items for construct validity and reliability. The items were evaluated in 7-point Likert scales and this improves the accuracy of the results.

3.3. Sample Profile

Totally 183 useful online questionnaires were collected during the survey period. Among the 183 respondents, 46% were male and 54% were female. A majority of the respondents (75%) aged 22-25. 49% respondents are undergraduate students or hold a bachelor's degree, another 49% are graduate students pursuing master's degree or already hold a master's degree. 85% of the respondents are students. More than half (56%) have been using Renren for over 3 years. 65% respondents login in renren.com at least once per day. Nearly 45% respondents spend more than 30 minutes on renren.com per day. Around 52% respondents have 101-300 friends on renren.com.

4. Data Analysis

This study uses the statistical program LISREL 8.70 to analyze the data because LISREL is one of the most popular and useful Structural Equation Modeling (SEM) techniques in information systems research area. SEM requires a two-step analytical procedure to estimate the two components of a causal model: measurement model and structural model. Firstly, the measuring model is estimated using confirmatory factor analysis (CFA) to judge whether the constructs own sufficient validation and reliability. Secondly, the structural model is tested to find out the strength and direction of the relationship between the theoretical constructs. Only when the two models prove efficient, total results are acceptable.

TABLE I. CONVERGENT VALIDITY

Constructs	Item Loading	Mean	Standard Deviation
<i>Behavioral Intention (CR = 0.95, AVE = 0.87)</i>			
BI1	0.94	5.45	1.11
BI2	0.93	5.48	1.15
BI3	0.89	5.52	1.11
<i>Perceived Usefulness (CR = 0.89, AVE = 0.74)</i>			
PU1	0.80	4.82	1.21
PU2	0.90	4.97	1.07
PU3	0.87	5.03	1.04
<i>Perceived Enjoyment (CR = 0.91, AVE = 0.77)</i>			
PE1	0.83	5.15	0.95
PE2	0.93	5.08	0.95
PE3	0.87	5.12	1.03
<i>Information Sharing (CR = 0.85, AVE = 0.65)</i>			
IS1	0.81	5.43	1.11
IS2	0.80	5.39	0.98
IS3	0.81	5.43	1.00
<i>Social Connection (CR = 0.75, AVE = 0.51)</i>			
SC1	0.74	5.66	1.00
SC2	0.72	5.55	1.00
SC3	0.67	5.04	1.16
<i>Self Presentation (CR = 0.75, AVE = 0.51)</i>			
SP1	0.80	4.82	1.21
SP2	0.90	4.97	1.07
SP3	0.87	5.03	1.04

Note: CR means Composite Reliability and AVE means Average Variance Extracted.

TABLE II. DISCRIMINANT VALIDITY

	BI	PU	PE	IS	SC	SP
BI	0.93					
PU	0.64	0.86				
PE	0.61	0.70	0.88			
IS	0.41	0.57	0.53	0.81		
SC	0.49	0.57	0.55	0.65	0.71	
SP	0.35	0.59	0.60	0.62	0.61	0.75

Note: Diagonal elements are square roots of the average variance extracted

4.1. Measurement Model

At first, the convergent validity got evaluated. The convergent validity means to which degree the items of a certain scale correlate with each other. There are two judging principles: the composite reliability (CR) should be 0.70 or above, and the average variance extracted (AVE) should be 0.50 or above [16]. Table I lists the item loading, composite reliability, average variance extracted, mean, and standard deviation of the measures of every construct in this study. Every indicator in this study fulfills the requirements, with the composite reliability ranging from 0.75 to 0.95 and the average variance extracted ranging from 0.51 to 0.87. This means the measures holds acceptable convergent validity.

Second, the discriminant validity was tested. Discriminant validity means to which degree the measures it not a reflection of any other variable. This is indicated by low correlations between the measure of interest and the measures of other constructs. The judging rule is that the squared root of the average variance extracted for each construct should be higher than the construct's correlations with any other construct [17]. In Table II, the results show that the square root of average variance extracted for every construct is higher than the correlations between the construct and all other constructs which means the measures of this study possesses adequate discriminant validity.

4.2. Structural Model

Maximum likelihood method was used to estimate the structural model. Fig.2 demonstrates the total explanatory power respectively for behavioral intention, perceived usefulness and perceived enjoyment associated with estimated path coefficients (note: significant paths are indicated with asterisks).

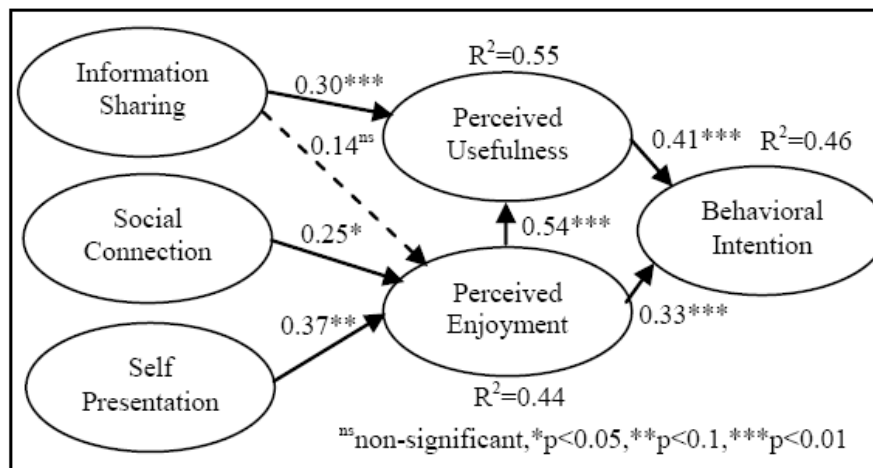


Fig 2. Structural Model

TABLE III. GOODNESS-OF-FIT MEASURES

Goodness-of-Fit Measures	Recommended Value	Fit Indices in this Study
Chi-Square / df	<3	2.11
Goodness-of-Fit Index (GFI)	≥0.80	0.86
Adjusted Goodness-of-Fit Index (AGFI)	≥0.80	0.81
Comparative Fit Index (CFI)	≥0.90	0.97
Normed Fit index (NFI)	≥0.90	0.95

The fit indices displayed in Table III suggests that the research model provides a good fit for the data (Chi-square/df = 2.11, GFI=0.86, AGFI=0.81, CFI=0.97, NFI=0.95).

In all, the research model explains 46% of the variance in behavioral intention to continually use social networking services. Information sharing with perceived enjoyment account for 55% of the variance of perceived usefulness of SNS. Social connection and self presentation covers 44% of the variance of perceived

enjoyment engaged in SNS sites. The results are acceptable and satisfying because they explain nearly half of the variance.

There is only one hypothesis not getting supported which is from information sharing to perceived enjoyment. This is mainly because people share information on the SNS platform primarily for utility and not just for fun.

As the direct influence is considered, perceived usefulness exhibits stronger impact on behavioral intention than perceived enjoyment. However, perceived enjoyment has additional indirect influence on behavioral intention through perceived usefulness. We can conclude that the intrinsic variable is not less important than the extrinsic variable in the SNS context.

5. Discussion and Conclusion

The aim of this study is to explore individual adoption of social networking services. The research model is developed totally based on previous literatures mainly integrating two theories which are TAM theory and uses & gratifications theory.

The measurement model proves to be adequate and the structural model explains 46% of variance. Every path coefficients are found significant except the path from information sharing to perceived enjoyment.

5.1. Implications for Theory and Research

There isn't enough literature on exploring the motivation to use social networking services and this study offers new perspectives to understand users' adoption of SNS.

At first, this study proves that the adjusted TAM model suits to the SNS context very well. In the adjusted TAM model, both intrinsic and extrinsic elements have been considered, and the results of this study show that these two aspects are both very important to explain users' behavioral intention.

What's more, the intrinsic element perceived enjoyment has a powerful impact on the extrinsic element perceived usefulness which indicates that SNS is a hedonic system inherently.

Secondly, this study brings in the uses and gratifications theory to find out the antecedent variables of the core adjusted TAM elements. The information sharing proves to have great impact on the perceived usefulness which may indicate that the SNS sites are becoming important information exchange media while retaining their social communication essence. Social connection and self presentation are important antecedent variables of perceived enjoyment which may suggest that people use SNS to communicate with friends and present themselves mainly for fun and joy.

5.2. Implications for Practice

Besides the implications for theory and research, this paper also offers some implications for the practitioners in the SNS field. First, users use the SNS not only just for fun but also for its usefulness. The practitioners should emphasize both the practical feature and the entertainment feature of the sites and should not ignore any side of both.

Secondly, the SNS sites should understand that SNS is not only a platform for users to communicate with each other, SNS is gradually becoming a critical platform for information exchange. To some degree, SNS is more functional for users to get valuable information than news site or search engine because the pieces of information are mostly recommended by the users' friends and colleague which means higher relevance with the users.

What's more, social connection and self presentation are the sources of enjoyment in SNS, so the sites should offer more convenience for users to communicate with other and present themselves inside the sites. For example, the sites can offer instant messaging channel to help people communicate immediately just in the sites without any program or improve the system to help users upload their photos and videos more easily.

5.3. Limitations and Future Research

There are some limitations in this study. First, although the research model proves effective, the core adjusted TAM model only explains no more than 50% of variance of behavioral intention. Future researches

can do comprehensive literature review and field study to understanding other antecedent elements of users' behavioral intention. This would be very helpful both in research and practice. Second, the study only focuses on a particular SNS site Renren. Although Renren is very typical in China's SNS environment, there exist distinct differences in users' adoption from other SNS sites. For example, Renren may be different from Facebook in several aspects and this needs the researchers' attention. Third, the survey in this study is based on the convenience sampling method and the respondents are mostly students. There may be significant differences between student users and white-collar users or other users group which needs future exploring. Surveys of different types of users may offer different results.

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