Summer 6-30-2018

Exploring Users' Intention to use QQ's Various Functions based on Social Cognitive Theory

Xun Wang

School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu, 611130, China

Ying Wu

School of Accounting, Southwestern University of Finance and Economics, Chengdu, 611130, China

Chuan Luo

School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu, 611130, China

Yalan Li

School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu, 611130, China

Follow this and additional works at: http://aisel.aisnet.org/whiceb2018

Exploring Users' Intention to use QQ's Various Functions

based on Social Cognitive Theory

Xun Wang[1], Ying Wu[2], Chuan Luo[3], Yalan Li[4]

[1, 3, 4] School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu, 611130, China

[2] School of Accounting, Southwestern University of Finance and Economics, Chengdu, 611130, China

Abstract: Based upon social cognitive theory, this study explores the effect of personal and environment factors on users' intention to use QQ's various functions. Online survey is used to collect data in China. The results show that relationship benefit, switching cost, compatibility and subjective norms can significantly affect users' intention to use QQ's various functions. Whereas image benefit, perceived advantage and popularity have no effect. Finally, we propose the theoretical contribution and practical implication of this study.

Keywords: QQ, social cognitive theory, personal factors, environment factors, intention to use.

1 INTRODUCTION

The thirty-ninth China[1] Internet development situation report shows that Chinese Internet users have reached 731 million by December 2016, of which mobile users have reached 695 million, accounting for more than 95%. With the development of mobile Internet, the Social Networking Service (SNSs) have changed from PC to mobile terminal such as QQ, Facebook, Twitter, etc. Among them, QQ is one of the most popular SNS APP, it has penetrated into every aspect of people's life. Currently QQ is no longer a simple instant messenger, but a comprehensive APP that integrates various functions, such as QQ wallet, city services, QQ space group and others.

How can QQ continue to dominate the SNS market is a problem in a time, when other social network software is booming, such as WeChat, Alipay, MOMO, and Skype. We believe the development of multifunctional QQ can encourage people to continue to use QQ; consequently, it is an important topic to explore the important factors that can affect the willingness of users to use various functions of QQ. However, as far as we know, seldom of previous research has investigated on this research question, this study endeavor to fill in research gap. We plan to use Social Cognitive Theory (SCT) as the theoretical background, to explore the key influencing factors that can affect QQ users' willingness to use various functions of QQ. We believe this study will not only provide some important theoretical contributions; but also can help the enterprise improve its APP design, which finally will improve the QQ user's usage experience.

The rest parts of this paper organize as following. First we review the relevant literature and introduce the SCT as the theoretical background, second we built our research model based on SCT, then we design and issue questionnaire to collect data. We analyze the data to find out which factors have the significant impact; finally, based on the results of the data, we put forward some suggestions on the functional design of QQ to promote the better development of QQ.

2 LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1 Literature review

In a recent study, Brandtzaeg and Heim surveyed 1,200 users of SNS and found that the main reason

---

[1] Corresponding author. Email: wangxunlisle@foxmail.com (Xun Wang) , luochuan@swufe.edu.cn (Chuan Luo)

people used SNS one was to establish contact with people[2]. Ellison et al. and Park et al. also found that people use Facebook as a social network first and foremost because of social needs and environmental factors for the impact of self-positioning and the need to acknowledge the message, which based on a corresponding number of Facebook user surveys[3]. Przepiorka, Błachnio and Díaz-Morales explored the discovery that people's procrastination was associated with the development of existing instant messaging tools through relevant psychological factors, social factors, investigators' own factor analysis, and modeling[4]. Other related studies are shown in Table 1 on social networking sites and instant messaging tools:

Table 1.Literatures on SNSs and instant messaging tools.

Study	Area	Factors	Results
Joinson, A.N.(2008)	Social Network Sites (SNSs)use	social connection shared identities photographs content	Social relations, entertainment, information and social interaction, entertainment, information, and personal identity all are important motivation factors for users to choose a software.
Hong, S.Y., Oh, J.C., (2010)	SNSs use	expert search, communication, connection, content Sharing, identity	The study found that users prefer to the different functions about the different social media.
Sung-joon Yoon (2014)	SNSs	effort expectancy, performance expectancy social influence, facilitating conditions, behavioral intention, and so on;	Bridging capital only had significant impact on qualitative use while subjective well-being did not mediate the relationship between social capital and SNS use
Hui Lin Weiguo Fan Patrick Y.K Chau(2014)	Users Continuance of Social Networking Sites	appraisal factors: pleasure, awareness, connectedness, and system quality; emotional reaction: satisfaction and sense of belonging	Appraisal factors are strong determinants of emotional reaction while user satisfaction and sense of belonging together positively influenced continuance intention.
Edmund W.J. Lee, Shirley S. Ho, May O. Lwin(2017)	SNSs	adolescents' relationship with their parents, depression, loneliness, self-identity, habit strength	1.positive relationship with father adolescents' dependence on SNSs 2.identity formation deficient self-regulation and SNSs habit strength adolescents' time spent on SNSs.
Joe Phuaa, Seunga Venus Jinb, Jihoon (Jay) Kima,(2017)	SNSs		social networking sites (SNSs) use
Sang Woo Lee., Jiyoung Lee.(2017)	SNSs	relationship, convenience self-expression entertainment	Compared the different motive factors affecting Kakao Story and Facebook users, information only appeared as motive for Facebook users;

2.2 Social Cognitive Theory

SCT is a learning theory based on the idea that people learn by observing others. The core concepts of this theory can be explained by Bandura's schematization of triadic reciprocal causation. The schema shows how the environmental, behavioral and personal interact with each other[5]. This theory indicates, various kinds of personal factors and environment factors can significant affect people's behaviors.

After a long period of improvement and development, SCT has been widely used to study the phenomenon. In 2001, Bandura applied SCT to mass communication to analyze how symbolic communication influenced human thought, emotion and action[6].Ming-Ten Tsai and Nai-Chang Cheng[7] showed that knowledge sharing self-efficacy and outcome expectancy, as well as organizational climate, will affect individual intentions to share knowledge, thus affecting people's behavior. As mentioned above, after a long period of improvement and development, SCT has been widely used in the study of phenomena and problems about people's actions and motivations.

## 3 RESEARCH MODEL AND HYPOTHESIS

3.1 Research Model

Based on the SCT, this study analyzes the personal factors and environment factors' effect on QQ users'

intention to use various functions. We analyze the personal factors from three accepts: benefits, costs and habits. First, benefit is the users' basic needs and spiritual satisfaction of people when using QQ. In this research, we include image benefit, relationship benefit and perceived advantage into the research model. Second, in terms of cost, we believe that there will be a switching cost if the QQ's users abandon QQ to utilize other social software. Third, habit refers to whether the use of QQ consistent with people's real habits in their life, working and communication with others, we will use the compatibility to describe the habits. Environment is the external cause of individual behavior. In this study, we include popularity and subjective norms as the environment factors. With the above description, our research model is showed in Figure 1:

3.2 Hypothesis of Research
3.2.1 Personal factors

We describe the personal factors from benefits (image benefit, relationship benefit and perceived advantage), costs (switching cost) and habits (compatibility), based on SCT and previous research.
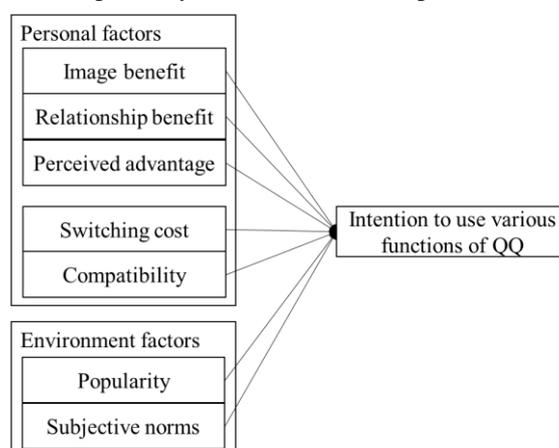
Figure 1: Model Framework

Image benefit refers to the users' personal expression in a social software, which can make others feel the users' personal image, and finally improving their personal recognition. According to the study of the Nadkarni and Hofmann, the two main motivation that people use Facebook are the sense of belonging and self-presentation[8]. Schlenker believes that self-presentation is a personal attempt to influence others through the act of being perceived by others, and the purpose is to make a special impression on others[9]. Following this viewpoints, we predict if QQ users can utilize QQ's various functions to fulfill their self-image recognition; they will be more willing to use these QQ functions.

H1: Image benefit positively affects users' intention to use various QQ functions.

Relationship benefit refers to the maintenance and expansion of interpersonal relationships gained through social software. Maintaining relationships has been recognized as an important reason for the use of a social software. Kuss et al. Proposed that social network is mainly used to keep in touch with the offline acquaintances[10], Jih-Hsin Tang & Ming-Chun Chen believe people use Facebook to keep the existing relationships and expand their social network[11]. QQ, as a social software prevailing in China, not only can help users keep contact with acquaintances, but also can broaden the scope of their social network. We predict if QQ users consider that the QQ's various functions can help them maintain personal relationship, expanding their social network and other aspects of the relationship, they will be more willing to use these QQ functions.

H2: Relationship benefit positively affects users' intention to use various QQ functions.

Perceived advantage refers to the degree to which individuals perceive their quality of life, job performance or work efficiency can be improved with the use of a social software. It has been suggested that the perceived

relative advantage would have a positive impact on knowledge contributing behavior and knowledge collecting behavior in professional virtual communities[12]. Rui-Ting Huang[13] found that perceived relative advantage has impact on the self-posting continuance intention in the social media. So we believe that if a system or platform can play an increasing role on job performance or work efficiency that can strengthen the users' intention to use system or platform. Finally we put forward the hypothesis of H3, as follows:

H3: Perceived advantage positively affects users' intention to use various QQ functions.

Switching costs refers to the real or perceived costs incurred when changing suppliers'[14]. Nakamura found that, the switching costs plays a significant role to affect people's attitude[15]. More recently, Mikolaj Czajkowski found that switching costs contribute to the total magnitude of consumer lock-in in mobile telephony[16]. If QQ users abandon QQ and turn to use other SNS APP, they need to bear various kinds of switching costs[17]. Firstly, they need time and effort to manipulate the function of the new software, Secondly, there are so many sunk costs inserted in QQ, such as money, time, friend, effort. In conclusion, we predict if QQ users consider there is a high switching costs, they will be more willing to use QQ continuously resulting from its various functions.

H4: switching costs positively affects users' intention to use various QQ functions.

Compatibility refers to the extent to which the user's existing values, beliefs, previously introduced ideas, and technology are matched[18].In this article, we define compatibility as the degree to which QQ App fits the habits, lifestyle, work style and experiences of individuals. Wu&Wang found that high compatibility has a significant effect in preferable adoption of mobile systems. Furthermore, it also plays an important role in behavioral intention to use[19]. Rui-Ting Huang [13] found that compatibility had a positive impact on usefulness and playfulness, which significantly influenced selfie-posting continuance intention. As a conclusion, it is valid to consider that compatibility leads to continuous usage of QQ's various functions.

H5: Compatibility positively affects users' intention to use various QQ functions.

3.2.2 Environment factors

Popularity is defined as the "fact or condition of being well liked by the people".[20]. The higher one's popularity is, people around will be more competing to imitate his or her behavior. The high popularity of people in a group can not only affect the people around, and even can reflect a group of trends[21].For those who use social media, especially those who are considered "social media generation", the pursuit of high popularity has inspired social media users to seek more online friends and to disclose more personal information to them[22]. Following these viewpoints, we can predict that, if QQ can help users get higher popularity, they will have a huge intention to use QQ's various functions. We thus construct the following hypothesis:

H6: Popularity positively affects users' intention to use various QQ functions.

Subjective norms can be defined as the degree to which a person thinks that "most of the people who are important to him or she think he or she should or should not perform the act"[23]. As Chinese culture is a collectivism culture, individuals feel the pressure of the group is relatively high, therefore, individuals have a relatively high tendency to comply with subjective norms[24].Subjective norms have proven to be extremely important to one's acceptance and use of a new technology[25]. Based on these viewpoints, we have a great chance to believe that if the use of QQ can be accepted by the relevant groups, the individual's willingness to use various functions of QQ will be much stronger. We thus construct the following hypothesis:

H7: Subjective norms positively affect users' intention to use various QQ functions.

4 METHODOLOGY

In this study, we utilized online survey to collect data. We used the mature scale of existing research to measure the variables, we made some changes to fit for the situation of QQ. The whole questionnaire is divided into two parts: The first part includes all the measurement items of the variables in the research model. All of

these items utilize seven point Likert scale, from "strongly disagree" to "strongly agree". The second part is to record the demographic information of the subjects, including gender, age, occupation, education and other demographic data. After 2 months data collection during March to April 2017, we got 450 respondents. Table 2 shows the demographic information of the subjects.

Table 2. QQ Sample statistical Description

index	options	frequency	proportion
Sample range	Prefecture-level city(288)	54	18.75%
	Province(34)	29	85.29%
Gender	Male	197	43.78%
	Female	253	56.22%
Age	Age under 20 years	108	24.0%
	21-30	197	43.78%
	31-40	69	15.33%
	40-50	63	14.0%
	Over 50	13	2.98%
Education	Primary	8	1.78%
	Secondary	61	13.56%
	Undergraduate	332	73.78%
	Master's and above	23	5.11%
	Others	26	5．78%
Occupation	Students	275	61.11%
	Businessmen	30	6.67%
	Farmers	8	1.78%
	Works	48	10.67%
	Civil servants	14	3.11%
	Others	75	16.67%

5 RESULTS

Confirmatory factor analysis (CFA) is utilized to test the measurement model. Fornell and Larcker [26] suggest that Cronbach's Alpha, composite reliability, and average variance extracted (AVE) can be utilized to assess the convergent validity. As shown in Table 3, the composite reliability of all of the constructs is above 0.9, Cronbach's Alpha is above 0.8, and the AVE is above 0.7, which are all beyond their corresponding thresholds. And the results shown in Table 4 that the factor loading of item is above 0.8, which means the item reliability is acceptable. Thus, the results confirmed the high convergent validity of our data. We further tested the discriminant validity of the constructs in our research model.   From Table 4, the results showed that the AVE square roots of the constructed are much higher than cross-correlation, it approves high discriminant validity.

Table 3. Internal consistency of model constructs

	AVE	Composite Reliability	Cronbach's Alpha
Image (IMG)	0.905	0.966	0.947
Relationship benefit (RELA)	0.844	0.942	0.907
Perceived advantage(PAD)	0.760	0.927	0.895
Switching cost(SCST)	0.796	0.940	0.915
Compatibility(CMPA)	0.830	0.951	0.932
Popularity(PPUL)	0.811	0.928	0.883
Subjective norm(SBNR)	0.845	0.942	0.908
Intention to use(INT)	0.848	0.957	0.940

Table 4. Factor loadings and cross-loadings for all constructs.

	IMG	RELA	PAD	SCST	CMPA	PPUL	SBNR	INT
IMG1	0.948							
IMG2	0.951							
IMG3	0.956							
RELA1		0.889						
RELA2		0.937						
RELA3		0.929						
PAD1			0.847					
PAD2			0.892					
PAD3			0.862					
PAD4			0.887					
SCST1				0.872				

SCST2				0.905			
SCST3				0.878			
SCST4				0.912			
CMPA1					0.891		
CMPA2					0.936		
CMPA3					0.928		
CMPA4					0.888		
PPUL1						0.849	
PPUL2						0.920	
PPUL3						0.930	
SBNR1							0.931
SBNR2							0.935
SBNR3							0.891
INT1							0.928
INT2							0.942
INT3							0.924
INT4							0.888

Table 5.Square root of AVE and cross-correlations

	IMG	RELA	PAD	SCST	CMPA	PPUL	SBNR	INT
IMG	0.951							
RELA	0.653	0.918						
PAD	0.547	0.507	0.872					
SCST	0.682	0.613	0.461	0.892				
CMPA	0.620	0.652	0.716	0.547	0.911			
PPUL	0.294	0.457	0.506	0.295	0.568	0.901		
SBNR	0.617	0.602	0.518	0.649	0.636	0.449	0.919	
INT	0.585	0.663	0.524	0.606	0.675	0.440	0.657	0.921

Smart PLS 3.0 was used to test the hypotheses in our research model. R^2 value is 0.599, indicating that the independent variables can explain the dependent variable 59.9% change, and the model fits well.

As Table 6 shows, we find that four factors can significantly affect intention to use, which are relationship benefit, switching cost, compatibility and subjective norm, with$\beta=0.24$, t=3.84; $\beta=0.15$, t=2.58; $\beta=0.27$, t=3.41; 0.27, t=3.41; =0.27, t=4.27.However, image, perceived advantage, and popularity have no significant effect on intention to use, thus H1, H3, and H6 are not supported.

Table 6 Main test.

	Original Sample (O)	T Statistics (|O/STERR|)	Hypotheses
IMG -> INT	0.012933	0.219940	H1 (not supported)
RELA -> INT	0.238916**	3.836844	H2 (supported)
PAD -> INT	0.005560	0.100754	H3 (not supported)
SCST -> INT	0.148272**	2.576592	H4 (supported)
CMPA -> INT	0.268401**	3.406418	H5 (supported)
PPUL -> INT	0.028295	0.550511	H6 (not supported)
SBNR -> INT	0.222732**	4.271889	H7 (supported)
Dependent variable：Intention to use(INT), R^2 =0.599;			

Note: **P<0.01

6 DISCUSSION

The findings of study help us understand the personal and environment factors' effect on QQ users' intention to use QQ's various functions. In this study, we analyze the personal factors from three accepts: benefits, costs and habits, we utilize image benefit, relationship benefit, and perceived advantage as the benefits of the QQ users, use switching cost to describe costs and use compatibility to describe habits strength. Then we include two environment factors, popularity and subjective norms into our research model.

The results showed that relationship benefit has positive impact on the intention to use, whereas image benefits and perceived advantage cannot affect the dependent variable. This highlights the importance of maintaining and expanding the relationship. Although QQ can maintain and enhance the personal image, improve people's life quality and work performance, but these two benefits (image & perceived advantage) are

not the main purpose for the users. In terms of switching costs, since there is high switching costs if QQ users change to use other SNS APPs, such as money, time, effort, which increase the exist barriers, so high switching costs will enhance QQ users' usage intention. Besides, If QQ users consider that their life and work habits fit QQ operating design and function layout, they will intend to use various kinds of QQ functions.

Also for environment factors, the results of the study show that subjective norm has significant influence on the willingness to use, but the popularity had no significant effect. That is to say, we find that the pressure of friends, relatives, classmates, colleagues and so on, have a significant impact on our behavior and decision-making. Whereas, without this pressure, just popularity do not have significant effect on people's usage intention.

7 THEORETICAL AND PRACTICAL IMPLICATIONS

This study has various theoretical contributions. First, this study utilizes SCT as the theoretical background, and propose various personal factors and environment factors which may affect users' intention to use QQ' various functions. This is one of the initial study that exert SCT in SNSs. Second, we further partition the personal factors into three groups: benefits (including image benefit, relationship benefit, and perceived advantage), costs (switching cost) and habits (compatibility). We find that only one kind of benefits (relationship benefit) can exert significant effects on SNS APP users' intention; besides, both the cost and habit factors take crucial roles on users' intention. Third, we identity the environment factors in this research from two directions, popularity indicates the users' observations toward other persons, whereas the subjective norms imply other persons' attitude toward the users. The statistical results that only subjective norms have significant effect whereas the popularity is ineffective in this research context.

This study has some practical implications. We find that relationship benefit, switching costs, compatibility and subjective norms have significant effect on users' intention to use various QQ functions. Firstly, we suggest some strategies to enhance the QQ users' relationship benefits. Current version of QQ has various kinds of designs relating to relationship maintenance, such as group activities, group operations, group voting, group check-in, etc., but some of these functions are not being used very frequently. Therefore, we propose the following suggestions: elevating the rank of the individual in the group based on the level of the activity and completion of the task, and then give special authority to individual based on the hierarchy, which can enhance the dependence of individual on groups. Increasing the anonymous comments function in QQ zone, which can enhance mutual intention by improving interaction each other. Secondly, QQ also needs to enhance the users' switching cost, QQ should design more online or offline activity to enhance users' time cost and relationship cost. QQ then also needs increase the switching cost of QQ account, the first step is improving the accounting security by improving the confirmation function of remote logging and QQ payment that is because it can enhance the user's stickiness to QQ which increase the users' switching cost. The second step is expanding the cooperation with other popular sites to enable QQ to log in more websites as a third party identity. Thirdly, in order to improve the compatibility, QQ may need to improve the usability by deleting some functions, for example, the 'nearby people' function is not used usually, and then QQ also needs increase the function of online preview and online alter of loaded files, which can keep in line with people's work habits, we also suggest that the QQ should include more functions of QQ's linked products, such as QQ music, QQ mail, QQ weather, which users can use those products all functions just by QQ service account without downloading those applications.

Finally, there are some limitations in our research. First, as an initial study to explore the antecedent factors of QQ users' intention to use various functions, we only includes seven variables in our research model. We suggest future research to explore and test more variables' effect on SNS users' usage intention. Second, we only

collect data from one SNS APP (QQ), it is not clear if our findings can apply to other SNS APPs.

ACKNOWLEDGEMENTS

REFERENCES

[1] December 2016 <Statistics report on the thirty-ninth China Internet development situation>［ EB/OL］. http://www.cnnic.cn/hlwfzyj/hlwxzbg/hlwtjbg/201701/t20170122_66437.htm.

[2]P.B. Brandtzæg, J. Heim. Why people use social networking sites. A.A. Ozok, P. Zaphiris (Eds.), Online communities, LNCS 5621, Springer-Verlag, Berlin Heidelberg (2009), pp. 143–152

[3]N. Park, K.F. Kee, S. Valenzuela.Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. Cyber Psychology & Behavior, 12 (2009), pp. 729–733.

[4]Aneta Przepiorka, Agata Błachnio, Juan F. Díaz-Morales. Problematic Facebook use and procrastination. Computers in Human Behavior, Volume 65, December 2016, Pages 59-64

[5] Bandura, A. (2002). Social cognitive theory of mass communication. In J. Bryant & M. B. Oliver (Eds.), Media Effects: Advances in Theory and Research (pp. 94-124). New York, NY: Routledge.

[6] Bandura, A. (2001). "Social Cognitive Theory of Mass Communication" (PDF). Media Psychology. 3 (3): 265–299.

[7] Ming-Ten, Tsai, Nai-Chang, Cheng. Programmer perceptions of knowledge-sharing behavior under social cognitive theory [J]. Expert Systems with Applications, 2010, (37): 8479-8485

[8]A. Nadkarni, S.G. Hofmann. Why do people use Facebook? .Personality and Individual Differences, 52 (2012), pp. 243–249.

[9]B.R. Schlenker. Self-presentation. M.R. Leary, J.P. Tangney (Eds.), Handbook of self and identity, Guilford, New York (2003), pp. 492–518.

[10]D.J. Kuss, M.D. Griffiths, et al. Internet addiction in students: prevalence and risk factors. Computers in Human. Behavior. , 29 (3) (2013), pp. 959–966.

[11]Jih-Hsin Tang, Ming-Chun Chen, Cheng-Ying Yang, Tsai-Yuan Chung, Yao-An Lee. Personality traits, interpersonal relationships, online social support, and Facebook addiction. Telematics and Informatics, 33 (2) (2016), pp. 102–108.

[12] Chen, C.-J., & Hung, S.-W. (2010). To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. Information & Management, 47(4), 226e236.

[13] Rui-Ting Huang,2018, What motivates people to continuously post selfies? The moderating role of perceived relative advantage, Computers in Human Behavior

[14] A.J. Padilla, M. Williams, C. McSorley Switching costs. Part one: economic models and policy implications NERA (2003)

[15] Nakamura, A., 2012. Estimating switching costs of changing social networking sites. In Proceedings of the 19th ITS biennial conference, Bangkok 2012: moving forward with future technologies-opening a platform for all, International Telecommunications Society (ITS).

[16] Mikołaj Czajkowski,Maciej Sobolewski;2015, How much do switching costs and local network effects contribute to consumer lock-in in mobile telephony,Telecommunications Policy

[17] Sharpiro,C.,H.R.Varian.Information Rules.Harvard Business School Press,Boston,MA,1998

[18] L. Chen, M.L. Gillenson, D.L. Sherrell Enticing online consumers: an extended technology acceptance perspective Information & Management, 39 (8) (2002), pp. 705-719

[19] J.H. Wu, S.C. Wang What drives mobile commerce? An empirical evaluation of the revised technology acceptance model Information & Management, 42 (5) (2005), pp. 719-729

[20] Etymology Online entry for Popular, 5 April 2009.

[21] Becker M. Sociometric location and innovativeness: reformulation and extension of the diffusion model. Am Sociological Rev 1970; 35: 267–282.

[22] Seidman, G. (2013). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. Personality and Individual Differences, 54(3), 402–407.

[23] Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Reading, Mass: Addison-Wesley.

[24] Ajzen, Icek. The Theory of Planned Behavior [J]. Organizational Behavior and Human Decision Processes, 1991,50(2):179-211

[25] Watjatrakul, B. (2013). Intention to use a free voluntary service. The effects of social influence, knowledge and perceptions. Journal of Systems and Information Technology, 15(2), 202–220.

[26] (C.Fornell, D.F. Larcker. Evaluating structural equation models with unobservable variables and measurement error [J]. J. Mark. Res. 1981: 39-50.)

Appendix 1

Variable	Items
Image benefit	A. Using QQ can enhance my personal image in my friend circle. B. Using QQ can improve my recognition from the friends. C. Using QQ can make me win high reputation in my friend circle.
Relationship benefit	A. Using QQ can help me keep in good touch with my friends. B. Using QQ can help me make more friends. C. Using QQ can expand my friend circle.
Perceived advantage	A. Using QQ has improved my quality of life. B. Using QQ has improved my job performance. C. Using QQ has provided useful help for my life and work. D. Using QQ has improved my efficiency.
Switching costs	A. If I stop to use QQ, I will lose the reputation accumulated on the QQ. B. If I stop to use QQ, I will lose the friends on the QQ. C. If I stop to use QQ, I will lose the money, time, energy and other costs spent on the QQ.
Compatibility	A. Using QQ matches with my habit of communicating with others. B. Using QQ matches with my lifestyle. C. Using QQ matches with my current environment. D. Using QQ matches with my way of working.
Popularity	A. I have seen other people use QQ. B. In my company or school, many people are using QQ. C. People using QQ can be seen everywhere.
Subjective norms	A. People who have influence on me think that I should use QQ. B. People around me think that I should use QQ. C. The environment around me prompts me to use QQ.
Intention to use	A. I am willing to continue to use the various functions of QQ. B. In a long time I will continue to use the various functions of QQ. C. In the future, I will often use the various functions of QQ. D. When there is a need, I will continue to use the various functions of QQ later.