

What Motivates Users to Play Mobile Phone Games More?

Wonjin Jung and Taehwan Kim

Abstract The literature review suggests that a high quality of system and service, which mobile phone games should provide, appear to be a critical determinant of not only user satisfaction but also the motivation to spend more time and play more games. However, not many past studies in IS have shown much interest in the issues about the effects of the quality of system and service that mobile phone games provide for user satisfaction. Furthermore, there is little research about the relationship between user satisfaction and the motivation to play in the context of mobile phone games. Therefore, this study aims to examine: (1) the effects of the system quality or the service quality of mobile phone games on user satisfaction, (2) the relationship between user satisfaction and motivation to play more games. Structural Equation Modeling (SEM) was employed to analyze data collected through a survey. The results showed that the system quality and the service quality of mobiles games both have a positive impact on user satisfaction. A strong causal relationship between user satisfaction and motivation was also found.

Keywords Smartphone · Application · Information · Usability · Loyalty

1 Introduction

With the advent of the smartphones, mobile phone games have gained popularity. The ownership of a smartphone boosted the possibility that users will play mobile games. According to Crosett [1], in 2011 over 90 % of smartphone owners played a mobile game at least once a week. Another industry report by a game industry expert showed that there was a tremendous growth in the mobile gaming world in

W. Jung · T. Kim (✉)
The School of Business and Economics, Dankook University,
152, Jook-Jun-Ro, Soo-Ji-Goo, Gyeonggi-do Yongin-si 448-701, Korea
e-mail: thkim@dankook.ac.kr

W. Jung
e-mail: jungw@dankook.ac.kr

2015; and furthermore the mobile games industry is projected to gross over \$40 billion by 2017 [2].

As a number of technical innovations and advances were made in smartphones, their capabilities also significantly improved. At the same time, in general, mobile phone games also became increasingly complicated because the technical innovations and advances allow game developers deploy a wide variety of sophisticated functionalities in their games. Accordingly, some are neither easy to play, nor even to understand. Another potential problem is that there can be a decline in the quality of system and service that mobile games offer, which is an expected result of this technical trend. If too many features and functions are deployed in a game, then, in general the likelihood of malfunctioning also increases. If that happens, then it may have a negative impact on user satisfaction and their motivation to play mobile games.

A literature review found that system and service qualities are strongly related to the issues of user satisfaction [3–5]. This can be also applicable to mobile games. If mobile games do not provide adequate quality for their system and service, then users will not be satisfied, or consider playing the games. If the game users do not even consider playing them, then it may be difficult for developers to secure a user base, as well as to make a profit off of the games. In fact, maintaining a higher level of system and service quality is a precondition for surviving in a highly competitive game industry. Thus, it is not too much to say that providing the users of mobile phone games with a high-quality system and service is more imperative than ever before.

In brief summary, the literature review and the discussion above suggest that a high quality of system and service, which mobile phone games should provide, appear to be a critical determinant of not only user satisfaction but also the motivation to spend more time and play more games. However, a review of the relevant literature in IS found that not many past studies have shown much interest in the issues about the effects of the quality of system and service that mobile phone games provide for user satisfaction. Furthermore, there is little research about the relationship between user satisfaction and the motivation to play in the context of mobile phone games. Therefore, the hypotheses below are proposed to test those relationships in a mobile phone game context.

- H1 The quality of a system that mobile phone games offer positively affects user satisfaction with the games.
- H2 The quality of service that mobile phone games offer positively affects user satisfaction with the games.
- H3 The user satisfaction of mobile phone games positively affects the motivation to play more mobile phone games more.

2 Research Methodology, Data Analysis, and Results

The goals of this study are not only to explore the factors that have an impact on user satisfaction but also to examine the relationship between user satisfaction and motivation in the mobile phone game context. This study gathered data by a survey, with a convenient sampling method being used for the survey. A total of 219 college students took part in the survey. They were recruited from various academic programs at two major universities in South Korea, including economics, business, and the humanities. Although a convenient sample of college students was used, efforts were made to gather diverse data in terms of gender, age, and games. The main reasons for using students are not only that they are frequent online-game players but they also play many kinds of games. Thus, the surveyed group of students was considered suitable subjects for this study.

This study employed Structural Equation Modeling (SEM) to analyze the proposed research model and used SPSS statistics and AMOS ver. 18 as the statistical software. First, the measurement model of this study was tested by examining the reliability of all observable variables in the model. The loadings of the variables on their respective constructs are required a minimum of 0.6 to meet the reliability standard [6, 7]. The results of this study showed that all of the loadings were 0.7 or higher, indicating that the reliability is appropriate (see Table 1).

Next, this study tested the convergent validity of the model by examining the composite reliability (CR) and the average variance extracted (AVE) of the latent variables in the model. These values are calculated manually because AMOS does not have the functions to calculate the values of CR and AVE. The formulas suggested by Fornell and Larcker [8] and Hair et al. [9] were used for the calculations. The results of the calculations showed that the values of CR for all latent

Table 1 Standardized regression weights of observable variables, composite reliability (CR), and average variance extracted (AVE)

Latent variables		Estimates	Composite reliability	AVE
System quality	Sys1	0.835	0.879	0.669
	Sys2	0.850		
	Sys3	0.767		
Service quality	Srv1	0.822	0.896	0.687
	Srv2	0.852		
	Srv3	0.811		
Satisfaction	Stf1	0.733	0.897	0.637
	Stf2	0.793		
	Stf3	0.864		
Motivation	Mtv1	0.703	0.864	0.671
	Mtv2	0.971		
	Mtv3	0.759		

variables in the model were of 0.8 or higher, well above the recommended tolerance of 0.7 (see Table 1). Moreover, the values of AVE for all the variables in the model also had values for AVE higher than the recommended cutoff of 0.5 (see Table 1). Thereby, the measurement model of this study demonstrated a satisfactory convergent validity.

$$CR = \left(\sum \text{Standardized Regression Weights} \right)^2 / \left(\left(\sum \text{Standardized Regression Weights} \right)^2 + \left(\sum \text{Variance} \right) \right) \quad [6]$$

$$AVE = \left(\sum \text{Standardized Regression Weights}^2 \right) / N \quad [7]$$

Then, this study examined the discriminant validity of the measurement model. To do so, this study compared the square root of the AVE for all latent variables with the correlations among the variables. To satisfy the requirements of the discriminant validity, all latent variables should have the square root of their AVEs be greater than the correlations with other variables [7]. The results of analyses showed that this study is the case (see Table 2). Therefore, the discriminant validity of the measurement model was also confirmed.

Finally, the structural model of the proposed model was tested. First, the goodness of fit was examined by the indices including χ^2/df , GFI, AGFI, NFI, TLI, and CFI. The results were as follows: $\chi^2/df = 2.925$, GFI = 0.905, AGFI = 0.854, NFI = 0.900, TLI = 0.910, and CFI = 0.931. Based upon the results of the goodness of fit, the structural model of the proposed research model turned out to have a fairly good fit.

Then, the significance of the relationships between the variables was examined to test the structural model. As expected, system quality had a significant influence on user satisfaction ($\beta = 0.242$, $p = 0.000$). Service quality also had a positive

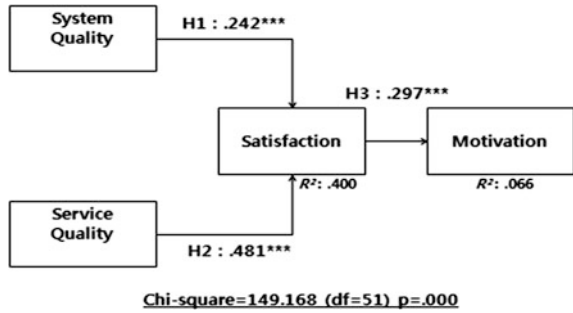
Table 2 Correlation coefficient value between constructs and AVE

Constructs	AVE	σ^2	σ^2	σ^2	σ^2
System quality	0.669	0.002	0.281	0.282	1.000
Service quality	0.687	0.039	0.422	1.000	
Satisfaction	0.637	0.071	1.000		
Motivation	0.671	1.000			

Table 3 Hypothesis test

	Paths	Coeff.	Stand. coeff.	P	Results
H1	System quality → satisfaction	0.242	0.303	0.0001	Accept
H2	Service quality → satisfaction	0.481	0.556	0.0001	Accept
H3	Satisfaction → motivation	0.297	0.256	0.0001	Accept

Fig. 1 Structural model results



impact on user satisfaction ($\beta = 0.481, p = 0.000$). In addition, user satisfaction also had a positive impact on motivation ($\beta = 0.297, p = 0.000$). Therefore, all hypotheses were supported. Table 3 shows the results of the test in detail. Figure 1 also presents the results with R^2 values representing the amount of variance.

3 Discussion

This study empirically examined whether the system quality or the service quality of mobile games have an impact on user satisfaction. Furthermore, there was an examination of the relationship between user satisfaction and motivation to play mobile games. The results of the analyses revealed that the system quality and the service quality of mobile games both have a positive impact on user satisfaction. A strong causal relationship between user satisfaction and motivation was also found. These results mean that when the system quality and the service quality of games reach a certain level that the users expect, then the users are generally satisfied with the games. Moreover, when they are satisfied, they are more motivated to play the games.

Mobile game developers may use these findings to have users spend more time with their games. In particular, the attributes of system quality and service quality in the survey questionnaire can be used to check whether the system quality and the service quality of their games meet the users' expectations, which in turn lead to user satisfaction. Based on this kind of evaluation, the developers may formulate a strategy to enhance the system and service qualities of their games that satisfies the users' standards. Once the system quality and the service quality of games are improved from the aspects of the attributes in the survey, then the users would not only be satisfied, but also motivated to play more games. Thus, developers who have considered system and service quality attributes when developing their mobile games can improve the competitiveness of their games, as well as secure large numbers of users who want to play the games. That is, the economic value that they can possibly achieve is significant.

4 Conclusion

In short summary, the system quality and service quality in mobile games have direct and indirect impacts on user satisfaction and motivation; therefore an effort should be made to manage them properly as an effective strategy to compete with competitors, as well as to also secure a user base at the same time. Despite some interesting findings, some limitations of this empirical study include a convenience sample of college students, thus this should be taken into consideration when interpreting the results.

References

1. Crosett K (2011) Mobile game marketing to increase. <http://wayback.archive.org/web/20120321162003/http://www.marketingforecast.com/archives/10608>. Accessed 18 Mar 2011
2. Meunier N (2015) 6 Trends shaping the games industry in 2015. <http://vungle.com/blog/2015/03/12/6-trends-shaping-the-games-industry-in-2015/>. Accessed Sept 2015
3. Bove LL, Johnson LW (2001) Customer relationships with service personnel: do we measure closeness, quality of strength? *J Bus Res* 54(3):189–197
4. Cronin JJ, Brady MK, Hult GTM (2000) Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *J Retail* 76(2):193–218
5. Lai F, Griffin M, Babin BJ (2009) How quality, value, image, and satisfaction create loyalty at a chinese telecom. *J Bus Res* 62(10):980–986
6. Barclay D, Higgins C, Thompson R (1995) The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration. *Technol Stud* 2:285–324
7. Chin WW (1998) The partial least squares approach for structural equation modeling. In: Marcoulides GA (ed) *Modern methods for business research*. Lawrence Erlbaum, Mahwah, pp 295–336
8. Fornell C, Larcker DF (1981) Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* 18:39–50
9. Hair JF, Black B, Babin B, Andersong RE, Tatham RL (2006) *Multivariate data analysis*, 6th edn. Pearson Prentice Hall, Upper Saddle River