Evaluation of University Students' Utilization of Smartphone

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Abstract

Students of a university in Korea have been surveyed in an effort to verify the usage status of smart phone. Based on survey data from 135 participants, the most preferred usage and usual usages of the smartphone are evaluated. Perceived and relative significance of satisfaction to usages of the smartphone according to demographic variables such as sex and academic year have been evaluated. The results indicate that the most important usage of smartphone is 'REAL-TIME COMMUNICATION' rather than 'TELEPHONE' or 'INTERNET SEARCH'. 'STUDY' usage gets the least response in usual usage and the most important usage of smartphone. 'REAL-TIME COMMUNICATION' usage received the most affirmative response in serviceability too. The worst serviceable usage is 'DMB TV WATCHING' followed by 'SHOPPING' which requires payment function. We found that there is no statistical difference in the most frequent usage of smartphone not only between males and females but also among school year of participants. We found significant differences in perceived satisfaction to 'DATE BOOK' usage and 'DMB TV WATCHING' according to gender. However, we found that there is no statistical difference in perceived satisfaction to usages of smartphone among school year of participants.

Keywords: *Perceived satisfaction, Usages of the smartphone*

1. Introduction

Recently, usages of the smartphone have evolved variously from the mere telephone. The convergence of multi-media and mobile communications creates new device which can provide services which span over camera, game, mobile Internet, digital multimedia broadcasting, and so on [1]. Hamp [2] suggested a concept of "infotainment" with smart phone coverage. Zhang [3] suggested a function of location based service and video sharing application on smart phone. Jung [4] proposed eight functional attributes of smart phone, and presented that most preferred functions are wireless Internet (25.3%), messaging(20%) and application(19.8%). Nam [5] made a research for preferred SNS sites, frequently using SNS functions, and pros and cons of SNS.

Many studies have documented smartphone applications in medical area [6-12]. Also, many studies have proposed smartphone applications in education area [13-17]. However, few studies have sought to verify the purposes of smartphone usage and preferences.

In this study, four-year university students have been surveyed to verify the preferences for the usages of smartphone. We tested whether there are statistically significant differences in preferences according to gender and school year. The obtained results are analyzed and reported. This study evaluates the usage of smartphone.

2. Verification of Usage of Smartphone

2.1. Survey Methodology

2.1.1. Survey Content: The survey is comprised of three categories: statistics of survey respondents, usages and perceived serviceability. Multiple-choice questions and 5-point Likert scale questions are employed. Survey categories and questions are listed in Table.

Table 1. Survey Content

Category	Question
Statistics of respondents	Sex School year grade
Usage	Usual usages of smartphone(multiple response) The most frequent usage of smartphone
Perceived serviceability	Perceived serviceability of usages

2.1.2. Statistics of Survey Respondents: We surveyed students during the period of December 26th, 2012 to January 4th, 2013 of a University in Korea, and received 135 replies. 96% of respondents possess smartphone. As we can see from the Table 2 and Table 3, the ratio of male: female amongst the respondents is 56% : 44%, while the school year (freshman : sophomore : junior : senior) ratio is 25% : 27% : 32% : 16%.

Table 2. Gender

Category	Respondents	Responder rate
Male	76	56.3%
Female	59	43.7%
Total	135	100.0%

Table 3. School Year

Category	Respondents	Responder rate
Freshman	34	25.19%
Sophomore	36	26.67%
Junior	44	32.59
Senior+	21	15.55
Total	135	100.0%

As we can see from Table 4, almost 96% of respondents possess smartphone. Those smartphone owners are subject to analysis.

Table 4. Possesion of Smartphone

Category	Respondents	Responder rate
Possess	129	95.56%
No possess	6	4.44%
Total	135	100.0%

2.1.3. Methodology: We analyzed descriptive statistics using SPSS 18. For the multiple choice problems, the ratio is analyzed. While for the Likert scale problems, averages and standard deviations are analyzed. To verify the statistical significance of demographic differences, the t-test and ANOVA test are employed.

2.2. Survey Results

2.2.1 Analysis of Usage: Questions for usage are multiple choices of usual usages and the most frequent usage.

1) Usual usages of smartphone. More than 96% of respondents replied that they used 'REAL-TIME COMMUNICATION', and 89% replied 'INTERNET SEARCH'. 'TELEPHONE', 'LISTENING MUSIC', 'CAMERA' and 'WAY FINDING' usages got high replies of 86%, 81%, 78% and 78% each. However, only 8.5% of respondents replied that they 'STUDY' using smartphone. 'DMB TV WATCHING', 'SHOPPING', 'MOVIE WATCHING', and 'MINI HOMEPAGE' usages got low replies of 20%, 21%, 23% and 23% each. 'GAME' got only 58% of unexpectedly low replies. Also, 'SMARTPHONE BANKING' got unexpectedly high replies of 54%.

Table 5. Usual Usages of Smartphone(multiple choices)

Answers	Response
REAL-TIME COMMUNICATION	96.12%
MINI HOMEPAGE	23.26%
GAME	58.14%
LISTENING MUSIC	80.62%
SMARTPHONE BANKING	54.26%
STUDY	8.53%
DATE BOOK	37.21%
RESERVATION(ticket, transportation,…)	45.74%
DMB TV WATCHING	20.16%
MOVIE WATCHING	22.48%
CAMERA	78.29%
SHOPPING	20.93%
TELEPHONE	86.05%
INTERNET SEARCH	89.15%
WAY FINDING(map, navigation, ..)	78.29%
Others	18.6%

2) The most frequent usage of smartphone. The most frequent usage was 'REAL-TIME COMMUNICATION' which got dominant replies of 70%. The next frequent usage was

'INTERNET SEARCH' which got only 10%. The third one was 'LISTENING MUSIC' followed by 'TELEPHONE' and 'DATE BOOK' which got 5%, 4% and 4% each.

Table 6. The Most Frequent Usage of Smartphone

Answers	Response
REAL-TIME COMMUNICATION	69.77%
MINI HOMEPAGE	0.78%
GAME	1.55%
LISTENING MUSIC	5.43%
SMARTPHONE BANKING	0%
STUDY	0%
DATE BOOK	3.88%
RESERVATION(ticket, transportation,…)	0%
DMB TV WATCHING	0%
MOVIE WATCHING	0%
CAMERA	1.55%
SHOPPING	0%
TELEPHONE	3.88%
INTERNET SEARCH	10.08%
WAY FINDING(map, navigation, ..)	2.33%
Others	0.78%
Total	100%

3) Perceived serviceability of usages. 'REAL-TIME COMMUNICATION' usage received the most affirmative response in serviceability. The next serviceable usage was 'WAY FINDING' followed by 'LISTENING MUSIC'. The worst serviceable usage was 'DMB TV WATCHING' which is vulnerable to signal strength, followed by 'SHOPPING' which requires payment function. 'STUDY' usage got the most response of 'Don't know'.

Table 7. Perceived Serviceability of Usages

Answers	Very bad	Bad	Neutral	Good	Very good	Don't know
REAL-TIME COMMUNICATION	0%	0.8%	9.3%	35.7%	52.7%	1.5%
MINI HOMEPAGE	0%	1.6%	31%	29.5%	15.5%	22.5%
GAME	1.6%	3.1%	29.5%	35.7%	22.5%	7.7%
LISTENING MUSIC	0%	1.6%	12.4%	41.1%	41.1%	3.9%
SMARTPHONE BANKING	1.6%	3.9%	18.6%	26.4%	31%%	18.6%
STUDY	1.6%	4.7%	32.6%	20%	14%	27.1%
DATE BOOK	0%	3.9%	24.8%	34.9%	24%	12.4%
RESERVATION(ticket, transport)	0%	3.1%	18.6%	31.8%	34.1%	12.4%
DMB TV WATCHING	5.4%	14.7%	34.1%	23.3%	10.1%	12.4%
MOVIE WATCHING	1.6%	11.6%	34.1%	26.4%	13.2%	13.2%
CAMERA	0.8%	2.3%	12.4%	47.3%	36.4%	1.6%
SHOPPING	2.3%	7.8%	41.9%	21.7%	12.4%	14%
TELEPHONE	0%	2.3%	12.4%	47.3%	36.4%	1.6%
INTERNET SEARCH	0.8%	2.3%	10.1%	48.1%	34.9%	3.9%
WAY FINDING(map, navigation,…)	0%	1.6%	14.7%	31%	48.8%	3.9%

3. Analysis of Differences in the Most Frequent Usage and Perceived Satisfaction to Usages of Smartphone according to Sex and School Year

3.1. Study Methodology

We tested whether there are differences in perceived satisfaction according to sex and school year. We performed t-tests for gender difference, which has two groups, and performed ANOVA test for school year difference which has more than three groups, using SPSS 20. We developed the following hypotheses.

3.1.1. Hypotheses of the Most Frequent Usage of Smartphone:

1) Gender difference in the most frequent usage of smartphone.
H0: There is no sexual difference in the most frequent usage of smartphone
H1: There is sexual difference in the most frequent usage of smartphone

2) School year difference in the most frequent usage of smartphone.
H0: There is no school year difference in the most frequent usage of smartphone
H1: There is school year difference in the most frequent usage of smartphone

3.1.2. Hypotheses of the Perceived Satisfaction to Usages of Smartphone

1) Gender difference in perceived satisfaction to usages of smartphone.
H0: There is no sexual difference in perceived satisfaction to usages of smartphone
H1: There is sexual difference in perceived satisfaction to usages of smartphone

2) School year difference in perceived satisfaction to usages of smartphone.
H0: There is no school year difference in perceived satisfaction to usages of smartphone
H1: There is school year difference in perceived satisfaction to usages of smartphone

3.2. Study Results

3.2.1. Internal Consistency Reliability and Correlation Analysis: In order to verify the reliability of questions which can represent the consistency of measured value, we adopt the internal consistency reliability technic getting the Cronbach's Alpha coefficient using SPSS 18. When the Cronbach's Alpha coefficient is more than 0.6, we can admit the reliability commonly. With this survey data eliminating a multiple response question, we got the Cronbach's Alpha coefficient of 0.706. Therefore we can admit the reliability of this survey data.

Table 8. Internal Consistency Reliability

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of items
.706	.810	19

3.2.2. The Most Frequent Usage of Smartphone

1) Gender difference in the most frequent usage of smartphone: We found from the t-test that there was no statistical difference in the most frequent usage of smartphone between

males and females. Therefore we adopt the hypothesis of "H0: There is no sexual difference in the most frequent usage of smartphone".

Table 9. t-test Results: Sexual Difference in the Most Frequent Usage of Smartphone

	t- value	Asymp. Sig.(2-sided)
the most frequent usage of smartphone	.522	.603

2) School year difference in the most frequent usage of smartphone: We found from the ANOVA test that there was no statistical difference in the most frequent usage of smartphone among school year of participants. Therefore we adopt the hypothesis of "H0: There is no school year difference in the most frequent usage of smartphone".

Table 10. ANOVA Test Result: School Year Difference in the Most Frequent Usage of Smartphone

	F-value	Asymp. Sig.(2-sided)
the most frequent usage of smartphone	.854	.494

3.2.3. Perceived Satisfaction to Usages of Smartphone

1) Gender difference in perceived satisfaction to usages of smartphone: We found from the t-test that there was no statistical difference in perceived satisfaction to usages of smartphone between males and females except 'DATE BOOK' and 'DMB TV WATCHING' usages in 95% accuracy level. We found significant differences in perceived satisfaction to 'DATE BOOK' usage and 'DMB TV WATCHING' according to gender. Male students show statistically more satisfaction to 'DATE BOOK' usage than female students. However, female students show statistically more satisfaction to 'DMB TV WATCHING' usage than male students. Therefore we adopt the hypothesis "H1: There is sexual difference in perceived satisfaction to usages of smartphone" in cases of 'DATE BOOK' usage and 'DMB TV WATCHING' usage. In other cases, we adopt the hypothesis "H0: There is no sexual difference in perceived satisfaction to usages of smartphone".

Table 11. t-test Results: Sexual Difference in Perceived Satisfaction to Usages

	t- value	Asymp. Sig.(2-sided)
REAL-TIME COMMUNICATION	1.395	.165
MINI HOMEPAGE	.608	.544
GAME	-.223	.824
LISTENING MUSIC	.882	.380
SMARTPHONE BANKING	1.078	.283
STUDY	.962	.338
DATE BOOK	**2.258**	**.026**
RESERVATION(ticket, transport)	.771	.442
DMB TV WATCHING	**-2.076**	**.040**
MOVIE WATCHING	-1.686	.094
CAMERA	.506	.614
SHOPPING	1.032	.304
TELEPHONE	1.105	.271
INTERNET SEARCH	-.719	.473
WAY FINDING(map, navigation,…)	1.074	.285

2) School year difference in perceived satisfaction to usages of smartphone: We found from the ANOVA test that there was no statistical difference in perceived satisfaction to usages of smartphone among school year of participants. Therefore we adopt the hypothesis "H0: There is no school year difference in perceived satisfaction to usages of smartphone".

Table 12. ANOVA Test Results: School Year Difference in Perceived Satisfaction to Usages

	F- value	Asymp. Sig.
REAL-TIME COMMUNICATION	.205	.935
MINI HOMEPAGE	1.192	.318
GAME	1.016	.402
LISTENING MUSIC	1.575	.185
SMARTPHONE BANKING	.590	.670
STUDY	.897	.468
DATE BOOK	.954	.435
RESERVATION(ticket, transport)	.207	.934
DMB TV WATCHING	.148	.964
MOVIE WATCHING	.460	.765
CAMERA	.589	.671
SHOPPING	1.022	.399
TELEPHONE	.533	.712
INTERNET SEARCH	.452	.770
WAY FINDING(map, navigation,…)	.600	.663

4. Conclusions

We verified the most frequent usage, usual usages and serviceability of smartphone. Also, we verified differences in the most frequent usage and perceived satisfaction to usages of smartphone based on survey data from 135 participants of a four-year university.

The results indicate that more than 96% of respondents used 'REAL-TIME COMMUNICATION', while 89% of respondents used 'INTERNET SEARCH' and 86% of 'TELEPHONE', and so forth. However, the most frequent usage of smartphone was 'REAL-TIME COMMUNICATION' which got 70% of replies followed by 'INTERNET SEARCH' which got only 10%, and 'LISTENING MUSIC' which got 5%, and 'TELEPHONE' and 'DATE BOOK' which got 4% each. The findings indicate that the most important usage of smartphone was 'REAL-TIME COMMUNICATION' rather than 'TELEPHONE'. Also, 'STUDY' got the least response in usual usage and in the most important usage of smartphone. 'REAL-TIME COMMUNICATION' usage received the most affirmative response in serviceability too. The next serviceable usage was 'WAY FINDING' followed by 'LISTENING MUSIC'. The worst serviceable usage was 'DMB TV WATCHING' followed by 'SHOPPING' which requires payment function. 'STUDY' got the most response of 'Don't know' too. We found that there was no statistical difference in the most frequent usage of smartphone not only between males and females but also among school year of participants. We found significant differences in perceived satisfaction to 'DATE BOOK' usage and 'DMB TV WATCHING' according to gender. However, we found that there was no statistical difference in perceived satisfaction to usages of smartphone among school year of participants.

We anticipate this feedback from students can provide important information for attaining usages of smartphone. Application development companies can find popular business area. Also, they can find different target marketing strategies for the man or woman.

Further study can be completed by increasing participants to peoples in other cities or other countries. Also, participants can be the general public.

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