Uses and gratifications for paid mobile applications

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Abstract

The increasing growth of the mobile applications industry attributes to the popularity of the smartphone. More and more people use mobile applications to achive their needs, when the demands for mobile applications increase rapidly create a new market opportunity. But the mobile applications distinguish into paid and free applications. This paper investigates consumer's perception on paid mobile applications.

This paper adopts uses and gratifications theory (U&G) to explore how consumer perceives paid mobile applications. The smartphone users participated in this paper. This paper involved a questionnaire and adopted exploratory factor analysis (EFA) and examined confirmatory factor analysis (CFA) to the dimensions for mobile applications payment factors and discussed the different effects of demographic variables. The four dimensions are " informativeness ", " mode of usage ", " functionality " and " value and interest ".

These findings have implications for the mobile applications company to create the new applications to fit different consumer's need, and make consumers willing to pay for mobile applications.

Key words: Paid mobile applications, Uses and gratifications theory, Exploratory factor analysis, Confirmatory factor analysis

Introduction

According to the Analytics (January 28, 2014) report, global smartphone sales grow 41 percent in end of 2013. On the other hand, IDC (January 27, 2014) also released the related survey, the annual growth rate of smartphone sales was approximately 38.4%.

In Taiwan market, Google (2013) released a survey about smartphone user behavior, the proportion of smartphone in Taiwan continued to grow and the penetration rate increased to 51% in 2013. But other Asia-Pacific countries were also having fast-growing, smartphone penetration rate of Taiwan still fell behind South Korea (73%) but higher than Japan (25%) and China (47%). Although the penetration of Taiwan fell behind South Korea, but the dependence rate of smartphone was the highest in Asia-Pacific, 81% of respondents must to carry out their smartphone every day, slightly ahead of Japan (80%) and Hong Kong (77%) in Asia-Pacific region.

Because of the popularity of smartphone, there has been a dramatic proliferation of report concerned with behavior of smartphone user in recent years. What's more, mobile application industry also becomes popular due to the popularity of smartphone. In Google report, the same report that has been noted above, the smartphone users download average 30 applications and 8 of these applications are paid applications.

Moreover, this paper also adopts uses and gratifications theory (U&G) to explore how consumers perceive paid mobile applications. Uses and gratifications theory is a method to understand why and how audience actively seeks out specific media to satisfy their demands. Uses and gratifications theory have been widely used for different researches about media. However, within that literature, little research has been published on paid mobile applications and adopted uses and gratifications theory.

Literature review

Early mass communications researches, the main ideas focus on media to influence the audience by one-way. Until 1964, Bauer proposed an opinion, stubborn audience. The concept started to be changed and Bauer also proposed an interactive communication model, he thought audiences can choose their desired information actively. The scholar, Blumler (1979) further pointed out that the active audience has following four meanings, utility, intentionality, selectivity and imperviousness to Influence. Therefore, early theorization of uses and gratifications theory can be traced back to Blumler and Katz (1974). They published a book named The Uses of Mass Communication and proposed a "uses and gratifications theory", that can be said to be an important watershed for this theory.

Moreover, various groups of researchers have worked with the motivations of uses and gratifications theory in different media, each group has its own classification. For example, McQuail (1994) has investigated the motivations of the television for uses and gratifications theory were information, personal identity, social interaction and also entertainment. The motivations of different media for uses and gratifications theory are listed below.

Table 1 Summary of the using motivations of different media adopt in U&G

Source	Media	Motivation Category
McQuail (1994)	Television	Information, personal identity, social interaction and entertainment.
Garramone, Harris, and Anderson (1986)	Political Bulletin Board System	Equally by surveillance, personal identity and diversion motives
Kaye (1998)	World Wide Web	Entertainment, social interaction, escape, information and network preferences
Vincent and Basil (1997)	Television news	Surveillance, escape, boredom and entertainment
December (1996)	Internet	Communication, interaction and information

Research Design

In order to understand the motivational factors of using paid mobile applications and adopt in uses and gratifications theory (U&G), this study conducted two-phase surveys. At first one phase is about keyword collecting. The questionnaire had four questions about the paid mobile applications and asked smartphone users to fill out the open-ended survey. Finally, this study got 493 keywords. This study chose 20 keywords which frequency greater than four times and accumulate percentage was about 94%. After that, the study used these 20 items to do a second one questionnaire.

At second phase, the formal questionnaire consisted of three main parts. First part, the motivation of using paid applications which were made by the keywords that this study collected at first phase. In second part, in order to understand the using behavior of smartphone user, this study had four questions such as the mobile system types, frequency of using applications, minutes of using applications and whether purchased mobile applications. Finally, questionnaire had some questions about personal characteristics such as demographic variables.

The participants in this study are smartphone users in Taiwan and the participants who volunteer for this study are chosen on a random basis. This study developed internet survey and paper survey. Then, the researcher posted a link on the Bulletin Board System (BBS), mobile network forum, facebook and asking the smartphone users to fill out the questionnaires during July 20, 2013 to October 4, 2013. Total of 592 questionnaires were recovered and 42 questionnaires were not valid. After that, this study randomly selected 200 questionnaires to do the exploratory factor analysis and 350 questionnaires to do the confirmatory factor analysis. Data were collected primarily by means of paper survey and online survey. The analysis used the SPSS and Amos statistical software package. To address the motivational factors of paid applications, exploratory factor analysis and confirmatory factor analysis were conducted in this study. The analyses of ANOVA were used to detect significant difference among varieties. To understand concerning relationship between the variable, Pearson correlations were calculated. (蕭文龍, 2007)

Results of data analysis

Exploratory factor analysis (EFA) is generally used to discover the factor structure of a measure and to examine its internal reliability. (Maccallum, 1990) And EFA method is in order to describe, classify and analyze the study of the social and behavioral sciences. This paper selected principal component method to do the exploratory factor analysis and varimax rotation method. Then, picked up the factors which eigenvalues were bigger than 1.(Fabrigar, Wegener, MacCallum, & Strahan, 1999) The demographic characteristics are showed below.

Table 2 Demographic Statistics of Respondents, N=200

Category	Item	Number	%
Gender	Male	118	59
	Female	82	41
Age	Under 20	23	11.5
	21~24	98	49
	25~29	50	25
	30~34	15	7.5
	35~39	6	3
	Above 40	8	4
Occupation	Finance, Insurance, Real Estate	13	6.5
	Government agencies, police consumers	13	6.5
	Education, research	8	4
	Building, construction, civil engineering	2	1
	Manufacturers, suppliers	17	8.5
	Medical, health care	6	3
	Law-related	1	0.5
	Logistics, retail	5	2.5
	Sightseeing, tourism, catering, food	7	3.5
	Entertainment, communication, public	2	1
	Advertising, marketing, art	1	0.5
	Agriculture, fishery, animal husbandry	1	0.5
	Student	100	50
	Other	24	12
Education	Junior or less	1	0.5
	High school (vocational)	17	8.5
	University	121	60.5
	Institute or more	61	30.5
Disposable Income	$NT 10,000 or less	95	47.5
	$NT 10,001～20,000	33	16.5
	$NT 20,001~30,000	25	12.5
	$NT 30,001~40,000	20	10
	$NT 40,000 or more	27	13.5
Residence	Northern Taiwan	50	25
	Central Taiwan	78	39
	Southern Taiwan	65	32.5
	East Taiwa	2	1
	Others	5	2.5

According to the item analysis, this study deleted the No.5 factor and did the EFA in the SPSS 17.0. Then, the result showed 5 dimensions, but one of the dimension only has two observed variables, so that this study deleted the two observed variables, No.7 and No.8. Because Bollen (1989) said the potential variables at least had three observed variables.

The KMO measurement was 0.820 and a statistically significant Bartlett (Bartlett, 1937) sphericity test (p=0.00). Consequently, this study deleted the No.7 and No.8 and did the exploratory factor analysis again. The result shows 4 dimensions, eigenvalues of first one dimension is 5.693 and named informativeness, second one is 2.052 and named mode of usage, third one is 1.558 and named functionality, final one is 1.196 and named value and interest, all of them have an eigenvalues greater than 1. Percentage of total variance explained by the four dimensions is 61.76%.

Table 3 Summary of exploratory factor analysis result

	F1	F2	F3	F4
19. Creative	0.83	.097	.040	.178
18. Abundant	0.77	.164	.124	.289
20. Interface	0.66	.169	.253	.155
6. Uniqueness	0.64	.218	-.059	-.094
17. Informational	0.58	.056	.158	.427
9. Frequency	.202	0.75	.082	.044
12. Unlimited use	.116	0.73	.063	.232
10. Necessity	.029	0.66	.220	.102
13. Return on investment	.163	0.66	.085	.161
11. Immediate service	.396	0.6	.183	.047
1. Practical	.059	.081	0.86	.028
2. Convenient	.094	.024	0.79	.237
3. Functional	.199	.194	0.77	.135
4. Demand	.025	.350	0.68	-.034
15. Interested	.206	.143	.170	0.79
14. No advertisements	.252	.140	-.026	0.72
16. Worth	-.023	.458	.273	0.62
Eigenvalues	5.693	2.052	1.558	1.196
explained variance	33.488	12.070	9.166	7.036
Accumulated explained variance	33.488	45.558	54.724	61.76%

Reliability refers to the characteristics of the test or the reliability of the measurement results, the test does not mean the scale or measuring instrument itself, but the consistency of test results or stability. In simple terms, reliability analysis is the degree of reliability of the results in a test. Refer to table 4, all of the α coefficient of the dimensions are greater than 0.6 so that the reliability analysis are acceptable. The dimension of functionality has higher α coefficient and representing the higher reliabilty. All of the factor loading were greater than 0.5 (0.58 to 0.86).

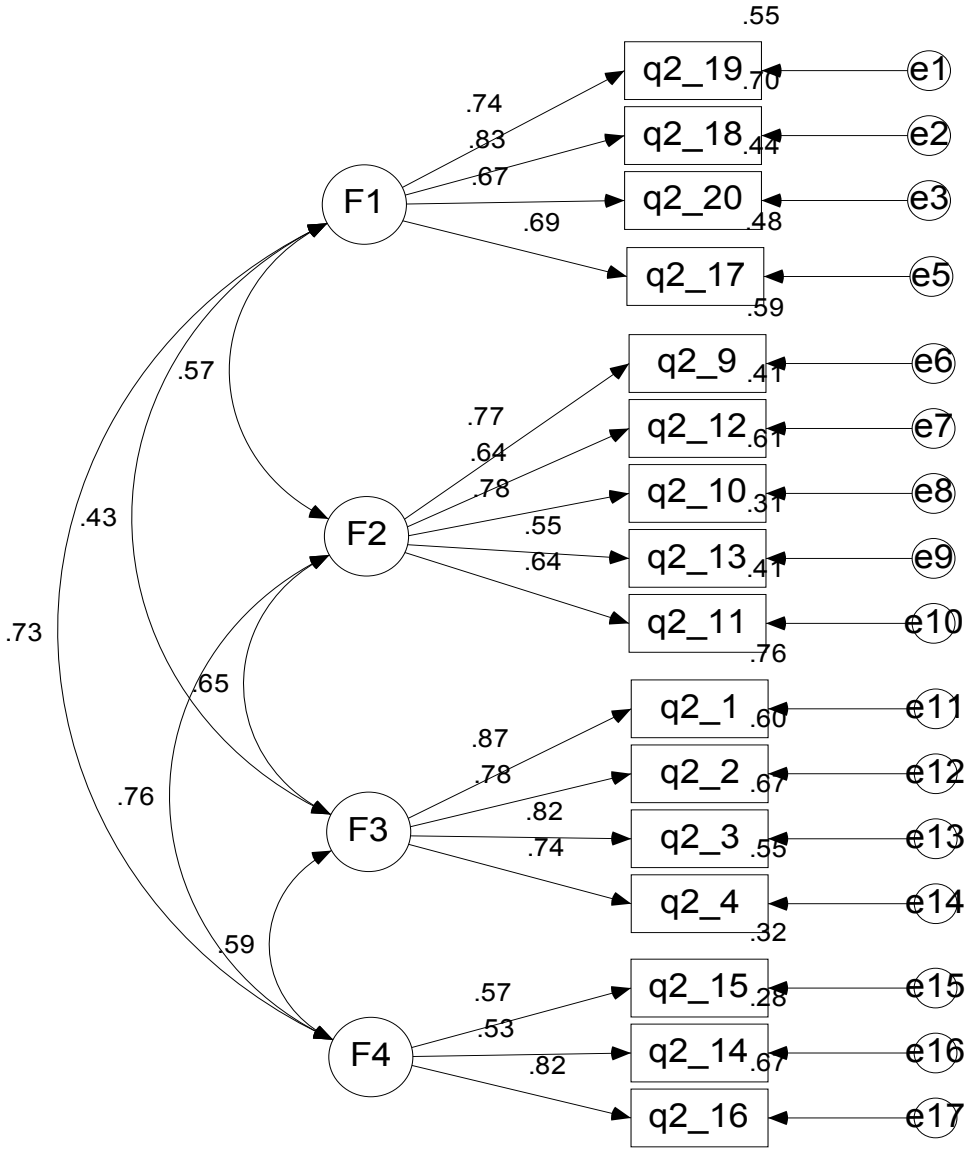
Table 4 Summary of reliability analysis

Item	M	Sd.	Factor loading	Cronbach's α
F1				
19. Creative	5.37	1.319	0.83	0.800
18. Abundant	5.41	1.299	0.77	
20. Interface	5.67	1.206	0.66	
6. Uniqueness	4.88	1.516	0.64	
17. Informational	5.70	1.238	0.58	
F2				
9. Frequency	5.92	1.163	0.75	0.783
12. Unlimited use	6.06	1.171	0.73	
10. Necessity	6.12	1.016	0.66	
13. Return on investment	5.46	1.459	0.66	
11. Immediate service	5.65	1.347	0.6	
F3				
1. Practical	6.31	.934	0.86	0.823
2. Convenient	6.07	.990	0.79	
3. Functional	6.25	.914	0.77	
4. Demand	6.14	1.008	0.68	
F4				
15. Interested	5.83	1.133	0.79	0.690
14. No advertisements	5.14	1.626	0.72	
16. Worth	6.10	1.040	0.62	

CFA belongs to a sub-structural equation modeling model, and allow to react with the interpretation of latent variables, and a set of linear equations interconnected. (Thompson, 2004) A total of 350 respondents participate in this survey, 59.7% are males and 40.3% are females. Most of them are students who have a bachelor's degree (61.7%) and the average monthly income is under NT$ 10,000 (40.6%). The residences of the respondents are northern Taiwan (28.3%), central Taiwan (31.4%) and southern Taiwan (37.4%).

This study analyzed the items by using AMOS 16 to assess the confirmatory factor analysis (CFA). Based on the results of four dimensions in exploratory factor analysis, then, conducted first time confirmatory factor analysis. Then, this study deleted the factor of No.6, uniqueness (factor loading=0.42), because the factor loading are lower than 0.5. Continuously, after deleting the factor of No.6, this study conducted second time confirmatory factor analysis. Then, each dimension is named Informativeness, Mode of usage, Functionality and Value and interest. The result of CFA is listed below.

Figure 1 The framework of confirmatory factor analysis



Fit of internal structural model is a test about internal quality of a model. Various comments of the moderate assessment of the model have been proposed over the course of decades of research.
Here are the four conditions:
- Individual item reliability > 0.5, Bagozzi and Yi (1988)
- Composite reliability > 0.6, Fornell and Larcker (1981)
- Average variance extracted > 0.5, Fornell and Larcker (1981)

The results of fit of internal structural model are listed below. As we can see, the results of fit of internal structural model in this study should be acceptable. Most of the individual item reliability is greater than 0.5, and three of the CR value are greater than 0.8, only one of the CR value is 0.685. Two of the average variance extracted are greater 0.5, two of the value equals 0.46 and 0.42, but that should be acceptable.

Table 5 Summary of Fit of internal structural model

Item	R^2	CR	AVE
F1-Dimenson- Informativeness			
19. Creative	0.547	0.824	0.540
18. Abundant	0.696		
20. Interface	0.444		
17. Informational	0.482		
F2-Dimenson- Mode of usage:			
9. Frequency	0.594	0.810	0.465
12. Unlimited use	0.411		
10. Necessity	0.612		
13. Return on investment	0.308		
11. Immediate service	0.409		
F3-Dimenson- Functionality:			
1. Practical	0.755	0.879	0.646
2. Convenient	0.604		
3. Functional	0.672		
4. Demand	0.554		
F4-Dimenson- Value and interest:			
15. Interested	0.322	0.685	0.426
14. No advertisements	0.281		
16. Worth	0.667		

Overall model fit is a test about the external quality for a model. Hair, Anderson, Tatham, and Black (1998) have proposed that overall model fit was constituted by three perceptions, absolute fit measurement, incremental fit measurement and parsimonious fit measurement. Therefore, this study conduct the different model fit indicators testing by these three perceptions, and consider different comments from different researchers. Refer to the Table 6, to put it briefly, the results of the overall model fit should be acceptable.

Table 6 Summary of overall model fit

Fit indices	Recommended Value	Research result	Estimation
Absolute fit measurement			
χ^2/df	≦3	3.867	might be accepted
GFI	>0.8	0.875	acceptable
AGFI	>0.8	0.827	acceptable
RMR	<0.05	0.097	not acceptable
RMSEA	>0.1 poor fit 0.08~0.1 mediocre fit 0.05~0.08 reasonable fit <0.05 good fit	0.091	mediocre
Incremental fit measurement			
NFI	>0.9	0.861	marginal
CFI	>0.9	0.892	marginal
Parsimonious fit measurement			
PGFI	>0.5	0.631	acceptable
PNFI	>0.5	0.703	acceptable

The concept of the discriminant validity is in order to confirm the measurements between the variables are different. According to the Anderson and Gerbing (1988), they proposed the confidence interval assay. Repeated 1000 times by the bootstrap estimates method, at 95% confidence level, the correlation coefficient of the two variables plus and minus 1.96 standard errors, and the confidence interval does not include 1. That is, this study has discriminant validity. Refer to the Table 7.

Table 7 Discriminant validity analysis - Confidence interval test

Parameter	Estimate	Lower	Upper	P
F1 <--> F2	0.573	0.403	0.733	.001
F1 <--> F3	0.433	0.268	0.594	.001
F1 <--> F4	0.726	0.625	0.826	.001
F2 <--> F3	0.655	0.495	0.790	.001
F2 <--> F4	0.756	0.606	0.889	.001
F3 <--> F4	0.590	0.413	0.736	.001

Conclusions and recommendations

This chapter is divided into five sections, the first section of this research focus on conclusions from research results. Next, section 2 is about research contributions, academic and managerial significances are explained. Final is limitations and future research directions.

Conclusions

This study shows that the motivations of smartphone users for paid mobile applications will be divided into four types, Informativeness, Mode of usage, Functionality and Value and interest. The following are details of four types.

(1.) Informativeness includes creative, abundant, interface and informational.
Mobile applications need to be creative and abundant; it should be special and diverse for customer so that customers are willing to pay for the applications. For example, a famous application named Angry Birds, which is a paid application on App store is fun, easy and high quality for customers. Each level in Angry Birds is a puzzle, which is a very creative game and the interface is also easy to understand. Therefore, information is also an important factor for customer when they decide to purchase a paid application.

(2.) Mode of usage includes frequency, unlimited use, necessity, return on investment and immediate service.
When customers want to purchase a paid application, they consider whether this application is necessary for them or not, and whether they will use this application with high frequency. If it is necessary and they will use it with high frequency, customers might think that it is good return on investment. In addition, the immediate service is also an important factor; developer can think about what features customers need really with immediate service.

(3.) Functionality includes practical, convenient, functional and demand.
In terms of practical, convenient, functional and demand, the functions in mobile application should be satisfactory to customer's needs. For example, navigation applications usually are on the top of best-seller list. Nowadays, customers like to go out and travel by themselves. Hence, navigation tools are very important and useful for them. Likewise, because most of the people bring smartphone with them every day, they can use navigation applications easily, which is convenient and fit customer's specific needs.

(4.) Value and interest includes interested, no advertisements and worth.
In this dimension, value and interest, customers consider the factors about interested, no advertisements and worth. Interested and worth were some kinds of impression. If customers feel that is interested and worth, they would be willing to buy apps. Beside, free applications may bring in advertisements, customers may dislike. In fact, in one-time purchase applications, there were no advertisements mostly. And in in-app purchase applications, maybe still have some advertisements.

Research contributions

In this section, there are academic and managerial contributions.

Academic contributions:
This study explores the motivations of using paid mobile applications. Although substantial studies have been performed on smartphone, app store and business model of application, researches of paid mobile application are still critically lacking. This study also adopts uses and gratifications theory. Uses and gratifications theory was adopted the researches about traditional media, television and radio. In recent years, as new media comes out, such as internet, smartphone and blog, etc, a large number of researches about these new media were conducted with uses and gratifications theory. In addition, the theme about paid mobile applications are novel and unique.

Managerial contributions:
(1.) For providers
Tens of thousands of applications come out, so, it is very important to let customers find the applications. Therefore, marketing and word of mouth could be good promotions for a new application. But, how to do good promotions for applications? Developers can base on the results of this study; they can think the relationship between characteristics of their target customer and their using behaviors. Then, they can do a good promotion for target customers. Also, they can base on their characteristics and create suitable applications.
To put it briefly, practical contributions of this study are the conclusions and recommendations from the research findings that we can know, the results can help the developers of mobile applications to understand what characteristics that customers want actually.

(2.) For customers
Customers can understand the relationship between characteristics, usage behavior and motivational factors, they can consider repeatedly before they pay for applications.

Limitations and future research directions

Although the rapid development in this mobile application industry, the academic researches in this area are relatively lacking. Most of the information comes from media reports, market researches and published reports by research institution; few academic papers have been done.

Because mobile application industry is a new industry, the development has only few years. But, the growth of this industry has increased rapidly. There are lots of possible developments in the future, so, it should have different issues and problems about mobile application in nearly future.

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