

INVESTIGATION TOWARD SMARTPHONE USERS' NEED BEFORE DEVELOP MOBILE APPLICATION PROGRAM

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ABSTRACT

In recent years, smartphones have been found of liking by consumers from all ethnic groups. Manufacturers also invest a lot of efforts related to R & D of hardware and software; therefore, currently smartphones' models become an international hot topic. According to IDC report, the first quarter of 2011, the smartphones sales grew 98% in Asia Pacific, and it is the first time beyond the Europe, Middle East and Africa. It means that the Asia-Pacific became the world's largest smartphone market, which includes China, Taiwan, Japan, South Korea, India and other countries. It can be seen that Asia-Pacific smartphone market is making amazing growth rate. In the first quarter of 2011, Taiwan's top five smartphone operating systems were shipped proportion: Symbian (41%), Apple iOS (26%), Android (17%), Windows (15%), and BlackBerry (1%). The above data clearly shows the battle has been extended smartphones' application programs (AP) dispute; therefore, various smartphone manufacturers, telecommunication business, developers want to grab all this pie of the smartphone market. Therefore, it is very important to observe people's smartphone usage, and to meet the functional needs of the public, which means design a proper smartphone application program can increase the business opportunities. Therefore, this study investigated the views of smartphone users to explore the relevance of the real needs, and contribute to personnel or vendors directly in R & D application program. It hopes to develop application program in accordance with consumer demands, thereby reducing cost and risk. The qualitative research interviewing was adopted firstly in this study for collecting views and satisfaction of application programs for smartphones consumers, then dealing data with classification, coding, and analysis. Secondly, the quantitative questionnaire was adopted. In this study, questionnaires were done via the most popular Google Web platform. The questionnaire could be filled out regardless of the computer, smartphone or internet, either directly iPad. Study covers all consumer groups, is not limited to those who hold only smartphones. Actual collection is 304 questionnaires, and the samples are not categorized, and not limited to purchased, not purchased, have been used and unused, etc. but covers all consumer groups. Questionnaire results showed that smartphones owners have accounted for 192 (63.2%), and does not own smartphones

users accounted for 112 (36.8%), and the top three smartphone brands accounted are the HTC 22%, Nokia 13%, and Apple 11%. The first priority to choose smartphone is functions; second priority is popular, then in order of advertising effectiveness, work needs, gift from friends and relatives, invited by friends' recommendation, etc. The "Information" factor is the highest average score, followed by the "advantage" factor, "leisure" factor, "social" factor and "shortcomings" factor. The smartphone users most care about is sending and receiving information in respect of the functions. In analyzing the survey data, this study found that the following points can be used as future in-depth investigation of the direction: first, the mobile user's gender for "social" function level; there are significant differences in demand, because this project's survey found that more women than men emphasize this feature. Second, the younger of the smartphone users have more emphasis on "merit"; however, the so-called "merits" refers to what capabilities? Refer to hardware or bandwidth on the need for special design and specifications? Does it imply that mobile hardware manufacturers and AP designers should work together to develop? The above concerns are good for the more in-depth study of the future. Third, the samples with age under 18 and the female are more stressed the "shortcomings" of smartphones. That is, smartphones without a preference function. In other words, those users would be impacted by emotions, habits and other less preferred of smartphones. The overall results found: first, smartphone-users are still looking forward to new features appear; second, the relative vendors and application program engineers should be courage to lead the development of new smartphone features or AP and not dare to change the user's habits.

Keywords: Smartphone, Application program Software, HTC, Nokia, Apple, Android

RESEARCH BACKGROUND AND PURPOSES

In recent years, smartphones are favored by various groups of consumers; therefore the industries have invested large amounts of related data to research and develop smartphones' software and hardware. According to IDC (2011), the global shipments of smartphones grew 83% to 101 million in the first quarter of 2011, and the Asia-Pacific region (China, South Korea and India and other countries included) grew 98%, shipments of 37.3 million. It is the first time beyond Europe, the Middle East and Africa (so called EMEA), and became the world's largest smartphone market.

The smartphone shipments of Asia-Pacific region accounted for 37% of the

world in the first quarter of 2011, and the EMEA region accounted for 32%, North America accounted for 24%, Latin America accounted for 6%; therefore, the smartphone market in Asia-Pacific growth rate is alarming.

In Taiwan, the top five proportion of smartphone operating system shipments in the first quarter of 2011 were: Symbian (41%), Apple iOS (26%), Android (17%), Windows (15%), and the BlackBerry (1%) (STPI 2011). It indicated that the battle of smartphone has been extended to the application program, and it is obvious that various mobile phone manufacturers, carriers, developers want to snatch a piece of the pie in the smartphone market.

Therefore, in order to explore the real appropriate demand, this study wants to start from the development process, built-in operating system and business opportunities of smartphone to investigate and analyze the smartphone users' needs and preferences.

LITERATURE REVIEW

Smartphones

The smartphone is featured with computing power and functioned than traditional phone handset, due to its built-in operating system, and similar to a mini computer. This is the biggest difference from traditional mobile phone. From its development history, there are following three sects views.

According to the first sect, the smartphone is evolved from the traditional mobile phone, due to the increasing demand, derived gradually from the traditional hand-dial function to a phone with the computer-like functions. This sect mostly came from the communications industry views.

According to the second sect, smartphones stem from the PDA (Personal Digital Assistant, personal digital assistants), due to the early notebook bulky and heavy and did not match the business person needs. Therefore, the early notebook has converted into a handheld, portable, and with a touch-screen PDA. However, with the improvement of the notebook size and weight, now the notebook is easy to carry than before, the number of PDAs use has gone down. Therefore, the industry gradually PDA functionality with phone functionality, and evolved into today's smartphones. This is the sect of information industry views.

According to the third sect, the smartphone is the phone which can be installed the operating system, free installation and removal of the application program software; therefore, it is so called SMART. This is the view of the typical information and communication industry (so called as Information Processing Communication).

This is also the start point of this study, which focuses on operating system and application program development; therefore, it is not the key point of understanding the internal structure of the smartphone hardware in this study.

Smartphone Operation System (OS)

The smartphone is smart, because of its built-in and computer-like operating system, which can offer developers through the SDK (Software Development Kit) to design new application program (Hereafter referred as AP). Currently the most global built-in operating system (hereafter referred as OS) of smartphones, respectively, under the following manufacturers:

- A. NOKIA: Symbian OS systems
- B. RIM: BlackBerry OS
- C. Microsoft: Windows Mobile (Windows Phone) system
- D. Apple: iOS system
- E. Linux: Linux-based Android system on behalf of, and Android (merged in 2005 by Google)
- F. Palm: Palm Web OS

The American market research firm, Gartner, has forecasted that the share of Android OS in 2011market would reach 38.5% in the global smartphone market, and Apple iOS operating system would reach 19.4%; now it is 2012, and it is true that they are the top two smartphone OS in the world.

Table 1 Market Share Forecast of Smartphone Unit: Thousand

OS	2010	2011	2012	2015
Symbian	111,577	89,930	32,666	661
Market Share (%)	37.6	19.2	5.2	0.1
Android	67,225	1,987,318	310,088	539,318
Market Share (%)	22.7	38.5	49.2	48.
Research In Motion	47,452	62,600	79,35	122,864
Market Share (%)	16.	13.4	12.6	11.1
iOS	46,598	90,560	118,848	189,924
Market Share (%)	15.7	19.4	18.9	17.2

Microsoft	12,378	26,346	68,156	215,998
Market Share (%)	4.2	5.6	10.8	19.5
Other Operating Systems	11,417.4	18,392.3	21,383.7	36,133.9
Market Share (%)	3.8	3.9	3.4	3.3
Total Market	296,647	467,701	630,476	1,104,898

Source: Gartner, April 2011

Mobile Application programs

Gartner had previously forecast that the global downloads of mobile application program programs in 2011 are expected to reach \$17.7 billion, compared to \$8.2 billion in 2010, and the annual growth rate is 117%. The IDC, another research firm, forecasted the estimated to 2015, the global downloads of mobile application program programs will rapidly grow to \$ 182.7 billion.

According to the prediction of IDC research firm, it is obvious for business that the key focuses will become the application program downloads and its revenue. Another important trend is that the future of its revenue sources will increase from the built-in AP to buying plug-in AP. The built-in AP is the program which set up in the smartphone already, and the plug-in AP is the program which needs to be purchased (such as Apple's APP Store, and HTC's Market).

Table 2 Types of Application Program (AP)

Types of Mobile Phones	Definition	AP
Smartphone	With OS	Built-in
		Plug-in
Traditional phone	Without OS	None

In general, most consumer groups in the use of mobile application programs will download built-in APs a lot at the first beginning. After the disappearance of freshness, most of users discovered the advantages of other download the plug-in APs (some of them are free), and then the users will be turning into a procurement program plug-in AP. Because those plug-in APs can download more full-featured or find more features programs. Therefore, it is becoming increasingly important of creating a sense of trust with consumer groups and to let them believe that your plug-in APs are more useful and attractive than other brands (STPI, 2011).

The Apple App Store, which appeared in 2008, subvert the traditional mobile value-added services business model, proceed to the next step, changed in both the mobile communications industry system and created new types of market opportunities.

For most people, smartphone is the tool not only for their contact with friends and family, but also indispensable partners in the life of leisure: for listening to music, setting alarm clock, checking the English words, scheduling calendar, sending text messages, MSN instant messaging, GPS navigation, shopping online, visiting the racquet, playing games, and so on. For the mobile workers, smartphone is the tool for keeping in touch with company executives and customers, receiving and sending emails, using internet, and so on. Both of the two kinds of people are used to download Podcast or App to their smartphones. The mobile application program are found everywhere, it shows the dependence of people is deepening for these gadgets.

In summary, because the smartphone is always available to allow users to download and replace the AP and information; therefore, it becomes part of their life that consumers prefer to build their own smartphones via download different plug-in APs.

Smartphone-Users' Needs

The needs of mankind is divided into many grades, similarly, the psychological needs of mobile phone users are also divers. In order to satisfy their needs, the product designers (application software and hardware included) must change and have innovations. Scholars Maslow's Hierarchy of Needs Theory which divided needs of mankind into five grades: physiological needs, safety needs, social belonging needs, esteem needs, self-actualization needs. If the product has to meet the one demand level of the above needs, then there will be another level of demand appear. Therefore, products must constantly change to meet the needs of different levels. According to Maslow's theory, it should be acceptable to say that "let products suit to the needs of consumers".

The key point to satisfy consumers' demands is if the designers provide them the features of previous operating looking, which means to encourage the smartphone users offer higher involvement, and then be stimulated with motivation of creating new functions. The app software designers and users of smartphones are working together as two sides of the same coin to "let products suit to the needs of consumer" (Tumer, 1986).

According to the United States to ComScore (2009), the studies have shown that the average age of the user population of touch screen smartphone is much younger

than the users of traditional mobile phone. There are only 38.8% of 13-14 young people in all of U.S. mobile phone users. But according to ComScore statistics, among the 38.8% of 13-14 young people, the smartphone owner population is 51.4% (20%), and the population of touch screen smartphone is 57.7% (22%).

Table 3 13-34 Yrs. Old Users -38.8% of Total Users of Mobile Phone in USA

Types of Mobile Phones	Rate of Smartphone Users	Rate of Smartphone Types
Smartphone	51.4% (of 38.8%)	Touch Screen 57.7%
		Touch Tone 42.7%
Traditional phone	48.6% (of 38.8%)	

From the opposite side, there are 25.5% of more 55 years old people in all of U.S. mobile phone users. Among those 55 years old people, the smartphone owner population is 12% (3%), and the population of touch screen mobile phone is 11.2% (4%). The statistics shows that the younger the population the higher the preference for the touch screen mobile, and the younger the population the higher the preference for the smartphone. There is one thing should be mentioned, the most difference between smartphone and touch screen mobile phone is smartphone with a open operating system and the touch screen mobile phone is a closed system with limited functions and no extensibility.

Table 4 50 Above Yrs. Old Users -25.5% of Total Users of Mobile Phone in USA

Types of Mobile Phones	Rate of Smartphone Users	Rate of Smartphone Types
Smartphone	12% (of 25.5%)	Touch Screen 11.2%
		Touch Tone 88.8%
Traditional phone	88% (of 25.5%)	

According to the Japanese INTERNET White Book (2011) shows, the rate of the popularity of smartphone rose sharply from 6.5 to 14.8%, and people who intend to buy are also increased to 33.1% than 2010. The findings show: 1. the possession rate of smartphone is gradually rising, 2. roughly between the ages of 13 to 34 in terms of age, and 3. white-collar workers and students are the most popular tribes. It shows that the smartphone generation has arrived, and traditional mobile phone will be replaced. It indicates that the tremendous opportunities for mobile application programs (especially the plug-in AP) are coming.

METHODOLOGY

The Consumer market of the phenomenon is diverse and complex; therefore, the mixed method is adopted in this research, which means qualitative and quantitative methods are both used while collecting and analyzing data. When the quantitative method is used, the research team concerned about external validity, reliability and objectivity, and in order to establish the general rule, the team also is adherent to the principle of value neutrality (value free) to avoid the researchers bias. When the qualitative method is used, the credibility, transferability, dependability and confirm-ability are researchers' important norms (Lincoln & Guba, 1985).

When researchers who adopt the qualitative and quantitative methods at the same time to explore the phenomenon can put aside the blind spot of a single event description; besides, on the one hand, the researchers can explore the quality of the unique event, on the other hand, the researchers can perceive qualitative data into a volume term via quantitative technology, and conduct an objective statistical analysis (Xie Zhiwei, 2007). Above are the reasons for the researcher of adopting the mix method.

Qualitative Part

In order to understand the function and AP preferences by interviewing 3 users of using smartphones with iOS System and 3 users of smartphones with Android system. The semi-structured questions for the focus group are:

1. The brands of currently used smartphone
2. The reasons of currently used smartphone
3. If familiar to the function and software of currently used smartphone
4. Most commonly (and uncommonly) used functions in your phone or AP
5. Most favorite function or AP
6. Most wished features or AP, but your phone does not have it.

Quantitative Part

There are several working steps in the quantitative part:

1. Based on the results of the qualitative research interview, and then plan the quantitative questionnaire.
2. Establish the reliability and validity of the questionnaire via expert validity, questionnaire reliability analysis and factor analysis.
3. Proceed the survey of the relative persons through Google Web Platform to a

issue questionnaire.

The owners of smartphones or iPab can fill in this questionnaire directly through internet access; this survey group not only covers all consumes but also not limited to hold a smartphone.

RESULTS

Qualitative Part

After interviewing the focus groups, the verbatim has been and classified into the following categories.

Table 5 Results Categories of Focus Group Interviewing

Category	Items	Contents
Prefer Functions	Access Internet	A-1 Always and easy access internet B-3 Easy to access most buildings' internet and wireless C-2 Offer face-book and internet games D-6 Usually access to the internet
	Listen to Music	B-10 iPad is my favorite
	Free Download	B-4 Some photo-modify programs are free B-7 Unless the programs are very fun, I won't pay for downloading fee B- 8 Only download free programs which are promote every day B-17 Dictionary, most of dictionary are free G-9 I had a lot of free programs in my smartphone, which now I don't think they are useful anymore
	Games	B-5 Games are fun to kill the time D-4 Because of games

	Settings	<p>B-11 The original functions of smartphone are few, that is why APP is needed</p> <p>B-13 I like “settings” very much, because it is open-and-shut and easy to manage</p> <p>C-6 The desk backgrounds (Desktop themes) are abundant for me to change my desk every day</p> <p>D-15 The system will inform me free downloading program today, which is saving my time</p> <p>D-17 The smartphone is quite user-friendly</p> <p>D-18 The smartphone is easy to use, you don’t need to search the “setting function” for a long time</p> <p>G-5 Through iTunes, the outlook sync automatically back up data</p> <p>G-6 Via iTunes all data of my old phone had completely back</p> <p>G-8 The setting is easy and not complex at all; unlike the traditional mobile phone</p>
	App-software	<p>B-16 I downloaded What's the APP as common as to the chat room</p> <p>C-3 Some of the game, change photo (mirror), almost all of the game</p> <p>C-4 Desktop themes, ringtones, train schedules</p> <p>C-9 Its dpi is good to taking pictures, listening to music, Internet, directly on to find information</p> <p>D-7 It is the most convenient tool to play face-book, because you can see directly see/ read.</p> <p>D-13 It offers the function of repairing photo, combining photos, directly accessing to internet, and locking photo up.</p> <p>F-8 Most useful APP is account book, which will help me analyze and ran out of the chart.</p> <p>G-2 There are a lot of things alternative in iPhone, ex. Angry Bird</p>
	Hardware	<p>D-8 People say that iPhone4 with powerful shooting features and not expensive</p>

Reasons for Purchasing	Functions	F-3 Similar to mini laptop with functions of editing paper-works and playing games
	Shape Feature	A-2 The appearance is attractive
	Relatives	B-1 Sister's old iPhone4, because she got a new one. C-1 A friend's gift which he likes. D-1 A salesman's suggestion who is my brother's girlfriend. The iPhone4's function of accessing network is very powerful, even when I took a high-speed rail.
	Others	F-1 It is a fashion. F-2 It's very convenient.
Often Used	communication	A-4 Still using on dialing and hanging up calls.
	Video/Audio	A-3 Commonly used, especially the KKBOX software is very good to use. B-4 Some programs of modifying photo are free and very convenient to make the photos and pictures become magazine cover and special decoration. C-5 I like YouTube by using smartphone D-2 I like to use smartphone to access face-book and listen to music. D-3 KKBOX is good to use. F-4 I like the photo function.
	Life Information	B-2 Weather forecast and map are good. B-18 I often used the functions of translation and conversation. F-5 The GPS(global positioning system) or navigation is really convenient. G-4 I like the timetables of High-speed Rail, Taiwan Railway and movie, and What's APP.
	Games	C-2 Playing on-line games and face-book. F-6 Most of time, I use smartphone to play games and access the network.

Unusual Used	Finance	B-9 I seldom use the functions of memorandum and stock quotes C-12 A lot, such as memorandum, and functions of finance and economics
	Life Information	B-12 I don't use economics and preferential advertisement. D-5 Just stocks and map, that's all.
	Video/Audio	C-7 Access to the What's APP, just download free stuff. F-7 I never use the recording function.
	Others	F-9 So far there is nothing I don't like.
Defect	Need Payment	B-6 The drawback is that most programs are English only. D-20 The chat feature is not free.
	Life Information	B-14 Actually there is no build-in radio station.
	Hardware	D-9 The resolution is not good of self-photo function. D-10 The function of self-photo is not good and seems easy to drop the phone. D-11 It becomes very hot while talking too long and charging the battery. D-12 The battery is not enough while access network, listen to the music; usually keeping 2-3 hours only. D-16 Only can use finger pulp to operate the iPhone4, I don't like it. G-1 The battery is very consumptive, it will cause troubles.
	Software	C-8 Some build-in functions need to be groped out. C-11 Some programs are poor compatible. D-14 No privacy. D-21 What's APP is good, but low privacy. G-9 The list of addresses in iPhone4 and Outlook can't be synchronic upgraded.

Most-wanted Software	Communication	A-5 More communication functions and features. B-19 Better to watch television programs.
	Software	F-10 Add Google Brower and faster... G-3 The function of editing list of addresses
	Video/Audio	A-6 Adding the function of making face-to-face call. C-10 Free downloading music access the network. D-19 Adding the function of watching motion picture, drama and soap opera.

Quantitative Part

The actual collections were 304 questionnaires from July 1 to 31, 2011. The results were described as followings:

1. The statistical results show users with smartphone is 192 (63.2%) and users without smartphone is 112 (36.8%).
2. Questionnaire results show the numbers of users with different brand, and the top three brands are HTC accounted for 66 (22%), Nokia accounted for 38 (13%), and Apple accounted for 33 (11%).
3. Questionnaire results show, the first priority of selecting is its function (accounted for 99 users), then currently the most popular (accounted for 55 users), impacted by Media advertising (accounted for 45 users), working needs (accounted for 41 users), gifts from relatives (accounted for 32 users), introduced by friends (accounted for 25 users), and other reasons (accounted for 8 users).

4. Rate of Accessing Internet

Questionnaire results are known that access to mobile Internet accounted for 128 (42%), and without the mobile Internet accounted for 176 (58%)

5. Average of Daily Mobile Internet

Questionnaire results are known that 122 users do not access to the mobile internet every day, 116 users (the highest percentage) access the mobile internet every day from 0 to 3 hours or less, 41 users access the mobile internet every day from 3 to 6 hours, 14 users access the mobile internet every day from 6 to 12 hours, and 11 users access the mobile internet every day more than 12 hours.

6. Basic Personal Information

(1) Gender

Male participants are 100; femaleParticipants are 204 (the majority).

(2) Age

Participants are mostly concentrated in the 26-32 years old (133), followed by 19-25 years (127) and 33-39 years of age (25).

(3) Occupation

Participants' occupation mostly placed on services industry (99), followed by students (93) and commercial (25).

(4) Education Background

Participants' education background mostly are university /college (217), followed by the institute (42) more than high school (31).

(5) Monthly Income

Participants' average monthly income is 20,001 NTD to 30,000 NTD (98 samples), followed by 10,001 NTD -20,000 NTD (63 samples), and 30,001 NTD -40,000 NTD (60 samples).

The quantitative results show that the average of the "IT" factor score is 4.08 for the highest, followed by "merit" factors, "leisure" factors, "social" factors and "shortcomings" factor. It indicated that most cared by smartphone users is the functionality of the send and receive information.

Question 9 of this study questionnaire is an open question for exploring the expectations of users: *what do you want the phone with any other functions?* The answers are compiled as Table 3.

Table 6 Expectations of Smartphone Users

Categories	Features/Functions
Mobile	<ol style="list-style-type: none"> 1. Anti-theft 2. Remote control 3. Voice control 4. Remote control of any electronic products 5. Electrical key lock 6. Identification of the master 7. Positioning sharing
Compute racy	<ol style="list-style-type: none"> 1. Flash drive accessible 2. As a virtual three-dimensional projector 3. External file output tool
visual-audio	<ol style="list-style-type: none"> 1. With PPS capabilities 2. Watch movies, radio-vision, cable television 3. Audio and video recording functions 4. Online learning 5. Special wallpaper and animation

Music	<ol style="list-style-type: none"> 1. Editing own music 2. Composing music 3. Metronome 4. Broadcasting
Life of leisure	<ol style="list-style-type: none"> 1. Mirror 2. Flashlight 3. Boils the soup 4. Similar to credit card 5. Identify the true counterfeit 6. Recommended clothing 7. Cigarette-lighter 8. Considerable astrology 9. Can fortune-telling
Time Management	<ol style="list-style-type: none"> 1. Notepad can be like laptops 2. Can display all the notes the day 3. Working trip reminder
Healthy Management	<ol style="list-style-type: none"> 1. level identifier of blood pressure 2. Measuring body temperature 3. Measure of blood sugar
News	<ol style="list-style-type: none"> 1. See the news broadcast 2. see the financial news 3. Real-time reporting natural disasters, alerts, breaking news
Phone	<ol style="list-style-type: none"> 1. Camera pixel can be a little higher 2. Caller ID, the phone's internal subtitles bigger 3. Waterproof Ruggedness(Bears falls) 4. Ring tones with more types 5. Battery Dean Pei number of larger, longer standby time
Others	<ol style="list-style-type: none"> 1. Expenses this month (Net to off-net, and the other using only the phone to spend) 2. Android version of the phone to increase msn function 3. More Chinese version of the software

FINDINGS

Taking the results of the qualitative and quantitative methods, the demands of the smartphone users can be described into the following levels: information, leisure, social, advantages and disadvantages.

1. Demand of Information: Related to the education background

The most important feature that smartphone users emphasize is the functionality for sending and receiving information. Furthermore, the finding shows the users holding university / college with more emphasis on this function than other users.

2. Demand of Leisure: Related to age and educational attainment

The findings show the users under the age of 18 emphasize on the particularly in the functional level of the leisure, and the users holding university / college and high school emphasis on pleasurable AP of leisure demand.

3. Demand of Social: Related to education level and gender

Users holding university / college demand social AP than other groups, and gender is also a significant difference for demand level of “social”. The findings show that female emphasizes this demand more than male do.

4. Demand of Advantages: age related

The needs of owning smartphone show the geometric difference by following age, which means that the younger the users, the more emphasis on the phone with “advantages”.

5. Demand of Disadvantages: gender and age related

Users under the age of 18 and female more emphasis on the shortcomings of smartphones (without their preference functions); in other words, for the smartphone, they care about whether it panders to their own use habits or holding new features.

CONCLUSIONS

First of all, the summary of question 9 of the questionnaire found that most commonly used and most want to use is accessing online. However, this part is the responsibility of government and communications companies, this study does not intend to make recommendations.

Secondly, users have been quite looking forward some features which are weak or not developed are: visual and auditory functions. This part of the function could be reached together by AP design, hardware improvement and network bandwidth. However, this study still suggests that manufacturers design application program earlier to meet the users’ expectations, because after hardware development maturely, this part of the function will become the mainstream.

Thirdly, currently the common unused phone features are: the stock market and the memorandum. This findings may be presumed that the questionnaire respondents are mostly university / college (217/304), age 26-32 years (133/304) and their monthly income ranging from 20,001~ 30,000 NTD (98/304), therefore, these two features are less for their favor.

SUGGESTIONS

This study found that the following points can be used as the direction of in-depth investigation in the future.

One is *why the gender is significant differences in the demand of social function?* The findings showed that women are more likely than men to emphasize this feature; does the term “social contact” with different definitions between different genders? It is a good start point to develop another study.

Second, *why the younger the age of users, the more stressed phones with advantages?* Its so-called "advantages", which refers to what function? Do the "advantages" require special design and specifications of the phone hardware, bandwidth?

Third, the users of younger than 18 years and female are more stressed the shortcomings of the smartphone, that is, without the function and preference they wanted. In other words, *what kinds of users' preferences drive their emotion and use habits?*

Overall the survey found that almost all of smartphone users like the questions listed in this study; therefore, this study would like to offer kind reminders: first, the smartphone users still look forward to new features or AP; second, the smartphone industry should have the courage to lead the development of new smartphone features, Aps, or change the user's habits.

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