Evaluation of User Sensibility Experience by Comparing the Product Use

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Abstract. This study drew user sensibility experience causes in the three dimensions of usability, perception and stimulation from smart-phone users who do not have use experience of I-Phone 4 or Galaxy S2. There were 10 cause factors that have impact on the sensibility experience of smart-phone users. They were; usefulness, ease of use, shortening capability, intuitive, orderly, similarity, aesthetic, difference, sensibility and fun. Among them, six causes had significant differences between the users of I-Phone 4 and Galaxy S2. These six causes were; usefulness, ease of use, intuitive, orderly, aesthetic and sensibility. Galaxy S2 received higher evaluation in usefulness, ease of use and sensibility. On the other hand, I-Phone received higher evaluation in intuitive, orderly and aesthetic.

Keywords: Sensibility Experience, Comparing the Product Use, Smart-phone.

1   Introduction

According to the market survey specialist IDC, the worldwide smart-phone market share of Samsung is 29.1% and I-Phone is 24.2%. However, according to recent information from NPD Co., in United States smart-phone market, Apple has market share of 31% and Samsung has 24% [1]. According to the survey results from comScore, mobiLens and Nielsen, the market shares of Samsung and Apple are slightly different by quarter dependent on new product launching; however, the fact that Samsung and Apple are top two is definite. Especially, Samsung and Apple forced HTC to withdraw from Korea and Motorola is also reducing their Korean operation now [2].

At present, the biggest issue in smart-phone market is the patent war between Samsung and Apple, in addition to the performances of two companies. The renowned design scholar Professor Donald Norman said that "Sensibility design that moves the emotion of consumer has the biggest and immediate impact on consumer's purchase decision. A product cannot succeed just because it has beautiful outlook design or it has excellent functions". Then it would be quite interesting to know the differences in sensibility response of I-Phone and Galaxy users, the two representative brands of Samsung and Apple. Accordingly, this study compares and analyzes the user sensibility experience causes on I-Phone and Galaxy, the two representative brands of Samsung and Apple.

2   Previous Studies

K.D, Woo worked on design model building for the development of sensitivity type GUI. Woo drew the design-determining causes for user sensitivity GUI and classified them into four types (easy-shopping type, design-focusing type, new-product aiming type, price-sensitive/health-focusing type). He then built a user sensibility type GUI design development model by analyzing the similarities and differences among four lifestyle types [3].

S.K, Ihm worked on the relationship between fun sensibility and visual elements of touch phone GUI icon design. Ihm identified the relationship between fun and user preference on the main menu icon design type, which is the most important communication tool between user and mobile phone among the touch phone graphic elements. Ihm verified the differences in preference and fun regarding the icon design types dependent on the socio-demographic characteristics such as gender, age, occupation and design education. Ihm drew the visual constitution elements that are highly related to fun sensibility and explained the relationships by verifying the relationship between visual constitution elements and fun sensibility [4].

J.H, Byeon worked on the impact of mobile phone sensibility GUI design on users focusing on full touch screen phones. Byeon believed that mobile phone with various contents and additional functions is the basic specification of mobile phones these days and verified the impact of design considering sensibility on the usability of users [5].

J.H, Ahn worked on the enhancement of UI design usability for mobile phone integrated service. Ahn did survey on the satisfaction of users on nine menus of Samsung, LG, Pentech and Motorola. Based on the user satisfaction on current mobile phone UI, Ahn suggested future service direction which can enhance the satisfaction and meet the psychological/behavioral demand of users by way of efficiency tests [6].

H.W, Jeong worked on sensibility measurement and evaluation methods. Jeong focused on visual/tactile sensibility evaluation of interior finishing material and studied the synaesthesia design evaluation method by establishing the vocabulary and concepts of sensibility. Jeong pointed out the issues in sensibility studies and tried to build basic theory. Jeong finally suggested synaesthesia interface guideline by redefining the concept of sensibility and building the Korean language sensibility vocabulary system [7].

J.M, Pyeon worked on the optimization of mobile phone GUI design usability evaluation method. In order to develop optimum GUI design that fits with mobile environment, Pyeon recombined the existing usability evaluation methods from the viewpoint of mutual complementation. Pyeon suggested optimum evaluation method which can analyze mobile GUI usability from various viewpoints [8].

J.R, Kim suggested user forecast model by way of design sensibility measurement. Kim explored the definitions and standards in Enneagram, MBTI and G-sensibility, which are the representative design sensibility measuring methods. Kim reviewed the characteristics, measurement method, classification criteria and utilization of each type. Kim finally suggested user forecast model by design sensibility measurement on three characteristics and classification methods on sensibility measurement [9].

The sensibility design theory gets impact from the development and characteristic of self. For example, modernism design theory intensely encouraged production efficiency in terms of standardization and rationalization to meet the mass production demand caused by industrialization; however, the rigid and simple design form could not appeal to the aesthetic taste of many people.

In other words, modernism design theory needs change to fit with time. At present, the advance of modern sensibility design has not reached the stage of definition with universal properness acknowledged by everybody. Meanwhile, the sensibility design theory is an efficiency design method that gives certain sensibility/characteristic to product and meets the consumer spirit by being based on men's sensibility and cognition [10].

Sensibility is an internal matter of men and it has been an important study subject mainly in philosophy and psychology. After the sensibility engineering has appeared, approach on sensibility from the perspective of engineering became active and this change gave birth to the sensibility design methodology [11].

2.1   User Experience Design

User experience is overall experience of user feeling and thinking while directly/indirectly using certain system, product or service. It is not limited to the satisfaction in certain function or procedure. It is a valuable experience which user gets by participating, using, observing and interacting in all perceptive aspect of product. The creation of positive user experience is an important task in industrial design, software engineering, marketing and business administration.

This is very important matter in meeting the needs of user, enhancing the brand loyalty and succeeding in market. When user cannot achieve intended purpose, or, even when user has achieved the intended purpose, if the user had negative experience, or, if the user felt it was not emotionally, rationally or economically convenient, negative user experience occurs.

User experience design is developing and creating positive user experience on theoretical level or practical level. User experience design is mainly studied and developed in the areas of product design, interactive design, user interface design, information architecture and usability. However, user experience is based on core principle, which should be approached from wider and inter-study viewpoint in various fields.

User experience is a concept which was used in computer user interaction study. Still many user experience principles are coming from the software and hardware development in computer engineering. However, now the user experience concept has spread to and applied in many areas such as industrial service, goods, process, society and culture, in addition to computer products.

E. C. Edwards and D. J. Kasik first used the terminology of user experience in their paper. Since then, there had been many studies in 1970s and 1980s mainly in the context of human-centered design, which tried to create positive experience value

from interaction between men and machine [12]. Apple Computer employee Donald Norman designed UX (User experience) in 1993 and he gave big impact on Apple computer design and researches on men-computer interaction.

In 1998, B. Joseph Pine II and James Gilmore gave their paper 'Welcome to the Experience Economy' to Harvard Business Journal. In 1999, they published it and it attracted interest on user experience in the field of economics and business management [13]. Pine and Gilmore said that the leading companies created unique experiences in their products and experiences in order to differentiate their products from others as superior products while agricultural economy advanced to industrial economy.

Especially entertainment companies like Walt Disney Co. put higher weight on the value of experience. They emphasized the positive aspect of consistent theme and removed negative aspect before they give visual-audio message to customers. They made the memories of such experience worthwhile to remember and ultimately tried to make products and service that can intensify the experience and memory through five senses.

3   Survey Method and Test Objects

Tests were done with 40 intensive smart-phone users in their 20s (average age 21.7 years old) in order to compare the sensibility of Apple I-Phone users and Samsung Galaxy phone users. 20 of the test objects used I-Phone only and another 20 used Galaxy phone only. The average use time of I-Phone users was 1 year and 3 months while that of Galaxy phone users was 1 year and 1 month. The two groups used smart-phone everyday for 7 hours and 7.5 hours respectively.

Regarding smart-phones to be used in the test, two iPhone-4s and two Galaxy-S2s were reset to original state immediately after purchase. We did not install any applications. Two I-Phone users and two Galaxy users entered the designated place for evaluation. Testing time for one team made of 4 users, was 90 minutes. In order to remove the familiarity effect, the I-Phone users were given Galaxy S2 and the Galaxy users were give iPhone-4.

Test objects answered the questionnaire on personal information and smart-phone use before the test. After the smart-phones were given, they performed the given tasks during given time limitation in accordance with the instruction given by test coordinator. After the task has been finished, they answered the questionnaire again.

3.1   Questionnaire Content and Measurement

Evaluation of user experience sensibility awareness of smart-phone user was done on 10 detail causes in 3 dimensions using 7 points Likert scale. The usability dimension had three causes of usefulness, ease of use and shortening capability. The perception had three causes of intuitive, orderly and similarity. The simulation had three causes of aesthetic, discriminative and sensibility and fun.

Table 1. Dimension and factors

Dimension	Factors	Questionnaire statement
Usability	Usefulness	It is easy to find desired function immediately
	Ease of use	It is easy to resolve an error
	Shortening	It provides with shortened path in major function execution
Perception	Intuitive	It is easy to visually recognize and understand
	Orderly	It is arranged in orderly manner
	Similarity	Similar functions are well grouped in menu
Stimulation	Aesthetic	It is visually attractive
	Discriminative	It is visually high-class and discriminative
	Sensibility	I feel homogeneity with others
	Fun	It stimulates curiosity without boring

4   Analysis Result

Users of Apple's I-Phone and the Samsung Galaxy smart-phone users sensibility comparative analysis results are as follows.

4.1   Usability Dimension Causes

In order to test the statistical differences among the items, matching sample t-test was done. There were statistically significant differences in usability (p<.001) and ease of use (* p<.05); however, there was no significant difference in shortening capability. In all three usability causes, Galaxy S2 had higher evaluation than I-Phone 4. Galaxy S2 was noticeably high in finding desired function immediately, in other words in usefulness, than I-Phone. The usefulness average of Galaxy S2 was 5.70 (s.d. = 1.19) while that of I-Phone was 4.98 (s.d.=.97). Regarding the ease of use for error resolving, Galaxy S2 was 5.09 (s.d. =1.15) and I-Phone 4 was 4.73 (s.d. = 1.08).

Table 2. Font sizes of headings. Table captions should always be positioned *above* the tables

	I-Phone 4	Galaxy S2	T
Usefulness	4.98 (.97)	5.70(1.19)	4.53 ***
Ease of use	4.73 (1.08)	5.09(1.15	2.03 *
Shortening	4.36 (1.27)	4.84(1.29	1.97

4.2   Perception Dimension Causes

In all three perception dimension causes, I-Phone 4 had higher evaluation than Galaxy S2. The intuitive average of I-Phone 4 was 5.77 (s.d.=1.13), average 1.04 higher than Galaxy S2 (m=4.73, s.d.=1.56). In orderly, I-Phone 4 (m=5.89, s.d.=1.26) was again

higher than Galaxy S2 (m=5.09, s.d.=1.36). I-Phone was also higher in similarity; however, its evaluation point was relatively lower than other items. According to the statistical test on average differences by matching sample, intuitive (p<.001) and orderly (p<.001) had high statistical difference. There was no significant statistical difference in the average of grouping of similar functions in menu.

Table 3. Font sizes of headings. Table captions should always be positioned *above* the tables.

	I-Phone 4	Galaxy S2	T
Intuitive	5.77 (1.13)	4.73 (1.56)	4.26 ***
Orderly	5.89 (1.26)	5.09 (1.36)	3.93 ***
Similarity	4.75 (1.12)	4.43 (1.35)	1.70

4.3   Simulation Dimension Causes

In aesthetic, discriminative and fun, I-Phone 4 had higher evaluation than Galaxy S2. However, in sensibility, Galaxy S2 was higher than I-Phone 4. In aesthetic, the visual attraction, I-Phone 4 (m=4.20, s.d.=1.51) was higher. The differences in discriminative and fun were negligible. On the other hand, Galaxy S2 (m=5.39, s.d.=1.08) had average 1.04 higher in sensibility than I-Phone 4. In the t-test result, there were statistical differences between I-Phone 4 and Galaxy S2 in sensibility (p<.001) and aesthetic (p<.05). There were no significant differences in discriminative and fun.

Table 4. Font sizes of headings. Table captions should always be positioned *above* the tables.

	I-Phone 4	Galaxy S2	T
Aesthetic	4.20 (1.51)	3.68 (1.23)	2.21 *
Discriminative	4.02 (1.19)	3.90 (1.12)	.67
Sensibility	4.34 (1.59)	5.39 (1.08)	4.79 ***
Fun	4.93 (1.60)	4.86 (1.30)	.35

5   Conclusion

This study drew and compared user experience sensibility causes in the three dimensions of usability, perception and stimulation with test objects that do not have use experience of I-Phone 4 and Galaxy S2 respectively. Regarding the causes that have impact on the smart-phone user experience sensibility, there are ten detail causes in three dimensions. The usability had three causes of usefulness, ease of use and shortening capability. The perception had three causes of intuitive, orderly and similarity. The simulation had four causes of aesthetic, discriminative and sensibility and fun.

Among them, six causes had significant differences between the users of I-Phone 4 and Galaxy S2. These six causes were; usefulness, ease of use, intuitive, orderly,

aesthetic and sensibility. Galaxy S2 received higher evaluation in usefulness, ease of use and sensibility. On the other hand, I-Phone received higher evaluation in intuitive, orderly and aesthetic.

After the test had been finished, the test objects were asked about their impression in using I-Phone 4 and Galaxy S2 for the first time. The I-Phone users said that they were not much confused or felt difficult in using Galaxy S2 for the first time; however, the Galaxy S2 users said that they had difficulty in finding desired functions in I-Phone 4. Galaxy S2 had higher evaluation than I-Phone 4 in usefulness and ease of use. The reason is believed that the UX of Galaxy S2 did not change a lot from the UX of previous feature phones, which the test objects had used before. Also, users who had used any smart-phone before seem to be capable of guessing the use method of new smart-phone, even it is their first time use.

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