A Study on the Subjectivity of Sensibility Quality Factors Affecting the Selection of the Smart-Phone

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Abstract. This study analyzed the sensitivity quality factors that are important in choosing smart-phone using PQ method of Q methodology. It was possible to find representative types such as sensibility focusing type, use-convenience focusing type and stability focusing type by the analysis. The discriminative sensibility focusing type thinks personality expression and social pride as important and this type prefers differentiation from others. The sensibility quality causes of sensibility focusing type are uniqueness, fun, curiosity, surprise, fashion, attracting others' view, ostentation and emotional attachment. The use-convenience focusing type prefers convenience cumulated by personal experience. This type thinks the sensibility quality causes such as comfort, freedom, expandability and control of device as important. The stability focusing type prefers familiarity by use experience, attachment by intimacy and harmony with personal image as important. This type thinks the sensibility quality causes such as experience, habits, intimacy, conciseness and fun as important.

Keywords: Subjectivity, Sensibility Quality factor, Selection of the smart-phone.

1 Introduction

Ericsson is the world's largest communication equipment manufacturer. It its recent report, Ericsson stated that worldwide smart-phone users were 700 million in 2011 and it will quadruple to 3.1 billion six years later in 2017. Ericsson forecasts mobile communication user in 2017 shall reach 8.9 billion in 2017; therefore, 30% of mobile communication user will use smart-phone in 2017. According to Gartner survey, the market share of Samsung smart-phone in the 2nd quarter of 2012 was 21.6%. Nokia 19.9% and Apple 6.9% followed Samsung [1].

The number of smart-phone users in Korea had been just 0.75 million in 2009. However, it became 7.2 million in 2010, 20 million in 2011 and it will be more than 35 million in 2012. According to another forecast by Roa Consulting, there will be more than 42 million smart-phone users in Korea in the end of 2012. The smart-phone users are rapidly increasing like above; however, only limited brands of smart-phone are being sold in the market. As anyone can easily expect, Galaxy series of Samsung

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and I-Phone series of Apple established two-top structure in the second half of 2011. HTC had launched premium grade smart-phones several times in Korea; however, they eventually withdrew from Korean market. Other foreign phones such as Sony Ericsson and Motorola even have difficulty in establishing launching plan in Korea for late 2012 except the launching of one Mp3 player.

Consumer choice always changes. Renowned design scholar Professor Donald Norman said that "Sensibility design that moves the emotion of consumers has the biggest and immediate impact on the purchase decision of consumers. A product cannot succeed just because it has beautiful outlook design or it has excellent functions". There are many smart-phone manufacturers home and abroad; however, only a few of them are chosen by consumers. The curiosity on the cause of this inevitably and directly led us to the question on why consumers buy certain brands of smart-phone. Accordingly, this study explores the subjectivity of consumer regarding the factors that have impact on their smart-phone choice.

2 Theoretical Review

The design quality causes that users perceive are not systemized yet because they are different dependent on researcher. The quality cause study in the area of interactive design has been done mostly on websites [2]. The most representative website quality cause classification is classifying the causes into functional causes and non-functional causes. Herzberg classified the needs of organization in human behavior dimension into hygiene causes and motivator causes [3].

J.H, Seo and G.P, Lee drew the sensibility quality vocabularies of users on mobile phone by way of card-sorting method with a specialist group. Seo and Lee classified the quality dimension into six dimensions such as usefulness, ease of use, aesthetic, stimulation, identity and harmony after statistical test process [4].

Kano approached the subject from the perspective of user expectation. Kano's classification is three dimensions; which are basic causes, performance causes and interest causes dependent on product and service quality model [5]. Zhang & von Dran evaluated actual websites using Kano's model. They established a ranking of quality points by applying 42 detail causes on 6 kinds of websites [6].

2.1 Q Methodology to Learn Subjectivity

Q methodology had been created by William Stevenson. The subjective areas such as attitude, belief, conviction and value had been ignored in science before Stevenson. He created a methodology integrating the concepts related to philosophical, psychological and statistical measurement in order to study them from objective viewpoint. It is a statistical method that can analyze the subjectivity of men with tactics. Since it can objectively study the concepts like awareness, values, attitude and conviction of consumers, it is possible to apply it to confirmative studies such as explorative studies and theoretical tests that generate hypothesis. Compared to the R methodology which has transverse characteristic by having large number of samples,

Q methodology is quite useful in the study of consumer behaviour because it enables in-depth study on individuals and small groups.

The Q methodology also satisfies overall and qualitative approach method which complements existing quantitative studies; therefore, it can remove the relation between subjectivity and objectivity. H.G, Kim, Chairman of Korean Society for Scientific Study on Subjectivity (Korea Q Society), said on the difference between qualitative study method and Q methodology that "the qualitative study method includes subjectivity dependent on the capability of researcher; while the Q methodology is finding the subjectivity of men from study object". Q methodology also scientifically measures the subjectivities of men such as values, attitude and conviction. It begins from the definition of doer, not from the hypothesis of researcher, and it finds the hypothesis instead of testing the hypothesis. Psychology is a research/analysis method widely used in social science. Now, the Q methodology has been proved of its appropriateness and usefulness in all areas where men's subjectivity is involved.

2.2 PQ Method

PQ method is one of the analysis programs used in Q research with Quanl. The PQ method is a program devised for easy entry of Q Sort data. PQ method has the advantage that the cause analysis is possible by Centroid method in addition to PCA, primary cause analysis. With PQ method, it is possible to draw the causes by Varimax method, when the cause is in rotation, or, by judgmental rotation through two-dimensional plotting [7].

3 Design of Study

3.1 Selection of Q Sample and Q Statement

More than 300 Q samples had been collected from books, newspaper articles, Internet articles and the content of FGI (Focus Group Interview) with a user group consisting of 55 persons. Then 47 Q statements related to smart-phone which fit with study purpose were finally extracted using unstructured method.

Table 1. 47 Q Statement

No	Statement	No	Statement
1	Method familiar to use	2	having many convenient functions
3	OS being stable	4	A/S being easy
5	grip being good	6	speech quality being excellent
7	screen conversion sliding being smooth	8	updating being easy
9	data transmission being fast	10	design with personality
11	being large	12	thin and slim design
13	luxurious design	14	diverse colours being offered
15	neat design	16	refined design

Table 1. (*continued*)

17	simple design	18	charming design
19	glamorous design	20	fresh design
21	beautiful design	22	stylish design
23	glossy design	24	angular design
25	round-shaped square containing a curve	26	plastic appearance material
27	metallic appearance material	28	appearance design with bends
29	appearance design with a pattern	30	flat design
31	natural touch	32	keypad size being large
33	screen and color being sharp	34	appl being diversified
35	being sturdy	36	being light weighted
37	importance of charging method and time	38	new functions being plenty
39	storage capacity being large	40	Loading speed being fast
41	foreign product	42	unique design
43	dignified design	44	heavy design
45	superior feeling	46	manufacturer
47	diverse accessories		

3.2 Selection of P Samples

P samples are males and females in their 10s to 40s who use smart-phones now, who want to buy new smart-phone, or, who want to change smart-phone. Their demographic characteristics are as following.

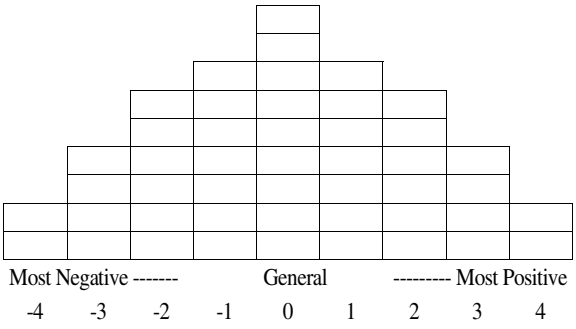
Table 2. P Samples

Teen's	20's	30's	40's	Male	Female
2	23	4	1	10	20

3.3 Q Sorting

Q Sorting has 'most positive' (+4) and 'most negative' (-4). The Q sorting of this study is as following.

Table 3. Q Sorting Table



4 Analysis

This study used PQ Method Version 2.11. The data from Q sorting went through cause analysis by Centroid method. Then judgmental rotation was performed. Among the relations with causes, optimum causes were found and rotation results that show high loading values were obtained. Then the rotation was finished and three causes with unique value bigger than 1 were selected as significant causes.

Table 4. Eigen Value

	1st Type	2nd Type	3rd Type
Eigen Value	10.2391	2.0298	1.0457
Loding's Percentage(%)	34	7	3

The correlation coefficient matrixes among 30 Q Sorts were no. 14 and no. 15 (r=0.52), no. 26 and no. 27 (r=0.53), and, no. 28 and no. 29 (r=0.66). It suggested that the possibility of their belonging to same cause in the future is very high. After the judgmental rotation had been finished, Q Sort 1 and 5 were allocated to cause 1, Q Sort 12 and 14 were allocated to cause 2, and, Q Sort 16 and 18 were allocated to cause 3 in the cause-loading value flagging. The correlations between factor-scores were as following; however, the Q methodology does not rely on correlation coefficients, different from R methodology.

Table 5. Factor scores

	1st Type	2nd Type	3rd Type
1	1.0000	0.655	0.2791
2	0.6552	1.0000	0.2582
3	0.2791	0.2582	1.0000

5 Interpretation of Analysis

The Q causes calculated by study result can be seen as common opinion or value-set of test objects that judge or think on specific subject in similar way. The classified data from 30 test objects on 47 Q statements regarding smart-phone preference were analyzed to get following cause values.

5.1 Discriminative Sensibility Focusing Type

The discriminative sensibility focusing type looks like they have keen interest in aesthetic elements; however, they think personality expression and social pride as important and prefer differentiation from others. It has been learned that they want to have a sense of superiority by having a product. According to Kano's study, this type thinks interest cause as important. The test objects belonging to this type think that the

message transmitted to others by way of personal image and owned product is important. They develop logics through reflective process on own concern. (42, 18, 22) Since they focus on the discriminative sensibility, this type thinks the sensibility aspect of non-functional quality dimension as important. This type overcomes the boredom caused by simplicity and pursues proper stimulation by interest and tension caused by the richness and novelty of interface elements in addition to outlook element. The sensibility quality causes of sensibility focusing type are uniqueness, fun, curiosity, surprise, fashion, attracting others' view, ostentation and emotional attachment.

Table 6. Discriminative sensibility focusing type

No	Z-Score	No	Z-Score
7	2.088	28	-1.042
43	2.024	5	-1.047
45	2.024	44	-1.239
42	1.565	8	-1.437
18	1.437	30	-1.437
22	1.239	32	-1.437
		26	-1.501
		41	-1.565
		25	-1.698

5.2 Use-Convenience Focusing Type

The use-convenience focusing type excludes the aesthetic elements and awareness on individual sensibility taste. Instead, they pursue the convenience accumulated by individual experience and they think the performance element is most important. They use more application programs ('app') than basic phone functions. They cumulate or consume data by way of various apps provided by smart-phone. (9, 40, 37) They also think the lifestyle of self is important. The sensibility quality causes of this type are more based on mechanical elements excluded of visual attraction, or, convenience such as comfort, freedom, expandability and control of device.

Table 7. Use-convenience focusing type

No	Z-Score	No	Z-Score
9	1.900	28	-1.252
40	1.900	19	-1.308
6	1.548	26	-1.308
31	1.365	24	-1.365
37	1.365	44	-1.365
3	1.252	45	-1.365
8	1.126	47	-1.365
2	1.126	29	-1.900
39	1.069		

5.3 Stability Focusing Type

The stability focusing type thinks that harmony and identity excluded of stimulation are important. They think the basic cause is the most important. (22, 13, 1) They think that familiarity by use experience, attachment by intimacy and harmony with personal image are important. This type has the characteristic of including self into people. They tend to show similar characteristics with use-convenience focusing type; however, they also share certain characteristics with discriminative sensibility focusing type. However, they have conflict between the burden of attracting gaze of others and internal tendency of rejecting common things. In other words, they do not give up both usability and aesthetic. The sensibility quality causes of this type are experience, habits, intimacy, conciseness and fun.

Table 8. Stability focusing type

No	Z-Score	No	Z-Score
31	1.721	38	-1.017
2	1.656	14	-1.082
7	1.532	3	-1.082
22	1.467	25	-1.147
13	1.402	30	-1.147
1	1.33	37	-1.212
42	1.277	8	-1.402
18	1.147	27	-1.467
		41	-1.532
		26	-1.721
		28	-1.786

6 Discussion and Conclusion

The craze on smart-phone is not limited in Korea. It is a global trend and the impact of smart-phone craze on industry is rapidly increasing. The domination of Samsung and Apple even created mania class that has very high brand loyalty. They do not change their smart-phones until their favorite brand, Samsung or Apple, would launch a new product. In this situation, a type analysis study to learn the sensibility quality causes that have impact on smart-phone choice has certain significance in setting up the direction of future smart-phone design.

This study analyzed the sensibility quality causes that have important impact on smart-phone choice by way of Q methodology. As the result, it was possible to find three representative types as following. The discriminative sensibility focusing type thinks personality expression and social pride are important and this type prefers differentiation from others. The sensibility quality causes of sensibility focusing type are uniqueness, fun, curiosity, surprise, fashion, attracting others' view, ostentation and emotional attachment. The use-convenience focusing type prefers convenience cumulated by personal experience. This type thinks the sensibility quality causes such

as comfort, freedom, expandability and control of device are important. The stability focusing type prefers familiarity by use experience, attachment by intimacy and harmony with personal image as important. This type thinks the sensibility quality causes such as experience, habits, intimacy, conciseness and fun are important.

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