

A Study on the Expectations and Actual Satisfaction about Mobile Handset before and after Purchase

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Abstract—This thesis is intended to examine factors that affect customer satisfaction in the domestic mobile communication terminal market as to expectations before purchase and actual satisfaction after purchase. Also, how the factors that affect customer satisfaction about mobile phones influence the customer base was theoretically and positively examined. The mobile communication terminal industry, which has been the driving force behind the development of Korea as a great power in the information and communication industry, has a great influence on the global market as well as the domestic economy. Nevertheless, research efforts on the existing mobile communication market have been focused on the mobile communication service market rather than the mobile communication terminal market. In addition, research on customer satisfaction about mobile communication terminals, which has been done by a few scholars in the related fields, has been limited to prices and brands. That is, the traditional research efforts on customer satisfaction about mobile communication terminal products have been focused on the influences of prices and brands on the purchase of products rather than on the evaluation of the unique quality attribute of each product. Therefore, this thesis is intended to examine factors expected to enhance customer satisfaction about products and expand the customer base other than the external factors including the prices and brand images of mobile phones so that customer-oriented mobile phones can be developed and manufactured.

Keywords-component: *Mobile Communication Industry, Customer Satisfaction, Mobile Communication Terminal*

I. INTRODUCTION

KOREA succeeded in developing the world's first commercial CDMA system in the year 1995 and started to provide commercial services in the year 1996. Ever since then, the domestic mobile communication industry has marked an unprecedented growth on a consistent basis. As of November, 2006, the number of subscribers to the domestic mobile communication services is over 40 million, which comes to one mobile phone per person as to the economic activity ratio per population, a high supply rate of mobile communication services (the Ministry of Information and Communication, 2006). 5). The rapid supply of mobile phones, which have become a necessity in modern life, and the development of communication service technology have led Korea to become a great power in the world's communication industry where communication services are available in the most convenient manner. Services activated by the development of CDMA equipment have made the domestic mobile communication market rapidly grow and develop,

having a huge influence on the global and domestic economies. The birth of Korea as a great power in information technology has resulted in an unprecedented growth within a short span of time and helped Korea take the lead in the export of information technology worth 100 billion dollars. Also, information technology, now a representative industry of Korea at the peak of the "Korea Brand Premium", is being admired by a number of nations in the world. Nevertheless, research efforts on the existing mobile communication market have been focused on the mobile communication service market rather than the mobile communication terminal market. As stated above, the mobile communication market is a combination of the service industry where services are provided through a network of mobile communication and the manufacture industry where systems and terminals are produced and supplied. Thus, research on the mobile communication market must be accompanied by the analysis of the mobile communication terminal market. Moreover, the quality evaluation of tangible terminals intended to use intangible services must be done besides the quality evaluation of mobile communication services. In general, the mobile phone industry is a production-led industry where the manufacturer's ideas stimulate the user's desires to purchase the supplied products. Also, new technology developed by mobile phone manufacturers has consistently educated consumers. Accordingly, customer satisfaction is formed on the basis of the nature of products suggested by manufacturers, and it is our tendency to understand the level of customer satisfaction as unmatched loyalty to the corresponding products. In addition, research on customer satisfaction about mobile communication terminals, which has been done by a few scholars in the related fields, has been limited to prices and brands. That is, the traditional research efforts on customer satisfaction about mobile communication terminal products have been focused on the influences of prices and brands on the purchase of products rather than on the evaluation of the unique quality attribute of each product. This research is designed to analyze factors that affect customer satisfaction in the mobile communication terminal market. Furthermore, the influences of expectations before purchase and actual satisfaction after purchase on customer loyalty will be analyzed so that factors expected to enhance customer satisfaction about products and improve customer loyalty as a result can be suggested and customer-oriented mobile phones can be manufactured with priority given to the unique quality attribute of each product.

II. THEORETICAL BACKGROUNDS

A. Customer Satisfaction

(1) Quality Attributes of Mobile Communication Terminal Products

The previous studies evaluated the quality of tangible materials as having a long life and a number of functions. However, the concept of quality is now being reinterpreted with the focused placed on "meeting the needs of customers". Parasuraman, Zeithaml and Berry (1985, 1988) claim that quality perceived by customers is determined by the comparison between customers' expectations for the level of quality to be met by manufacturers and their actual perception of quality supplied by manufacturers. Such studies mainly use "Servqual" as a means to evaluate customer service quality. The 10 categories of corporeality, credibility, response, capability, courtesy, reliability, accessibility, communication, and customer understanding are expounded within the limit of corporeality, credibility, reactivity, assurance, and response. The quality evaluation of corporeal materials like mobile communication terminals mainly uses the attribute clue (Zeithaml, 1988), and the criteria for the attribute clue vary according to the nature of corporeal materials. SERVQUAL is customized in accordance with the criteria used by service providers, and the attributes like "polite and tidy-looking staff" and "accurate customer record maintenance" are very much different from the quality evaluation of corporeal materials. Thus, this research selected 8 attribute clues from 22 attribute clues of SERVQUAL closely associated with the unique attributes of mobile communication terminals through interviews with experts in mobile communication.

TABLE I. QUALITY ATTRIBUTES OF MOBILE COMMUNICATION TERMINAL PRODUCTS

Corporeality	Shape and Size of Terminals / Design of Terminals
Performance	Various Functions of Terminals / Up-to-date Functions of Terminals
Convenience	Convenience of Character Input / Convenience of Subsidiary Functions of Terminals
Durability (Credibility)	Life of Terminals / Breakdown Frequency of Terminals

(2) Customer Satisfaction

Customer satisfaction was perceived differently by a number of scholars in their previous studies, and it has been also evaluated in different manners. Research efforts on customer satisfaction can be roughly categorized into two perspectives. Yi (1990) divided customer satisfaction into resultant satisfaction obtained from consumer experience and interim satisfaction in the middle of the evaluation process. Oliver (1980) defined customer satisfaction as the function of expectations met and perceptions of discrepancies, suggesting a discrepancy paradigm. Westbrook & Reilly (1983) referred to customer satisfaction as a psychological response caused by experiences associated with the purchase of products or services. Churchill and Surprenant (1982) defined customer satisfaction as a conceptual, practical meaning and regarded the conceptual implication of customer satisfaction as the comparison between expected results of purchase, use, and consumption and price and compensation. In addition,

Churchill and Surprenant regarded the practical implication of customer satisfaction as the sum of satisfaction about various attributes of products or services. In addition, they claimed that the quality of products and services increases when it exceeds the demands, needs, and expectations of customers in that customer satisfaction relies on the perceptions and expectations of customers. On the basis of such studies, this research is intended to analyze customer satisfaction about mobile communication terminal products as to expected satisfaction in the middle of evaluation before purchase and actual satisfaction coming from purchase experiences. The previously mentioned quality attributes of mobile communication terminal products will be measured as a major factor that determines customer satisfaction based on the level of customer perception (Bitner, 1990; Zeithaml and Bitner, 1996).

(3) Customer Loyalty

Customer loyalty has been studied with a wide scope by a number of scholars. The existing studies on customer loyalty can be roughly categorized into behavioral, attitudinal, and integrated approaches (Oh, 1995). The behavioral approach examines the continuity of customer purchase history and deals with customer loyalty in association with the rate, frequency, and probability of purchase (Jeuland, 1979; Raj, 1982). The attitudinal approach interprets customer loyalty as psychological immersion, preference, and favorable attitude toward particular products or services (Jacoby and Chestnut, 1978; Oh, 1995; Oliva et al., 1992). Combining these two approaches, the integrated approach uses customer behaviors and attitudes to conceptualize customer loyalty and is used as a valuable means to understand customer loyalty in various industrial fields (Dick and Basu, 1994). Customer loyalty is sometimes manipulated as behaviors and attitudes, and the attitudinal criteria include recommendations of brands, resistance against superior competitive alternatives, intention to buy again, and intention to pay for the premium (Anderson & Sullivan, 1993; Boulding et al., 1993; Cronin & Taylor, 1992; Narayandas, 1996; Zeithaml et al., 1996). Based on such studies, this thesis defines customer loyalty as the sum of 7 behavioral patterns and uses them as a means of measurement: superiority as to mobile phone brand images, favorable attitudes toward mobile phone brands, pride in using mobile phones, resistance against superior competitive alternatives, recommendations of products being used, intention to buy again, and intention to pay for the premium.

III. POSITIVE ANALYSIS

A. Research Model and Hypothesis

On the basis of the results of the previous studies, this thesis categorizes customer satisfaction into expected satisfaction in the middle of evaluation before purchase and actual satisfaction coming from purchase experiences and illustrates the relationship with customer loyalty as shown in Figure 1. To emphasize use Emphasis and Strong styles. For code fragments use Code style, for URLs standard Hyperlink style, for file names – File Name style.

Satisfaction about products is divided into expected satisfaction in the course of evaluation before purchase and actu-

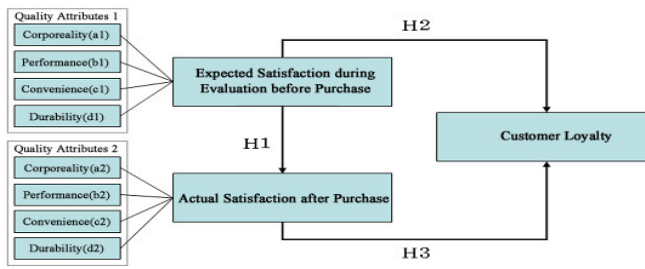


Fig. 1 Research Model

al satisfaction coming from purchase experiences (Yi, 1990), and customer satisfaction about products relies on customer expectations, increasing when such expectations exceed the quality of products (Churchill& Surprenant, 1982). In addition, Oliver (1980) defined customer satisfaction as the function of expectations met and perceptions of discrepancies, suggesting a discrepancy paradigm. Based on such studies, hypotheses 1 and 2 were established as follows:H1. The level of expected satisfaction in the course of evaluation before the purchase of mobile communication terminals is expected to have a positive influence on the level of actual satisfaction coming from purchase experiences. H2. The level of expected satisfaction in the course of evaluation before the purchase of mobile communication terminals will have a positive influence on the level of customer loyalty. According to the studies done by Westbrook & Reilly (1983), customer satisfaction is defined as a psychological response resulted from experiences associated with the purchase of products or services, and such attitudes are related to customer loyalty including psychological immersion, preference, and favorable attitude toward the corresponding products (Jacoby and Chestnut, 1978; Oh, 1995; Oliva et al., 1992). Hypothesis 3 was then established based on the results of such studies.H3. The level of actual satisfaction obtained from the purchase of mobile communication terminals is expected to have a positive influence on the level of customer loyalty. On the basis of the 3 hypotheses stated above, this thesis will analyze the relationship between variables through the SEM (Structural Equation Model) with the focus placed on factors like the level of expected satisfaction in the course of evaluation before purchase, the level of customer satisfaction obtained from purchase experiences, and the interrelated influence on and causal relationship between various levels of customer loyalty.

B. Makeup of Measured Items

The manipulative definition of variables used to test the hypotheses established in this thesis is based on the suggestions made by the previous studies. This research selected 8 attribute clues from22 attribute clues of SERVQUAL closely associated with the unique attributes of mobile communication terminals through interviews with experts in mobile communication. The 4 factors that affect the level of customer satisfaction in the course of evaluation before purchase consist of 8 items: corporeality (2 items), performance (2 items), convenience (2 items), and durability (2 items). In addition, the 4 factors that affect the level of customer satisfaction after purchase consist of 8 items: corporeality (2 items), performance (2 items), convenience (2 items), and durability (2 items), making the total of 8 factors and 16

items. Also, the factors that affect customer loyalty were measured as 7 items. Expected satisfaction in the course of evaluation before purchase, actual satisfaction obtained from purchase experiences, and customer loyalty were measured by the Likert 7-score criteria, with score 1 being "Not at all" and score 5 being "Very much".

C. Data Collection and Analysis

1,000 male and female consumers ranging from 10's to 60's across the nation including small and medium-sized cities who own mobile communication terminals were interviewed in person, and samples were assigned and extracted in consideration of gender, age, region, and the occupancy ratio in the domestic mobile communication service market. SPSS was used to statistically process the questionnaire results, and an analysis was made as follows: First, the demographic density of respondents was analyzed based on the collected data so that the representativeness of the population could be checked. Second, credibility was checked with the Cronbach's alpha value by using SPSS in order to check whether the actual concept measured corresponds to the abstract concept to be measured in the measurement model (measurement variable) of this research, and then the research model was analyzed by using Amos 4.0 of the covariance structure analysis in order to examine the determinant factors that affect customer loyalty.

D. Results of the Analysis

(1) Characteristics of the Sample Data

(A) Distribution of Gender and Age

Among the 1,000 respondents who own mobile communication terminals, there were 472 men (47.2%) and 528 women (52.8%) while there were 155 people in the 10's (15.5%), 328 people in the 20's (32.8%), 291 people in the 30's (29.1%), 193 people in the 40's (19.3%), 30 people in the 50's (3%), and 3 people in the 60's (0.3%).

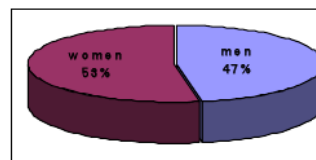


Fig. 2 Research Model

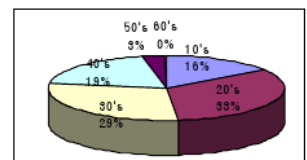


Fig. 3 Research Model

TABLE 2
DISTRIBUTION OF GENDER AND AGE

	10's	20's	30's	40's	50's	60's	Total (ratio)
Number of Men	71	153	142	95	9	2	472 (47.2%)
Number of Women	84	175	149	98	21	1	528 (52.8%)
Number of Samples (ratio)	155 (15.5%)	328 (32.8%)	291 (29.1%)	193 (19.3%)	30 (3%)	3 (0.3%)	1,000 (100%)

(B) Distribution of Terminal Manufacturers

As for the terminal manufactures that are currently selling mobile communication terminals in the domestic market,

those whose names start with S, L, ST, P, M, and K were targeted, and 453 respondents turned out to own terminals manufactured by company S (45.3%), 179 by company L (17.9%), 107 by company ST (10.7%), 109 by company P (10.9%), 77 by company K (7.7%), 65 by company M (6.5%), and 10 by other manufacturers (1%).

TABLE 3
DISTRIBUTION OF MOBILE PHONE MANUFACTURERS

	S	L	ST	P	K	M	Others	Total
Number of Samples (%)	453 (45.3)	179 (17.9)	107 (10.7)	109 (10.9)	77 (7.7)	65 (6.5)	10 (1)	1000 (100)
Population Ratio	46.87	20.5	16.38	6.92	4.66	2.66	2.00	100%

(C) Distribution of Mobile Communication Service Providers

The mobile communication service providers in the domestic market include SK Telecom, KTF, and LG Telecom, and 507 respondents turned out to have made a contract with SK Telecom (50.7%), 328 with KTF (32.8%), and 165 with LG Telecom (16.5%) in consideration of the occupancy ratio of each provider in the domestic market.

TABLE 4 DISTRIBUTION OF MOBILE COMMUNICATION SERVICE PROVIDERS

Category	SK Telecom	KTF	LG Telecom	Total
Number of Samples (%)	507 (50.7)	328 (32.8)	165 (16.5)	1,000 (100)
Population (ratio)	52%	32%	16%	100%

(2) Analysis of Credibility

As means to test the credibility of variables, the split-half method and the internal consistency analysis are used to compute the credibility coefficient as to measured items. The most widely used method is the internal consistency analysis in that it tests credibility in consideration of the average relationship between items within each measurement device in case a number of items are used to measure the identical concept. In particular, in case a measurement variable consists of a number of items, the method using the Cronbach's alpha tests whether the component items are formed to measure the identical concept, enhancing credibility by excluding the items that hamper credibility from the measurement device. In this research credibility was tested by the Cronbach's alpha, and the results are shown in Table 5.

TABLE 5
CREDIBILITY COEFFICIENTS

Name of Variables		Number of Items	Cronbach' Alpha
Expected Satisfaction during Evaluation before Purchase	Corporeality	2	.7679
	Performance	2	.7457
	Convenience	2	.6877
	Durability	2	.6279
Actual Satisfaction after Purchase	Corporeality	2	.8928
	Performance	2	.7228
	Convenience	2	.7457
	Durability	2	.6993

The standards for credibility vary among a number of scholars, but in general, if the Cronbach's alpha coefficient exceeds 0.6, no one doubts the level of credibility, and if the Cronbach's alpha coefficient is over 0.8, the level of credibility is said to be significantly high. Most of the Cronbach's alpha coefficients for the measurement variables used in this research exceed 0.6, making all variables credible.

(3) Testing Hypotheses

The method used to analyze the relationship between a number of variables using the correlation matrix or the covariance matrix in a synthetic manner is referred to as the "multivariate analysis", and the covariance structure model is a model that integrates various methods of the multivariate analysis. That is, the multiple regression analysis is possible if there are more than 2 independent variables and only 1 dependent variable whereas the multivariate analysis is a proper method to analyze the causal relationship between variables if there are more than 2 dependent variables. LISREL has been widely used up until now for the covariance analysis, but it has several drawbacks including the complexity in entering data or processing statements. To complement such drawbacks, therefore, Amos was used to analyze the structural equation model in that the interface works well on the Windows platform and the SPSS or Excel worksheet data are easily retrieved. The causal relationship between variables is obtained by the causal coefficient (estimation) or the correlation coefficient of each path, and the level of significance needs to be evaluated. As a means of evaluation, the Wald test is often used where the hypothesis that the path coefficient is zero or there is no causal relationship is tested. This is based on the fact that the estimation divided by the standard error becomes the t distribution. If the number of samples is significantly large, the distribution is regarded normal, so if the estimation divided by the standard error is over 1.96, the hypothesis is accepted at 5% of the significance level and it can be said that there is a causal relationship. In Amos this is output as the critical ratio. The structural equation model analyzed in this thesis to test the hypotheses is shown in Figure 6.

FIG. 4
COVARIANCE STRUCTURAL MODEL

Research Hypothesis		Estimate	S.E	C.R	P	Acceptance
H1	Expected Satisfaction during Evaluation before Purchase → Actual Satisfaction after Purchase	0.737	0.070	10.545	0.000	Accepted
H2	Expected Satisfaction during Evaluation before Purchase → Customer Loyalty	0.411	0.100	4.125	0.000	Accepted
H3	Actual Satisfaction after Purchase → Customer Loyalty	0.915	0.115	7.987	0.000	Accepted

The results of the covariance structural analysis between variables are shown in Table 6. * Accepted if the critical ratio is over 1.96 and the level of significance (P) is below 0.05, C.R. = Estimate / S.E. As a result of the covariance structural analysis as shown in Table 6, the hypotheses proposed in this research (H1, H2, and H3) were all accepted.

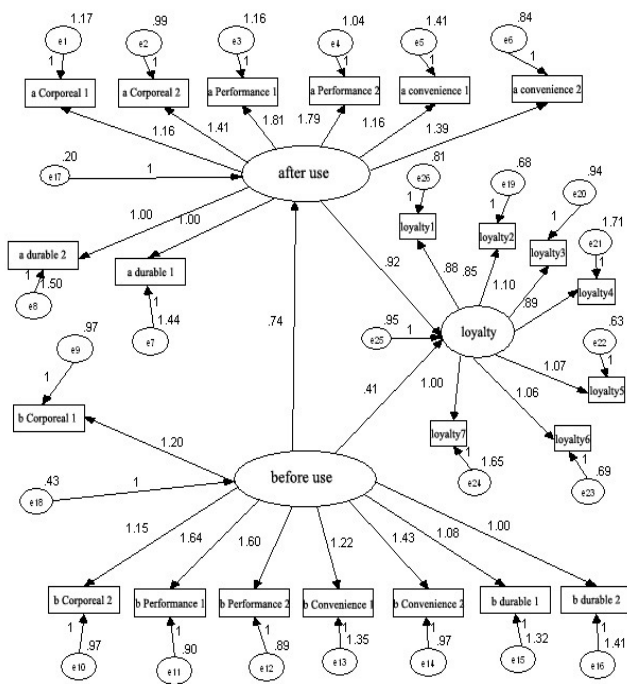


TABLE 6 RESULTS OF THE COVARIANCE STRUCTURAL ANALYSIS

First, hypothesis 1 states that the level of expected satisfaction in the course of evaluation before the purchase of mobile communication terminals is expected to have a positive influence on the level of actual satisfaction obtained from purchase experiences. As a result of the analysis, the level of expected satisfaction in the course of evaluation before the purchase of mobile communication terminals turned out to have 0.737 of the estimation and 10.545 of the critical ratio, which are similar to those of actual satisfaction obtained from purchase experiences. Accordingly, hypothesis 1 is eligible for acceptance. Second, hypothesis 2 states that the level of expected satisfaction in the course of evaluation before the purchase of mobile communication terminals is expected to have a positive influence on the level of customer loyalty. As a result of the analysis, the level of expected satisfaction in the course of evaluation before purchase turned out to have 0.411 of the estimation and 4.125 of the critical ratio, which are similar to those of customer loyalty. Accordingly, hypothesis 2 is eligible for acceptance. H3. The level of actual satisfaction obtained from the purchase of mobile communication terminals is expected to have a positive influence on the level of customer loyalty. As a result of the analysis, the level of actual satisfaction obtained from purchase experiences turned out to have 0.915 of the estimation and 7.985 of the critical ratio, which are similar to those of customer loyalty. Accordingly, hypothesis 3 is eligible for acceptance

IV. CONCLUSION

This research was intended to positively analyze factors that affect customer satisfaction about products in the mobile communication terminal market as to the influences of expected satisfaction and actual satisfaction before and after purchase on customer loyalty. As a means to measure the relationship between related variables, Amos 4.0 was imple-

mented to test the structural equation model hypothesized in this research. Hypotheses 1, 2, and 3 were all accepted while each of the measurement variables describing the level of expected satisfaction before the purchase of products, the level of actual satisfaction after the purchase of products, and the level of customer loyalty was also over 1 with a high level of credibility. The results of this research point out many important aspects of product designs, sales, and consistent customer services managed by the R&D department and the marketing department at a mobile communication terminal manufacturer. First, for hypothesis 1 the influence of expected satisfaction before the purchase of mobile communication terminals on actual satisfaction after the purchase of products turned out to be 0.737, which has an extremely high level of significance. This implies that when customers planning to buy mobile phones have a high expectation for the shape, design, performance, convenience, and durability, actual satisfaction about such quality elements after the purchase of products also increases. Thus, mobile phone manufacturers must pour their efforts into the elevation of customer satisfaction about the unique quality attributes of mobile communication terminals at the stages of product design and production. In addition, accurate information on the basic attributes of mobile phones must be provided in that the level of customer satisfaction may drop rapidly in case the actual functions and performance of mobile phones differ from those publicly advertised. Second, as for the influence of expected satisfaction before the purchase of mobile communication terminals on customer loyalty, the estimation is 0.411, which has a fairly high level of significance. As customers have a certain level of expectation for the quality of products through the preliminary product information provided by mobile phone manufacturers, strategic methods must be established so that the information on the unique features of products can be provided to customers through advertisements. As the mobile communication terminal technology rapidly develops, new attributes start to take their forms while convergence products that combine the existing attributes also appear. Wibro, developed locally first in the world and ready for commercialization, is now breaking the boundary between wired and wireless communication by combining the highly efficient transmission capability of wired communication and the mobility of wireless communication. Moreover, the terrestrial DMB service expected to lead the era when communication and broadcasting are combined was commercially provided in the domestic market, first in the world, drawing attention from all around the world. According to such convergence trends for mobile communication terminals, customers acquire information on new products with attributes different from those of the existing products through a variety of channels. Furthermore, as suggested by this research, customer expectations for the quality of products whose information is obtained before purchase through various channels were analyzed to have a direct influence on customer loyalty. Therefore, mobile phone manufacturers must enhance the level of customer satisfaction by providing information on the unique quality attributes of products ultimately to improve the level of customer loyalty. Third, as for the influence of actual satisfaction after the purchase of mobile communication terminals

on the level of customer loyalty, the estimation turned out to be 0.915, which has a fairly high level of significance, and this helps conclude that mobile phone manufacturers need to pour their efforts into the enhancement of product quality in that customer satisfaction after purchase is directly proportional to customer loyalty and that customer loyalty may stimulate the intention to buy again. As suggested by the positive analysis, mobile phone manufacturers must strive to develop and manufacture mobile communication terminals with enhanced designs, performance, convenience, and durability. Mobile phone manufacturers have recently focused on the R&D and designs of mobile communication terminals. Nokia, with the No. 1 occupancy rate in the global market, have been making utmost efforts to manufacture products ranging from monoblock to cramshell and slide devices under the motto, "To satisfy the customer and the operator". Ever since the year 1993, Samsung Electronics, one of the domestic manufacturers, has hired more than 1,000 designers for the Design Management Center, differentiating a group of products, establishing a consistent identity, and developing a design first.. In this research the uniqueness attributes of mobile phones were analyzed besides prices and brand images regarded, in general, as important factors that affect customer satisfaction. Prices and brand images are the most influential attributes applicable to almost all purchase circumstances. However, the two factors were excluded from this research in that such external factors had a possibility to cause conflict in the analysis of the unique quality attributes of products. Nevertheless, in the future research the previous studies need to be carefully reexamined while the balance of such factors is considered for a broader understanding and diverse research attempts. On the basis of the results of this research as well as the following research efforts as to customer satisfaction about mobile communication terminals, customer expectations for the quality of products must be met while actual satisfaction is achieved through the use of products. Also, manufacturers must pay close attention at all manufacturing stages to improve customer loyalty and maintain the competitive power of the domestic mobile communication terminal industry in the global market.

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