

Determinants of The Continuance Intention to Use in The Korean 3G Telecommunications Market

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Abstract Korean mobile telecommunications market is shifting from 2G to 3G service. Considering the revenue of voice-based communication has reached its maximum, 3G services can provide telecommunication companies with the opportunity to increase their revenues. As the competition in the market is becoming fierce, mobile carriers are trying to increase their profits by preventing their customers from switching to rivals. In this regard, managing customer can be a key success factor of the mobile telecommunications business by retaining existing customer.

In this research, we tried to develop and test a model that aids further understanding of the determinants of continuance intention to use the current 3G service. We conducted empirical study through the analysis of 3G service users' data in Korea. The results indicated that continuance intention to use the current 3G is dependent on the customer's satisfaction with the service quality, handset, and brand image. We hope that analysis results will have significant implications in terms of both practical and theoretical aspects.

Keywords 3G Service • Continuance Intention • Customer Loyalty

Introduction

Korean mobile telecommunications industry has improved from 2G to 3G. Under the 2G systems, even though subscribers can use short messaging service (SMS) and mobile Internet service, voice-based communication was a main

service. 3G offers faster data transmission that means faster mobile Internet use and clearer images on video calls than 2G. Considering the revenue of voice-based communication has reached its maximum, 3G services can provide telecommunication companies with the opportunity to increase their revenues. In this regard, the paradigm of competition in the mobile communications market is evolving from voice-centered service to a data-centered communications service leveraging the high-speed data transmission (Kim et al. 2004; Lee et al. 2009). In this competitive market, all companies tried to increase their profits by preventing their customers from switching to rivals. Therefore, managing customer can be a key success factor of the mobile telecommunications business by retaining existing customer. Building customer loyalty provides the foundation of a firm's growth and performance (Lee & Cunningham 2001; Reichheld 1996).

There are two main telecommunication companies that provide 3G service in Korea such as SK Telecom and KT in Korea. They launched their nationwide 3G services in 2007. They can provide faster data transmission, enabling subscribers to use multi-media service including network game and mobile Internet, and so on. As the telecommunications market is already saturated with voice-based communication, mobile carriers regard these data services using 3G technology as a new profit source. Hence, two companies tried to attract customers from rival each other by giving heavy subsidies. In 2011, Korean mobile companies invested about 6 billion dollars in their marketing activities to acquire customers. That sum was 20 percent higher than the recommendation of the Korea Communications Commission. The mobile companies are conducting cutthroat competition against each other. This negatively affects the financial performance by deteriorating profitability.

The purpose of this study is to develop and test a model

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that aids further understanding of the sources of the continuance intention to use the current 3G service. Continuance intention to use is directly connected to the concept of customer loyalty which is the base of firm's profit. Our results will have significant strategic insights for companies in the mobile telecommunications market. After we reviewed the past research, we explain the data and the methodology used for the empirical analysis. Then analysis results are suggested and interpreted. Finally, the main implications of the analysis are summarized along with the conclusions including further research.

Literature Review

Continuance intention to use service is directly connected to the customer loyalty of telecommunications market which is based on the contractual relationship with a subscriber. Therefore, we identified the factors affecting the continuance intention to use from the past research related customer loyalty in the mobile telecommunications industry. Customer loyalty refers to the customer's intention to repurchase(reuse) product(service) from the same product/service provider (Edvardsson et al. 2000). Therefore, comparing to the concept of satisfaction, loyalty is more directly connected to the profits of company. Therefore, the customer loyalty has received a great deal of attention in various industries, including financial, manufacturing, and telecommunication sector. Especially considering the customer relationship can be achieved based on the contract in the telecommunications service, the customer loyalty is the key facilitator of the business success in the telecommunication company. However, there are not enough researches on the mobile telecommunication business in Korea (Kim et al. 2004). The studies were conducted in the context of Korean mobile telecommunication industry as followings.

Kim et al. (2004) researched on the relationship among customer satisfaction, switching barrier, and customer loyalty in Korean mobile telecommunication services. They analyzed how customer satisfaction and the switching barrier impact on the customer loyalty. In their results, they showed that building satisfaction and switching barrier can be the necessary strategies to increase company's profits by retaining their own customers. Ahn et al. (2006) identified the determinants of customer churn in the Korean mobile telecommunication industry. Call quality related factors influence the customer churn in their study. Kim & Kwon (2003) identified that network size is an important factor in choosing mobile operators. The result indicated that Korean subscribers take into account intra-net call discounts and the quality signaling effect in their choice of mobile carriers. Choi et al. (2001) evaluated the business

strategies of the Korean mobile telecommunication companies and analyzed the impact of government regulations on the mobile telecommunications market. Song & Kim (2001) analyzed the effect of the restructuring the Korean mobile telecommunications market using a simulation method. Lee et al. (2009) examined the status of the 3.5G technology and reviewed the service standardization strategy in the perspective technology evolution. Kim & Yoon (2004) identified the determinants of customer churn and customer loyalty in the Korean mobile telecommunication market through the empirical study using the binomial logit model. Their results indicated that the probability of subscriber's switching carrier is dependent on the level of satisfaction with alternative in terms of call quality, tariff level, handset type, brand image, income, and subscription duration.

Past research suggested the various kinds of factors influencing the customer satisfaction and loyalty in the telecommunications industry. Kim et al. (2004) suggested that call quality, value-added services, mobile device, pricing structure, customer support, and convenience in procedures are sources of customer satisfaction in the Korean mobile telecommunications market. They verified empirically the call quality, value-added services, and customer support are positively related to the customer satisfaction. Kim & Yoon's research (2004) showed that call quality, handset type, and brand image affect the customer loyalty in the Korean mobile telecommunications industry. In their study, the customer loyalty was measured by the intention/non-intention to recommend the interviewee's current service provider to other person. Gerpott et al. (2001) maintained that the customer satisfaction is a significant factor of the customer loyalty in the German mobile cellular telecommunications market and the customer satisfaction is positively affected by the network quality, prices, and personal benefits. In addition, the image of competitors is negatively connected with the customer loyalty.

Recently, 4G service was introduced and the number of subscribers is 6 million as of 8, 2012 (About 10 percent of the total mobile telecommunications users). Therefore, there are few researches on the users of the 4G service.

Research Model and Hypotheses

The research model specifying factors influencing on continuance intention to use current 3G service in the mobile telecommunications market is represented in Figure 1. Based on past research related to the customer loyalty, we try to extract various kinds of sources connected with the continuance intention to use. In this regard, we assume that continuance to use in the 3G telecommunications service can be developed by the satisfaction with multi-dimensions

including the service quality, pricing structure, handset quality, brand image, and switching cost.

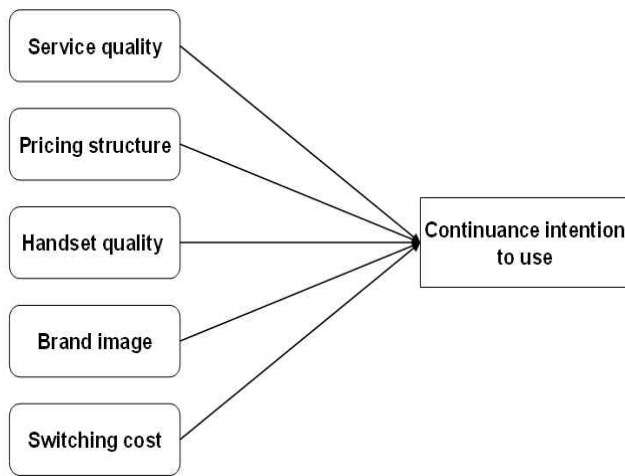


Fig. 1 Research Model

The important factor affecting customer satisfaction is the customer's perception of the service quality (Zeithamal & Bitner 1996). In the past research conducted in the context of the mobile telecommunications industry, service quality was mainly measured by the call quality, value-added services, mobile device, and customer support service, etc (Kim 2000; Lee et al. 2001). In terms of customer churn, the probability of the user's switching into other service provider was found to be influenced by the service attributes such as call quality, tariff plan, handsets, and brand image (Kim & Yoon 2004). Call quality is the basic service quality in the telecommunications service. Mobile telecommunications service providers have traditionally put a high value on the importance of the call quality (Kim et al. 2004). Especially, call drop rate is a significant determinant of the customer churn rate (Ahn et al. 2006). In their study, call drop rate denotes the percentage of abnormally terminated calls (Ahn et al. 2006; p.555). In this regard, the more a customer is satisfied with the service quality, the more he/she continues to use the current service.

The level of service usage including the concept of monthly charge is one of the most important predictors of customer churn (Buckinx & Poel 2005). Mozer et al. (2000) maintained that the customer churn is directly connected to the monthly charge and the amounts of usage. Kim & Yoon (2004) suggested that the satisfaction with the tariff level is negatively associated with the customer churn through the empirical analysis. In line with this, the subscribers who satisfied with the level of pricing structure are more likely to continue to use the current mobile service. Therefore, hypotheses for this group of factors are;

H1: The satisfaction on the service quality of 3G service is positively related to the continuance intention to use the current 3G service.

H2: The satisfaction on the pricing structure of 3G service is positively related to the continuance intention to use the current 3G service.

Handsets are the significant factor of customer satisfaction. Even though the quality of the handset is dependent on the capacity of a handset maker, service users are likely to regard this factor as the attribute of their mobile service provider (network operator). Kim & Yoon's study (2004) showed that the subscriber's satisfaction with the handsets is positively related to the customer loyalty. In addition, their research showed that the user's satisfaction with the handset lowers the customer churning rate.

H3: The satisfaction on the handset quality of 3G service is positively related to the continuance intention to use the current 3G service.

In current mobile telecommunications market because the level of technology and infrastructure is standardized, it is very difficult for subscribers to distinguish service quality among various service providers (Kim & Yoon 2004). In the competitive market, if the current service provider delivers a differentiated service that is hard for a rival to copy or if the service quality of a rival is equivalent to that of a current service provider, the customer is likely to retain a relationship with the existing service provider (Bendapudi & Berry 1997; Kim et al. 2004). In this regard, managing brand image of the service provider can be an effective differentiation strategy (Kim & Yoon 2004). Once the brand image is built up, it plays an important role in keeping existing customers and attracting new ones. Therefore, the more a user is satisfied with the brand image of an existing service provider, the more he/she is likely to maintain the relationship between them.

H4: The satisfaction on the brand image of 3G service is positively related to the continuance intention to use the current 3G service.

Switching cost refers to the expense incurred when a customer switch into other service provider. Switching cost includes monetary and non monetary expense such as time, labor, and psychological losses (Dick & Basu 1994). Switching cost can be perceived as the risk in the perspective of a customer in terms of the aspect related to performance and safety, a financial loss, and so on (Kim et al. 2004; Murray 1991). Hence, switching costs prevent

the existing customer from switching into a new service provider by building switching barrier (Fornell 1992). Therefore, the higher the switching cost, the more a subscriber is likely to retain the relationship with a current service provider.

H5: The level of switching cost of 3G service is positively related to the continuance intention to use the current 3G service.

Analysis

The questionnaires in our study were developed based on the past research and on the results of the prior interviews with 3G service users. We analyzed our research model through the empirical study. For the survey, a questionnaire was developed using the five point scale ranging from '1' strongly disagree to '5' strongly agree. The final sample for analysis in our study consisted of 263 3G service users after screening out unusable samples including non-response and inconsistent response. Samples in this research were primarily in their twenties and thirties, 31% and 37% respectively. As for gender, they were 49% male and 51% female. In terms of current mobile carriers, the samples used in our study consisted of 51% SK Telecom, 32% Korea Telecom, and 17% LG Telecom.

Factor analysis and Cronbach's alpha with SPSS 18.0 used to test the measurement model and establish validity of the constructs. In this study, most measurement items were extracted and modified from past research. We evaluated the internal consistency of a set of indicators, ranging from 0, no internal consistency to 1, perfect internal consistency using Cronbach's alpha test. The reliabilities of all constructs were above 0.6. Therefore, the results of Cronbach's alpha test in our research exceeded the acceptable minimum level. Generally, the minimum level of acceptance is 0.6 in the social science (Hair et al. 1998). The results of Cronbach' alpha test are shown in Table 1.

We measured the service quality of the 3G service using the concepts of call quality, quality of the value-added service, and mobile Internet service (Kim 2000; Gerpott et al. 2001; Lee et al. 2001). The concept of pricing structure included the reasonability of services price, variety of calling plan (Kim et al. 2004). Handset was measured by the functions of a handset, design of a handset, and variety of the handset types (Kim et al. 2004). As for the brand image was operationalized by the degree of the brand recognition and familiarity of the brand in the market (Keller 1998). Switching cost refers to the cost incurred when changing the product or service of provider from the various aspects including money, time, and psychology (Dick

& Basu 1994). In this research, we classified the switching cost into two based on Kim et al. (2004)'s research. One is the device cost which is related to the purchase of a new mobile phone and adaptation to the new phone. The other is the monetary including the subscription fee and damages for breach contract with the existing mobile carrier. Continuance intention to use was measured using the items such as hesitance to use and intention to use continuously (Wangpipatwong et al. 2008).

Table 1 Measurement items for survey

Construct	Measurement items	Cronbach's alpha
Service quality	Call quality	0.672
	Quality of the value-added service	
	Quality of mobile Internet service	
Brand image	Degree of the brand recognition	0.750
	Familiarity of the brand	
Switching cost	Device cost	0.739
	Monetary cost	
Pricing structure	Reasonability of services price	0.723
	Variety of calling plan	
Handset	Functions of a handset	0.685
	Design of a handset	
	Variety of a handset types	
Continuance to use	Hesitance to use	0.862
	Intention to use continuously	

Exploratory Factor Analysis (EFA) is a method of searching for structure among a set of variables or as a data reduction (Hair et al. 1998). Therefore, we assessed the validity of constructs in the measurements through the exploratory factor analysis. VARIMAX rotation was used in our analysis. Factor loadings of the measurement items were above 0.5 on the constructs, with the total of 72.3% of the variance being explained by the data. The results are shown in Table 2.

In our study to test hypotheses, we conducted the regression analysis. As for the determinants of continuance intention to use the current 3G service. As we expected, satisfaction with the service quality (0.320; $p < 0.01$), handset (0.220; $p < 0.01$), and brand image (0.168; $p < 0.05$) had a positive effect on the continuance to use the current 3G service. However, satisfaction on the pricing structure (0.086; $p > 0.05$) and the level of the switching cost (0.078; $p > 0.05$) were found to be unrelated to the continuance to use 3G service. Therefore, the hypothesis 1, 3, and 4 are accepted while the hypothesis 2 and 5 are rejected. The results of regression analysis are presented in Table 3.

Table 2 Results of the exploratory factor analysis

Measurement items	1	2	3	4	5
Service quality 1	0.805	0.028	0.069	-0.001	0.234
Service quality 2	0.741	0.130	0.000	0.091	0.134
Service quality 3	0.700	0.266	0.084	0.292	-0.065
Brand image 1	0.123	0.099	0.075	0.137	0.863
Brand image 2	0.065	0.238	0.075	0.327	0.752
Switching cost 1	0.274	0.097	0.076	0.793	0.331
Switching cost 2	0.098	0.155	0.132	0.867	0.214
Pricing structure 1	0.040	0.870	0.084	-0.045	0.076
Pricing structure 2	0.284	0.816	0.040	0.284	0.142
Handset 1	-0.150	0.068	0.806	-0.015	-0.087
Handset 2	0.202	-0.007	0.724	0.089	0.174
Handset 3	0.109	0.058	0.893	0.135	0.078

Table 3 Results of the regression analysis

Hypotheses	Standardized Coefficient	t-value	Sig.	Supported/Not supported
H1: service quality → continuance to use	0.320	4.692	0.000	Supported
H2: pricing structure → continuance to use	0.037	0.544	0.587	Not supported
H3: handset → continuance to use	0.220	3.253	0.001	Supported
H4: brand image → continuance to use	0.168	2.520	0.013	Supported
H5: switching cost → continuance to use	0.078	1.288	0.199	Not supported

Adjusted R^2 : 0.294

The results from our analysis provide strong support for the research model presented in Figure 1. We confirm that the continuance to use the current 3G service can be developed by satisfaction with the service quality, handset and brand image. On the contrary to our expectation, the satisfaction on the pricing structure and the level of switching cost were not related to the continuance to use the current 3G service. These results indicate that the pricing structure and switching cost cannot be the differential factors across mobile service providers in Korean mobile telecommunications market. The main reason is that the pricing structures of the 3G service are similar among Korean mobile carriers. Hence it is difficult for subscribers to discern the service rate and calling plan across mobile carriers. As for the switching cost, all mobile carriers are trying to attract new customers by providing mobile users who want to switch from rivals with subsidies. Therefore, it means that the switching cost can be no longer the obstacle when subscribers change their own service providers in Korean mobile telecommunications market.

Conclusions

Continuance intention to use the current service is directly

connected to the customer loyalty in the perspective of a company. In addition, customer loyalty can be a key success factor in the all kinds of industry by increasing profits. In this study, we tried to identify the determinants of continuance intention to use the current 3G service through the analysis of individual 3G subscribers' survey data. The results showed that the satisfaction with the service quality, handset, and brand image are positively associated with the continuance intention to use the current 3G service. Based on these results, we suggest three implications in the perspective of a mobile carrier.

First, the service quality of 3G is the main factor in deciding whether a subscriber continue to use the current 3G service or not. This result corresponds with the traditional research finding that the service quality is a core attribute in customer's evaluation of the service. Mobile carriers should manage the call clarity by investing in network infrastructures. In addition, as the mobile Internet service is a killer service of 3G service, a service provider has to secure resources such as network and communications equipments to deliver the fast and reliable mobile services.

Second, mobile service providers plan to continue developing the strategic partnership with the handset makers. Most of mobile subscribers tend to owe the high quality

of a handset to the capability of their own service provider. In Kim & Yoon's research (2004), they suggested the interesting result that the satisfaction with the handsets is one of the important determinants of churn. Therefore, it is needed to establish a strategic alliance with a capable handset maker. In doing so, mobile carriers can supply mobile subscribers various kinds of handsets with a high performance. In Korea, there are many cases reflecting in these consequences. For example, KT made an exclusive contract with Apple's iPhone in 2009. In the case of SKT, SKT frequently made a strategic alliance with Samsung Anycall to provide SKT's customers with the most popular mobile phone in Korea.

Third, building the brand image is an effective way to retain the existing customers in the highly competitive market. Brand image can be a good entry barrier to block the competitor's imitation strategy by differentiating from competitors. As the new kinds of technologies and terminals are launched continuously in the mobile telecommunications market, mobile users have a difficulty in evaluating and choosing the right service. In addition, because the quality of the mobile service and terminal is standardized, it is difficult for users to distinguish differences of quality across the service providers and handset makers (Kim & Yoon 2004). In this regard, the brand image of a service provider is an important factor in developing a differentiation strategy.

In this research, we extend loyalty-related research to a new context, the 3G telecommunications service. Therefore, we hope that this study can offer the insights for the advanced IT services in terms of practical and theoretical contributions. However, our study has some limitations. We did not consider other important determinants affecting continuance to use 3G service in our research model, which were conducted in the past research such as the demographic variables of mobile users and actual service usage data. Therefore, it is needed to include these additional factors in the further research.

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