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The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services

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Abstract

The Korean mobile telecommunication services industry is entering a new transition period. This has been brought about by the market for mobile telecommunications reaching maturity, the launching of the IMT-2000 service and the scheduled introduction of mobile number portability. In response, the industry is shifting its strategic focus away from attracting new customers, towards retaining existing customers through the promotion of customer loyalty. This paper investigates how customer satisfaction and the switching barrier influence customer loyalty. The adjustment effect of the switching barrier on customer satisfaction and customer loyalty is also analysed.
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Keywords: Korea; Mobile; Customer loyalty; Customer satisfaction; Switching barrier

1. Introduction

Korean mobile telecommunication services are clearly exhibiting signs of an abrupt industry paradigm change and symptoms of a market in transition. Bolstered by the rapid development of information and communication technologies (ICT) and high demand from customers, the paradigm of mobile telecommunication services is now shifting from voice-centred communication to a combination of high-speed data communication and multimedia. Further, factors such as the growth of the wireless Internet, the introduction of IMT-2000, and the upcoming introduction of mobile number portability (MNP) all contribute to emphasize the appearance of a transition period in the mobile telecommunication services market. Moreover, a stagnating rate of

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diffusion, indicated by a fall in the rate of increase in subscriber numbers, suggests that the market may have now reached maturity (ETRI, 2002).

This change of paradigm and the symptoms of a market in transition are driving the industry's restructuring efforts and intensifying competition between companies. Korean mobile carriers are coming to a full realization of the importance of a customer-oriented business strategy as a condition for sustaining their competitive edge and maintaining a stable profit level, and, indeed, for their very survival. When the number of subscribers has reached its saturation point, creating and securing new customers is not only difficult but also costly in terms of marketing. Hence, it is becoming an industry-wide belief that the best core marketing strategy for the future is to try to retain existing customers by heightening customer loyalty and customer value.

Earlier studies suggest that customer loyalty provides the foundation of a company's sustained competitive edge, and that developing and increasing customer loyalty is a crucial factor in companies' growth and performance (Lee & Cunningham, 2001; Reichheld, 1996). However, not enough studies have been conducted on the subject of the mobile telecommunication services industry inside or outside Korea; a mere handful of research papers have been published. This is partly due to the relatively short history of the industry. Only in the late 1990s did research on factors affecting customer loyalty and carrier switching begin. In particular, there are few studies examining interactions between factors affecting customer loyalty.

This paper analyses the effects on customer loyalty of customer satisfaction and the switching barrier, and the structural relationship between these factors in the Korean mobile telecommunication services industry. This study has four objectives: first, to identify variables that constitute customer satisfaction and the switching barrier, insofar as they affect customer loyalty; second, to carry out an empirical analysis of the relative effects on customer loyalty of customer satisfaction and the switching barrier, and the causal relationships between them; third, to analyse the adjustment effect between customer satisfaction and customer loyalty that is produced by the switching barrier; and, fourth, to examine the strategic implications for mobile carriers attempting to raise the level of customer loyalty.

2. The characteristics of the Korean mobile telecommunication services market

Korea Mobile Telecom (currently SK Telecom) offered Korea's first mobile telecommunication service, an analogue service, in March 1984. Until 1996, the market's structural monopoly resulted in high subscription and usage fees, and high prices for mobile devices. This kept subscriber numbers and sales low, and the growth rate was equally insubstantial.

The entry of Shinsegi Telecom in April 1996 put an end to the monopoly of Korea Mobile Telecom. After the introduction of digital service, the entry of the three PCS firms (KTF, Hansol PCS and LG Telecom) in 1997 triggered a full-scale activation of the market. Competition between carriers quickly brought down subscription fees, and led to struggles to secure new subscribers by such means as subsidizing the purchase of mobile devices. All these developments contributed to the rapid growth of the mobile telecommunication services market. As can be seen in Table 1, the annual average growth rate of mobile service subscriber numbers in Korea between 1996 and 1999 reached an unprecedented 95.7%. In 1999, the number of mobile telecommunication services subscribers surpassed that of fixed-line subscribers.

Table 1
Trends in the Korean mobile telecommunication market

Year	1995	1996	1997	1998	1999	2000	2001	2002
Subscriber numbers (thousands)	1641	3180	6910	13,983	23,443	26,816	29,045	32,342
Penetration rates (%)	3.6	7.0	15.1	30.2	50.0	56.6	61.4	68.3
Sales (million USD)	706.4	1878.0	2801.9	4443.4	7216.0	9785.5	1140.0	1150.7
Monthly ARPU[a] (USD)	43.0	59.0	40.5	31.7	30.7	36.4	39.2	35.6

Source: Reconstructed from the homepage of ministry of information and communication (http://www.mic.go.kr).
[a] ARPU: Average revenue per user.

This high rate of growth came to an end with the new millennium, when the market, nearing its maturity phase, started to slow down (ETRI, 2002). The diffusion rate of mobile telecommunication services having surpassed 60% of the total population, factors such as the discontinuing of subsidies for mobile device purchases after June 2000 reduced the increase of subscriptions to a marginal level, and some carriers even experienced a decrease in subscriber numbers. This is evident in support of the assertion that the mobile telecommunication services sector had reached its saturation point in terms of customer numbers, in other words, attained market maturity. In addition, over-investment and excessive competition, combined with the deterioration of profitability for latecomers to the industry, have led to a market restructuring. Hansol PCS merged with KTF and Shinsegi Telecom was acquired by SK Telecom, reducing the number of players in the market from five to three. As of December 2002, the subscriber numbers were 32, 342, 493, or over 68% of the total population.

Some of the most noteworthy current developments in the Korean mobile telecommunication services are the start of 3G (third-generation) services and the explosive growth of wireless Internet. After the introduction in 2000 of the IS-95A/B service, a 2.5G service of synchronous type, Korea has now moved on to the third-generation cdma-2000 1x/EV-DO service. Wireless Internet is showing sharp growth, boosted by the advance of mobile telecommunication technology, the extensive diffusion of mobile devices capable of connecting to the wireless Internet and colour LCD display mobile devices, and diversification of digital content. The wireless Internet market grew from 2.0% of total mobile telecommunication services sales in 2000, to 10% in 2002.

3. Theoretical background and research hypotheses

3.1. Customer loyalty

Approaches to the study of customer loyalty fall into three broad categories: the behavioural approach, the attitudinal approach and the integrated approach (Oh, 1995).[1] The integrated

[1] The behavioural approach examines the customer's continuity of past purchases, then measures customer loyalty by rate of purchase, frequency of purchase, and possibility of purchase. The attitude approach infers customer loyalty from psychological involvement, favouritism, and a sense of goodwill towards a particular product or service.

approach takes account of both behavioural and attitudinal variables, in order to create its own concept of customer loyalty. We adopt the integrated theory of customer loyalty as our methodological framework. The concept of customer loyalty is understood as a combination of customers' favourable attitude and the behaviour of repurchase.

Earlier studies of factors affecting customer loyalty usually set the focus on customer satisfaction and the switching barrier (e.g., Dick & Basu, 1994; Gerpott, Rams, & Schindler, 2001; Lee & Cunningham, 2001). Customers experiencing a high level of satisfaction are likely to remain with their existing providers and maintain their subscription. However, according to some research, customer satisfaction, while positively influencing customer loyalty, is not always a sufficient condition, and, in some cases, fails to produce the expected effect. Hence, these researchers suggest that it is necessary to analyse other potentially influential factors. It is in this context that the concept of the switching barrier was proposed (Jones, Mothersbaugh, & Betty, 2002).

Further, it has been demonstrated that the switching barrier plays the role of an adjustment variable in the interrelationship between customer satisfaction and customer loyalty. In other words, when the level of customer satisfaction is identical, the level of customer loyalty can vary depending on the magnitude of the switching barrier (e.g., Colgate & Lang, 2001; Jones et al., 2002; Lee & Cunningham, 2001).

The significance of customer loyalty is that it closely relates to the company's continued survival, and to strong future growth. Hence, for a company to maintain a stable profit level when the subscription level has reached the saturation point, the market is mature, and competition is fierce, a defensive strategy which strives to retain existing customers is more important than an aggressive one, which expands the size of the overall market by inducing potential customers (Fornell, 1992; Ahmad & Buttle, 2002).

In the case of Korean mobile telecommunication services, customer loyalty is particularly significant, given the rising customer churn rate as the market matures. Specifically, the monthly average customer churn rate rose sharply from 1.3% in the late 1990s (1998–1999) to 3.3% in the early 2000s. These rates are rather high, compared to the rates recorded by other major foreign mobile carriers during the same period (from 1.0% to 3.0%).[2] Further, the full-scale launch of the IMT-2000 service and the introduction of mobile number portability are likely to increase customer churn, making customer loyalty more crucial than ever.

3.2. *Customer satisfaction*

Customer satisfaction generally means customer reaction to the state of fulfilment, and customer judgment of the fulfilled state (Oliver, 1997). In this paper, we borrow this definition of customer satisfaction. There are many benefits for a company from a high customer satisfaction level. It heightens customer loyalty and prevents customer churn, lowers customers' price sensitivity, reduces the costs of failed marketing and of new customer creation, reduces operating

[2] International telecommunication providers' monthly customer disconnection rates between 2000 and 2001 are as follows: Verizon Wireless (2.8%), Sprint PCS (2.5%), AT&T Wireless (3.0%), NTT DoCoMo (1.4%), Vodafone (2.1%) , Orange (0.8%), Sonera (1.0%) and Swisscom (2.3%). (SK Telecom, 2002)

costs due to customer number increases, improves the effectiveness of advertising, and enhances business reputation (Fornell, 1992).

The main factor determining customer satisfaction is the customers' own perceptions of service quality (Zeithamal & Bitner, 1996). In this study, we shall define service quality as the customers' satisfaction or dissatisfaction formed by their experience of purchase and use of the service (Parasuraman, Zeithamal, & Berry, 1988).

In earlier studies on mobile telecommunication services, service quality has been measured by call quality, pricing structure, mobile devices, value-added services, convenience in procedures, and customer support (e.g., Kim, 2000; Gerpott et al., 2001; Lee, Lee, & Freick, 2001).

3.3. The switching barrier

The switching barrier refers to the difficulty of switching to another provider that is encountered by a customer who is dissatisfied with the existing service, or to the financial, social and psychological burden felt by a customer when switching to a new carrier (Fornell, 1992). Therefore, the higher the switching barrier, the more a customer is forced to remain with his or her existing carrier. According to a previous study, the switching barrier is made up of switching cost, the attractiveness of alternatives, and interpersonal relationships.[3]

Switching cost means the cost incurred when switching, including time, money and psychological cost (Dick & Basu, 1994), and is defined as perceived risk, insofar as there are potential losses perceived by customers when switching carriers, such as losses of a financial, performance-related, social, psychological, and safety-related nature (Murray, 1991).

For the purpose of this study, taking into account both findings from earlier studies, and specificities pertaining to mobile telecommunication services, we have defined switching cost as loss cost, adaptation cost, and move-in cost. Loss cost refers to the perception of loss in social status or performance, when cancelling a service contract with an existing carrier; adaptation cost refers to the perceived cost of adaptation, such as search cost and learning cost; and move-in cost refers to the economic cost involved in switching to a new carrier, such as the purchase of a new device and the subscriber fee.

Attractiveness of alternatives means the reputation, image and service quality of the replacing carrier, which are expected to be superior or more suitable than those of the existing carrier. Attractiveness of alternative carriers is intimately linked to service differentiation and industrial organization. If a company offers differentiated services that are difficult for a competitor to match or to provide with equivalents, or if few alternative competitors exist in the market, customers tend to remain with the existing company (Bendapudi & Berry, 1997).

Interpersonal relationship means a psychological and social relationship that manifests itself as care, trust, intimacy and communication (Gremler, 1995). The interpersonal relationship built through recurrent interactions between a carrier and a customer can strengthen the bond between them and finally lead to a long-term relationship. Companies are not alone in desiring a sustained relationship. Many customers wish to establish, develop and continue with a company an

[3] While pre-paid cards influence customer churn in some major countries, the situation differs in Korea where pre-paid card usage for mobile telecommunication service is less popular, with only a small proportion of users, including foreigners, in Korea.

Table 2
Research hypotheses

	Hypotheses statements
H 1	Higher levels of service quality are associated with higher levels of customer satisfaction
H 1-1	Higher levels of call quality are associated with higher levels of customer satisfaction
H 1-2	Higher levels of pricing structure are associated with higher levels of customer satisfaction
H 1-3	Higher levels of mobile device are associated with higher levels of customer satisfaction
H 1-4	Higher levels of value-added services are associated with higher levels of customer satisfaction
H 1-5	Higher levels of convenience in procedures are associated with higher levels of customer satisfaction
H 1-6	Higher levels of customer support are associated with higher levels of customer satisfaction
H 2	Higher levels of each switching cost are associated with higher levels of the switching barrier
H 2-1	Higher levels of loss cost are associated with higher levels of the switching barrier
H 2-2	Higher levels of adaptation cost are associated with higher levels of the switching barrier
H 2-3	Higher levels of move-in cost are associated with higher levels of the switching barrier
H 3	Lower levels of attractiveness of alternatives are associated with higher levels of the switching barrier
H 4	Stronger levels of interpersonal relationship are associated with higher levels of the switching barrier
H 5	Higher levels of customer satisfaction are associated with higher levels of customer loyalty
H 6	Higher levels of the switching barrier are associated with higher levels of customer loyalty

interpersonal relationship that provides value and convenience (Gwiner, Gremler, & Bitner, 1998). Therefore, relationship-specific investment helps increase customers' dependence, and thus magnifies the switching barrier (Jones, Mothersbaugh, & Betty, 2000).

3.4. The relationship between customer satisfaction, the switching barrier and customer loyalty

As a general rule, customer satisfaction and customer loyalty are very closely related. Customer satisfaction functions as an antecedent of customer loyalty. It prevents customer churn and consolidates retention, thereby constituting an important cause of customer loyalty (Fornell, 1992; Reichheld, 1996). Further, while affected by market structure, customer type and customers' individual ways of solving problems, the connection between customer satisfaction and customer loyalty is not always a linear relation, although it constitutes a positive relationship (Fornell, 1992; Soderlund, 1998). And when customers switch the service provider, they tend to perceive the burden of risks which becomes the switching barrier that influence customer loyalty.

Based on the results of earlier studies discussed in Section 3, we have formulated the following hypotheses in Table 2.

4. Research methodology

4.1. Definition and measurement of variables

We summarize the operational definition and measurement of variables for validation of the research hypotheses in Table 3. We have adjusted some variables by using the results of a

Table 3
Operational definition and measurement of variables

Variable	Operational definition	Measurement items
Service quality		
Call quality	Call quality according to customer perception	Call clarity coverage
Pricing structure	Pricing and price schedule	Reasonability of price Variety of price schedule Possibility of freely choosing price schedules
Mobile device	Mobile device functionality and design	Quality of mobile device Variety of mobile device types Quality of mobile device design
Value-added services	Type and convenience of value-added services	Variety of value-added services Convenience of use of value-added services Whether value-added services are up-to-date
Convenience in procedures	Subscription and change procedures	Ease of subscribing and changing service Staff friendliness, when subscribing and changing
Customer support	Customer support system and complaint processing	Variety of customer support systems Speed of complaint processing Ease of reporting complaint Friendliness when reporting complaint
Switching cost		
Loss cost	Perception of loss in social status and performance associated with the churn of service from an existing carrier	Difficulty of changing number Loss of benefits such as mileage program
Adaptation cost	Perception of cost of adaptation, associated with switching to a new carrier	Inconvenience of having to learn a new service Need to search for information on new carrier, when switching carrier
Move-in cost	Perception of economic cost involved in switching to a new carrier	Cost of replacing mobile device Subscription fee for new membership
Attractiveness of alternatives	Alternative carrier's reputation, image and service quality, according to the customer's perception	Alternative carrier's reputation Alternative carrier's image Alternative carrier's overall service quality
Interpersonal relationship	Customer's perception of social and psychological rapport with carrier	Carrier's care for customer Trust toward carrier Intimacy felt toward carrier Level of communication with carrier
Switching barrier	Economic and psychological difficulty perceived by customer, when switching carriers	Economic loss associated with switching carriers Psychological burden associated with switching carriers
Customer satisfaction	Customer's reaction to the state of satisfaction, and customer's judgment of satisfaction level	Overall satisfaction with the carrier Overall satisfaction with the service
Customer loyalty	Combination of customer's favourable attitude toward the service and intention to re-purchase the service	Intention to stay with the carrier Intention to recommend the carrier to others

preliminary survey conducted with researchers and marketing experts from the mobile telecommunication services industry. The survey, with all the above variables, used the seven-point Likert scale for rating (1: not at all to 7: extremely so).

4.2. Data collection and analysis

We chose the sample for the survey from current users of mobile telecommunication services. A pilot survey was administered to revise and complement survey questions. Five surveyors visited schools, homes and workplaces of the sample group to collect the data from March to April 2002. A total of 350 survey forms were distributed and all 350 were collected. Among completed survey forms, excluding those with omissions or with randomly repeated answers, there were a total of 306 valid survey responses. SPSS 10.0 was used for basic statistical analysis, factor analysis and reliability analysis, and AMOS 4 was adopted for analysis of the structural equation model.[4]

4.3. Sample

The sampling for this research was taken similarly with the ratios of Korean mobile telecommunication service carriers' subscription ratios. The demographic characteristics of the respondents to this survey are summarized as follows. Gender composition is roughly half and half, with 46.4% of men and 53.6% of women. People aged in their 20s (44.8%) and 30s (27.1%) constituted the majority.

The sample characteristics in usage of mobile telecommunication services are summarized as follows. SK Telecom, KTF, and LG Telecom comprise 51.6%, 34.7% and 14.0% of respondents' subscriptions. The average length of service use appeared to be 33.6 months (the standard deviation was 17.7 months), and average mobile device replacement frequency 1.75 times (the standard deviation was 0.26 times). The cross-tabulation of all measures by demographics is represented in Table 4.

4.4. Reliability and validity

We analysed the internal consistency of the sample to check the reliability of our data. First, we carried out an exploratory factor analysis of each construct, using Maximum Likelihood Estimation via the VARIMAX method, as the orthogonal rotation method, and items with factor loadings below 0.3 were eliminated.[5] Eliminated items are 'variety of mobile device types' in the

[4] The structural equation model is able to analyse the empirical causal relationship from the measurement table for correlation and structural concepts, which is the theoretical causal sequence between variables. It is the result of the enhanced integration of factor, path and regression analysis. Therefore, this model differs from other analyses, as it is possible to examine the overall relationship between theoretical concepts and measurable variables.

[5] Factor loadings refer to the scale that represents the direction and size of correlation of each variable and factor. The sample size and the number of variables are important in explaining factor loadings. Generally, the result is meaningful if the absolute value of a factor loading is above 0.3.

Table 4
Cross-table of measures by demographics (mean standard deviation)

Variable/ages	15–19	20–29	30–39	40 over
Service quality				
Call quality	3.71 (0.51)	3.69 (0.64)	3.62 (1.08)	3.76 (0.97)
Pricing structure	3.83 (1.03)	3.67(0.88)	3.28(1.06)	3.17 (0.89)
Mobile device	4.01 (0.92)	3.87 (0.98)	3.55 (0.97)	3.47 (0.68)
Value-added services	3.89(1.09)	3.98 (1.01)	3.76 (0.87)	3.67 (0.77)
Convenience in procedures	3.72 (0.97)	3.64 (1.08)	3.27 (0.75)	3.34 (1.07)
Customer support	3.98(1.08)	3.94(0.83)	3.64(0.82)	3.68(0.95)
Switching cost				
Loss cost	4.01 (1.09)	4.10 (0.87)	4.25(0.54)	4.28(0.65)
Adaptation cost	2.98(0.96)	3.43(0.84)	3.57(0.98)	3.65(0.93)
Move-in cost	4.21(0.98)	4.12(0.65)	3.98(0.69)	4.03(0.53)
Attractiveness of alternatives	3.98(0.87)	4.01(1.08)	3.58(1.01)	3.47(0.97)
Interpersonal relationship	3.76(0.76)	3.81(0.98)	3.68(0.98)	3.62(0.91)
Switching barrier	4.02(0.98)	4.01(0.87)	4.15(0.65)	4.21(0.76)
Customer satisfaction	3.93(1.12)	3.97(1.01)	3.99(0.97)	4.01(0.47)
Customer loyalty	3.87(1.17)	3.97(1.21)	4. 01(1.02)	4.06(1.43)

factor ''mobile device'' and 'convenience of use in value-added services' in the factor ''value-added services''.

The reliability analysis of each factor, performed after eliminating measurement items that lower the overall reliability, produced the following results: call quality: 0.7346, pricing structure: 0.7687, mobile device: 0.9083, value-added services: 0.8097, convenience in procedures: 0.8026, customer support: 0.8197, loss cost: 0.8795, adaptation cost: 0.7615, move-in cost: 0.8527, attractiveness of alternatives: 0.9062, interpersonal relationship: 0.8435, switching barrier: 0.8122, customer satisfaction: 0.8144, customer loyalty: 0.8266. Cronbach's alpha value for all factors was over 0.7, indicating a sound reliability level.[6]

Next, a confirmatory factor analysis, performed in order to analyse the constructs' validity on units remaining after discarding items disturbing the homogeneity of the set, indicated that they generally satisfied validity evaluation standards.[7]

[6] Reliability refers to the consistency of results when the research object has been repeatedly measured. Reliability is usually measured using Cronbach's alpha methodology, which is based on internal consistency. Cronbach's alpha measures the average of measurable items and its correlation, and if the result is generally above 0.5, it is considered to be reliable.

[7] Validity refers to whether the measurable concepts or attributes are exactly measured. This research used confirmative factor analysis, which is one of the construct validity methods that assess whether the measuring tools have measured the concepts in the research. After the confirmative factor analysis of the research units that are removed with items that obstruct unidimensionality, GFI, AGFI, NFI and CFI had values of 0.908, 0.886, 0.891, and 0.906 and satisfied the validity evaluation standards.

Table 5
Index of fit of the model

Index of fit	Chi-Square (df)	P	GFI	AGFI	NFI	CFI	RMR
Value	864.6 (356)	0.000	0.883	0.813	0.887	0.889	0.165

Table 6
The results of hypothesis tests

Path	Estimates	*t*-value	Se	Hypothesis	Result
Call quality → customer satisfaction	0.283	3.206	0.001	H 1-1	Accept
Pricing structure → customer satisfaction	−0.169	−1.632	0.104	H 1-2	Reject
Mobile device → customer satisfaction	0.067	0.554	0.580	H 1-3	Reject
Value-added services → customer satisfaction	0.483	4.208	0.000	H 1-4	Accept
Convenience in procedures → customer satisfaction	0.069	0.729	0.467	H 1-5	Reject
Customer support → customer satisfaction	0.420	3.534	0.000	H 1-6	Accept
Loss cost → switching barrier	0.298	3.380	0.001	H 2-1	Accept
Adaptation cost → switching barrier	0.021	0.258	0.797	H 2-2	Reject
Move-in cost → switching barrier	0.215	2.391	0.017	H 2-3	Accept
Attractiveness of alternatives → switching barrier	−0.056	−0.856	0.393	H 3	Reject
Interpersonal relationship → switching barrier	0.243	2.726	0.007	H 4	Accept
Customer satisfaction → customer loyalty	0.797	8.895	0.000	H 5	Accept
Switching barrier → customer loyalty	0.195	2.214	0.028	H 6	Accept

5. Results

5.1. Hypothesis tests

The index of fit for our model is shown in Table 5. Taking degrees of freedom (356) into account, most index values approach the general standards for index of fit.[8]

The results of hypothesis tests of the relationship between constructs including customer satisfaction, the switching barrier and customer loyalty are shown in Table 6 and Fig. 1.

The test of hypothesis 1, which shows that factors establishing service quality positively affect customer satisfaction, revealed that call quality, value-added services and customer support are significant. This reinforces the fact that call quality of telephone service is the top issue that directly creates customer satisfaction for mobile subscribers. It also highlights the continuing growth of the importance of value-added services, including mobile Internet, multimedia services,

[8] Fitness evaluation for the model defines the process that measures the appropriateness of the level of similarity between the sample's characteristics and its theoretical characteristics. The most widely represented value and recommended optimal standard is as follows, and rather than deciding on one standard, values are compared overall and a decision is made: Chi-square value (significant level > 0.05), Goodness of Fit Index (GFI > 0.80), Adjusted GFI (AGFI > 0.80), Normed Fit Index (NFI > 0.9), Comparative Fit Index (CFI > 0.90) and Root Mean Square Residual (RMR < 0.05). Our research model does not satisfy some indexes, hence it cannot be recommended as the optimal model; however, since most approach the expected values it may overall be an acceptable model.

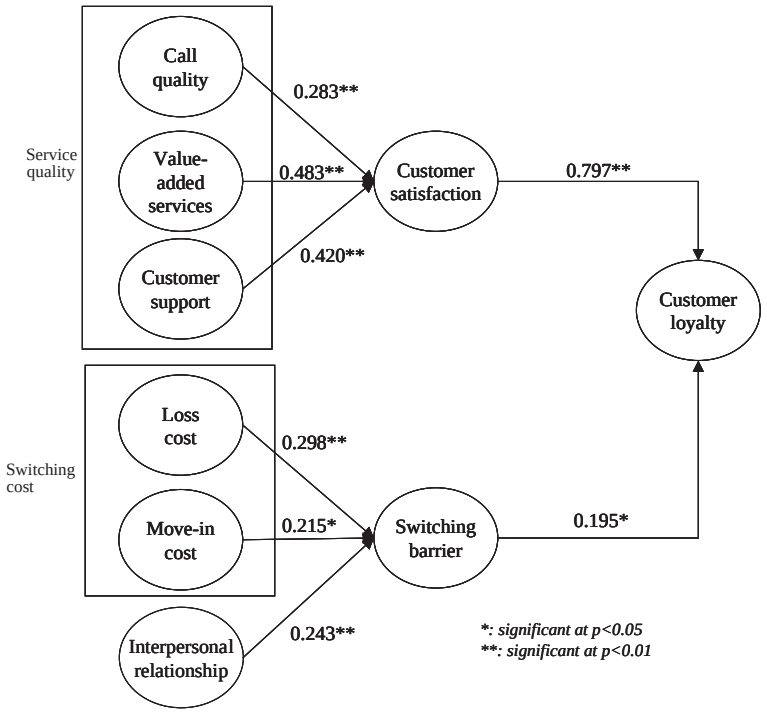

Fig. 1. The results of the empirical causal model (SEM).

location-based services and camera-enabled phones, as mobile telecommunications technology evolves rapidly. A customer support service to help resolve customer dissatisfaction when first encountered is also important for creating customer satisfaction. It is suggested that each carrier's differentiated price plans and device strategies do not increase the level of customer satisfaction.

The test of hypothesis 2 shows that factors creating switching costs positively affect customer satisfaction. Loss cost and move-in cost were significant in this regard. Hypotheses 3 and 4 relate to the effect of attractiveness of alternatives and interpersonal relationships on the switching barrier. Tests of these hypotheses confirmed that interpersonal relationships between carriers and customers have a significantly positive effect on the switching barrier. This shows that the factors creating the switching barrier are closely connected with customers' relationship-specific assets. Losses involved in removing special customer status or customer benefit programs, and move-in costs such as changing numbers, could be an important switching barrier for customers changing to other service providers. Trust and the personal relationships between the company and the customer are also significant in the mobile telecommunication industry.

Tests of hypotheses 5 and 6, which assume that customer satisfaction and the switching barrier have a positive effect on customer loyalty, indicated that both factors have a significant positive effect.

These results partly corroborate results produced by earlier studies from Korea and abroad. However, there were differences. First, the conclusion that a high level of satisfaction with pricing structure leads to high customer satisfaction could not be statistically verified in this study. This

may be because the effect of satisfaction with pricing structure, compared to other service quality factors, was relatively meagre, as evidenced by a descriptive statistical analysis conducted on the matter. It may also be due to the negligible importance of pricing structure for customer satisfaction overall. Other Korean studies conducted on the subject have reached the same conclusion (Kim, 2000).

Nor could the argument be verified that the more attractive an alternative carrier, the lower the switching barrier. This discrepancy may be explained by the fact that perception of which carrier is attractive and to what degree a carrier is attractive varies greatly from customer to customer, as confirmed by basic statistics and F-tests, to such an extent that no definite link can be said to tie this factor to the switching barrier.

5.2. Additional analysis: adjustment effect of switching barrier

In addition, we analysed the adjustment effect produced by the switching barrier on customer satisfaction and customer loyalty. The result of the regression analysis is summarized in Table 7. This reveals that the switching barrier is a factor directly affecting customer loyalty, and its influence on customer loyalty is produced through an interaction with customer satisfaction. Among factors constituting the switching barrier, loss cost has a direct effect and an adjustment effect on customer loyalty, and interpersonal relationship only an adjustment effect. One of the main focuses of interest is that, while move-in cost appears to be only a major effect, loss cost can be both a major and a controlling effect of the switching barrier. This reinforces the fact that the loss cost, which involves the loss of benefits and conveniences received from the existing telecommunication carrier, strengthens customer satisfaction. However, move-in costs, such as

Table 7
Adjustment effect of switching barrier on customer satisfaction and customer loyalty

Adjustment effect		R^2	t-value	Significant level
Switching barrier	Customer satisfaction		13.036	0.000**
	Switching barrier	0.636	2.113	0.036*
	Interaction		2.608	0.010*
Loss cost	Customer satisfaction		12.568	0.000**
	Loss cost	0.630	2.392	0.017*
	Interaction		2.840	0.005**
Move-in cost	Customer satisfaction		17.353	0.000**
	Move-in cost	0.535	1.627	0.105
	Interaction		0.849	0.396
Interpersonal relationship	Customer satisfaction		13.492	0.000**
	Interpersonal relationship	0.606	0.963	0.337
	Interaction		2.396	0.017*

*Significant at $p<0.05$.
**Significant at $p<0.01$.

changing telephone numbers, only add to the switching barrier, and do not appear to affect customer satisfaction and interaction.

This suggests that a customer is likely to remain with the existing carrier even when he or she experiences only a low level of customer satisfaction, if he or she perceives the overall switching barrier or loss costs to be high, or forms a high level of interpersonal relationship.

6. Conclusions and implications

The primary purpose of this study was to investigate the strategies of businesses in the Korean mobile telecommunication services to increase customer loyalty. In the following, we summarize the conclusions reached on hypotheses we have formed in this study. We also provide strategic suggestions for mobile carriers.

First, mobile carriers must, above all else, maximize customer satisfaction and the switching barrier in order to enhance customer loyalty. In particular, mobile carriers must focus on service quality and offer customer-oriented services to heighten customer satisfaction. At the same time, efforts to raise the switching barrier must build a long-term relationship with customers by further investing in customer relationship management.

Second, among factors establishing service quality, the factors with a significant impact on customer satisfaction appeared to be call quality, value-added services, and customer support. This suggests that, while mobile carriers have improved call quality over the past several years through massive equipment investments, call clarity and coverage, according to customers' perceptions, still retain their importance. In addition, mobile carriers must concentrate their efforts on developing value-added services to increase enjoyment and convenience. In the area of customer support, carriers must strive to minimize customers' inconvenience by speedily processing customers' complaints through a variety of systems and channels.

Third, the factor significantly affecting the switching barrier appeared to be switching costs such as loss cost, move-in cost, and interpersonal relationships. Carriers must continuously develop customer reward programs that concretely compensate customers, such as mileage programs and price discounts, in order to increase loss cost and move-in cost. Further, interpersonal relationships between carrier and customer are factors that retain customers, even when competitors try to win them over with lower prices or offers of other conveniences.

Fourth, the switching barrier was revealed to have an adjustment effect on customer satisfaction and customer loyalty. In a mature market, building a switching barrier emerges as a necessary strategy to safeguard one's market. Hence, mobile carriers must increase the cost of switching in order to increase customer lifetime value and customer retention, while developing and carrying out relationship-oriented marketing strategies to enhance interpersonal relationships with customers.

The following are the theoretical and practical contributions of this study.

First, by performing an empirical analysis of the impact of customer satisfaction and the switching barrier on customer loyalty, and the causal relationship between them, this study has provided a comprehensive foundation for future studies of customer loyalty in the mobile telecommunication services industry, and suggested directions for companies in the industry.

Second, this study analysed the structure and effect of the switching barrier in the mobile telecommunication services market. While other studies have treated the switching barrier as a simple concept without constitutive elements, or have used it as a concept identical to switching cost, this study subdivided the concept of switching barrier into several concepts, giving it a theoretical structure. Further, the mutual interaction between factors influencing customer loyalty has been systematized through an analysis examining the adjustment effect produced by the switching barrier.

On the other hand, this study has some limitations. There are other factors influencing customer loyalty, apart from factors suggested in this study, such as the demographic characteristics of customers, their life cycles, and their usage pattern of mobile telecommunication services. In order to remedy these limitations, future studies could examine some of the following factors.

As well as customer satisfaction and the switching barrier, it is necessary to include customers' demographic characteristics and their behavioural and psychological characteristics. These must be structurally analysed for their effects on customer loyalty. In particular, an important research task is to examine whether these factors function as adjusting variables in the existing interaction. In addition, in order to identify more methodically the factors influencing customer loyalty, mobile telecommunication services must be compared with other communications services and with other industries.

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