

The impact of customer satisfaction on brand loyalty for mobile telecommunications services

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Abstract

This study was aimed at investigating five factors of customer satisfaction and assessing the impact degree of each factor on brand loyalty for mobile telecommunications services in Ho Chi Minh City. Data were collected from 205 customers who have been using mobile telecommunications services in Ho Chi Minh City. The author uses a quantitative method to analyze Cronbach's Alpha reliability, Exploratory Factor Analysis EFA and multiple linear regression analysis. The results indicated that satisfaction with services is the strongest factor affecting brand loyalty, followed by satisfaction with employees, satisfaction with distribution channels, satisfaction with enterprise, satisfaction with brand image and environment. The results are consistent with the hypothesis because services quality plays an important role in this industry's existence. Research findings are about to build scientific basis for Ho Chi Minh City's mobile telecom enterprises in developing customer loyalty that is a matter of urgency in all aspects of theory and practice.

Keywords: Brand loyalty, Customer satisfaction, Ho Chi Minh City, Mobile telecommunications services

1. Introduction

In terms of theory, a customer is considered to be loyal when he or she has a positive attitude toward a brand and stably buys the brand (Dick and Basu, 1994). Thus, brand loyalty brings numerous benefits to enterprises, including: (1) stabilizing sales revenue; (2) reducing marketing costs; (3) keeping the brand better protected and the negligence or error of the enterprises easily accepted and ignored; (4) having more and more new customers through word-of-mouth recommendations. It has been proved in many empirical studies that one of the most important factors affecting brand loyalty is the level of customer satisfaction.

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Vietnam has 130 million mobile subscribers, among which there are more than 51 million mobile broadband subscribers (3G and 4G) (Ministry of Information and Communications statistics, 2018). In fact, until 2018, there are only five mobile networks in mobile telecommunications market in Vietnam, consisting of: Viettel, VinaPhone, MobiFone, Vietnamobile and Gmobile. Each mobile network occupies a certain number of mobile subscribers. Therefore, enterprises themselves must constantly maintain the number of these subscribers, which means the demand for enhancing customer's loyalty to the brand is needed. Nevertheless, the mobile telecommunications market has been suffering a lot. Firstly, since the 1990s, mobile telecommunications service has soon become a dynamic sector of economic development in the industrialized nations. That is not only because of the rapid development of technology but also because of the increasing amount of network operators. In addition, the fiercely high competition among mobile telecommunications service providers is inevitable in this field. When customers have more choices, their loyalty to a brand can be reduced. Secondly, 2018 is a volatile year for Vietnam's mobile telecommunications industry with new policies coming into force such as: tightening promotion for prepaid subscribers with maximum level of 20% and for postpaid subscribers with 50% maximum (Ministry of Information and Communications, 2017), taking a portrait of the main owner as well as shortening SIM from 11 numbers down to 10 numbers. Thirdly, in practice, mobile telecommunications market has been saturating and the competition among mobile networks now is the stage of customer care.

In particular, Ho Chi Minh City is one of our major mobile telecommunications markets demonstrated by two reasons. First, the number of mobile subscribers has reached about 13 million until 2018, accounting for around 10% of the total number of nationwide subscribers. Second, this is the most potential market in the country with a high population growth rate and the highest rate of population using services throughout all provinces (93% in 2018). In the context of many market changes, one of the best ways to raise the level of customers' brand loyalty is boosting the level of customer satisfaction, which is applied by mobile telecommunications enterprises in Ho Chi Minh City. Nevertheless, the quality of mobile telecommunications services of the three largest mobile networks: Viettel, Vinaphone and MobiFone occupying 95% of mobile telecommunications market shares has not met the customers' expectations when 2 in 3 customers using mobile telecommunications services do not satisfy with the service's quality (Vietnam ICT White Book, 2018), which is a risk for mobile telecommunications enterprises in Ho Chi Minh City. In consequence, the reality of the mobile telecommunications market in this city shows that strengthening the customers' brand loyalty for mobile telecommunications services is an urgent requirement for every enterprise in the industry. Concurrently, the approach from the perspective of raising customer satisfaction is potentially risky and challenging.

Due to numerous types of mobile telecommunications services, this study focuses on 3G and 4G mobile services, so other services can be studied by similar methods. The paper studies the impact of customer satisfaction on brand loyalty for mobile telecommunications services

(3G and 4G mobile services) in Ho Chi Minh City. Respondents are people who bought and/or have been using 3G and 4G mobile services. They are customers who are living in more than 20 districts in Ho Chi Minh City.

2. Theoretical overview

2.1 Overview of mobile telecommunications services

“Telecommunications service means the service of sending, transmitting, receiving or processing of information between two users or within a group of users of telecommunications services, including basic service together with value-added service.” (Vietnam National Assembly, 2009). Mobile telecommunications service is understood as a two-way radio communication service that allows certain subscribers to use voice and non-voice services within service providers’ coverage (Chu, 2014).

3G mobile service, which is in short for third-generation mobile service, is the third generation of wireless mobile telecommunications technology service. It is upgraded from 2G and 2.5G GPRS networks (General Packet Radio Service) with the purpose of faster internet speed, which is backed up on a group of standards used for mobile devices and mobile telecom use services and networks that conform to the International Mobile Telecommunications-2000 (IMT-2000) specifications from the International Telecommunication Union. 4G mobile service is the fourth-generation of broadband cellular network technology service succeeding 3G. 4G technology is in addition referred as “MAGIC” meaning integrated wireless and personalized services and Mobile multimedia Anytime Anywhere Global mobility support.

2.2 Overview of customer satisfaction

According to Oliver (1999) and Zineldin (2000), customer satisfaction is the emotional response or total feedback of customers towards suppliers of goods or services on the basis of comparing the differences between what they had received and what they had expected. Besides, customer satisfaction is also defined by many other researchers by construing levels of satisfaction. One of them is Carpenter and Fairhurst (2005), who claim that customer satisfaction is the result of the subjective assessment of customers, appearing when the choice of using goods or services meets low, equal or high expectations. Additionally, Pham (2014) defines customer satisfaction as the emotional state in which the needs, desires and expectations of customers about the values and/or benefits of products or services are met lower, equal or higher expectations, which leads to loyalty and the act of repeat purchases of enterprises’ goods and services. Customer satisfaction is approached by many researchers from distinct perspectives. Nevertheless, all the views agree that customer satisfaction is the emotional state formed by comparing the values and benefits of goods or services before, during and after purchasing that consumers are truly aware of after consumption with customer expectations.

2.3 Overview of brand loyalty

According to American Marketing Association (AMA), brand loyalty is a situation in which customers tend to repeatedly buy products from the same manufacturer over a certain period of time instead of buying from other manufacturers, which is based on behavioral loyalty (repeat purchasing behavior). Notwithstanding, in practice, repeat purchasing behavior may not come from loyalty, but stem from a limit on the number of brands in consumer buying areas, low prices or other causes. Overcoming this limitation, Amine (1998) defines brand loyalty based on attitudinal and behavioral loyalty. Brand loyalty is the act of buying a certain brand, repeating it for a long time and being strengthened by a strong commitment to the brand. Although Amine has appreciated the role of attitude and behavior towards brand loyalty, the author affirms that brand loyalty only happens to only one brand. In reality, brand loyalty can happen to a group of brands. This is confirmed in Oliver's definition (1999), which demonstrates that brand loyalty is a deep commitment that leads to repeat purchasing behavior of a favorite product or service in the future, which leads to repeat purchasing behavior of a brand or a group of brands without being affected by situations and marketing activities.

2.4 Factors of customer satisfaction affecting brand loyalty

Brand loyalty is influenced by various factors of customer satisfaction. For mobile telecommunications services, previous studies focused on: (1) Satisfaction with services (Pham and Bui, 2007; Thai and Ton, 2007; Kamalakumati Dilani, 2013; Trinh and Luu, 2015); (2) Satisfaction with employees (Duong and Nguyen, 2011; Motaher and Nusrat, 2013); (3) Satisfaction with distribution channels (Motaher and Nusrat, 2013; Trinh and Luu, 2015); (4) Satisfaction with enterprise (Kamalakumati and Dilani, 2013); (5) Satisfaction with brand image and environment (Kamalakumati and Dilani, 2013; Motaher and Nusrat, 2013).

Satisfaction with services comes from the quality assessment of the enterprises' mobile telecommunications services (Trinh and Luu, 2015). The authors define services here as 3G and 4G mobile services which are illustrated in some criteria comprehending signal strength, signal coverage, stable connection at peak time, the match between service quality and price, downloading – posting data speed. Satisfaction with services is higher when the services' quality goes far beyond their original expectations. This is the most significant and fundamental factor that constitutes overall customer satisfaction (Pham and Bui, 2007; Thai and Ton, 2007).

Satisfaction with employees is satisfaction about the employees' attitudes and behaviors in the companies that customers directly contact or hear from the others (Motaher and Nusrat, 2013). The employees at mobile telecommunications stores are understood to be the persons who directly contact, communicate and work with customers, one of the key factors that ensure customer satisfaction and brand loyalty (Duong and Nguyen, 2011). In the framework of the research, the authors concentrate on the employees who are official ones under the management of the company in all direct distribution channels and some indirect distribution

channels because a few indirect distribution channels' employees are not official ones of the company, which cannot be controlled.

Satisfaction with distribution channels is understood as customer satisfaction about the convenience in accessing mobile telecommunications services (Motaher and Nusrat, 2013). According to Kotler and Armstrong (2012), distribution channel is a collection of features that an enterprise offers in providing a service so that it becomes available at the time customers want to consume. More particularly, distribution channels in mobile telecommunications services (3G and 4G mobile services) are composed of direct and indirect distribution channels. Direct distribution channels are mobile telecommunications multi-service stores such as Viettel stores, Vinaphone stores, etc. in many districts. Indirect distribution channels consist of first level agents, second level agents and retail points (FPT shops, The Gioi Di Dong shops), convenient stores (B'smart, Circle K, Ministop, etc) for mobile cards.

Satisfaction with enterprise is customer satisfaction about the enterprise's values and commitments to consumers and the realization of those values and commitments (Kamalakumati and Dilani, 2013). For mobile telecommunications services, an enterprise is determined as mobile operators' strategies and commitments to their customers. To be more specific, they are the enterprises' commitments about the 3G and 4G mobile service pack of data and promotion policies.

Satisfaction with brand image and environment is assembled on the basis of assessing the images that a business wants to communicate to the public through marketing tools (Kamalakumati and Dilani, 2013). Brand image is defined as the perception of a brand held in consumers' memory. Actually, the brand is not first built and then perceived by the customers. Instead, every step in the branding process, every brand message, is separately perceived by customers and together add up to brand image, which is formed in customers' mind. An environment is the mobile telecommunications stores' surroundings, infrastructure, decorations and working environment.

Factor "Satisfaction with price" is not mentioned in the research model suggested below due to the following reasons. First, currently, the rates of prepaid/postpaid subscribers of most mobile telecommunications operators are the same. There is no difference or insignificant difference (3G Mobifone Portal, 2018). Second, the mobile telecommunications market in Vietnam in general and in Ho Chi Minh City in particular is saturated and fiercely competitive, moving from mutual competition in price perception to mutual competition in mobile telecommunications services' quality (Vietnam ICT White Book, 2018).

2.5 Research model and research hypothesis

Hereunder is the theoretical model studying the impact of customer satisfaction on brand loyalty used in this research.

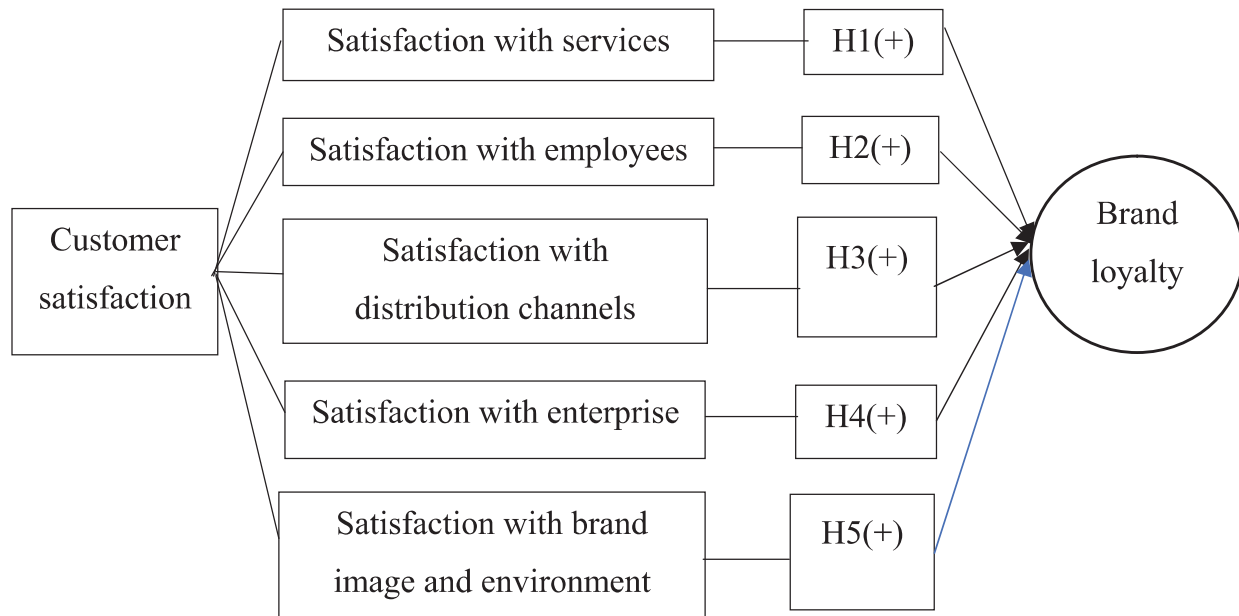


Figure 1. Proposed theoretical research model

Source: Collected by the author

Most researchers believe that customer satisfaction has a positive impact on brand loyalty. According to Fornell (1996), increasing customer satisfaction enhances brand loyalty in terms of repeat purchasing power and accepting high prices. Oliver (1999) asserts that customer satisfaction is the beginning of a transition to the highest state of loyalty. Furthermore, Pham (2014) also agrees with the above view. Stemming from the above analysis, the author made the following hypotheses:

Customer satisfaction with services, especially with services quality is a key factor of brand loyalty. Service quality is defined as “an overall assessment of services by the customers” (Ganguli and Roy, 2010). It is also stated that service quality is a critical and indispensable factor in persuading customers to use a particular service provider instead of another (Kandampully, 1998). Actually, when the customers are satisfied with the company’s service quality, they will come again and buy more services from that company, which means they become more loyal. Therefore, customer satisfaction with services positively influences brand loyalty.

Hypothesis H1: The factor “Customer satisfaction with services” has a positive impact on brand loyalty.

Customer satisfaction with employees is much essential because employees are considered as a key part of the face of mobile telecommunications services stores. Their attitudes, behaviors, communication skills, external appearance and professional qualifications strongly affect customers’ perception (Aysha, 2012). In other words, when customers are satisfied with the employees’ action and gesture, they can immediately make decisions about in-store

consumption and repeatedly future return. These are the reasons why the hypothesis suggested by the author here is:

Hypothesis H2: The factor “Customer satisfaction with employees” has a positive impact on brand loyalty.

Customer satisfaction with distribution channel is understood as the satisfaction with transport services from enterprises to customers in an easy, convenient, quick and effective way. A distribution channel is considered effective if it can bring a lot of value and meet customers’ best needs. Moreover, factors of distribution channels such as location and layout in stores also affect customers’ perception and mood, which makes them more satisfied and then encourages them to come back with high loyalty level. Forasmuch as, the submitted hypothesis is:

Hypothesis H3: The factor “Customer satisfaction with distribution channels” has a positive impact on brand loyalty.

These days, customers are becoming more satisfied with organizations which really understand their needs, build strong relationships and provide superior value, which specified in their commitments to the customers. (Davidson, 2005). This means they feel that they are heard and taken care of and then repeatedly buy services in future return. So, satisfaction with enterprise through its commitments affects brand loyalty by recommended hypothesis below:

Hypothesis H4: The factor “Customer satisfaction with enterprise” has a positive impact on brand loyalty.

Every brand is in a race to become its customers’ favorite so they are focusing on creating an image that resonates with their target market. Customer satisfaction with brand image and environment is customer satisfaction with the entire personality of the brand. A strong and satisfied brand image and environment in most cases means higher customer loyalty. Correspondingly, the proposed hypothesis is made:

Hypothesis H5: The factor “Customer satisfaction with brand image and environment” has a positive impact on brand loyalty.

3. Research methodology and measurement scales

The author conducts interviews and consults with 50 customers on a number of issues related to the research topic. The chosen interview method is the focus group interview (6-8 people who are currently working, living and using mobile telecommunications services in Ho Chi Minh City) at the end of February 2019. Group study during interview process consists of three main tasks: assessing the appropriateness of factors in a proposed research model, eliminating factors appearing in the initial research model but not feasible to assess and searching for other factors of the impact of customer satisfaction on brand loyalty for mobile telecommunications services. From these interviewed groups’ comments, the author developed a questionnaire appropriate to the conditions of mobile telecommunications in

Ho Chi Minh City and presented satisfaction factors that influence brand loyalty for mobile telecommunications services.

The author designed a questionnaire consisting of 31 questions in which there are 25 questions evaluating five components of customer satisfaction, one component of brand loyalty: Satisfaction with services factor (five variables), Satisfaction with employees factor (five variables), Satisfaction with distribution channels factor (three variables), Satisfaction with enterprise factor (four variables), Satisfaction with brand image and environment factor (four variables) and four questions of dependent variable as brand loyalty as well as six questions of demographic factors. The questions are designed to especially evaluate customer satisfaction and brand loyalty thanks to using Likert measurement scale of five levels from 1 to 5 for each level, from strongly disagree to strongly agree. Exceptionally, in this research, they will be: 1 point as Strongly disagree, 2 points as Disagree, 3 points as Neutral, 4 points as Agree, 5 points as Strongly agree.

After being designed and edited, the questionnaire was tested on a small sample group of 20 customers who have been using mobile telecommunications services in Ho Chi Minh City for the purpose of estimating objectivity, reliability and appropriateness in both format and content of the questionnaire towards research subjects. The time for this pilot survey was in mid-March 2019. There were no comments leading to the removal or addition of questions for the survey.

About the direct interview (175/205 samples), the author executed random collection and carried out face-to-face interviews with interviewees in various locations in Ho Chi Minh City such as mobile network stores (Viettel stores, Mobifone stores, etc.), some agencies (FPT shops, The Gioi Di Dong), supermarkets (Coopmart, E-mart), shopping centers (Vincom, Saigon Centre) and a natural park (23/9 Park). Additionally, the author distributed a different timeline to carry out a survey to make sure to get valuable results and raise the overall representation of the sample.

About online survey (30/205 samples), the author used Google Forms support tool to create the questionnaire and sent it to research subjects who bought and/or have been using 3G and 4G mobile services and who are living in more than 20 districts in Ho Chi Minh City. In the questionnaire, the author made a remark for clarification “If you have never used mobile telecommunications services (especially 3G/4G mobile services) in Ho Chi Minh City, please stop the survey here.” to identify right targeted people who have been using mobile telecommunications services in Ho Chi Minh City.

For the sample size, according to Tabachnick and Fidell (2001), the sample size for the regression analysis can be based on the formula: $n \geq 8m + 50$, of which n is the sample size and m is the number of independent variables. With $m=5$ then the minimum sample size is 90. To ensure representativeness and reliability for the sample and EFA analysis, each observed variable needs at least 5 samples (Bollen, 1989). With 25 observed variables, at least sample size must be $25 \times 5 = 125$ samples. Based on the two studies, 205 samples were collected for

Table 1. The research's measurement scales

Observed variables	Content	Source
Satisfaction with services		
SE1	This is the service I need	Trinh and Luu (2015) "Customer satisfaction and customer loyalty in Vietnamese mobile telecommunication industry"
SE2	I feel satisfied with my decision to use this service	
SE3	I really like this service	
SE4	The service I am using is better than expected	
SE5	Given a chance to choose again, I still choose this service	
Satisfaction with employees		
EM1	The employees helped me solve all the questions arising before, during and after buying services	Motaher and Nusrat (2013) "Influence of customer satisfaction on loyalty: A study on mobile telecommunication industry"
EM2	I feel satisfied with the employees' attitude towards customers	
EM3	I feel very pleased with the employees' professional advice	
EM4	I like the employees' professionalism and uniformity	
EM5	The employees create trust and confidence for customers when they are using services	
Satisfaction with distribution channels		
DC1	Distribution channels are diversified. I find it easy to get access to and understand the enterprise's services	Adjustment from Motaher and Nusrat (2013) "Influence of customer satisfaction on loyalty: A study on mobile telecommunication industry"
DC2	I feel very pleased with the convenience of distribution channels when buying services	
DC3	I really like distribution channels because of the simplicity and quickness in case of complaints or needing-advice situations	

Observed variables	Content	Source
Satisfaction with enterprise		
EN1	I feel very pleased with the enterprise's basic values and commitments to their customers	
EN2	I feel satisfied with the enterprise's exact implementation of commitments to their customers	Adjustment from Kamalakumati and Dilani (2013) "Impact of customer satisfaction on customer loyalty towards Sri Lanka Telecom PLC"
EN3	I feel very proud and assured when using the enterprise's services	
EN4	The enterprise's implementation of commitments is beyond my expectations	
Satisfaction with brand image and environment		
IE1	Brand image expresses its unique and exclusive features and leaves me with a deep and unforgettable impression	
IE2	I feel very pleased to use a brand having the same image as the brand I am using	Kamalakupati and Dilani (2013) "Impact of customer satisfaction on customer loyalty towards Sri Lanka Telecom PLC"
IE3	I feel very interested in professionalism in the enterprise's working environment	
IE4	I really like the enterprise's working environment because it creates the best conditions for customers to buy services	
Brand loyalty		
BL1	I will not buy the service I am currently using from any brand other than this brand	
BL2	I will buy other types of services from this brand	Adjustment from Trinh and Luu (2015) "Customer satisfaction and customer loyalty in Vietnamese mobile telecommunication industry"
BL3	I will recommend this brand to my family and friends	
BL4	I consider this brand as my first choice when I am in need of the service I am using	

Source: Calculated by the author

the research. The data obtained from measurement scale (Table 1) are encoded and processed. The analysis sequence was conducted as follows: First, the authors conduct Coefficient of reliability Cronbach's Alpha analysis and Coefficient Corrected Item- Total Correlation. Second, the authors conduct Exploratory Factor Analysis (EFA). Third, the authors conduct Multiple linear regression analysis.

4. Research findings and discussion

4.1 Descriptive statistics

On the report of the sample statistics, the number of female customers conducting the survey is 108 persons, which occupies 52.7% of the number of surveyors. Meanwhile, the number of male ones accounts for 47.3% of the number of surveyors, equivalently 97 persons compared to the whole research sample. In compliance with statistical results, the percentage of customers aged below 25 years old is overwhelmingly high at 41.5% (85 people), in compared to group aged from 25 to 50 years old and group aged above 50 years old with 30.2% (62 people) and 28.3% (58 people) respectively. From educational aspect, not surprisingly, the figure for respondents who are graduated from University, College, Intermediate is the highest around 39.5% (81 people). In contrast, the figures for customers who belong to "graduated from High School", "after university" and "not graduated from High School" are relatively low at 34.1% (70 people), 15.1% (31 people) and 11.2% (23 people) respectively. In conformity with statistical results, customers working as students and customers working in enterprise sector constitute the highest ratio of respondents in the survey with 38.5% (79 people) and 28.3% (58 people) respectively. Meanwhile, customers working in administrative sector and freelance work comprise 19.5% (40 people) and 13.7% (28 people) respectively. The results show that customers with monthly salary of 5-20 million VND, below 2 million VND and from 2 to below 5 million VND make up the highest percentage with 34.1% (70 people), 31.2% (64 people) and 23.9% (49 people) respectively. The proportion of respondents having high income (above 20 million VND) is the lowest at 10.7% (22 people). Out of 205 responses, Viettel is 39.5% (81 people), Mobifone is 29.3% (60 people), Vinaphone is 23.9% (49 people), Vietnamobile is 5.9% (12 people), Gmobile is 1.0% (2 people) and Vodafone is 0.5% (1 person).

4.2 Reliability test: Cronbach's Alpha

In the first analysis, the result reveals that five groups of customer satisfaction factors affecting brand loyalty and one brand loyalty factor all have Cronbach's Alpha coefficients that meet the requirements with the standard of Cronbach's Alpha coefficient which is not less than 0.6. Besides, no observed variables have correlation coefficient Corrected Item – Total Correlation less than 0.3 and relative variables are stabilized. All observed variables have Cronbach's Alpha if Item Deleted value not greater than Cronbach's Alpha value (Table 2). As a result, all measurement scales are suitable, qualified, highly reliable and accepted in the research model.

Table 2. Cronbach's Alpha analysis results

Factor	Observed variables	Corrected Item – Total Correlation	Cronbach's Alpha if Item Deleted
Satisfaction with services: $\alpha= 0.797$	SE1	0.521	0.776
	SE2	0.678	0.728
	SE3	0.615	0.748
	SE4	0.508	0.787
	SE5	0.594	0.754
Satisfaction with employees: $\alpha= 0.903$	EM1	0.759	0.881
	EM2	0.776	0.878
	EM3	0.850	0.861
	EM4	0.690	0.895
	EM5	0.716	0.890
Satisfaction with distribution channels: $\alpha= 0.790$	DC1	0.579	0.769
	DC2	0.709	0.637
	DC3	0.615	0.737
Satisfaction with enterprise: $\alpha= 0.812$	EN1	0.530	0.808
	EN2	0.708	0.726
	EN3	0.673	0.744
	EN4	0.621	0.769
Satisfaction with brand image and environment: $\alpha= 0.808$	IE1	0.605	0.769
	IE2	0.618	0.763
	IE3	0.657	0.744
	IE4	0.623	0.761
Brand loyalty: $\alpha= 0.826$	BL1	0.603	0.802
	BL2	0.619	0.795
	BL3	0.720	0.749
	BL4	0.665	0.774

Source: synthesized by the author from SPSS results on official samples

4.3 Exploratory Factor Analysis (EFA)

Based on the theoretical basis of EFA, the coefficients of independent variables cited in Table 3 and 4 meet the criteria set forth: KMO coefficient is 0.888 ($0.5 < 0.888 < 1$); Bartlett's test result is 2277.632 with the p-value 0.000, which is satisfied (p-value < 0.05). Consequently, we reject the hypothesis stated that observed variables do not correlate with each other. This also points out that the data used for factor analysis are relevant. Cumulative % Extraction Sums of Squared Loadings is 67.003% $> 50%$ (satisfied). Eigenvalues value is 1.037 > 1 (satisfied).

Table 3. Rotated Component Matrix of independent variables

Factor	Observed variables	Factor loading
Satisfaction with employees	EM3	0.819
	EM2	0.797
	EM4	0.785
	EM1	0.755
	EM5	0.711
Satisfaction with services	SE2	0.778
	SE1	0.775
	SE3	0.689
	SE5	0.650
	SE4	0.513
Satisfaction with enterprise	EN3	0.746
	EN4	0.727
	EN2	0.670
	EN1	0.541
Satisfaction with brand image and environment	IE3	0.786
	IE1	0.728
	IE4	0.653
Satisfaction with distribution channels	IE2	0.640
	DC1	0.851
	DC2	0.750
	DC3	0.621

Source: Calculated by the author

Table 4. Result summary of the coefficients in EFA analysis for independent variables

Criteria	Value	Comparison
Sig. in Bartlett's test	0.000	0.000 < 0.05
KMO value	0.888	0.5 < 0.888 < 1
Cumulative % Extraction Sums of Squared Loadings	67.003	67.003% > 50%
Eigenvalues	1.037	1.037 > 1

Source: Synthesized by the author from SPSS results on official samples

Proportional to the results presented below in Table 5, the coefficients of dependent variables satisfy all the criteria set for factor analysis, as follows: KMO coefficient = 0.766 ($0.5 < 0.766 < 1$), so factor analysis is perfectly suited to the research data; Bartlett's test result is 301.121 with p-value 0.000 (p-value < 0.05); total variance explained is 65.805% > 50% and Eigenvalues value of the factor is 2.632 > 1, so this factor remains the same. Thereby, we find that the data used for factor analysis is perfectly relevant.

4.4 Multiple linear regression analysis

Regression model:

$$BL = \beta_0 + \beta_1 SE + \beta_2 EM + \beta_3 DC + \beta_4 EN + \beta_5 IE \quad (1)$$

In which: β_0 is y-intercept coefficient (constant term), β_i is slope coefficient for each explanatory variable

The multiple linear regression analysis in the model is performed by Enter method with the dependent variable "Brand loyalty (BL)" and 5 independent factors incorporating "Satisfaction with services (SE)", "Satisfaction with employees (EM)", "Satisfaction with distribution channels (DC)", "Satisfaction with enterprise (EN)" and "Satisfaction with brand image and environment (IE)".

Hypotheses testing about the relevance of the model:

The coefficient of determination R^2 reflects the variation of the dependent variable explained by the independent variables and adjusted R^2 coefficient assesses more closely the relevance of the multiple linear regression model because it does not depend on magnification deviation R^2 (Nguyen, 2011).

Table 6. Model summary of multiple linear regression analysis

Model	R	R ²	Adjusted R ²	Standard Error of the Estimate
1	0.872 ^a	0.760	0.754	0.35502

Source: Synthesized by the author from SPSS results on official samples

In accordance with the results in Table 6, R^2 coefficient is 0.760 and adjusted R^2 is 0.754, so the accuracy of the model is 75.4 or it is understood that 75.4% of the variation of brand

loyalty is explained by 5 independent variables, remaining 24.6% is due to measurement errors and the absence of other variables in the model.

F-test: testing hypothesis about the meaning of regression coefficient:

F-test is a test of the meaning of regression coefficient or the accuracy of the model in order to consider the linear relationship of the dependent variable with all the independent variables of the research model. Hypothesis H_0 gives that $\beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$. If we reject this hypothesis, we can conclude the variables in the model explain the difference of brand loyalty.

Table 7. F-test in ANOVA analysis

Model	Sum of Squares	df	Mean Square	F	p-value
Regression	79.417	5	15.883	126.016	0.000b
1 Residual	25.082	199	0.126		
Total	104.499	204			

Source: Synthesized by the author from SPSS results on official samples

In fulfillment of the ANOVA test results Table 7, F statistics value calculated from R2 value of the full model is other than 0 and p-value = 0.000 < 0.05, so we reject H_0 . This proves that the linear regression model is suitable for the overall data and this model can be used.

Table 8. Multiple linear regression analysis result

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics	p-value
	B	Std. Error	Beta			Tolerance	VIF
Constant	-1.101	0.190		-5.792	0.000		
SE	0.342	0.051	0.288	6.713	0.000	0.654	1.530
EM	0.223	0.046	0.227	4.857	0.000	0.551	1.815
DC	0.248	0.048	0.223	5.140	0.000	0.641	1.560
EN	0.228	0.052	0.209	4.360	0.000	0.525	1.906
IE	0.194	0.052	0.178	3.750	0.000	0.533	1.876

Source: Synthesized by the author from SPSS results on official samples

Variance inflation factor coefficient (VIF) in theory should be less than 10 then we can conclude that there is no multicollinearity phenomenon (Hoang and Chu, 2005). In fact, to make sure there is no multicollinearity, it is necessary to compare it to be less than 4. All variables have VIF values less than 4, so they all satisfy the criteria that there is no multicollinearity phenomenon. The p-value of the independent variables are smaller than 0.01

and all the regression coefficients are positive, showing that the independent variables about customer satisfaction have positive impacts on brand loyalty. Thereby, we can determine that “Satisfaction with services” is a decisive variable that has positive influence on brand loyalty, which is followed by “Satisfaction with employees” (0.227), “Satisfaction with distribution channels” (0.223), “Satisfaction with enterprise” (0.209) and finally “Satisfaction with brand image and environment” (0.178). Such results are also partly satisfied with the current reality of mobile telecommunications business in the market when services quality plays a very extensive role for the existence of this industry. Thus, all five factors have positive impacts on brand loyalty. The results show that hypotheses about impacts of customer satisfaction on brand loyalty are all accepted.

5. Conclusion and recommendations

The results of the study show that five components of customer satisfaction on brand loyalty are satisfaction with services, satisfaction with employees, satisfaction with distribution channels, satisfaction with enterprise and satisfaction with brand image and environment. Satisfaction with services is the most influential factor in customers’ brand loyalty for mobile telecommunications services. Inasmuch as, these networks need to concentrate on improving service quality to meet the customers’ increasing demand.

In terms of satisfaction with services, extending spectrum will help business boost the number of customers, inspire new customers to use their services and reduce costs without being fear of affecting sales. In addition, the planning of spectrum must also be simultaneously implemented by mobile telecom enterprises in areas with a high density of mobile telecommunications service users by increasing broadcasting station density, decreasing broadcasting radii and having reasonable methods of wave loading at peak hours. Moreover, to promote the network’s service quality, mobile telecom enterprises should pay attention to and invest in updated technology like Wimax and especially 4G LTE (Long Term Evolution). Additionally, these enterprises should diversify value-added services and high-qualified additional services including information service, entertainment service and commercial service (mobile banking, online sales, etc.) and strengthen the interaction with other partners because large enterprises often use these services in form of self-supply without joint ventures with other businesses inside and outside mobile telecom industry.

In terms of satisfaction with employees, enterprises need to develop human resource policies by concentrating on two phases: recruitment and staff training under the motto “Customer is the first”. They should build quick and convenient process of providing mobile telecom services to customer by raising the speed of meeting the customers’ needs, not making them frustrated and uncomfortable in case of waiting. Is there any unintended delay, employees must have a friendly attitude and apologize to the customers. Besides, they should build a mobile telecom enterprise culture and customer-oriented sales culture by clearly guiding their employees that consumers are always right and they must deftly meet consumer requirements.

In terms of satisfaction with distribution channels, mobile telecom enterprises need to expand the scale of service provider network in all locations by widely broadening their agent channels which should be developed in a way of having transaction points and expanding more specialized stores of telecom services packages because the number of customers in Ho Chi Minh City's mobile telecom market is huge. Furthermore, applying display skills to arrange service areas in a scientific way is necessary. Specifically, service areas should be classified into separate groups: service registration, customer consulting and customer waiting area.

In terms of satisfaction with enterprises, mobile telecom enterprises should conduct deep commitment to consumers in the process of before, during and after providing mobile telecommunications services, which must be tied to consumers' interests and derived from their needs, which are composing of service quality, employees serving, distribution channels' quality and brand image and environment commitments by carrying out several surveys to gain specific data on customers' expectations. In addition, it is necessary to give the determination to implement stated commitments to gain customers' trust. Before implementing commitments, enterprises need to balance and calculate resources.

In terms of satisfaction with brand image and environment, mobile telecom enterprises can consider trade promotion activities through 4 main forms. Advertising is a form of non-direct communication made through various means of media such as newspapers, magazines, television, radio and etc. Promotion is a form of stimulating consumers to use mobile telecom services especially 3G and 4G mobile services by giving them certain additional material benefits. Propaganda programs are needed to consider four steps: identifying the propaganda targets, designing the propaganda messages, selecting means of media and carrying out propaganda programs. Direct marketing campaign is in intention of selling services through the customers' direct feedback, collecting customers' information and boosting the brand's image and reputation.

It is undeniable that the study should be conducted over a longer period of time with a larger sample size in order to increase the overall representation of the sample and the analytical effect. Moreover, in the next research, the author will perform the probability method instead of non-probability method, choose the sample by the stratified method to enlarge the generalization and effective statistical analysis. In addition, in future research, Structural Equation Modeling (SEM) should be applied as a popular data-analytic technique because of some its capabilities such as having more flexible assumptions, measurement error reduction, testing total model rather than individual coefficients in compared with Multiple Regression which performed analysis separately.

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