Influence of the Development of OTT Services on Customer Loyalty in the Telecommunications Market

Shi Chen [1, a], XiaoHang He[2, b]

[1] Chongqing University of Posts and Telecommunications, Chongqing 400065, China;

[2] Chongqing University of Posts and Telecommunications, Chongqing 400065, China.

[a] 617863768@qq.com, [b]478506517@qq.com

Abstract

The continuous development of OTT services has seriously affected the traditional services of telecom operators. The communication market is becoming more and more homogeneous. How to improve customer loyalty has become an important issue for operators to solve. This paper studies the impact of the development of OTT business on customer loyalty in the telecom market. Focus on the relationship between customer perceived value, customer conversion cost, customer satisfaction and customer loyalty. On this basis, the impact mechanism model of OTT business development on customer loyalty is constructed. Then through empirical research, explore the impact of OTT business development on customer loyalty in the telecommunications industry, including the path of impact and the intensity of impact.

Keywords

OTT services, telecom industry, customer perceived value, customer loyalty.

1. Introduction

After the reorganization of telecommunications, the three major operators entered the era of full competition, and the communication market became more and more homogenous. The improvement of customer loyalty began to become an important issue for operators to solve. Under the circumstance of the development of OTT business, how will customer loyalty in the telecom market change and affected by other factors, how dose elecom industry operators to improve customer loyalty is the key research issue in this paper.

2. Iiterature Review

2.1 OTT Business and Its User Characteristics

OTT (Over-The-Top) means "through the top." The OTT service is based on the open Internet instant messaging, video and data services, such as WeChat/Wechat, QQ and WHAST App, Skype, YouTube and other applications. The OTT service mainly involves telecom operators, cable TV network service providers, Internet content providers and end users[1]. Because of the characteristics of low cost and wide application range, the consumers of OTT business have a high degree of customer stickiness, which creates high customer loyalty.

2.2 Customer Perceived Value of OTT Business

Customer perceived value is the subjective perception of the product or service provided by the customer, which reflects the customer's satisfaction of the product and service[2]. Scholars divide customer perceived value into two types: economic value and emotional value[3], the former mainly refers to the costs incurred by consumers in the consumption process, such as the cost of use and time, the latter mainly refers to the emotional satisfaction and social satisfaction strive from the usage of OTT service. The two major categories of customer perceived value are equally applicable in the telecommunications industry. This paper starts with the customer perceived value brought by the OTT business, and divides the customer's perceived value into the economic value of the material level and the emotional value of the spiritual level. From the perspective of economic and emotional

interests, this paper studies whether customers actively use OTT business, whether they increase their OTT business and whether they are loyal to OTT business.

2.3 The Impact of Customer Perceived Value of OTT Business on Customer Loyalty

Research shows that customer perception has a positive impact on customer satisfaction[4]. According to the research, customer satisfaction is determined by the value consumers obtain in consumption. In the traditional marketing process, the cost, service and quality of products affect customer perception[5] .The more value perceived by customers, the higher customer satisfaction and loyalty. Customer perceived value is the key factor to improve customer loyalty[6]. This paper believes that the customer perceived value -- economic value and emotional value brought by OTT business development can influence customer loyalty by influencing customer satisfaction and conversion cost.

2.4 Influencing Factors of Customer Loyalty in the Telecom Industry

Based on previous studies and the nature of the telecom industry, this paper believes that the factors affecting customer loyalty are customer satisfaction, conversion cost, customer trust and service quality. However, in practical analysis, customer satisfaction and conversion cost have a much greater impact on the operation and management process of telecom operators than the other two factors. The reasons are as follows: customer satisfaction, as the main factor affecting customer loyalty, plays an equally prominent role in the telecom industry, and customer satisfaction is the primary factor affecting customer loyalty when consuming products and services. In terms of conversion cost, whether it is money, time or emotional cost, it will greatly affect customer loyalty. Based on the above reasons, this paper mainly selects customer satisfaction and conversion cost as two factors for analysis and research in the subsequent research.

This paper proposes the following hypotheses:

H1: The economic value brought by OTT business development has a positive impact on customer satisfaction.

H2: The emotional value brought by OTT business development has a positive impact on customer satisfaction.

H3: The economic value brought by OTT business development has a positive impact on the conversion cost.

H4: The emotional value brought by OTT business development has a positive impact on conversion cost.

H5: Customer satisfaction has a positive impact on customer loyalty.

H6: Switching cost has a positive effect on customer loyalty.

3. Experimental Design

3.1 Operational Definition and Questionnaire Design

(1) customer perceived value: economic value and emotional value. Economic value refers to customers' perception of the economic benefits brought by OTT business. Foreign scholars Brian and Jones (1995) believe that the economic perceived value of customers is a necessary condition for the cultivation of customer loyalty, and the perceived value of customers' use of OTT business is determined by the cost, time, customers' desire for use and the range of choice of use, which is brought by customers' use of OTT business. Emotional value refers to customers' emotional satisfaction in the process of using OTT business, such as satisfaction in the process of use, social satisfaction and personal emotional perception.

(2) customer satisfaction: the psychological variable of customers in the consumption process, that is, the evaluation of products and services. Oliver (1980) believes that customer satisfaction is directly affected by two factors. Second, the level of customer expectations or needs. One is the degree to which customer expectations or needs are met; the other is the level of customer expectations or needs.

(3) conversion cost: namely, transfer cost. The cost of developing a new customer is 20 times that of maintaining an old customer, and losing a customer is also expensive for the enterprise. Therefore, conversion cost plays a pivotal role in the marketing process. Dick and Basu (1994) believe that the conversion cost is manifested as monetary cost, which is the psychological and time cost caused by uncertainty in the face of new service providers. According to this paper, the transfer cost mainly includes money cost, time cost and emotional cost which occur when customers change their choice of operators or transfer traditional business to OTT business.

(4) customer loyalty: customers have a high psychological demand for continuous purchase behavior, and this behavior will keep constant when external conditions change.

This paper combined the characteristics of the telecom industry and OTT business to design a questionnaire, which involves a total of 23 questions, the first five questions are the basic information of the respondents, including age, occupation, gender, income, etc. Seven items were used to measure the perceived value of customers, four items were used to measure the economic value of customer perceived value, and the last three items were used to measure the emotional value of customer perceived value. There are 3 items to measure customer satisfaction; There are also three items used to measure transfer costs; The last five items are used to measure customer loyalty.

The operational definitions of the research variables are shown in the Table 1. The research model is shown in Fig. 1.

Table 1 Measurement items of corresponding variables

The research variables	Measuring item	Source
Customer perceived value	Q1: I think using OTT services such as WeChat and QQ is more cost saving and more valuable. Q2: I think it is convenient and easy to use OTT business processes such as WeChat and QQ Q3: I think the business scope of OTTs such as WeChat and QQ is wider than that of traditional telecommunication services. Q4: I find it attractive to use OTT services such as WeChat and QQ Q5: I hope to improve my social skills by using OTT services such as WeChat and QQ Q6: I think using OTT services such as WeChat and QQ can meet my emotional expectations. Q7: I hope to join relevant clubs and organizations through the use of WeChat, QQ and OTT businesses	Brien & Jones(1995)
Customer satisfaction	Q1: I am quite satisfied with the products and services of WeChat, QQ and other OTT businesses Q2: Compared with telecom operators, OTT services such as WeChat and QQ provide ideal products and services Q3: OTT services such as WeChat and QQ provide products and services in line with their original expectations	Oliver（1980）

Conversion cost	Q1: I've been using carrier products and services for a long time, and I value those experiences Q2: If I change new products and services, such as WeChat, QQ and OTT businesses, it will take me more time and energy Q3: According to my personal perception, I think the products and services provided by the operator I work for are better and can meet my personalized needs	Dick& Basu(1994)

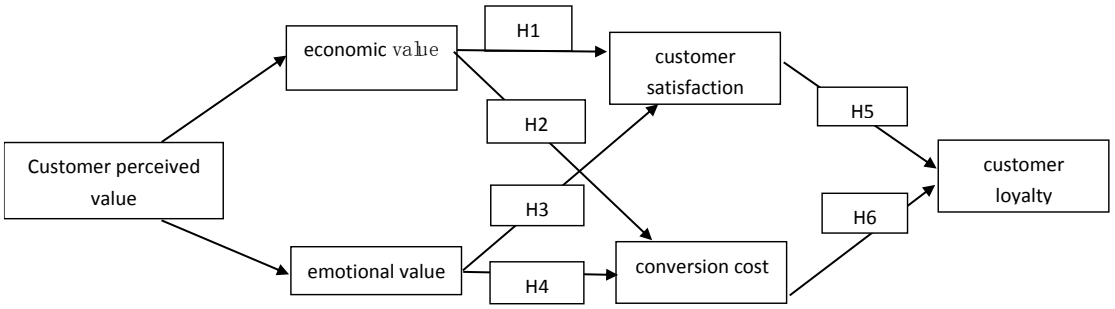

Fig. 1 Research model of the impact of OTT business development on customer loyalty in the telecommunications industry

3.2 Data analysis

3.2.1 Sample analysis Sample feature analysis

The questionnaires were mainly distributed on the Internet, which lasted for one month. A total of 264 questionnaires were issued and 235 were recovered, among which 23 were invalid questionnaires. Sample information see Table 2.

Table 2 Summary of sample information

Summary of sample information				
Basic description	Subdivision	Quantity	percentage	Cumulative percentage
Gender	male	132	62.86%	62.86%
	Female	78	37.14%	100.00%
Age	18 and below	26	12.38%	12.38%
	19-22	81	38.57%	50.95%
	23-25	66	31.43%	82.38%
	26-28	25	11.90%	94.28%
	29 and above	12	5.72%	100.00%
Education	Below undergraduate leve	23	10.95%	10.95%
	undergraduate	152	72.38%	83.33%
	Postgraduate	28	13.33%	96.66%
	PhD and above	7	3.34%	100.00%
Monthly living expenses	500 and below	44	20.95%	20.95%
	501-1000	115	54.76%	75.71%
	1001-1500	25	11.91%	87.62%
	1501-2000	16	7.62%	95.24%
	2001-3000	7	3.33%	98.57%
	3001 and above	3	1.43%	100.00%
Telecom operators use	China Telecom	47	22.38%	22.38%
	China Mobile	142	67.62%	90.00%
	China Unicom	21	10.00%	100.00%

3.2.2 Descriptive statistical analysis of samples

In the experiment, IBM SPSS Statistics 23, Eviews7.2 and other statistical software were used for analysis. According to the five-point measurement method, descriptive Statistics were conducted for each factor investigated. The results see Table 3.

Table 3 Descriptive statistical results

	Number of cases	Minimum value	Maximum value	average value	Standard deviation
Q1	210	1	5	2.98	.570
Q2	210	1	5	3.11	.689
Q3	210	1	5	3.07	.660
Q4	210	1	5	3.66	.736
Q5	210	1	5	3.55	.948
Q6	210	1	5	3.80	.823
Q7	210	1	5	3.71	1.000
Q8	210	1.0	5.0	3.219	.8005
Q9	210	1.0	5.0	3.329	.8593
Q10	210	1.0	5.0	3.243	.8376
Q11	210	1.0	5.0	3.367	.9144
Q12	210	1.0	5.0	3.448	1.0305
Q13	210	1.0	5.0	3.419	1.0192
Q14	210	1.0	5.0	3.367	.8030
Q15	210	1.0	5.0	3.438	.8463
Q16	210	2.0	5.0	3.405	.6868
Q17	210	1.0	5.0	3.514	1.0177
Q18	210	2.0	5.0	3.495	.7841

3.2.3 Reliability and validity analysis of the questionnaire

(1) Reliability analysis of sample data

The analysis results see Table 4. From the above reliability test report, it can be seen that the Alpha coefficient of the four subscales of customer perceived value, customer satisfaction, conversion cost and customer satisfaction is 0.744, 0.732, 0.762 and 0.721 respectively, while the total Alpha of the total measurement table is 0.791. All the above clonbach Alpha coefficients were between 0.70 and 0.80, so the questionnaire data had good reliability.

Table 4 Reliability statistical analysis

Measurement item	Cronbach's Alpha	Cronbach's Alpha Based on Standardization Items	Number
Customer perceived value	.744	.792	7
Customer satisfaction	.732	.726	3
Conversion cost	.762	.779	3
Customer loyalty	.721	.702	5
Aggregate table	.791	.792	18

(2) Sample data validity analysis

The most commonly used detection methods for validity analysis are KMO coefficient and bartlett test significant P value. Generally, studies believe that KMO value less than 0.5 is not suitable for factor analysis, while larger than 0.5 is suitable. The bartlett test is suitable for significance P value less than or equal to 0.01. The analysis results see Table 5.

Table 5 KMO and Bartlett test

Customer perceived value	KMO Kai ser-Meyer-Olkin measure sampling adequacy.		.729
	Bartlett Test of Phericity	Approximate chi square	410.175
		Degree of freedom	21
		Significant	.000
Customer satisfaction	KMO Kai ser-Meyer-Olkin measure sampling adequacy。		.502
	Bartlett Test of Phericity	Approximate chi square	5.999
		Degree of freedom	3
		Significant	.000
Conversion cost	KMO Kai ser-Meyer-Olkin measure sampling adequacy。		.552
	Bartlett Test of Phericity	Approximate chi square	6.999
		Degree of freedom	3
		Significant	.000
Customer loyalty	KMO Kai ser-Meyer-Olkin measure sampling adequacy。		.592
	Bartlett Test of Phericity	Approximate chi square	362.086
		Degree of freedom	10
		Significant	.000
Aggregate table	KMO Kai ser-Meyer-Olkin measure sampling adequacy。		.688
	Bartlett Test of Phericity	Approximate chi square	1851.669
		Degree of freedom	153
		Significant	.000

The KMO coefficients of the above variables are 0.729, 0.502, 0.502 and 0.592, all of which are greater than 0.5. At the same time, the KMO coefficient of the total table is 0.688, also greater than 0.5, and the significance probability of bartlett sphericity test is 0.00 is less than 0.01. It conforms to the general research standards and meets the basic requirements of inspection.

To sum up, the sample data collected by the questionnaire in this paper have good reliability and validity, which can be further analyzed.

3.2.4 Correlation analysis

The software is used to analyze the correlation of the data. The analysis results see Table 6.

Table 6 Correlation analysis

		Customer perceived value - economic value	Customer perceived value - emotional value	Customer satisfaction	Conversion cost	Customer loyalty
Customer perceived	Pearson correlation	1	.032	.655**	.410**	.238**

value - economic value	Significance (two-tailed)		.642	.000	.000	.000
	Square Sum and Cross Product	28.055	1.783	25.236	17.563	8.370
	Covariance	.134	.009	.121	.084	.040
	Number	210	210	210	210	210
Customer perceived value - emotional value	Pearson correlation	.032	1	.454*	.450	.034
	Significance (two-tailed)	.642		.037	.472	.626
	Square Sum and Cross Product	1.783	108.499	10.904	4.211	2.335
	Covariance	.009	.519	.052	.020	.011
	Number	210	210	210	210	210
Customer satisfaction	Pearson correlation	.655**	.454*	1	.715**	.425**
	Significance (two-tailed)	.000	.037		.000	.000
	Square Sum and Cross Product	25.236	10.904	52.976	42.141	20.509
	Covariance	.121	.052	.253	.202	.098
	Number	210	210	210	210	210
Conversion cost	Pearson correlation	.410**	.450	.715**	1	.430**
	Significance (two-tailed)	.000	.472	.000		.000
	Square Sum and Cross Product	17.563	4.211	42.141	65.507	23.084
	Covariance	.084	.020	.202	.313	.110
	Number	210	210	210	210	210
Customer loyalty	Pearson correlation	.238**	.234	.425**	.430**	1
	Significance (two-tailed)	.000	.626	.000	.000	
	Square Sum and Cross Product	8.370	2.335	20.509	23.084	43.917
	Covariance	.040	.011	.098	.110	.210
	Number	210	210	210	210	210

The data in Table 6 show that the Pearson correlation coefficient between customer perceived value and economic value, customer satisfaction and conversion cost is respective 0.655 and 0.401. There is a significant positive correlation at the statistical level of 0.01. The proposed hypothesis H1 and H3 have been preliminarily verified. Pearson correlation coefficients between customer perceived value and emotional value, customer satisfaction and conversion cost were respective 0.454 and 0.450. There was a significant positive correlation at the statistical level of 0.01. The proposed hypothesis H2 and H4 were preliminarily verified. Pearson correlation coefficients of customer satisfaction, conversion cost and customer loyalty were respective 0.425 and 0.430, showing a significant positive correlation at the statistical level of 0.01. The proposed hypothesis H5 and H6 were preliminarily verified. This can be further verified and analyzed.

3.2.5 Regression verification analysis of research hypotheses

(1) Multiple regression verification of H1 and H2

The regression coefficients of the introduced variables are: 0.894, 0.386, and the regression constant is 0.217. The regression equation that yields customer satisfaction is:

$$Y1=0.217+0.894X1+0.386X2$$

Y1 indicates the dependent variable, which means customer satisfaction, X1 and X2 respectively represent two imported variables, which are positively correlated with the dependent variable. The values of the two introduced variables t are respective 2.543 and 2.367, and the significance is 0.000, 0.019, less than 0.1. The correlation coefficient is significant under the condition of 90% significance level. Therefore, it is proved that the H1 and H2 assumptions are true, see Table 7.

Table 7 Coefficienta

Model		Unstandardized coefficien		Standardization coefficient	t	significance level
		B	Standard error	Beta		
1	(Constant)	.217	.253		.859	.392
	Customer perceived value - economic value	.894	.071	.651	2.543	.000
	Customer perceived value – emotional value	.386	.036	.123	2.367	.019
a. Dependent variables: customer satisfaction						

(2) Multiple regression verification of H3 and H4

The regression coefficients of the introduced variables are: 0.624, 0.229, and the regression constant is 1.400. The regression equation that yields customer satisfaction is:

$$Y2=1.400+0.624X3+0.229X4$$

Where Y2 indicates the dependent variable, which means conversion cost, X3 represents customer perceived value -- economic value, X4 represents customer perceived value -- emotional value. The values of the two introduced variables are respective 6.445 and 2.580, and the significance is 0.000, 0.063, less than 0.1. The correlation coefficient is significant under the condition of 90% significance level. Therefore, it is proved that the H3 and H4 assumptions are true, see Table 8.

Table 8 Coefficienta

Model		Unstandardized coefficien		Standardization coefficient	t	significance level
		B	Standard error	Beta		
1	(Constant)	1.400	.344		4.072	.000
	Customer perceived value - economic value	.624	.097	.408	6.445	.000
	Customer perceived value – emotional value	.229	.049	.037	2.580	.063
a. Dependent variable: conversion cost						

(3) Multiple regression verification of H3 and H4

The regression coefficients of the introduced variables are: 0.219, 0.212, and the regression constant is 2.008. The regression equation that yields customer satisfaction is:

$$Y3=1.400+0.219X5+0.212X6$$

Where Y3 indicates the dependent variable, which means customer loyalty, X5 represents customer satisfaction and X6 represents conversion costs. The values of the two introduced variables are respective 2.742 and 2.930, and the significance is 0.007, 0.004, less than 0.1. The correlation coefficient is significant under the condition of 90% significance level. Therefore, it is proved that the H5 and H6 assumptions are true, see Table 9.

Table 9 Coefficienta

Model		Unstandardized coefficien		Standardization coefficient	t	significance level
		B	Standard error	Beta		
1	(Constant)	2.008	.194		10.326	.000
	customer satisfaction	.219	.080	.240	2.724	.007
	conversion cost	.212	.072	.258	2.930	.004
a. Dependent variable: customer loyalty						

3.3 3.3 Results of hypothesis testing

Combined with the correlation coefficient calculated by the above analysis, the model structure after the hypothesis test is shown as follows, see Fig. 2.

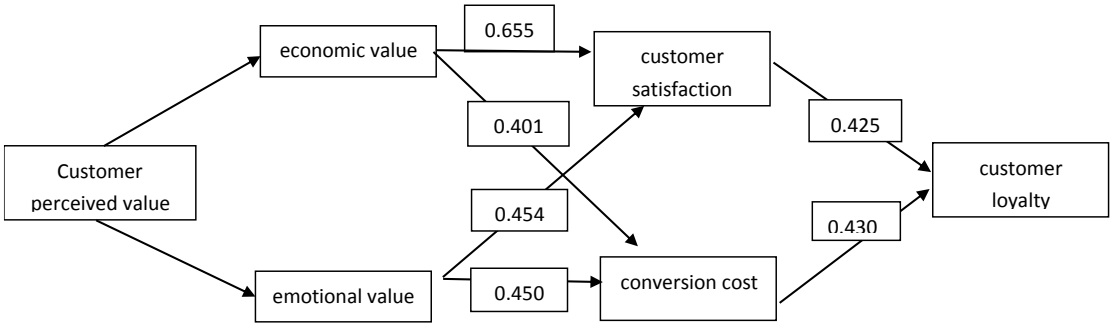

Fig. 2 Model structure after completion of hypothesis testing

4. Conclusion

Starting from the economic value and emotional value of customer perceived value, this paper studies the influence of customer satisfaction and transfer cost. The main conclusions of this paper are as follows:

First, the economic value and emotional value of customer perceived value brought by OTT business development have a positive impact on customer satisfaction, while the economic value has a strong impact on customer satisfaction, followed by emotional value.

Second, the economic value and emotional value of customer perceived value brought by OTT business development have a positive impact on conversion cost, while the economic value has a strong impact on customer satisfaction, followed by emotional value.

Third, customer satisfaction and conversion cost have a positive impact on customer loyalty in the telecom industry. Customer satisfaction has a strong impact on customer loyalty, followed by switching cost.

Fourth, the development of OTT business influences customer satisfaction and conversion cost through customer perceived value brought by it, thus affecting customer loyalty.

Combined with the above conclusions, this paper puts forward some suggestions on management:

First, pay attention to customer perceived value. Operators should attach importance to customer perceived value in management planning, and enhance customer loyalty through the channel of customer perceived value. Second, strive to improve customer satisfaction, with the concept of "all customer-centric". Third, increase transfer costs or enhance transfer barriers. Enterprises should try

their best to enhance customer stickiness and retain customers. At the same time, enterprises can also invest heavily in customers' emotions to increase customers' emotional transfer value, thus reducing customer loss.

This paper also has the following shortcomings:

Firstly, this paper only selects customer perceived value as a factor influencing customer loyalty in OTT business development. Secondly, the main body of the questionnaire sample is school students, which lacks certain representativeness. Finally, this paper aims to analyze the customer loyalty of the entire telecommunications industry, but only based on the mobile terminal customers of the three major operators in the telecommunications industry. For the fixed-line users and broadband users, the development of these OTT services is not involved. How it affects and how it affects, these are worthy of further study.

References

[1] Sujata J, Sohag S, Tanu D, et al. Impact of over the top (OTT) services on telecom service providers[J]. Indian Journal of Science and Technology, 2015, 8(S4): 145-160.

[2] Liotou E, Tseliou G, Samdanis K, et al. An SDN QoE-Service for dynamically enhancing the performance of OTT applications[C]//2015 Seventh International Workshop on Quality of Multimedia Experience (QoMEX). IEEE, 2015: 1-2.

[3] Gentile C, Spiller N, Noci G. How to sustain the customer experience:: An overview of experience components that co-create value with the customer[J]. European management journal, 2007, 25(5): 395-410.

[4] Wallin Andreassen T, Lindestad B. Customer loyalty and complex services: The impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise[J]. International Journal of service Industry management, 1998, 9(1): 7-23.

[5] Zeithaml V A. Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence[J]. Journal of marketing, 1988, 52(3): 2-22.

[6] McDougall G H G, Levesque T. Customer satisfaction with services: putting perceived value into the equation[J]. Journal of services marketing, 2000, 14(5): 392-410.