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# The Influence of "Last One Kilometer" Service Quality on Customer Loyalty under C2C Mode——The Mediating Role of Customer Satisfaction

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**Abstract** Via questionnaire investigation on express users in Wuhan colleges and universities, it is found that client satisfaction plays partial mediator role between service quality of express industry and client loyalty. Moreover, correlation regression analysis of data is conducted by SPSS17.0 software. It is found that communication quality, order quality, delivery quality and remedy quality have significantly positive impacts on client satisfaction, while personalized service quality does not have significant impact on client satisfaction; communication quality, order quality, personalized service quality and remedy quality have significantly positive impacts on client loyalty, while communication quality does not have significant impact on client loyalty. Finally, countermeasures and suggestions are proposed according to the above conclusions.

**Key words** Service quality, Client satisfaction, Client loyalty, Mediating role

## 1 Introduction

With rapid development of computer technology and the popularity of internet application, e-commerce presents rapid development trend. On-line consumption is no longer the biggest problem of enterprise, but the aided logistics distribution system of e-commerce becomes key problem hindering further development of electronic commerce enterprise. At present, in three stages of electronic commerce logistics system, warehouse distribution and backbone network transportation could be implemented by the technology, which is relatively mature. The distribution of "last one kilometer" involves accurate delivery and communication with terminal client, which has many problems. Additionally, express industry of China does not have perfect law and regulation guarantee. In actual work, courier will encounter many difficulties and disputes, and complaint from customer is more and more. Therefore, it is imminent to effectively improve service quality of "last one kilometer", improve client loyalty by customer-oriented, and establish long-term cooperation relationship with client.

## 2 Literature review

"Last one kilometer" is not a kilometer in the distance, and indicates the distance of goods from the sorting point to the customer, which belongs to short-distance distribution and is at the end of whole logistics link. Distribution of last one kilometer indicates that commodity is sent to client from the sorting point via transportation tool when client buys goods online<sup>[1]</sup>. Many data about personal tailor of customer are obtained by end contact. Service quality of "last one kilometer" directly decides satisfaction degree of

terminal client<sup>[2]</sup>. There are a lot of researches about distribution of "last one kilometer" in electronic commerce logistics, which involves problem, obstruction and countermeasure in the distribution, distribution and operation modes. For example, Yang Yan thought that logistics distribution also has below problems: slow velocity not matching with customer's timeliness requirement, high logistics cost and not easy to transfer to other party<sup>[3]</sup>, "distribution" not matching with "delivery". Distribution diversification should be encouraged. Selection, stopping, loading and unloading of distribution vehicle, distribution network and information, and talent loss also restrict O2O distribution. Gevaers *et al.* thought that unsuccessful delivery, bad road situation and bad shipping could increase distribution cost and decline efficiency, while Punakivi *et al.* thought that artificial factor also causes high cost. Taking community logistics distribution as focus point, Weihao analyzed the shortages of several existing distribution models, and explored the new model of community distribution from two aspects: direct distribution and indirect distribution<sup>[2]</sup>. There are researches about the classification of distribution mode. Han Limei introduced enterprise self-support logistics distribution and the third party logistics distribution, and analyzed their advantages and disadvantages. Yu Fangfang established index system and quantitatively analyzed three modes (self-support, the third party and mixed) by using fuzzy evaluation method. The technology, management and development direction of distribution mode information are studied. Zhan Bin *et al.* optimized distribution mode from the angle of promoting user experience and saving cost by "internet + " background<sup>[4]</sup>. Geng Huijun proposed common distribution mode based on cyclic distribution box<sup>[3]</sup>. Additionally, Huang Yanran *et al.* divided receiving mode into two kinds: participating receipt and non-participating receipt<sup>[5]</sup>. Sun Han ana-

lyzed pharmaceutical electricity supplier, and pointed out that last one kilometer should be started from solving the pains: "prompt and quick" and "on demand". Yang Xiaohong *et al.* explored evaluation index system of service quality of college "last one kilometer" distribution from SERVPERF<sup>[6]</sup>. Liu Ying analyzed internal and external factors affecting express delivery alliance of the same city from the angle of strategic alliance. Although these researches provide thought for solving bottleneck problem of "last one kilometer", they are qualitative analysis, and there is less empirical analysis. In this paper, starting from service quality, service quality is divided into five dimensions to inspect client loyalty of "last one kilometer".

### 3 Research hypothesis and variable illustration

Foreign scholars defined service quality from the different angles<sup>[7]</sup>. They thought that the essence of service quality is based on the concept of perception, and it is related to client's perception of service level offered by enterprise. Client will determine service quality level by comparing actual perception of service with the predicted level. The agreement on measuring service quality has not been reached. Zhang Cheng evaluated service quality of express industry from the angle of client perception value. By combining rough set with fuzzy neural network, and constructing RS-FNN model, evaluation model of service quality of express enterprise was established. Taking EMS Company as the example, Yan Jingmin modified original evaluation model of service quality based on the angles of customer expectation and perception, and weight analysis on each dimension of service quality was conducted. Finally, evaluation model of service quality of express industry suiting to China's national condition was formed. Copeland firstly proposed client loyalty on Harvard Management Review. Some scholars thought that repeated selection and utilization of one brand is client loyalty. With continuous deepening of research, more and more scholars found that client loyalty could not be inspected singly from the angle of client attitude or purchase behavior, but should combine them<sup>[8]</sup>. Based on the perspective of service satisfaction, Yu Wei *et al.* studied client loyalty of express company, measured service quality and client loyalty from several dimensions, and measured client satisfaction by expectation discrepancy theory. Zhuo Xiaowei *et al.* thought that client trust could be taken as independent variable or intermediary variable, and client value could be introduced to establish research model of client loyalty in express industry.

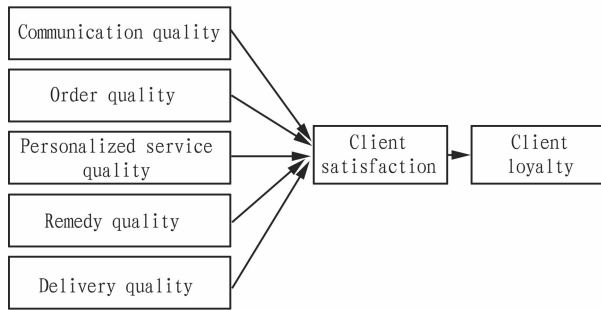
**3.1 Service quality and client loyalty** Parasuraman *et al.* proved an objective fact via multiple empirical studies, that is, service quality of enterprise is closely related to customer repeat purchase intention<sup>[9]</sup>. Domestic scholars summarized occurrence process of service quality affecting client loyalty via reviewing a larger number of literatures. Ye Zuoliang *et al.* found that operation quality could affect client loyalty<sup>[10]</sup>. Qin Xiaoli *et al.* found that remedy measures of enterprise after service failure could change complaint from customer, and client is easier to generate

satisfaction and dependence on business service. If enterprise could carry out personalized service<sup>[11]</sup>, such as offering home picking and delivery service and various payment manners, client will be easier to generate the feeling of dependence on enterprise and trust enterprise. Therefore, the below hypotheses are made in this paper. H1: communication quality has significantly positive impact on client loyalty; H2: order quality has significantly positive impact on client loyalty; H3: delivery quality has significantly positive impact on client loyalty; H4: personalized service quality has significantly positive impact on client loyalty; H5: remedy quality has significantly positive impact on client loyalty.

**3.2 Service quality and client satisfaction** There are many factors affecting client satisfaction, and service quality is a very important factor. Menizer *et al.* thought that service quality of express industry directly affects client satisfaction, and proposed studying regulated variables of culture background and organization feature<sup>[12]</sup>. Xu Haojie *et al.* studied service quality of express industry under internet background, and results showed that service quality has direct impact on client satisfaction. Good service attitude of courier service personnel and the ability to communicate comfortably with customer impress customer from the details, and let customer enjoy the service beyond the expectation, and client is easier to generate the feeling of satisfaction. If an enterprise could offer personalized service according to client's demand, client is easier to have a good opinion on the enterprise. When enterprise service has mistake, enterprise's image could be saved by timely admitting mistake and giving satisfactory remedy measures<sup>[13]</sup>. Most of researches at home and abroad show that service quality has direct positive impact on client satisfaction. Therefore, the below hypotheses are made in this paper. H6: communication quality has significantly positive impact on client satisfaction; H7: order quality has significantly positive impact on client satisfaction; H8: delivery quality has significantly positive impact on client satisfaction; H9: personalized service quality has significantly positive impact on client satisfaction; H10: remedy quality has significantly positive impact on client satisfaction.

**3.3 Client satisfaction and client loyalty** Client satisfaction is a very important factor affecting client loyalty. Client loyalty is affected by service quality, and the influence process is completed by the mediating variable of client satisfaction<sup>[14-17]</sup>. Service quality could not directly cause repeat purchase and mouth publicity of client, but client forms a satisfactory feeling, thereby affecting client loyalty. Client satisfaction is closely related to client loyalty, and the generated behaviors by satisfaction and dissatisfaction are different. Client satisfaction is crucial to maintain good relationship between client and enterprise. Therefore, the below hypotheses are proposed. H11: client satisfaction mediates the relationship between service quality and client loyalty; H12: client satisfaction has significantly positive impact on client loyalty.

**3.4 Research model** Research model is shown as Fig. 1.



**Fig. 1 Research model**

**3.5 Variable illustration** The research mainly involves three variables: service quality (communication quality, order quality, delivery quality, service remedy quality and personalized service quality), client satisfaction and client loyalty (repeat purchase, mouth publicity and price tolerance). Here, question item of service quality is mainly from the researches of Mentzer *et al.* <sup>[12]</sup>, while question item of client satisfaction is mainly from the research of Huang Chunping *et al.*, and question item of client loyalty is mainly from the researches of Ingrid *et al.*, which is modified according to actual situation. The questionnaire is measured by Likert 5-score scale table, in which 1 shows total disagreeing, 3 shows uncertainty, and 5 shows complete agreeing. Higher score represents that the informant agrees the item.

## 4 Empirical research results and analyses

In this paper, sample is limited in college students and teaching staff, which is utilization objective of campus express service. The focus of research is college students and teaching staff with online shopping experience. Questionnaire investigation contains two kinds of manners: field issue and network issue, and investigated objectives are college students, which is conducted in each univer-

sity of Wuhan. There are 600 copies of questionnaires, and 550 copies of questionnaires are recovered. By ridding invalid questionnaire caused by incomplete information, there are 412 copies of effective questionnaires, with effective recovery rate of 68.7%. The 412 copies of questionnaires are input into SPSS software, which is original database.

**4.1 Basic characteristics of sample** Seen from Table 1, in the investigated objectives, man accounts for 51.5%, while woman accounts for 47.6%. It illustrates that the surveyed man and woman proportions are moderate, in which male respondents are more than female. Research finds that man has stronger price tolerance degree than woman, and most of men do not concern the price using express. Woman more values communication quality than man and herself emotional feeling when using express, and thinks that good communication affects her subjective cognition on express enterprise. At the aspect of social identity, undergraduate students account for 42.7%, which is dominant; postgraduates, doctoral students and teaching staff respectively account for 13.6%, 23.3% and 20.4%, which is relative equilibrium. At monthly consumption aspect, person consuming 600 – 1000 yuan/month accounts for 38.6%, which is dominant; person consuming less than 600 yuan/month accounts for 9.5%, which is relatively less; person consuming 1000 – 1500 yuan/month accounts for 30.1%, which is more; person consuming more than 1500 yuan/month accounts for 21.8%. At father's profession aspect, farmer accounts for 39.8% and is dominant, followed by individual household (17.5%), government office accounts for 8.7%, staff member is 13.6%, and free practitioner and other are respectively 9.7% and 10.7%. At hometown aspect, village accounts for 48.5%, which is dominant, and city and town are respectively 27.2% and 24.3%.

**Table 1 Basic characteristics of sample**

Index	Classification index	Percentage// %	Index	Classification index	Percentage // %
Sex	Male	51.5	Father's occupation	Government office	8.7
	Female	48.5		Staff member	13.6
Social identity	Undergraduate	42.7		Free practitioner	9.7
	Graduate student	13.6		Farmer	39.8
	Doctoral student	23.3	Hometown	Individual household	17.5
	Teaching staff	20.4		Other	10.7
Monthly consumption//yuan	Less than 600	9.5		City	27.2
	600 – 1000	38.6		Town	24.3
	1000 – 1500	30.1		Village	48.5
	More than 1500	21.8			

**4.2 Reliability and validity tests of scale table** Reliability test results of five dimensions of service quality are shown as Table 2. Results show that Cronbach's values of communication quality, order quality, delivery quality, personalized service quality and remedy quality are 0.882, 0.827, 0.820, 0.851 and 0.890 respectively. In the model, the index is more than 0.80, illustrating that internal consistency degree of the model is higher, and the scale table has better reliability. Cumulative explanation rate of

factor analysis reaches 76.51%. Seen from factor load and grouping after rotation, except the third question item of order quality and the fourth question item of personalized service, factor load value of question item of each index is all more than 0.6, and KMO value is 0.873. Sig value of Bartlett sphericity test is 0.000, which is very significant. It illustrates that fitting goodness is ideal, and validity of scale table is good.

**Table 2** Reliability and validity tests of variable

Dimension	Measured item	Load of rotated factor		Cronbach's Alpha
Communication quality	Question 1	0.654		0.882
	Question 2	0.789		
	Question 3	0.715		
	Question 4	0.834		
Order quality	Question 1	0.861		0.827
	Question 2	0.884		
	Question 3	0.583		
Delivery quality	Question 1	0.612		0.820
	Question 2	0.869		
	Question 3	0.832		
Personalized service quality	Question 1		0.745	0.851
	Question 2		0.800	
	Question 3		0.720	
	Question 4		0.478	
Remedy quality	Question 1		0.736	0.890
	Question 2		0.802	
	Question 3		0.822	

**4.3 Correlation analysis** Correlation analysis is statistical method studying close degree among different variables, which reveals statistical relationship among things. In this paper, common Spearman correlation analysis method is used to verify the relationship among five independent variables, mediator variable and dependent variable. Seen from Table 3, correlation coefficients between communication quality, order quality, delivery quality, personalized service quality, remedy quality and client satisfaction are respectively 0.743, 0.601, 0.540, 0.525 and 0.660, while correlation coefficients between communication quality, order quality, delivery quality, personalized service quality, remedy quality and client loyalty are respectively 0.464, 0.258, 0.328, 0.746 and 0.726. Client satisfaction is positively related to client loyalty, with correlation coefficient of 0.588.

**Table 3** Correlation analysis between each influence factor and client satisfaction, client loyalty

Item	Communication quality	Order quality	Delivery quality	Personalized service quality	Remedy quality	Client loyalty
Client satisfaction	0.743 **	0.601 **	0.540 * *	0.525 * *	0.660 **	0.588 * *
Client loyalty	0.464 **	0.258 **	0.328 * *	0.746 * *	0.726 **	1.000

Note: \* \* shows that correlated significant confidence level is 0.01, while \* shows that correlated significant confidence level is 0.05.

**4.4 Regression analysis** (i) Taking communication quality, order quality, delivery quality, personalized service quality and remedy quality as independent variables, client satisfaction as mediator variable, and client loyalty as dependent variable, regression analysis is conducted, and result is shown as Table 4. Model 1: regression analysis between independent variable and dependent variable; model 2: regression analysis between independent variable and mediator variable. Seen from Table 5, the adjusted  $R^2$  of models 1 and 2 are respectively 0.642 and 0.733, illustrating that regression equation has representation. Probability of  $F$  value  $<0.001$ , which is very significant. In model 1, regression analysis of order quality, delivery quality, personalized service quality and remedy quality to client loyalty is significant, and significance probabilities of  $\beta$  coefficients of four variables are all less than 0.05, and regression coefficients are respectively 0.132, 0.115, 0.451 and 0.392. That is to say, order quality, delivery quality, personalized service quality and remedy quality have significantly positive impacts on client loyalty, and hypotheses H2, H3, H4 and H5 are established. Significance probability of  $\beta$  coefficient of communication quality is more than 0.05, illustrating that explanation effect of communication quality to dependent variable is smaller, and hypothesis H1 is not established. In model 2, regression analysis between communication quality, order quality, delivery quality, remedy quality and client satisfaction is significant, and significance probabilities of  $\beta$  coefficients of the four variables are all less than 0.05, and regression coefficients are respectively 0.239, 0.397, 0.075 and 0.301. That is to say, communication quality, order quality, delivery quality and remedy quality have significantly positive impacts on client satisfaction, and hypotheses H6, H7, H8 and H10 are established. The probability of  $\beta$  coefficient of personalized service quality is more than 0.05. It illustrates that explanatory force of personalized service quality on client satisfaction is small, and hypothesis H9 is not established.

(ii) In this paper, regression analysis is used to test mediation effect of client satisfaction. Model 3: regression analysis between service quality and client satisfaction; model 4: regression analysis between service quality and client loyalty; model 5: regression analysis between client satisfaction and client loyalty. Seen from Table 5, the adjusted  $R^2$  of models 3, 4 and 5 are 0.695, 0.535 and 0.433 respectively, and probability of  $F$  value is less than 0.01, which is very significant. Regression coefficient between service quality and client satisfaction is 0.834, while regression coefficient between service quality and client loyalty is 0.732, and regression coefficient between client satisfaction and client loyalty is 0.659.  $P$  value is less than 0.01, illustrating that regression coefficient is very significant. Seen from above analytic re-

sults, mediation effect of client satisfaction between service quality and client loyalty is established, and hypothesis H11 is established.

**Table 4 Regression analysis among variables**

Variable	Model 1	Model 2
Communication quality	-0.086	0.239 ***
Order quality	0.132 *	0.397 ***
Delivery quality	0.115 *	0.075 *
Personalized service quality	0.451 ***	0
Remedy quality	0.392 ***	0.301 ***
F value	148.684 ***	226.730 ***
Adjusted R <sup>2</sup>	0.642	0.733
R <sup>2</sup> change	0.005	0.003

Note: \*\*\* shows that correlated significant confidence level is 0.001, while

\* shows that correlated significant confidence level is 0.05.

**Table 5 Fitting goodness test of regression model**

Model	R	Adjusted R <sup>2</sup>	F value	Standardizedβcoefficient
3	0.834 <sup>a</sup>	0.695	939.072 ***	0.834 ***
4	0.732 <sup>a</sup>	0.535	472.966 ***	0.732 ***
5	0.659 <sup>a</sup>	0.433	314.398 ***	0.659 ***

Note: \*\*\* shows that correlated significant confidence level is 0.001.

## 5 Conclusions and suggestions

**5.1 Conclusions** In this paper, the relevant literatures of last one kilometer distribution are combed, and the existing problems and related solving measures are summarized. By combining theoretic literatures about express service quality and satisfaction loyalty, and referring to theoretic results in logistics service field, the factors affecting client loyalty in "last one kilometer" distribution are analyzed. Results find that communication quality, order quality, delivery quality and remedy quality have significantly positive impacts on client satisfaction, while the influence of personalized service quality is insignificant. Order quality, delivery quality, personalized service quality and remedy quality have significantly positive impacts on client loyalty, while the influence of communication quality is insignificant. Mediation effect of client satisfaction between express service quality and client loyalty is very obvious.

**5.2 Suggestions** (i) Communication aspect: courier should enhance communication with client, and let client more understand service content and process of enterprise. Enterprise also could better understand client's demand via communication, and dig potential demand of client. Work content and service attitude of enterprise frontline staff could be trained, and frontline staff should understand concrete situation of client by placing himself in other's position. When client has problem complaint, staff should treat it with good service attitude. (ii) Service recovery aspect: when distribution has problem, enterprise should firstly apologize, timely ease customer's dissatisfaction, timely deal with customer's problem, and strive for satisfactory solution. It should actively undertake responsibility, give customer material and mental compensation, and assess and supervise professional quality and working spirit of courier to decrease the occurrence of distribution error event. (iii) Order quality aspect: based on guaranteeing reasonable price, enterprise should standardize service flow, timely handle with client's order, offer safe, solid,

feasible and protective pack for client's goods, provide detailed and concise bills and documents, and simplify order process of client. (iv) Personalized service aspect: enterprise could perfect payment manner and accept various payment manners according to client's demand; according to client's specific requirement, enterprise could freely offer home delivery and picking service; according to client's time arrangement, enterprise could provide flexible distribution time and site.

## References

- [1] YANG Y. Research on the "last-mile" issue of distribution in the China e-commerce logistics system [J]. Storage Transportation & Preservation of Commodities, 2014(10): 90–91. (in Chinese).
- [2] WEI H, LI Y. Research on the "last mile" distribution model of community e-commerce logistics [J]. Market Modernization, 2016(10): 50–51. (in Chinese).
- [3] GENG HJ. Research on the "last mile" distribution model of fresh food products e-commerce based on the circulating box [J]. Logistics Management, 2016(2): 31–35. (in Chinese).
- [4] ZHAN B, GU ZQ, LI Y. Study on optimization of e-commerce last mile distribution mode against Internet + background [J]. Logistics Technology, 2016(1): 1–4, 11. (in Chinese).
- [5] HUANG YR, WU GX. Study on the reception modes of last mile of e-commerce [J]. Journal of Jiaying University, 2014(4): 37–41. (in Chinese).
- [6] YANG XH, YAN ZH. Study on distribution mode of campus express concerning last mile problem based on SERVPERF [J]. Logistics Technology, 2015(14): 16–19. (in Chinese).
- [7] GRONROOS. A service quality model and its marketing implication [J]. European Journal of Marketing, 1984(18): 36–44.
- [8] GREMLER DD, BROWN SW. Service loyalty: It is nature importance and implications [M]. International Service Quality Association, 1996: 121–130.
- [9] BERRY LL, PARASURAMAN A. Prescription for a service quality revolution in a merican [J]. Organizational Dynamics, 1992, 20(Spring): 5–15.
- [10] YE ZL, CAI L, YE ZH, *et al.* Third party logistics service quality and its impact on customer satisfaction of C2C [J]. Science Research Management, 2011, 32(8): 119–126. (in Chinese).
- [11] HU ZH, JIANG FM, YU WP. Analysis on factors of service quality in personal financing [J]. Journal of Tsinghua University (Philosophy and Social Sciences), 2004(3): 70–76. (in Chinese).
- [12] MENTZER JT, GOMES R, KRAPFEL RE. Physical distribution concept [J]. Journal of the Academy of Marketing Service: A Fundamental Marketing Science, 1989, 17: 53–62.
- [13] ZHENG QY, FAN XC. Service recovery management in on-line retailing: Integration of justice theory and expectation theory [J]. Management Review, 2007(10): 17–23, 63. (in Chinese).
- [14] MICHAEL KB, J. JOSEPH CJ. Some new thoughts on conceptualizing perceived service quality (A hierarchical approach) [J]. Journal of Marketing, 2001(65): 34–49.
- [15] FAN XC, DU JG. The effect of five-dimensional service quality on the degree of satisfaction to service and loyalty [J]. Management World, 2006(6): 111–118. (in Chinese).
- [16] HE YY, LV YW. The practical research on the influencing factors of logistic service quality and customer loyalty [J]. China Business and Market, 2012(7): 79–81. (in Chinese).
- [17] LI HQ, ZHANG ZG. An empirical study on the effects of corporate social responsibility on corporate reputation and customer loyalty [J]. Nankai Business Review, 2010(1): 90–98. (in Chinese).