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An Empirical Study on E-commerce Logistics Service Quality and Customer Satisfaction

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Abstract: Based on consumer's perspective, the influences of logistics service quality on customer satisfaction were empirically studied in order to clarify the key logistical factors affecting consumer's satisfaction. An empirical method is used to investigate the factors in E-commerce logistics service quality that influence customer satisfaction. The results indicate that delivery service quality, after-sales service quality and staff service quality have positive impacts on customer satisfaction; the influence of communication service quality on customer satisfaction is not significant.

Key Words: logistics service quality; shopping online; customer satisfaction

1. INTRODUCTION

With the rapid development of our national economy and the wide application of information technology, e-commerce has enjoyed a great boost. Statistics show that by June 2014, the network shopping user has scaled up to 332 million and the first half of 2014 China's online shopping market size has reached 1.0852 trillion yuan. Simultaneously the users and online transactions continue to grow. Electronic commerce mainly consists of payments and logistics information platform. With high efficient and fast information interaction technology, electronic commerce is easy to deal with information flow, capital flow and commerce flow while the logistics should be done offline. Logistics platform, as one of the three major supporting platforms is not only the last key link to e-commerce transactions, but also an important factor in the success of e-commerce. Through the cooperation with professional logistics companies, online retailers provide consumers with the required logistics service, which is the only chance for network business to directly contact with consumers. This chance has also great influence on the consumption psychology and consumption behavior.

However, in reality there is a problem that logistics service quality and vast network shopping volume do not match. Through the surveys on users' post-purchase evaluation from major e-commerce platforms, it can be found that the vast majority of users' complaints are related to logistics services, such as delivery which is not timely, packing damage, unfriendly attitude and so on. Those defects in logistics services have seriously affected consumers' shopping experience. Thus exploring what factors in logistics services have significant influence on customer satisfaction has practical meaningfulness in that it can help to improve the logistics service quality and promote E-commerce's development.

2. LITERATURE REVIEW

The most representative scholars who have made definitions on logistics service quality in prior studies are PERRAULT and RUSS with their 7R theory based on time, place and utility^[1]. Nevertheless, definitions on logistics service quality made at that time were made from the point of logistics service providers not from the customers' view. Later MENTZER et al^[2] pointed out from the view of customers that physical distribution service should include three dimensions, namely the availability of goods, the timeliness of delivery and the

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quality of service. Their study became the foundation for latter measurement of logistics service quality. The significant watershed in the measurement of logistics service quality was the SERVQUAL scale developed by PZB (1988). BRENSINGER et al^[3] once applied the SERVQUAL scale in measurement of B2B logistics services but the result was not satisfactory.

As the logistics evolved from physical distribution perception to the modern logistics concept, MENTZER et al^[4] advanced that logistics service quality (LSQ) under B2B circumstances should consist of nine dimensions. The nine dimensions were: information quality, order procedure, order release quantity, timeliness, order accuracy, order quality, goods status, error handling and staff communication. And they also verified the logic relationships between the nine variables. This nine-dimension scale was mainly used to measure B2B logistics service quality so it is not suitable for this study. ZhengBin^[5] have developed China's homegrown LSQ measurement scale from the perception of delivery process and divided logistics service quality into several dimensions: time-quality, quality of staff communication, order-completion quality, error-handling quality, flexibility, goods-in-good-condition quality, and convenience. Also they verified them.

Logistics services are closely connected with customers in online shopping environment. From customers' post-purchase evaluation, it can be seen how much customers value logistics service quality. Studies have shown that service quality is an important factor which influences customer satisfaction. Also as one of the important links in online shopping, logistics service and its quality have positive effects on customer satisfaction. Thus thorough, timely, and reliable logistics service can efficiently increase customer satisfaction. Based on their study in 1999, MENTZER et al^[6] raised a customer-oriented LSQ model which was based on the time and process of Logistics services. This model was used to study the correlation between different dimensions and compare how each dimension of Logistics service quality influence customer satisfaction in different market segment. BianWenliang et al^[7], who studied Logistics services after online transactions, held that logistics service perception factors had significant influence on customer satisfaction, and improving logistics service quality is the key for B2C online retailers to gain initiatives in the markets.

So far there have been a lot of researches on logistics service quality and customer satisfaction. Nevertheless, there are few studies which research the relationship between each dimension of logistics service quality and customer satisfaction from the point of customers. This study aimed to fill this gap and explore from the point of view of customers.

3. RESEARCH HYPOTHESIS

MENTZER et al^[2] have pointed out that the target of logistics services is the customer, so it is more reasonable and gives decision makers more practical significance to define and evaluate logistics service quality from the perspective of customers' requirements. Therefore the logistics service quality in this study, from the view of customers, includes the overall process from the moment the order is made to the moment the delivery is finished. Whether it is C2C or B2C online shopping, customers' requirements for logistics service of are basically identical.

Different from shopping in physical stores, there is little person-to-person contact in online shopping, which renders it hard to maintain the relationship between merchants and customers. This means it is highly important for merchants to complete service through good communication with their customers. In developing the scale of LSQ, many scholars listed communication service as one of the dimensions of logistics service quality, which indicated the importance of communication service quality in logistics service quality. And until now, almost all merchants have provided various channels such as online customer service, email, and telephone as the means to offer communication service for customers. Those means can also help merchants to know the problems customers may meet in shopping and help to solve them in time, which builds up merchants' good

impression on customers. MENTZER^[6] found that communication quality was correlated with customer satisfactory and communication quality gained the largest amount of customers' attention. Hence improving communication quality may increase customer satisfaction. Therefore, there is a hypothesis:

H1: communication service quality has positive effects on customer satisfaction

Delivery service offers logistics a time-space effect and realizes the transference of the goods' ownership in online shopping. Therefore delivery service has the closest relationship with customers among all the elements of logistics function and is also the core of customers' requirements and logistics services. Delivery service means delivering to customers the well-packed goods whose quantity and specification is in accordance with the order at the agreed time and place. It also requires timeliness, the goods in good condition and order's accuracy. If the customers get the right goods and there is no damage on it, it can save the trouble of communicating with the service staff to return the goods. In a word, the higher the delivery service quality, the more satisfied the customers are. Based on this, there is another hypothesis:

H2: delivery service quality has a positive effect on customer satisfaction.

Customer can only have an idea of the goods' information through pictures and descriptions of the goods when shopping online. This renders it sometimes inevitable for customers to receive damaged goods or goods which are not in accordance with their expectation. If merchants can make out measures ahead of time to deal with those problems, and take relevant measures in time to solve problems which emerge, they can show their responsibility to customers and make shopping more secure for customers. Also many studies have proved that in traditional shopping environment, service recovery behavior of enterprises will influence customers' satisfaction and loyalty. In one word, the timeliness and completeness of after-sales measures can better customers' shopping experience and increase their satisfaction. So there is another hypothesis:

H3: after-sale service quality has a positive impact on customer satisfaction

PARASURAMAN et al^[8] regarded emotion input as one of the service quality's dimensions, which proves the significance of staff services. Staff services mainly refer to the images of logistics staff, service attitude, concern for customers, and initiatively offered help to solve customers' problems. In the delivery process of online shopping, logistics staff should have efficient communication with customers in time because their service attitude and language can directly decide customers' consequent behaviors. If logistics service staff can provide customer-oriented service, fully understand their requirements, and offer polite, respectful, hospitable, and considerate service, customer satisfactory will surely increase. Hence there is another hypothesis:

H4: staff service quality has a positive impact on customer satisfaction

With hypothesis above, a customer satisfaction model is put forward for E-commerce logistics service quality is put forward, as shown below:

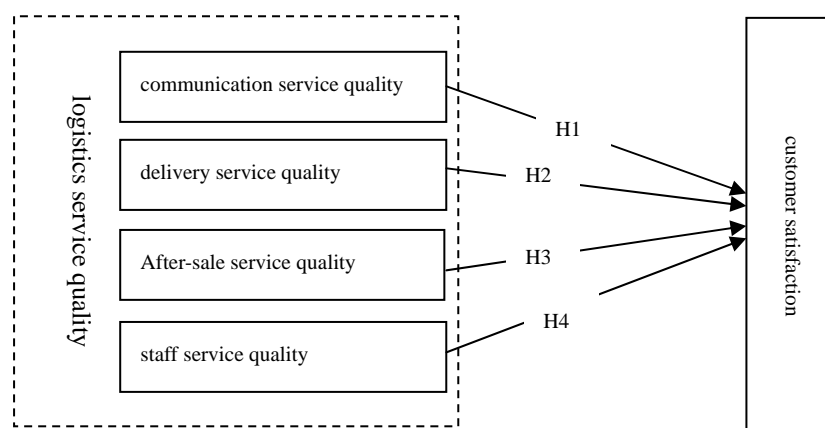


Figure1. The model of E-commerce logistics service quality and customer satisfaction

4. RESEARCH DESIGN

4.1 Measuring Variables

With a literature review and researching on prior studies, the author of this paper designed a group of questions for measurement which formed a questionnaire (Table 1). The questionnaire was made of two parts: the first part was an investigation on customers' perception of logistics service quality, including communication service quality, delivery service quality, after-sales quality service and staff service quality. There were 14 items; the second part was an investigation on customer satisfaction which had three items. The 7-scale of Li Kete was applied in the questionnaire. Each measurement variable varies from 1 to 7, among which 7 means *strongly agree*, 6 *agree*, 5 *somehow agree*, 4 *agree*, 3 *somehow disagree*, 2 *disagree*, and 1 means *strongly disagree*.

Table1. Questionnaire

Variable	Codes	Measurement items
communication service quality	Q1	rapid replies to consumer inquiries
	Q2	online communications with customers
	Q3	initiative inquiries about customers' need
delivery service quality	Q4	goods delivery at the appointed time
	Q5	correct commodities
	Q6	intact goods
	Q7	proper and intact packing
After-sale service quality	Q8	changing or refunding service
	Q9	convenience in changing or refunding
	Q10	quick responses in changing or refunding
staff service quality	Q11	clean and neat image of the delivery staff
	Q12	amiable calls by the delivery staff
	Q13	delivery personnel and customers working together to solve the problems from signing for goods
	Q14	delivery personnel good manner in approaching the goods
customer satisfaction	Q15	The network store was satisfactory
	Q16	Satisfied with the shopping experience in the network store
	Q17	Overall, satisfied with the network store

4.2 Data Collection

Relevant statistics show that young people were the main force of online shopping. Therefore this investigation was targeted towards college students, investigating college students' perception of logistics service quality and their satisfaction of online shops. The survey used simple random sampling method, and randomly selected 280 college students from different grade and different subjects, thus ensuring that participants were not centralized. 280 questionnaires have been handed out. Eliminating invalid questionnaires, there were 236 recycled and valid questionnaires, and the efficient rate was 95.83%.

4.3 Reliability and Validity

Reliability refers to the consistency and stability of the data measured by the questionnaire. Cronbach's Alpha is now the most widely applied reliability coefficient, and its value in subscale should better be above 0.7. This article used SPSS18 to analyze the reliability of the data (Table2). From the table, it could be observed that the value of each factor was greater than 0.7. At the same time, the Cronbach's Alpha coefficient in the total scale is 0.856. Those values of Cronbach's Alpha coefficient indicated that the scale was reliable.

Table2.Cronbach's Alpha coefficient of the variable

Variable	Quantity	Cronbach's Alpha coefficient
communication service quality	3	0.853
delivery service quality	4	0.839
After-sale service quality	3	0.807
staff service quality	4	0.810
customer satisfaction	3	0.793
The total scale	17	0.856

Factor analysis method was adopted to analyze the construction validity of the questionnaire. First, the author analyzed the KMO value and gave a Bartlett's test of sphericity. The value of KMO was 0.817. The result of Bartlett's test of sphericity was significant, which means it was suitable to use factor analysis to analyze the scale. The author also used SPSS 18 to make a factor analysis of the scale. Based on the standard that Eigenvalue should be greater than 1, there were five common factors with the variance explanation rate valuing 71.118%. All indexes' loads on their corresponding factors are greater than 0.6, and the cross load is less than 0.5 (Table 3), which preliminarily indicated that the scale had good Convergent validity and discriminant validity.

Table3 .The results of factor analysis

Code	Component 1	Component 2	Component 3	Component 4	Component 5
Q1	0.235	0.240	0.790	0.119	0.112
Q2	0.309	0.185	0.773	0.151	0.089
Q3	0.241	0.111	0.850	0.009	0.016
Q4	0.635	0.133	0.309	0.051	-0.062
Q5	0.780	0.255	0.149	-0.063	0.031
Q6	0.849	0.167	0.156	0.050	0.110
Q7	0.758	0.263	0.275	-0.016	0.109
Q8	0.045	-0.053	-0.016	0.842	0.095
Q9	-0.011	0.139	0.105	0.837	0.019
Q10	-0.020	0.032	0.121	0.843	0.060
Q11	0.272	0.627	0.020	-0.121	0.171
Q12	0.145	0.816	0.101	0.177	-0.069
Q13	0.194	0.806	0.206	0.048	0.110
Q14	0.230	0.713	0.349	0.044	0.163
Q15	0.042	0.139	0.086	-0.005	0.819
Q16	0.027	0.101	0.138	0.087	0.797
Q17	0.071	0.005	-0.055	0.096	0.870

4.4 Hypothesis Test

This study used software SPSS18 and applied Pearson product moment correlation analysis method to compute the correlation coefficient between dimensions of logistics service quality and customer satisfaction, and evaluated the degree of correlation between factors. Detailed analysis can be observed in Table 4.

Tabel4.The correlation coefficient between logistics service quality and customer satisfaction

		communication service quality	delivery service quality	After-sale service quality	staff service quality
customer satisfaction	Pearson correlation	0.103	0.179**	0.214**	0.143*
	Sig. (Two-tailed)	0.115	0.006	0.001	0.028
	N	236	236	236	236

** : Correlation is significant at the 0.01 level; * : Correlation is significant at the 0.05 level

From Table 4, it was clear that communication service quality and customer satisfaction ($r=0.103$, $p=0.115>0.05$) were not significantly correlated, which meant hypothesis 1 was not verified. There was a significant positive correlation between delivery service quality and customer satisfaction ($r=0.179$, $p=0.006<0.01$), which meant hypothesis 2 was verified. Also after-sales service quality was significantly positively correlated with customer satisfaction ($r=0.214$, $p=0.001<0.01$), which indicated that hypothesis 3 was verified. A significant positive correlation existed also between staff service quality and customer satisfaction ($r=0.143$, $p=0.028<0.05$), which showed that hypothesis 4 was verified.

Therefore, it was clear that customers paid more attention to delivery service quality, after-sales service quality, and staff service quality. The according measures taken by merchants when goods were unsatisfactory, the specification of logistics service personnel and things the like also had great impacts on customer satisfaction. The influence of communication quality on customer satisfaction was not significant. A possible reason for this result could be that customers had little communication with merchants and lacked such experience of communication. Customers might contact with merchants only when there was some problems about the goods they ordered. Customers cared little about the communication service quality so the influence of communication quality on customers' satisfaction in this study was not significant.

5. CONCLUSION

In the increasingly competitive market of online shopping, customer is God of the enterprise. Increasing customer satisfaction through improving logistics service quality is the key for enterprises to gain competitive advantages. This study, based on a literature review of prior researches and findings, identified communication quality, delivery quality, after-sales quality and staff quality as the four factors which influenced customer satisfaction. Also the author constructed under the online shopping environment the *Model of Logistics Service Quality and Customer Satisfaction*, collected first-hand data through filed research with a self-designed questionnaire and used relevant analysis method to deeply explore the relationship between online shopping logistics service quality perception factors and customer satisfaction. The results of the empirical study indicated that there were significant positive correlation between delivery service quality and customer satisfaction, between after-sales service quality and customer satisfaction, and between staff-service quality and customer satisfaction; yet the correlation between communication service quality and customer satisfaction was not significant. Hence online merchants should pay attention to the improvement of goods delivery, after-sales measures, and logistics service staff's quality. In this way, the logistics service quality can be promoted, then customer satisfaction could be increased and competitive power would be enhanced. At the same time, logistics providers can also put forward strategies to improve service quality.

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