

Analysis of Consumer Recognition Based on Logistics Factors

Xuzhao Yang

School of Economics and Management
Hebei University of Science and Technology
Shijiazhuang, China

Abstract—This article will use questionnaires to obtain consumers' views on various factors of e-commerce logistics, so as to analyze the opinions of consumers on logistics factors. Then the grounded theory is used to qualitatively analyze the valid data returned from the questionnaire mobile phone, and get the key elements of the logistics service and its classification and the influence relationship between various factors. Then, the article proposes a model of the impact of relevant factors on consumer acceptance. Finally, the single factor difference method is used to verify its hypothesis, draw conclusions, and finally summarize.

Keywords—logistics; service; grounded theory; SPSS

I. INTRODUCTION

The large-scale development of e-commerce, from offline shopping to online shopping, is not only a change in form, but also a pattern of shopping, and changes in shopping concepts. But at the same time, it is also the production of large-scale data. According to the relevant data report of CCNIC (China Internet Development Statistics Report), as of December 2018, the number of Internet users in China reached 829 million, of which the number of online shopping users reached 610 million. The annual growth rate reached 14.4%. At the same time, the first law in the field of e-commerce, the "E-commerce Law" was officially introduced. Under such a large-scale and rapid development, the competition of e-commerce companies has become increasingly fierce. Therefore, researching consumer recognition, grasping consumer consumption, and providing consumers with diverse and effective services that consumers want can make e-commerce companies not be lost and defeated in the tide of development. At the same time, it can also effectively promote the innovation and development of China's e-commerce model.

II. THEORETICAL REVIEW

A. Behavior Mode

Behavioral scientists point out that human behavior is the result of interaction between humans and the environment. The behavioral pattern of this article refers to the sum of all the behaviors that consumers take while shopping online. In the general online shopping behavior process, it is usually demand, looking for information, analyzing information,

selecting purchase objects, making decision purchases, and after-sales activities. This is an updated model proposed on the basis of existing research (see "Fig. 1").

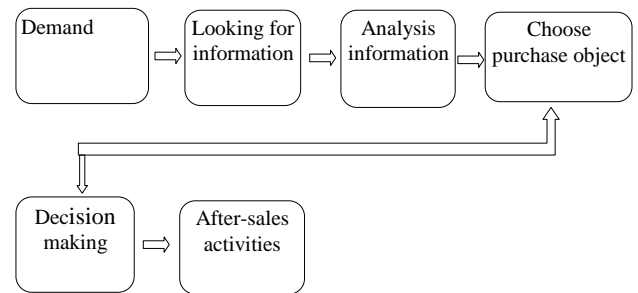


Fig. 1. Consumer behavior logic.

B. E-commerce Logistics Services

The emergence and rise of e-commerce can be said to have greatly impacted the traditional sales model. The online shopping mode has the convenience and speed that it cannot be provided offline. However, for online purchase of physical products, it is necessary to involve an online and offline integrated link. As is known, this is the after-sales activity of the behavioral patterns as mentioned in "Fig. 1". Domestic and foreign logistics services for e-commerce have achieved a certain degree of results.

Especially in foreign countries, such as the research results of logistics service quality in the University of Tennessee in 2001, scholars summed up nine key indicators that affect the quality of logistics services based on customer perspective, namely error processing, quality of personnel communication, integrity of goods, timeliness, quantity of order releases, quality of information, quality of goods, accuracy of goods and ordering process. Rabinovich et al. concluded that delivery timeliness, reliability and inventory availability are the main influencing factors of logistics service quality. Davis pointed out that if e-commerce enterprises can improve the logistics service capability of online shopping and win the trust of customers, they will definitely improve their competitiveness.

C. Innovations in This Study

In this study, the traditional method of grounded theory is applied. In the three-level coding process, not only the model is established on the theoretical logic, but also the various factors and the main categories are linked together to form a module, each factor and research object. The strength of the relationship is expressed.

Traditional research is basically based on the impact of logistics factors on the choice of flat, the impact on consumer loyalty, etc., but for the consumer's in-depth analysis of the logistics service itself, this article is based on this on the basis of the logistics service itself. The in-depth analysis has been analyzed for the impact of consumer acceptance. Provide guidance for problem analysis of logistics services themselves and related self-improvement related to logistics services.

III. DATA COLLECTION AND VERIFICATION PROCESSING

The research in this paper needs to be based on a large amount of data. The source of the data must be an online shopping consumer with some experience. Here it is called an experienced online shopper. Questionnaires were used to investigate their views on the relevant factors of logistics services. Then the invalid questionnaire is eliminated, and the data obtained on the basis of a certain number of questionnaires is valid.

A. Issuance and Recycling of Questionnaires

This questionnaire is mainly divided into two parts, the first part is the occupation of the survey object, and the second part is the opinion of the survey object on the main factors of logistics service. The questionnaire basically uses the Likert 5 subscale, setting the options to five levels of related questions, such as "not at all attractive", "having a small attraction", "having some attraction, but not very strong", "attractive" and "very attractive". A total of 150 questionnaires were distributed, 130 points were collected, and 11 invalid questionnaires were excluded. The questionnaire has an effective rate of 91.5%. In the screening of invalid questionnaires, it believes that the questionnaire completed less than 50 seconds is an invalid questionnaire, the inconsistency of the answers are invalid questionnaires, and all the missing questions are invalid questionnaires.

B. Reliability and Validity Analysis

The reliability of the questionnaire indicates the credibility of the questionnaire data. The credibility of the questionnaire increases as the reliability of the questionnaire increases. Cronbach's Alp coefficient is currently the most widely used evaluation index, which evaluates whether the same set of items in the scale has high internal consistency. The validity analysis refers to the analysis of the scale quantity expressed to the accuracy of the measurement index. The validity and correctness of the questionnaire should be measured by validity. The availability and correctness of the questionnaire should be measured by effectiveness.

1) *Reliability test of the overall indicators of the questionnaire Reliability analysis:* The reliability of the questionnaire data was analyzed by spss 23.0 software. The results are shown in "Table I" and "Table II".

TABLE I. RELIABILITY TEST OF QUESTIONNAIRE INDICATORS

Reliability statistics	
Clone Bach Alpha	Number of items
.859	16

TABLE II. RELIABILITY TEST OF THE OVERALL INDICATORS OF THE QUESTIONNAIRE

factor	Scale average after deleting items	Scale variance after deleting an item	Corrected item and total relevance	Clone Alpha after deleting the item
<i>Career</i>	53.3291	88.8650	.210	.863
<i>Choice of consumer platform</i>	51.3797	86.2390	.277	.862
<i>Independently choose logistics providers</i>	52.0506	83.7670	.446	.853
<i>Freight price</i>	51.4937	82.0480	.533	.849
<i>Convenient distribution</i>	52.3291	76.9160	.790	.836
<i>Delivery timeliness</i>	51.1519	81.0540	.582	.847
<i>Item protection</i>	51.1139	80.8970	.610	.845
<i>Return and exchange mechanism</i>	51.1139	77.7950	.684	.841
<i>Timely evaluation</i>	52.0759	87.4040	.273	.861
<i>Logistics information inquiry</i>	51.3291	80.6340	.632	.844
<i>Delivery staff attitude</i>	51.5696	80.8120	.583	.847
<i>Logistics providers</i>	52.4304	84.8120	.380	.857
<i>Price fluctuation</i>	51.8481	86.2590	.322	.859
<i>Self-raising point</i>	51.7848	83.5810	.437	.854
<i>Information protection</i>	50.8861	82.2050	.541	.849
<i>Material damage recovery</i>	51.4430	81.9420	.465	.853

According to the reliability analysis in the above figure, the measurement result coefficients are all greater than 0.8, indicating that the reliability is very high, that is, the reliability of this questionnaire is relatively high.

2) *Validity analysis:* By using SPSS 23.0 for validity analysis, the validity of the questionnaire was measured, the

sufficiency test of the KMO sample was performed, and the Bartlett spherical test was used to judge whether the scale can be factored based on the test results. The results are shown in “Table III”.

TABLE III. TEST OF KMO AND BARTLETT OF THE TOTAL SAMPLE

Kmo and Bartlett test		
<i>Kmo sampling suitability</i>		0.826
<i>Bartlett sphericity test</i>	<i>Approximate chi square</i>	455.532
<i>Degree of freedom</i>		120.000
<i>Significant</i>		0.000

From the “Table III”, it can be seen that the KMO value of the sample population is 0.826, and most of the indicators also exceed 0.8, which is in line with the basic conditions of factor analysis, and Bartlett's sphericity test of all variables is 0.000. A significant level is reached, so the sample is more effective. However, in the factor analysis, the “platform logistics provider selected” factor load is less than 0.5, so the question is removed from the questionnaire.

C. Making Assumptions

Based on the application of the above grounded theory, four main categories that influence consumers' acceptance of logistics services are summarized. In the category of service quality, in the minds of most consumers, reasonable timeliness is very important for consumers' recognition. The timeliness here is not necessarily as fast as possible, but according to the needs of consumers. Appropriate timeliness should be selected. Convenient end delivery and protection of items are also important. In the same way, there are different factors in the main categories of service costs, service after-sales, service experience, etc., and the degree of consumer recognition is different. Based on this, the following assumptions are made:

- A more reasonable timeline has a positive and important impact on consumer acceptance. Convenient distribution and project protection are slightly weaker.
- Freight rates have a positive impact on consumer recognition. The price change caused by the quality change is weak.
- Material damage remedy has a positive and significant impact on consumer recognition. The return factor is slightly weaker.
- The protection of personal information has a positive and significant impact on consumer recognition. The remaining factors, to varying degrees, weaken the impact.

IV. ANALYSIS OF LOGISTICS SERVICE FACTORS

A. Rooted Theory

The grounded theory analysis method is an organic interaction and mutual promotion process consisting of sample interviews, text analysis and theoretical construction. The data collection and analysis are carried out simultaneously, and the theory is continuously summarized and corrected to form a theory that can reflect the nature and meaning of the phenomenon. The grounded theory is a qualitative research method [5] proposed by sociologists Glazer and Strauss in 1967.

This study has made a targeted change to the traditional application in the use of grounded theory. In the second-level coding and the third-level coding, encoding is not conducted according to the traditional category extraction but on the basis of a combination of its importance and types of factors, as well as a comprehensive analysis of the main categories.

1) Concept and category extraction based on open coding: This is the first step in our application of grounded theory. In this process, it is necessary to maintain an objective attitude and avoid the impact of personal emotions on the research results. Next, it is needed to collect the returned questionnaires and incorporate all the options with the most answers to the corresponding questions as the first level of corpus. The first question, the answerer identity questions are not applied to the rooted theory, as shown in “Table IV”.

TABLE IV. INTERNET SHOPPING STREAM SERVICE FACTORS OPEN CODING CATEGORIZATION

Serial number	Category	Original expectation
1	Consumer platforms are more important	When shopping, consumers will consider the consumer platform in most cases.
2	Independent selection of logistics providers is not important	When shopping, you can choose your own logistics provider. For most consumers, the attraction is generally
3	Freight price is not important	When shopping, the shipping price is generally influential for most consumers.
4	Convenient distribution is more important	When shopping, the convenience of distribution has a strong appeal to consumers.
5	More appropriate timeliness is very important	When shopping, the distribution time of logistics providers is very attractive to consumers.
6	Item protection is more important	When shopping, logistics services have a strong appeal to consumers.
7	Improve the return process is more important	When shopping, the return and exchange process is very attractive to consumers.

Serial number	Category	Original expectation
8	The evaluation mechanism is not very reasonable and effective	After the purchase is completed, the consumer will occasionally give the logistics service in time.
9	Convenient query logistics information is more important	When shopping, you can easily find out the logistics information is very attractive to consumers.
10	End delivery is less important	When the goods are delivered, the service attitude of the delivery personnel is important to the consumers.
11	Since the attraction point is generally attractive	Establishing self-raising outlets is generally attractive to online consumers.
12	Focus on protecting consumer personal information	Consumers are very concerned about the protection of personal information.
13	Remediate damaged items in a timely manner	Commodity damage, logistics providers timely remediation is very influential for consumers
14	Because the price of quality changes the influence	When shopping, logistics providers increase prices because of improving quality, and the influence on consumers' online shopping frequency is generally

Serial number	Category	Original expectation
3	Freight price is not important	When shopping, the shipping price is generally influential for most consumers.
4	Convenient distribution is more important	When shopping, the convenience of distribution has a strong appeal to consumers.
5	More appropriate timeliness is very important	When shopping, the distribution time of logistics providers is very attractive to consumers.
6	Item protection is more important	When shopping, logistics services have a strong appeal to consumers.
7	Improve the return process is more important	When shopping, the return and exchange process is very attractive to consumers.
8	The evaluation mechanism is not very reasonable and effective	After the purchase is completed, the consumer will occasionally give the logistics service in time.
9	Convenient query logistics information is more important	When shopping, you can easily find out the logistics information is very attractive to consumers.
10	End delivery is less important	When the goods are delivered, the service attitude of the delivery personnel is important to the consumers.
11	Since the attraction point is generally attractive	Establishing self-raising outlets is generally attractive to online consumers.
12	Focus on protecting consumer personal information	Consumers are very concerned about the protection of personal information.
13	Remediate damaged items in a timely manner	Commodity damage, logistics providers timely remediation is very influential for consumers
14	Because the price of quality changes the influence	When shopping, logistics providers increase prices because of improving quality, and the influence on consumers' online shopping frequency is generally

2) *Category extraction of spindle coding*: the purpose of the spindle coding is to determine the interrelationship between the various concepts, and to integrate a higher level of the category through further analysis and research of open coding. This study classifies the four categories of questionnaire design, defines “service quality” as a, defines “service experience” as b, and defines “service cost” as c, which is the cost required by the customer. Service after sales” is defined as d, as shown in “Table V”.

TABLE V. CATEGORY EXTRACTION OF SPINDLE CODE

Serial number	Category	Original expectation
1	Consumer platforms are more important	When shopping, consumers will consider the consumer platform in most cases.
2	Independent selection of logistics providers is not important	When shopping, you can choose your own logistics provider. For most consumers, the attraction is generally

3) *Selective coding*: Selective coding is based on the main category obtained from the main axis coding. The core category is developed and the connection between the core category and other hierarchical categories is systematically analyzed. The model is divided into four parts, each part is divided into four areas, which are from left to right in turn, very important, more important, generally important, less important, forming the model shown in “Fig. 2”.

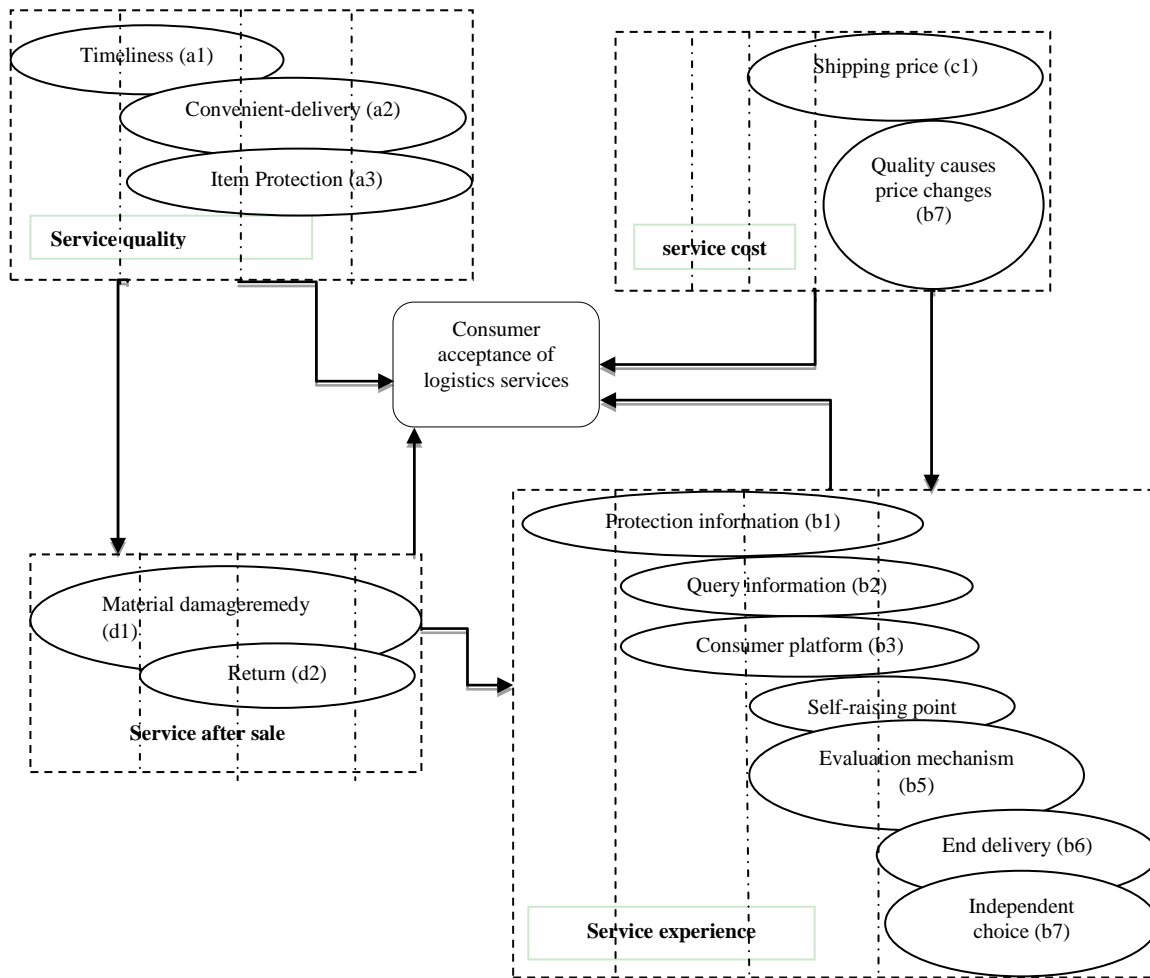


Fig. 2. Main category and logistics service recognition degree model.

In this study, the quality of service consists of the timeliness of logistics, the distribution at the end, and the protection of the articles being transported. The quality of service will affect the factors of service after-sales, and will also affect the customer's service experience. Service costs, that is, freight prices, etc. will also affect consumption and recognition of logistics services. In the above model, the importance of different factors is represented by four unequal regions in each module. The influence between different modules is also indicated by arrows. The final summary will be applied to consumers for logistics services. The degree of recognition is the online shopping based on logistics factors, which is attractive to consumers.

V. SATURATION TEST AND ITS HYPOTHESIS VERIFICATION

Theoretical saturation refers to the moment when the analyst further develops the characteristics of a certain category without being able to acquire additional data.

In the process of using the original data verification method, the obtained online shopping flow service factor is returned to the original data for verification, and it is not difficult to find "service", "freight", "information inquiry", "price change", "after sale". The concepts are the original

comments of the questionnaire. This study is supported by ample theoretical data, as the use of information in the research process is a corpus provided by the content of the questionnaire. At the same time, the model is finally determined by repetitively comparing the original data with the extracted categories and relationship structures.

Taking various factors of logistics service as independent variables and taking consumers' recognition of logistics services as dependent variables, multiple regression analysis was carried out. Then, using four dimensions as independent variables, the recognition of logistics services is used as a dependent variable for regression analysis. First, through the results of regression analysis, it is found that the results of the two regression analyses are consistent, so it can be proved that our classification of each element is correct, which can explain the correctness of our model (as shown in "Table VI" and "Table VII").

TABLE VI. ANALYSIS OF THE IMPACT OF LOGISTICS SERVICE FACTORS ON LOGISTICS SERVICE RECOGNITION

Model	Unnormalized coefficient		Standardization coefficient			Collinear statistics	
	B	Standard error	Beta	t	Significant	Tolerance	VIF
Career	.961	.132	.092	7.255	.000	.887	1.127
Platform selection	1.059	.123	.124	8.579	.000	.677	1.477
Logistics provider selection	.967	.142	.104	6.806	.000	.603	1.657
Freight	.851	.147	.093	5.804	.000	.552	1.810
Convenient distribution	1.142	.199	.13	5.753	.000	.278	3.599
aging	.838	.167	.092	5.008	.000	.417	2.398
Item protection	1.080	.165	.116	6.560	.000	.454	2.200
Return	1.067	.165	.130	6.459	.000	.351	2.848
Evaluation	1.077	.130	.109	8.312	.000	.821	1.217
Information inquiry	1.185	.1680	.126	7.045	.000	.444	2.255
Delivery attitude	0.979	.152	.110	6.441	.000	.488	2.050
Platform logistics	1.081	.138	.119	7.807	.000	.615	1.627
Price change	0.910	.140	.096	6.495	.000	.655	1.528
Self-reporting point	1.144	.130	.128	8.821	.000	.678	1.474
Information protection	1.500	.149	.160	10.044	.000	.560	1.785

TABLE VII. ANALYSIS OF THE IMPACT OF MAIN CATEGORY ON LOGISTICS SERVICE RECOGNITION

Model	Unnormalized coefficient		Standardization coefficient	t	Significant	Collinear statistics	
	B	Standard error	Beta			Tolerance	VIF
Service quality	1.106	.089	.311	12.473	.000	.448	2.230
Service cost	1.141	.112	.198	10.198	.000	.740	1.352
Service after sale	.861	.116	.177	7.418	.000	.487	2.052
Service experience	1.100	.059	.490	18.514	.000	.398	2.513

According to the “Table VI” and “Table VII”, the service quality, service cost, service after-sales, service experience, and the regression coefficient of the consumer's recognition of the logistics service, and the measurement of the t-test are all in line with the requirements, and the importance of each category is less than 0.05, so it can be considered that service quality, service cost, service after-sales, service experience and other factors have a significant impact on consumers' recognition of logistics services. Therefore, it can be verified that the assumptions are correct.

VI. CONCLUSION

According to the above verification summary, it can be seen that in order to eliminate the problem barriers brought by e-commerce logistics, it is not wise to blindly increase investment, and it is necessary to make targeted advances in the new mode of innovative logistics services.

- Create a system for customers to choose their own delivery time. This ensures that every shipment can be delivered to the customer in a timely manner. It is possible to provide more high-end and high-quality services in a targeted manner.

- Damage to items during transportation, if it is possible to promptly propose remedial measures, it is acceptable to consumers
- The most important thing to pay attention to is the protection of consumers' personal information, changing the traditional information protection mechanism, so that personal information can only be seen by individuals.

The road to innovation in e-commerce logistics in China is still very long, and the degree of research and exploration is still far from enough. The way of sharing logistics may be a bold innovation but it can also be studied and tried. Not only for e-commerce logistics, can logistics services of other industries also learn from the development ideas of e-commerce logistics.

REFERENCES

- [1] Liu Fengrui. Basis of Behavioral Science [M]. Shanghai: Fudan University Press, 1991.
- [2] Rabinovich E, Bailey J P. Physical distribution service quality in internet retailing: service pricing, transaction attributes, and firm attributes[J]. Journal of Operations Management, 2004, 21(6): 651-672.

- [3] Davisdf, Golicicsl, Marquardtaj. Br and inga B2B service: Does a brand differentiate a logistics service provider [J]. In dustrial Marketing Management, 2008, 37(2): 218 227.
- [4] Sun Xiaowei. An example of grounded theory in in-depth interview research [J]. Journal of Xi'an Jiaotong University: Social Science Edition, 2011, 31(6): 87-92.
- [5] Zhao Yang, Shi Kan, Wang Lin. Research on the behavior types of microblog clusters based on grounded theory [J]. Information Science, 2015, 33(4): 2.
- [6] Xu Jianzhong, Qu Xiaoyu. Qualitative research on driving factors of environmental technology innovation behavior in equipment manufacturing enterprises based on grounded theory [J]. Management.
- [7] Yin Yuanyuan, Peng Mixiang. Construction of Influencing Factors Model for Selection of Agricultural Products E-commerce Marketing Models [J]. Business Economics Research, 2017(2): 57 59.
- [8] Glaser B G. Basics of grounded theory analysis [M]. Mill Valley CA: Sociology Press, 1992.