

Research on Logistics Service Quality of JD

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Abstract. With the continuous progress of the times and the continuous innovation of science and technology, the development of the Internet industry is booming, especially the e-commerce industry. In terms of customer satisfaction of online shopping, the quality of logistics service is one of the important factors. Improving the quality of logistics service not only affects the customer flow of online shopping platform, but also is an important basis for e-commerce enterprises to maintain their competitive advantages.

This paper takes the online medium and poor reviews of eight kinds of goods on JD platform as the research object, searches the keywords related to logistics, selects all the comments related to logistics and makes data analysis, so as to find out the reasons that affect customer satisfaction, and puts forward some problems existing in the quality of logistics service. And through the data analysis to give feasible solutions to such problems, make JD platform logistics service quality improved, improve customer satisfaction, so as to improve the competitiveness of enterprises. This paper uses octopus to collect relevant review data, cleans the data and selects the data according to the logistics keywords, then draws the word cloud map after word segmentation and removing stop words, and finally analyzes the data by using the unsupervised analysis method of TF-IDF text mining, so as to get the logistics service quality problems that affect consumer satisfaction. The results of this study show that the logistics service quality problems that most affect consumers include: the quality and integrity of package packaging, the quality, speed and signing process of express logistics, the communication problems after purchasing goods, the problem of commodity price protection, the problem of corporate image, the problem of after-sales service and so on. Based on these, the corresponding improvement suggestions are given to JD e-commerce platform.

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1. Introduction

With the continuous progress of the times and the continuous innovation of science and technology, the development of the Internet industry is booming, especially the e-commerce industry. In recent years, there has been an upsurge of online shopping, and online shopping software emerges in endlessly. App such as Jingdong, Taobao, pinduoduo, etc. are essential software for almost everyone's mobile phones. This brand-new shopping mode indicates that the way people get the goods they need is changing, and there must be feedback when there are services, and the comments provided by customers imply their satisfaction with the shopping experience. Nowadays, many studies can show that the quality of logistics service is an important aspect of customer satisfaction. If the quality of logistics service can not be guaranteed, it will certainly face the reduction of passenger flow and reduce its competitive advantage with other enterprises. The experience of FedEx, an international logistics company, can also prove that the high level of logistics service quality has a significant impact on corporate profits.

The purpose of the study is to find out the deficiencies of the current logistics service quality, effectively improve the quality of logistics service, and achieve customer satisfaction. The development of logistics in China started late. Although it has developed rapidly in recent years, there is still much room for improvement in service quality, and there is a big gap compared with developed countries. The quality of logistics service is one of the bottlenecks restraining the development of China's logistics. In order to break through the bottleneck and realize the further development of China's logistics industry and e-commerce enterprises, we must start from customers, be customer-oriented, adapt to customers' needs, and provide customers with high-quality logistics services, so as to achieve the goal of higher customer satisfaction. The purpose of this paper is to find out the deficiencies of the current logistics service quality, improve the logistics service quality and achieve customer satisfaction. The significance of this topic is to point out the problems existing in the current domestic logistics service quality, which will not be the problems existing in individual cases, but all logistics related industries need to be improved, so which aspects to start from will be the final conclusion of this topic. If these problems can be well solved, it will have a positive role in promoting the development of China's logistics industry and e-commerce platform, and it will also have a positive role in promoting people's sense of convenience and happiness.

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Aiming at the logistics service problem of e-commerce platform, this paper uses Octopus software to collect the data of user's consumption comments, and selects the comments related to logistics, and then uses the method of text mining for data analysis, selects the logistics comments from a large number of data, and carries out word frequency statistics, keyword extraction and other analysis techniques, So as to extract the main aspects and performance that affect consumers' dissatisfaction with JD logistics service, and get the main problems and deficiencies of logistics service. Specifically, through the research on the customer review data of several commodities on JD e-commerce platform, this paper uses the analysis method of text mining to analyze the text information related to the logistics service quality in all the medium and poor reviews of commodity reviews, find out the problems related to the logistics service quality that affect customer satisfaction, and put forward the improvement scheme.

2. Literature review

Yanyan et al. [1] from the perspective of consumers, based on the medium and poor evaluation data of logistics services of five types of goods of JD e-commerce platform as the research object, using TF-IDF algorithm and roscm (6) and other tools, identified some prominent problems of logistics service quality of JD e-commerce platform. Liu Yifei [2] selected online evaluation data of five types of cross-border e-commerce users in recent three months, including tmall global, Suning e-buy, Haidun international, vipshop international and Jumei Youpin, analyzed the logistics service quality problems of cross-border e-commerce platform by using cognitive map method, and proposed upgrading information platform service, logistics service process management and control, improving customer signing quality, improving service quality and improving service quality Improve the four dimensions of customer center and optimize the logistics service quality of cross-border e-commerce platform. Hu Fanfan et al. [3] Based on the organic combination of crowdsourcing idea and logistics industry, from three stages of order receiving process, distribution process and order follow-up process, combined with SERVQUAL (service quality) model, constructed the crowdsourcing logistics platform service quality evaluation index system from five dimensions of guarantee, response, reliability, empathy and safety, AHP is used to determine the index weight of the service quality evaluation system of crowdsourcing logistics platform, so as to find problems and further improve the service quality of e-commerce platform. Zhao Menghan et al. [4] Based on the cluster analysis algorithm and the delay rate, loss and damage rate and distribution service complaint rate of commodity distribution, established the three most important indicators to evaluate the quality of e-commerce logistics service, and

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established the evaluation model of e-commerce logistics service quality, This paper analyzes the evaluation results from the perspective of categories and indicators, and puts forward corresponding suggestions to improve the logistics service quality. Hu Yuanrong et al. [5] Based on the online user review data of Jingdong household appliances, books and food, through word segmentation and keyword filtering, identified the dimensions of logistics service quality that users are most concerned about, looked for the main problems existing in the logistics distribution service of e-commerce from the perspective of consumers, and gave suggestions for improvement, so as to further improve the customer satisfaction of e-commerce platform and increase the sales of the platform. Guo Yanyan, Liu Yifei, Hu Yuanrong and others analyzed the logistics service quality problems based on the online review data. Through data preprocessing, model building, data mining and other operations, they came to a more rigorous and reliable conclusion, which is similar to the method used in this paper. The development of rural e-commerce market is on the rise. This paper explores some problems of rural logistics service quality, and puts forward measures to solve the problems, so as to promote the further development of rural e-commerce [6-8]. B2C e-commerce is now booming, but the low quality of logistics service of B2C e-commerce not only caused great harm to the rights and interests of consumers, but also greatly harmed the social and public interests. Therefore, for B2C e-commerce enterprises, we should timely analyze and supervise the problems existing in their logistics services, promote B2C e-commerce enterprises to provide high-quality logistics services, protect consumers' rights and interests, bring better consumption experience to consumers, and ensure the continuous progress of B2C e-commerce development [9-11]. In the development process of cross-border e-commerce, cross-border e-commerce logistics has played a great role in promoting it. Now the proportion of cross-border logistics in logistics business is higher and higher, but cross-border e-commerce logistics has also exposed many problems, which affect the development of cross-border e-commerce to varying degrees. Therefore, from the perspective of consumers, this paper analyzes the relationship between logistics service quality problems and consumer satisfaction in cross-border e-commerce, and puts forward relevant suggestions to increase consumer satisfaction, so as to consolidate the status of cross-border e-commerce in the hearts of consumers [12-16].

3. Research design

3.1. Research process

In this paper, from the perspective of consumers, based on the data of medium and poor reviews of a number of products on Jingdong e-commerce platform, we explore the

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logistics service quality problems perceived by consumers. By using the method of text mining, this paper finds out the shortcomings of the logistics service quality of Jingdong e-commerce platform, and puts forward suggestions for improvement, so as to effectively improve the logistics service quality, improve customer satisfaction, and enhance the competitiveness of e-commerce enterprises. The specific experimental analysis process is shown in Figure 3.1. The main research steps of this paper are as follows

(1) Collect data. In this paper, the octopus collector is used to collect the online comments of several products on JD e-commerce platform;

(2) Data processing. The collected data is cleaned by manual cleaning method, and then the cleaned data is filtered according to the words containing logistics semantics to get the comment data related to logistics services. Then the selected data is segmented by using Jieba word segmentation, and the data after segmentation is processed by using the stop word list of Harbin Institute of Technology as reference, The word frequency statistics of the processed data is used to draw the word cloud.

(3) Analyze the data. According to the TF-IDF algorithm, the TF-IDF value of words is calculated, and the importance of keywords is determined by the TF-IDF value. Then through the use of rostm (6) software, we analyze the data of logistics service related reviews, draw a semantic network analysis diagram, and identify the potential views of consumers through the relationship between each node in the diagram and the density of different nodes in the network diagram. The research process is shown in Figure 1.

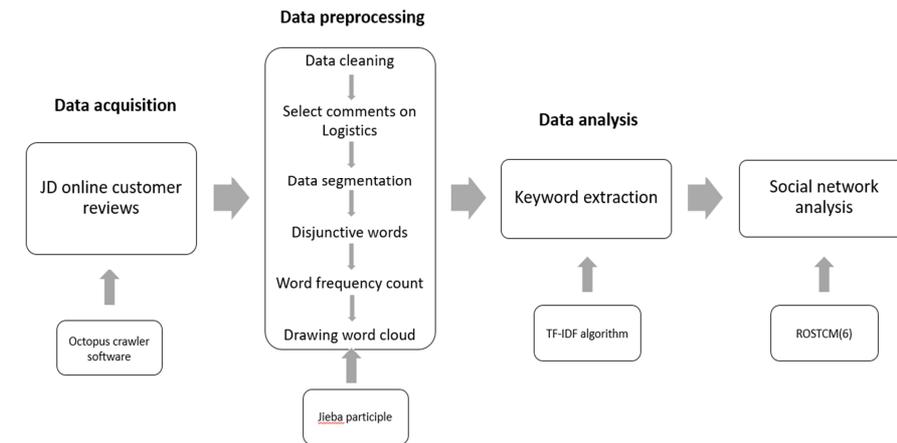


Figure 1: The research flow chart of this paper

3.2. Data acquisition

The data source of this paper is the comments on the selected commodities on JD e-commerce platform by using Octopus software. In order to avoid the data being too one-

sided, the review data used in this paper comes from cosmetics, wearables, electrical appliances, mobile phones, kitchenware, snacks, books, plants and other types of goods, which ensures the comprehensiveness of the research object and makes the research conclusions more convincing, and all the review contents collected in the recent year, It ensures the real-time and applicability of the research conclusions.

The data used in this paper contains a total of 10499 comments on 11 kinds of Jingdong self operated commodities. After summarizing dozens of words including logistics characteristics, such as "logistics", "express", "packaging", "customer service", "after-sales", "delivery", "distribution" and "delivery", 3154 comments related to logistics related service links were screened out After removing the duplicate data and other processing, a total of 3090 effective comment data were obtained. The statistics and screening results of comment data are shown in Table 1.

Table 1: JD e-commerce platform product review data statistics

Commodity type	Trade name	Number of medium and poor reviews collected	Selected logistics related review data
Cosmetics	Lanzhi cream	853	355
	Mac lipstick	833	352
Wearables	Nike brand sports shoes	993	263
	Daniel Wellington men's Watch	750	165
Electrical equipment	Mi TV	993	381
Mobile phone	Mi phones	997	170
Kitchenware	SUPOR wok	1000	282
	SUPOR steamer	998	301
Snacks	Liangpin shop	954	252
	Three squirrels	414	138
Book	《Silent Cruise》	381	113
	《A long farewell》	388	117
Botany	Potted plants	895	201
Total		10499	3090

4.2. Keyword extraction

This paper uses unsupervised learning TF-IDF algorithm to extract keywords. TF-IDF (term frequency inverse document frequency, TF-IDF) is a common weighting technique for information retrieval and data mining. The main idea of TF-IDF is: if a word or phrase appears frequently in one article and rarely in other articles, it is considered that the word or phrase has good classification ability and is suitable for classification.

TF is the term frequency, which indicates the frequency of a keyword (entry) in the text. If set $tf_{i,j}$ is the entry t_i in document d_j . Let the entry appear in document d_j . The number of occurrences in J is $n_{i,j}$, then the following is the calculation formula of TF:

$$tf_{i,j} = \frac{n_{i,j}}{\sum_k n_{k,j}}$$

IDF is the inverse document frequency index, which is often used to measure the universal importance of an entry. The main idea of IDF is: if there are fewer documents containing entry t_i , that is, the smaller the entry $n_{i,j}$ is, the larger the IDF is, then entry t_i has a good ability to distinguish categories. If $|D|$ is the total number of documents in the corpus, and $|\{j: t_i \in d_j\}|$ is the number of documents containing entry t_i (that is, the number of documents with $n_{i,j} \neq 0$). The following is the calculation formula of IDF:

$$idf_i = \lg \frac{|D|}{1 + |\{j: t_i \in d_j\}|}$$

If the entry is not in the corpus, the denominator will be 0, so $1 + |\{j: t_i \in d_j\}|$ is the denominator.

TF-IDF is a keyword extraction method based on unsupervised learning. The larger the TF-IDF value of a word, the more it can reflect the characteristics of the document. The following is the calculation formula of TF-IDF:

$$tfidf_{i,j} = tf_{i,j} \times idf_{i,j}$$

In this paper, the keywords with word length greater than 1 and TF-IDF ranking in the top 200 are selected for statistical analysis, and the vocabulary of medium and poor evaluation keywords with word frequency and weight value in logistics service related reviews is obtained. Due to the large amount of data, only a part of the vocabulary (as shown in table 2) is displayed, such as "packaging", "Jingdong", "price reduction", "return", "things", etc. "Express", "arrival", "self support", "after sale", "logistics" and so on. It can be seen from table 2 that among the poor reviews of many commodities extracted from JD platform, the problems of packaging, price guarantee, return and exchange, and express logistics are more prominent, so improvement suggestions should be put forward from these aspects, so as to enhance consumer satisfaction. This article

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uses Python's jieba library to extract keywords for five types of commodities. The extraction results are as follows:

Table 2: Keyword list (part)

Sl. no.	Keyword	Frequency	TF-IDF value	Sl. No.	Keyword	Frequency	TF-IDF value
1	Packing	873	0.1377	16	self-support	93	0.0239
2	JD	665	0.0924	17	After sales	209	0.0239
3	Price reduction	306	0.0754	18	Taste	77	0.0208
4	Thing	311	0.0731	19	Logistic	223	0.0208
5	Return goods	112	0.0447	20	Attitude	193	0.0200
6	Open	174	0.0439	21	Deliver goods	113	0.0200
7	Receive	298	0.0385	22	Service	259	0.0193
8	Express	434	0.0347	23	Humble	109	0.0185
9	Goods	113	0.0339	24	Return and exchange	55	0.0185
10	Arrival	181	0.0339	25	Distribution	70	0.0177
11	Price	114	0.0293	26	Sign for	42	0.0170
12	Box	139	0.0285	27	Mark	33	0.0162
13	Disconnect	58	0.0262	28	Freight	23	0.0154
14	Problem	56	0.0254	29	Speed	84	0.0147
15	Outer packing	47	0.0247	30	Transport	19	0.0139

4.3. Analysis results

This paper uses rostm (6) to analyze the co-occurrence of high-frequency words and semantic network of the keywords extracted from logistics service related reviews. The documents used in the analysis include the top 200 words of logistics service related high-frequency words, and the co word matrix and semantic network analysis diagram include the top 100 words of logistics service related high-frequency words, The analysis

results are obtained through semantic network diagram and co-occurrence frequency table. Due to the large amount of data, only a part of the co-occurrence frequency table is shown (as shown in Table 3).

Table 3: Co-occurrence frequency table of high frequency keywords (part)

Keyword 1	Keyword 2	Co-occurrence frequency	Keyword 1	Keyword 2	Co-occurrence frequency
humble	packing	101	JD	attitude	35
JD	express	95	express	received	35
packing	oprn	87	JD	return goods	34
express	packing	73	express	service	32
attitude	service	73	give	packing	31
JD	packing	72	logistics	Fast	31
JD	service	68	after sales	Apply	31
packing	Box	64	after sales	problem	31
JD	self-support	59	delivery	JD	31
quality goods	packing	59	disappointment	packing	30
logistics	JD	57	JD	deliver goods	30
JD	problem	52	color	packing	30
lipstick	packing	50	insured price	price reduction	29
JD	first	48	open	packing	29
after sales	JD	47	JD	price reduction	29
shopping	JD	43	express	open	29
quality	problem	43	buy	JD	28
damaged	packing	42	packing	obvious	27
JD	contact	41	return goods	packing	26
JD	received	40	Lipstick	box	26
disappointment	JD	40	bag	packing	26
quality	JD	39	millet	JD	25
packing	received	37	contact	received	25
Install	service	36	packing	problem	25
JD	Arrival	36	JD	Open	25

Based on the above analysis results of the cloud chart of logistics related comments, keyword thesaurus, co-occurrence matrix and semantic network analysis chart, and co-

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occurrence frequency table of high-frequency keywords, we can see that the logistics service quality problems that consumers pay attention to in the logistics service link mainly include:

First, the quality and integrity of package. Consumers are very concerned about whether the packaging of the purchased goods has been opened in advance, whether it is too simple, whether the quality is up to standard, whether it is damaged, whether there is a peculiar smell, etc;

Second, the quality, speed and signing process of express logistics. Consumers have high requirements for the speed of delivery and the time of logistics delivery. They pay attention to whether the express delivery can be delivered safely, whether the delivery and arrival are fast, whether the demand of consumers can be met in time, and whether the signing process is rigorous;

Third, communication after purchasing goods. Consumers have a high demand for the attitude of customer service staff. After purchasing goods, consumers are very concerned about whether the after-sales service is considerate, whether customer service is patient in answering questions, whether the attitude is good, and whether they can solve consumers' problems in a timely and effective manner.

Fourth, the issue of commodity insurance. For most consumers, the price of goods has a direct impact on consumers' purchase intention to a large extent, and if enterprises and businesses can not guarantee the price of goods, they will undoubtedly be greatly dissatisfied by consumers.

Fifth, corporate image. From the perspective of consumers, after purchasing goods, what they fear most is to spend money to buy fake goods. Therefore, whether the goods are authentic and whether the promises given by businesses to consumers can be fulfilled are also very concerned by consumers. These problems directly affect the corporate image of JD e-commerce platform.

Sixth, after sales service. After sales service can also greatly affect the satisfaction of consumers. In the process of after-sales service, if it is necessary to return and exchange goods, there will be problems such as after-sales personnel can not arrange in time, the speed of return and exchange goods is not fast enough, and who will bear the freight of return and exchange goods.

5. Research conclusion

According to the data analysis results of this paper, in terms of logistics service quality, the quality and integrity of package packaging, the quality, speed and signing process of express logistics, the communication problems after the purchase of goods, the problem

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of commodity price guarantee, the problem of enterprise image, and the problem of after-sales service are the main dissatisfaction factors of consumers to logistics service. Based on the above results, this paper puts forward the following improvement suggestions and measures for the logistics service quality problems of JD e-commerce platform

First, in terms of package, JD e-commerce platform should formulate corresponding packaging specifications according to different types of goods. Different types of goods should use the most reasonable packaging materials and packaging schemes. While ensuring the beauty and integrity of commodity packaging, it should also strictly eliminate the phenomenon of too simple and excessive packaging.

Second, in terms of express delivery and logistics, we should improve the delivery and delivery process of goods, improve the delivery and delivery efficiency, improve the arrival operation process, strengthen cooperation with third-party logistics companies, and actively deal with the "last mile" problem. We should have a long hand, constantly expand the scope of delivery, and cover more distant areas. Adhere to the consumer's manual confirmation of receipt as the standard, to avoid the phenomenon of automatic order sign in before arrival.

Third, for the communication between consumers and customer service, we should conduct unified professional training for customer service, improve the communication ability of customer service personnel, effectively respond to the needs of different consumers, adhere to the principle that customers are God, and resolutely avoid the emotional phenomenon of customer service personnel.

Fourth, in terms of commodity prices, we should strictly abide by the regulations on commodity insurance. If a commodity participates in multiple activities, we should compensate consumers for the price difference according to the price of the last activity, so as to increase consumers' trust in the platform brand.

Fifthly, in terms of corporate image, JD e-commerce platform should form a united front with businesses, strengthen the management of the platform to businesses, strictly guarantee the quality of goods purchased by consumers, seriously deal with complaints from consumers, give the best solution, and give consumers the most fair and just treatment, Maintain a good image of the enterprise in the hearts of consumers.

Sixth, in the aspect of after-sales service, we should improve the service level of the staff, handle the return and exchange applications submitted by consumers in time, improve the return and exchange efficiency, and clarify the responsibility of who is responsible for the freight before consumers buy the goods. For the exchange link, the relevant staff should receive the goods to be exchanged in time, and shorten the cycle of the exchange process.

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REFERENCES

1. Yanyan Guo, Yingying Ren and Baiyun Yuan, Research on JD logistics service quality based on text mining, *Logistics Science and Technology*, 43(12) (2020) 22-26.
2. Yifei Liu, Research on cross border e-commerce platform logistics service quality based on user online evaluation, *Logistics Technology*, 39(11) (2020) 78-82.
3. Fanfan Hu and Hu Li, Research on service quality evaluation of crowdsourcing logistics platform based on instant delivery, *Logistics Technology*, 43(11) (2020) 40-44.
4. Menghan Zhao and Lihua Wu, Evaluation of e-commerce logistics service quality based on cluster analysis, *Journal of Beijing University of Information Technology*, 35 (2) (2020) 85-89.
5. Yuanrong Hu, Ling Zhou, Sainan Li, et al., Multi dimensional analysis of logistics service quality based on online reviews and its impact on users' purchase intention, *Contemporary Economy*, 12 (2019) 122-126.
6. Xiuhong Guo, The path to improve the quality of rural e-commerce logistics service under the Rural Revitalization Strategy, *Shanxi Agricultural Economics*, 17 (2020) 75-76.
7. Ling Xie, Lin Zhou, Xiaoqin Li, et al., Regional differentiation of terminal distribution service quality of rural e-commerce logistics: a case study of four districts and counties in Chongqing, *Logistics Technology*, 39(11) (2020) 73-77.
8. Luyuan Lin, Evaluation of rural e-commerce logistics service level under the background of rural industry revitalization, *Journal of Changchun Normal University*, 39(10) (2020) 197-200.
9. Xi Zhu, Research on service evaluation and decision model construction of B2C cross border e-commerce logistics, *Journal of Anhui Radio and TV University*, 2 (2020) 8-13.
10. Xiaobing Qiao and Liming Wu, Construction of B2C cross border e-commerce logistics service quality evaluation system, *China Collective Economy*, 10 (2020) 99-100.
11. Wei Wu, Research on evaluation index of logistics service quality in B2C mobile online shopping environment, *Journal of Xiangyang Vocational and Technical College*, 18(4) (2019) 77-80.
12. Yanqi Zhang, Analysis of the impact of cross border logistics service quality on customer satisfaction, *Economic Research Guide*, 7 (2021) 144-146.
13. Jain Nikunj Kumar, Gajjar Hasmukh and Shah Bhavin J., Electronic logistics service quality and repurchase intention in e-tailing: Catalytic role of shopping satisfaction,

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- payment options, gender and returning experience, *Journal of Retailing and Consumer Services*, 2021, 59.
14. Ying Dai, Yu Li, Xiaodong Yu, et al., Empirical study on influencing factors of cross border e-commerce logistics service satisfaction, *Journal of Chongqing University of Technology*, 35(1) (2020) 60-69.
 15. Shuxin Yi, An empirical study on the impact of cross border e-commerce logistics service quality on customers' repurchase intention, *Business Economics Research*, 17 (2020) 85-88.
 16. Sabine Limbourg, Ho Thi Quynh Giang and Mario Cools, Logistics service quality: the case of Da Nang City, *Procedia Engineering*, 142 (2016) 124-130.