Science, Technology and Social Sciences Procedia
2021; 2021(1): acm008
https://wjst.wu.ac.th/index.php/stssp

# Customer Satisfaction on E-commerce Logistics Distribution Service Quality: A Case Study of Jingdong

**Wenqiang Dong[1,*] and Panida Chamchang[2]**

*[1]College of Graduate Studies, Walailak University, Nakhon Si Thammarat 80160, Thailand*
*[2]School of Management, Walailak University, Nakhon Si Thammarat 80160, Thailand*

**([*]Corresponding author's e-mail: 634428113@qq.com)**

## Abstract

This paper studies the satisfaction theory. Based on the China Satisfaction Index Model (CCSI) that meets China's national conditions and previous studies, the CCSI is improved according to the characteristics of e-commerce companies, and 5 dimensions are determined, namely Enterprise contact, perceived service quality, communication and convenience quality, service price and expected quality, build a customer satisfaction model for e-commerce logistics and distribution services. Based on these 5 dimensions, 21 evaluation index systems for e-commerce logistics and distribution services based on customer perception have been constructed. A questionnaire was designed, and SPSS software was used to test the reliability and validity of the scale through empirical research, and the structural equation model was used to conduct empirical research with Jingdong e-commerce logistics as an example. The empirical results showed that the perceived service quality and the quality of communication and convenience The effects of customer satisfaction coexist, and both have a greater impact on customer satisfaction. Improving the quality of e-commerce logistics and distribution services should focus on these 2 aspects. And it provides reasonable countermeasures and suggestions.

**Keywords**: E-commerce logistics distribution, Logistics service quality, Customer satisfaction; Structural equation model

## Introduction

### *Research background*

As of June 2019, the number of online shopping users in China reached 639 million, an increase of 28.71 million from the end of 2019, accounting for 74.8 % of the total number of Internet users. Online shopping and Internet payment have become consumers' major consumption methods. With the soaring volume of online shopping orders, the development of logistics and distribution is far from keeping up with the development of online shopping, and it has gradually revealed that there are big problems in the quality of services provided by e-commerce logistics and distribution, such as the loss, damage, and delay of goods. It directly affects customers' satisfaction with the quality of distribution services.

From the overall point of view, the impact of customer satisfaction during the entire shopping process includes the quality of the logistics and distribution services provided by the enterprise, and even plays a very important role. Therefore, the current research on the influencing factors of logistics and distribution service quality is a very important task for improving customer satisfaction. Customer satisfaction greatly affects the operating performance of e-commerce companies. The service quality of e-commerce logistics

and distribution is an important factor in retaining customers and enhancing the competitiveness of e-commerce enterprises.

Therefore, if e-commerce companies want to have strong competitiveness in the market, they must improve the quality of their logistics and distribution services to increase customer satisfaction. Regarding the field of logistics and distribution services, looking up a large amount of literature can find that the current domestic scholars' research on the logistics industry is mainly on the analysis of the status quo of the competitiveness of the logistics industry and the network layout, and there are few studies on the quality of logistics and distribution services. From the perspective of customers, this paper studies the customer's satisfaction with the quality of logistics and distribution services in order to provide evidence for the direction of improvement of e-commerce companies and improve the quality of e-commerce companies' logistics and distribution services

### Objective

If an e-commerce company wants to survive in the market, it must constantly discover its own problems, through continuous self-improvement, win the trust of customers, understand the true needs of customers, and achieve the goal of customer satisfaction. This article has the following purposes by studying the service quality of logistics distribution. First, study the impact of logistics service quality on online shopping satisfaction, and conduct empirical research on JD.com as an example. Second, by studying the quality of Jingdong's logistics and distribution services and the results of empirical analysis, in order to study the current impact of logistics and distribution service quality on customers'online shopping behaviors, and to explore how to improve the quality of logistics and distribution services when customers have dynamic behaviors. Provide reference for the optimization of logistics and distribution service quality. There are 2 objectives; first, to study the impact of logistics service quality on online shopping satisfaction through Jingdong for example; second, to explore how to improve the quality of logistics distribution service and put forward countermeasures for the quality of logistics and distribution service.

## Literature review

### Research on customer satisfaction research

In 2001, China established the CCSI model. The CCSI model is based on the ACSI model and consists of 6 structural variables and 10 path relationships. Removed customer complaints, increased corporate exposure variables, while changing customer expectations to expected quality; increased corporate exposure to the path of perceived quality and expected quality.

Chen (2019) built a research hypothesis model around the theme of customer satisfaction. Introduce customer participation adjustment variables, including four dimensions of tangibility, safety, responsiveness and reliability. Yang and Wang (2019) proposed a third-party logistics enterprise customer satisfaction evaluation index system, and designed the weights of each index, and finally conducted an empirical study to test the feasibility of the model. The structural equation model was used to analyze the residents' satisfaction, and the customer satisfaction index model was optimized through continuous revision (Luo et al., 2013).

### Research on customer satisfaction of logistics service quality

Eleonora et al. (2006) conducted an empirical study on the customer satisfaction and quality of logistics services and pointed out that companies are competitive in the industry and should continuously improve the quality of their logistics services. And the study found that when customers are not satisfied with the quality of service, they will choose to go shopping on other websites. Donna et al. (2008) pointed out that

customers believe that shopping on the Internet is risky. If the quality of the logistics services provided by the company does not meet their expectations, they will choose to shop on the relevant website.

Kennth (2005) analyzed the influencing factors of online shopping, and the results showed that products and the quality of services provided are the focus of customers' attention and can directly affect customer loyalty and satisfaction. Rooney (1994) proposed a logistics service quality model based on customer service. However, the study only reached the conclusion that there is a strong positive correlation between customer satisfaction and the quality of logistics services, and did not study the factors that affect the quality of logistics services.

Yang and Jun (2008) conducted an empirical study on relevant online reviews, and found that reliability and convenience are the key factors that have the most significant impact on customers' evaluation of logistics service quality. Xing and Grant's (2007) evaluation of online shopping logistics service quality and customers' evaluation of logistics services Empirical research on the content reveals 6 factors that affect online shopping flow services, including delivery speed, staff communication quality, order error handling, order quality, and convenience.

**Comprehensive review**

A summary study of relevant domestic and foreign literature reveals that in recent years, domestic and foreign scholars have gradually paid attention to the research on the quality of e-commerce logistics services. Domestic scholars have studied the problems of logistics services and the relationship between logistics distribution and e-commerce. The construction of models and the analysis of key factors are mostly based on qualitative analysis. Quantitative analysis is still relatively. In the quantitative analysis, the methods used to determine the weights are mostly subjective evaluation methods such as analytic hierarchy process, etc., and the objective analysis of them is still relatively small. Moreover, most of the research on it is concentrated in the stage of theoretical model construction, and it is not too mature to conduct specific and detailed research on the indicators, and the analysis of the evaluation results when the results are obtained needs to be further refined. E-commerce logistics and distribution services have their uniqueness, change and development. Some past research results on the quality of logistics services are not completely suitable for the current evaluation of the current e-commerce logistics and distribution service quality in my country. Therefore, on the basis of the relevant literatures studied by previous scholars, the construction of the index system will be further improved, and scientific and effective methods will be selected to determine the weights and conduct multi-directional evaluations. With the continuous development of society and the continuous improvement of the domestic economic level, the demand for logistics and distribution is also increasing. E-commerce companies should pay more attention to the quality and management of logistics and distribution services. With the enhancement of customers' online purchasing power, more attention should be paid to the service quality of logistics and distribution at this time. This paper combines the research methods and contents of the relevant literature of domestic and foreign scholars, draws on the relevant research theories at home and abroad, and combines the status quo of the logistics and distribution services of JD.com. It analyzes specific issues and explores the impact of e-commerce logistics and distribution service quality on the customer network. The impact of purchasing behavior, the final research results can provide suggestions for e-commerce companies to improve the quality of logistics services.

**Research purposes**

1) Turn satisfied customers into loyal customers.
2) Attract more new customers to purchase.
3) Provide suggestions for improving JD's deficiencies.

### Hypothesis

H1: Corporate exposure has a positive impact on customer satisfaction;

H2: Communication and convenient quality have a positive impact on customer satisfaction;

H3: Expected quality has a positive effect on customer satisfaction;

H4: Perceived service quality has a positive impact on customer satisfaction;

H5: Service price has a positive effect on customer satisfaction;

H6: There is a positive interaction between service prices and business contacts;

H7: There is a positive interaction between perceived service quality and business contacts;

H8: Convenient communication, quality and business contacts have a positive mutual influence;

H9: It is expected that there will be a positive interaction between quality and business contacts;

H10: There is a positive interaction between service price and expected quality;

H11: There is a positive interaction between expected quality and perceived service quality;

H12: There is a positive interaction between the quality of communication convenience and the expected quality;

H13: Perceived service quality and service price have a positive mutual influence;

H14: There is a positive interaction between the quality of communication convenience and the perceived service quality;

H15: Convenient communication, quality and service prices have a positive mutual influence.

### Conceptual framework

Conceptual framework in **Figure 1**.

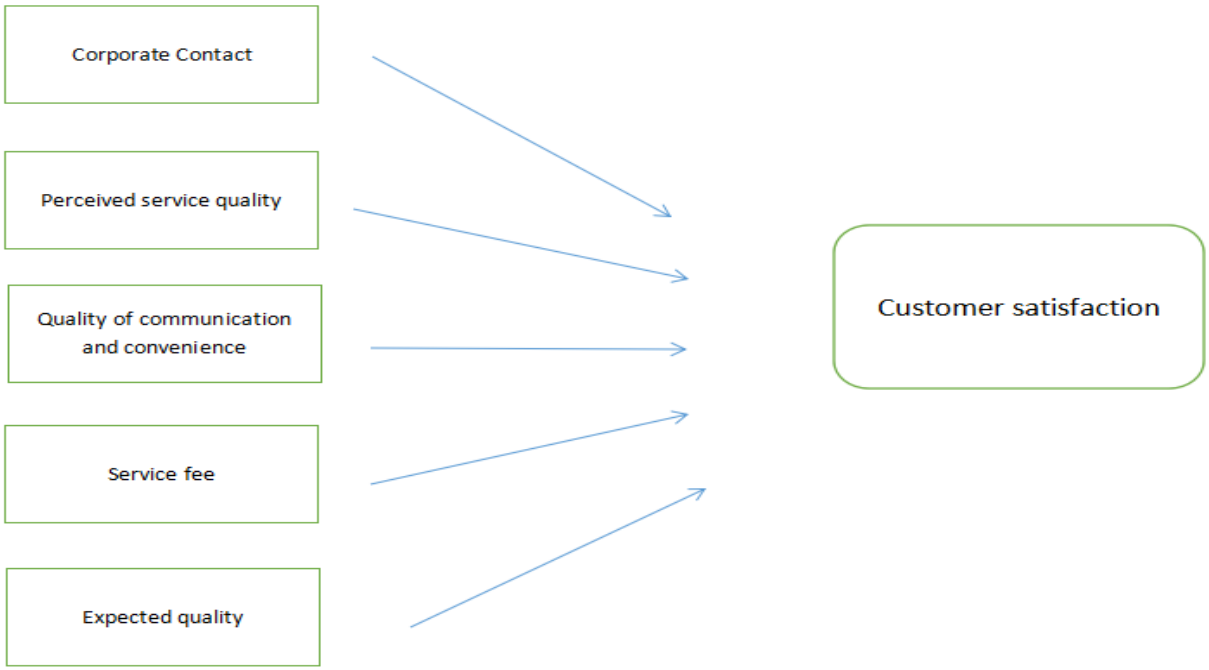


**Figure 1** Conceptual framework.

## Research methods

### Population

The questionnaire is distributed to different types of people across the country.

**Data collection**

***How to collect***

Through the collection of online questionnaires and paper questionnaires.

***What data to collect***

The basic information of the customer and the degree of customer satisfaction with each evaluation index.

**Data analysis**

***Descriptive statistical analysis***

The relevant statistical data of each scale meets the requirements. The point value is set to a maximum of 7 points.

The sample population distribution is as follows, 360 questionnaires received 300 valid questionnaires. The maximum absolute value of the kurtosis of the questionnaire data sample is 2.857, which is lower than the standard value of 10, and the numerical distribution is normally distributed. The maximum absolute value of the skewness of the sample data is 1.465, which is less than the standard value of 3, and the maximum standard deviation of the sample is 1.601, indicating that the numerical distribution has little difference and the dispersion is small. The smallest mean is 5.23, the largest is 5.92, the difference between the mean is not big. Therefore, the relevant statistical data of each scale meets the requirements.

**Table 1** Sample distribution.

| Sample classification | Option | Frequency | Percentage |
|---|---|---|---|
| sex | Male | 122 | 40.7 % |
| | Female | 178 | 59.3 % |
| age | Under the age of 18 | 34 | 11.3 % |
| | 19 - 35 | 160 | 53.3 % |
| | Age of 35 - 50 | 86 | 28.7 % |
| | 50 Years old and above | 20 | 6.7 % |
| occupation | student | 159 | 53 % |
| | Enterprise and business staff | 65 | 21.7 % |
| | self-employed businessman | 43 | 14.3 % |
| | retiree | 22 | 7.3 % |
| | other | 11 | 3.7 % |
| Average number of online shopping per month | 3 or less times | 96 | 32 % |
| | 4 - 7 times | 120 | 40 % |
| | 8 - 10 times | 48 | 16 % |
| | 10 & More | 36 | 12 % |
| Online shopping history | 2 years and less | 29 | 9.7 % |
| | 3 - 5 years | 177 | 59 % |
| | 6 - 10 Years | 86 | 28.7 % |
| | More than 10 years | 8 | 2.7 % |

**Table 2** Descriptive statistics.

| | N | Mean | Standard | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|
| | Statistics | Statistics | Statistics | Statistics | Standard | Statistics | Standard |
| Jingdong visibility | 300 | 5.67 | 1.166 | −1.087 | 0.165 | 1.566 | 0.329 |
| Jingdong public image | 300 | 5.30 | 1.105 | −0.667 | 0.165 | 0.587 | 0.329 |
| Delivery quantity accuracy | 300 | 5.90 | 1.184 | −1.465 | 0.165 | 2.857 | 0.329 |
| Commodity loss rate | 300 | 5.45 | 1.601 | −1.215 | 0.165 | 0.781 | 0.329 |
| merchandise integrity | 300 | 5.92 | 1.018 | −1.066 | 0.165 | 1.102 | 0.329 |
| Complete the outer packaging | 300 | 5.80 | 1.094 | −0.798 | 0.165 | 0.164 | 0.329 |
| arrival rate on time | 300 | 5.62 | 1.253 | −0.925 | 0.165 | 0.849 | 0.329 |
| Employee business ability | 300 | 5.59 | 1.156 | −0.899 | 0.165 | 0.978 | 0.329 |
| Employee work attitude | 300 | 5.52 | 1.194 | −0.699 | 0.165 | 0.262 | 0.329 |
| Employee work efficiency | 300 | 5.65 | 1.192 | −0.594 | 0.165 | −0.490 | 0.329 |
| Logistics charge price level | 300 | 4.62 | 1.406 | −0.102 | 0.165 | −0.635 | 0.329 |
| Diversity and transparency of charging methods | 300 | 4.64 | 1.463 | −0.388 | 0.165 | −0.567 | 0.329 |
| Service quality for the staff expect | 300 | 5.75 | 0.934 | −0.618 | 0.165 | 0.179 | 0.329 |
| Expectations the logistics distribution | 300 | 5.76 | 1.072 | −1.003 | 0.165 | 1.410 | 0.329 |
| Communication hotline is smooth | 300 | 5.23 | 1.159 | −0.486 | 0.165 | 0.123 | 0.329 |
| Reasonable communication time | 300 | 5.23 | 1.209 | −0.538 | 0.165 | −0.200 | 0.329 |
| Access to logistics information | 300 | 5.45 | 1.261 | −0.599 | 0.165 | −0.413 | 0.329 |
| On-route information tracking | 300 | 5.52 | 1.270 | −0.917 | 0.165 | 0.631 | 0.329 |
| Number of outlets and coverage | 300 | 5.44 | 1.261 | −0.701 | 0.165 | 0.237 | 0.329 |
| Door-to-door satisfaction degree | 300 | 5.42 | 1.200 | −0.644 | 0.165 | 0.584 | 0.329 |
| Personalized satisfaction degree of packaging | 300 | 5.34 | 1.073 | −0.261 | 0.165 | −0.373 | 0.329 |

***Trust level analysis***

After the data is tested by Cronbach's Alpha, the Cronbach's Alpha value of the latent variables is greater than 0.7, and the Cronbach's Alpha of the total table is 0.907, indicating that all the measured variables have good consistency and validity, so they are considered to be reasonable data available, which shows that this survey questionnaire has good reliability.

**Table 3** Results of the reliability test for the latent variables.

| Sublatent variables | Number of observed variables | Cronbach's Alpha |
|---|---|---|
| Corporate contact | 2 | 0.719 |
| Communication and convenient | 5 | 0.849 |
| Perceive service quality | 10 | 0.879 |
| service price | 2 | 0.718 |
| Expected quality | 2 | 0.820 |
| Total sheet | 21 | 0.907 |

***Validity test***

Here, the component numbers such as 1, 2, ..., 21 are the corresponding components such as "Jingdong popularity" in the above descriptive statistics table.

The results of Bartlett's sphericity test show that Sig = 0.000 < 0.5, indicating that the correlation between variables is high, and the validity of the data is good.

**Table 4** Result of KMO and Bartlett's test.

| | | | |
|---|---|---|---|
| The Kaiser-Meyer-Olkin measure of sampling adequacy | | 0.901 | |
| Bartlett's sphericity test | Approximate chi-square | 2056.912 | |
| | df 210 | | |
| | | Sig. | 0.000 |

**Table 5** Total variance.

| Ingredients | Initial eigenvalue | | | Extract the sum of squares and load | | | Rotate the sum of squares loading | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Variance % | Accumulation % | Total | Variance % | Accumulation % | Total | Variance % | Accumulation % |
| 1 | 7.967 | 37.939 | 37.939 | 7.967 | 37.939 | 37.939 | 4.449 | 21.185 | 21.185 |
| 2 | 1.647 | 7.844 | 45.783 | 1.647 | 7.844 | 45.783 | 3.527 | 16.798 | 37.983 |
| 3 | 1.196 | 5.697 | 51.479 | 1.196 | 5.697 | 51.479 | 1.913 | 9.111 | 47.094 |
| 4 | 1.140 | 5.427 | 56.906 | 1.140 | 5.427 | 56.906 | 1.696 | 8.077 | 55.170 |
| 5 | 1.019 | 4.853 | 61.759 | 1.019 | 4.853 | 61.759 | 1.384 | 6.589 | 61.759 |
| 6 | 0.893 | 4.251 | 66.010 | | | | | | |
| 7 | 0.844 | 4.021 | 70.031 | | | | | | |
| 8 | 0.776 | 3.695 | 73.726 | | | | | | |
| 9 | 0.715 | 3.405 | 77.131 | | | | | | |
| 10 | 0.635 | 3.024 | 80.155 | | | | | | |
| 11 | 0.619 | 2.948 | 83.103 | | | | | | |
| 12 | 0.559 | 2.664 | 85.767 | | | | | | |
| 13 | 0.482 | 2.296 | 88.063 | | | | | | |
| 14 | 0.459 | 2.186 | 90.249 | | | | | | |
| 15 | 0.431 | 2.052 | 92.301 | | | | | | |
| 16 | 0.364 | 1.735 | 94.035 | | | | | | |
| 17 | 0.324 | 1.542 | 95.577 | | | | | | |
| 18 | 0.283 | 1.349 | 96.926 | | | | | | |
| 19 | 0.265 | 1.263 | 98.188 | | | | | | |
| 20 | 0.200 | 0.952 | 99.140 | | | | | | |
| 21 | 0.181 | 0.860 | 100.000 | | | | | | |

Extraction method: Principal component analysis.

## Result

Construct a customer satisfaction model for JD logistics services.

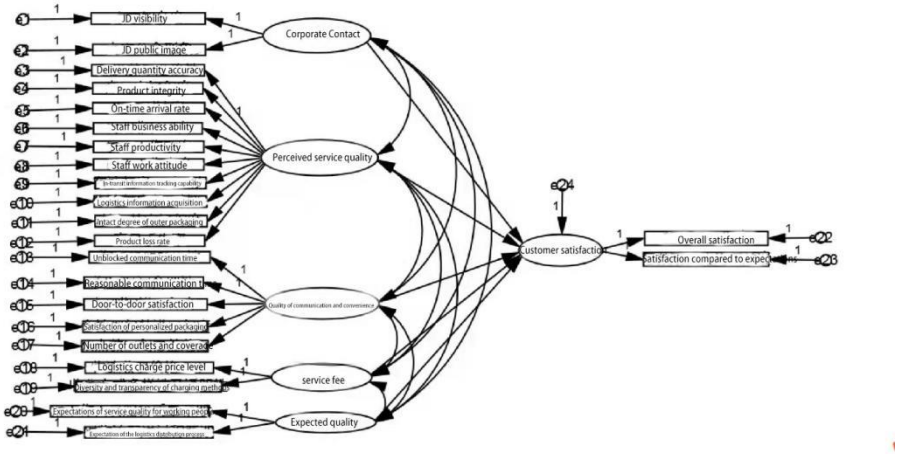


**Figure 2** JD logistics distribution service customer satisfaction path map.

### Model estimation and fitting

Import the data into the AMOS software for calculation and estimation. As shown in the table, the fitness indicators of the output results are generally performing well.

**Table 6** Results of the main fitness index test.

| Index name | Absolute fit measures | | | | Value-added fit index | | | Parsimony fit index | |
|---|---|---|---|---|---|---|---|---|---|
| | X2/DF | RMR | GFI | RMSEA | TLI | CFI | IFI | PGFI | PNFI |
| evaluation | < 3 | < 0.05 | > 0.8 | < 0.08 | > 0.8 | > 0.8 | > 0.8 | > 0.5 | > 0.5 |
| Output results | 1.993 | 0.086 | 0.851 | 0.068 | 0.882 | 0.897 | 0.899 | 0.678 | 0.710 |
| Adaptive judgment | accord with | A little bias | accord with | accord with | accord with | accord with | accord with | accord with | accord with |

Draw a path diagram of the relationship between variables in the AMOS software, and assign values.

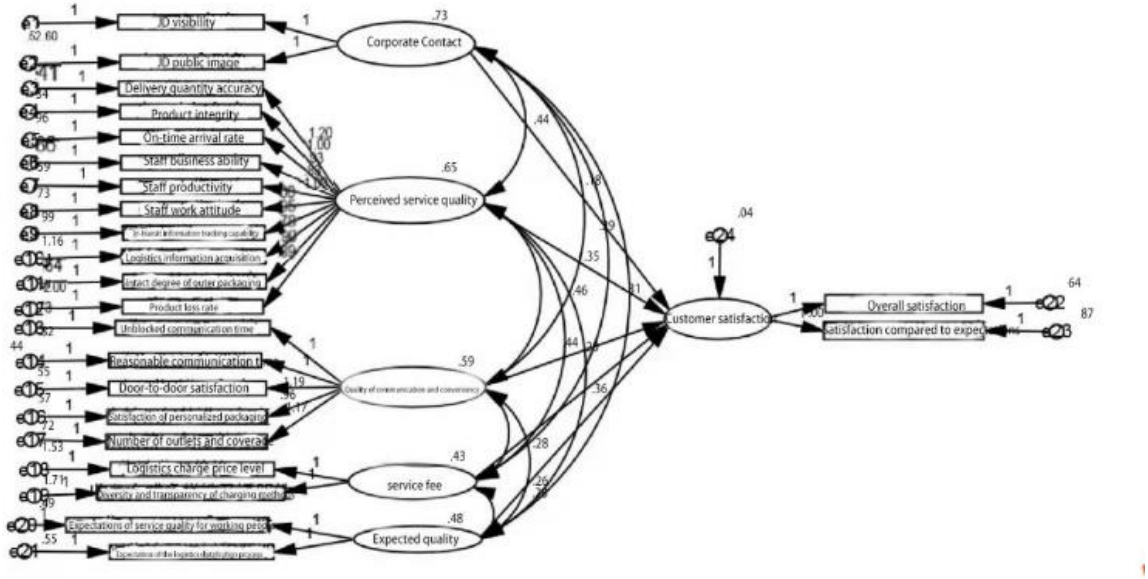


**Figure 3** Model calculation estimated output path diagram.

From the results in the table below, it can be concluded that the regression coefficients of corporate exposure and service prices and service prices and expected quality have not reached significance, and this path should be adjusted.

**Table 7** Pathway coefficients and significance levels for the 5 exogenous latent variables.

| | | | **Estimate** | **S.E.** | **C.R.** | **P** |
|---|---|---|---|---|---|---|
| Corporate contact | ↔ | service price | −0.009 | 0.087 | −0.099 | 0.921 |
| Corporate contact | ↔ | Expected quality | 0.126 | 0.063 | 2.010 | 0.044 |
| Perceive service quality | ↔ | Communication and convenient quality | 0.547 | 0.073 | 7.535 | *** |
| Perceive service quality | ↔ | service price | 0.270 | 0.077 | 3.504 | *** |
| Perceive service quality | ↔ | Expected quality | 0.303 | 0.062 | 4.925 | *** |
| Communication and convenient quality | ↔ | service price | 0.374 | 0.084 | 4.453 | *** |
| Communication and convenient quality | ↔ | Expected quality | 0.208 | 0.058 | 3.599 | *** |
| Corporate contact | ↔ | Perceive service quality | 0.477 | 0.072 | 6.604 | *** |
| Corporate contact | ↔ | Communication and convenient quality | 0.354 | 0.072 | 4.910 | *** |
| service price | ↔ | Expected quality | 0.078 | 0.062 | 1.262 | 0.207 |

The path coefficients between the 5 latent variables and customer satisfaction are shown in the following table. The output results show that the non-standardized path coefficients of enterprise contact, perceived service quality, communication and convenience quality to customer satisfaction are all positive, and the *p*-value are all positive. Less than 0.05, which indicates that the impact of corporate contact, perceived service quality, communication and convenience quality on customer satisfaction has reached a positively significant level. The *p*-value of service price and expected quality are 0.467 and 0.642, respectively, indicating that the impact on customer satisfaction has not reached a positively significant level, and this path should be adjusted.

**Table 8** Pathway coefficient and significance level of exogenous latent variables to customer satisfaction.

| | | | **Non-standardized, path coefficient** | **S.E.** | **C.R.** | **P** | **Standardized path coefficients** |
|---|---|---|---|---|---|---|---|
| customers | ← | Corporate contact | 0.197 | 0.092 | 2.136 | 0.033 | 0.252 |
| customers | ← | Perceive service | 0.374 | 0.140 | 2.676 | 0.007 | 0.475 |
| customers | ← | Communication and | 0.451 | 0.127 | 3.557 | *** | 0.614 |
| customers | ← | service price | −0.153 | 0.210 | −0.727 | 0.467 | −0.150 |
| customers | ← | Expected quality | −0.058 | 0.125 | −0.464 | 0.642 | −0.60 |

According to the above table, the relationship between the latent variables is compared. By analyzing the non-standardized path coefficients of the 5 exogenous latent variables to customer satisfaction, it can be seen that the coefficient of the company's exposure to customer satisfaction is 0.197, and the *p*-value is 0.33, indicating that the company Exposure has a positive and significant impact on customer satisfaction; the non-standardized path of service price and expected quality to customer satisfaction is negative, and the *p*-value is greater than 0.5, indicating that the service price is reasonable and the expected quality improves customer satisfaction cannot promote, so adjust these 2 paths.

***Modification of the model***

When the model fit is not ideal, make appropriate corrections to the model. The symbol here corresponds to the symbol in the path diagram.

**Table 9** The value of correction model index.

| | | | **M.I** |
|---|---|---|---|
| el5 | ↔ | F5 | 8.024 |
| el5 | ↔ | el6 | 12.570 |
| e5 | ↔ | ell | 5.021 |
| e20 | ↔ | F2 | 5.521 |
| e21 | ↔ | F2 | 6.028 |
| e21 | ↔ | ell | 5.449 |
| el4 | ↔ | F5 | 5.292 |
| el4 | ↔ | e6 | 7.301 |
| el4 | ↔ | el3 | 49.386 |
| e3 | ↔ | Fl | 8.942 |
| e4 | ↔ | ell | 15.476 |

The revised index value can provide a reference for the modification of the path diagram. After inspection and exclusion, the 2 pairs of indexes el3, el4, e4, and ell can be revised. After the correction of C.R. value and MI value, it is found that each path has reached the significance level, as shown in the following table;

**Table 10** Modified path coefficient and the results of significance test.

| | | | **Non-standardized path coefficients** | **S.E.** | **C.R.** | **P** |
|---|---|---|---|---|---|---|
| customers satisfaction degree | ← | Corporate contact | 0.179 | 0.087 | 2.062 | 0.039 |
| customers satisfaction degree | ← | Perceive service quality | 0.446 | 0.109 | 4.083 | *** |
| customers satisfaction degree | ← | Communication and convenient quality | 0.345 | 0.123 | 2.811 | 0.005 |
| Corporate contact | ↔ | Expected quality | 0.308 | 0.062 | 4.927 | *** |
| Percise service quality | | | | | | |
| Quantity | ↔ | Structure, communication and convenient quality | 0.460 | 0.068 | 6.813 | *** |
| Percise service quality | | | | | | |
| Quantity | ↔ | service price | 0.204 | 0.055 | 3.740 | *** |
| Percise service quality | | | | | | |
| Quantity | ↔ | Expected quality | 0.361 | 0.058 | 6.206 | *** |

| | | | Non-standardized path coefficients | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| Communication and convenience | | | | | | |
| quality | ↔ | service price | 0.257 | 0.065 | 3.971 | *** |
| Communication and convenience | | | | | | |
| quality | ↔ | Expected quality | 0.257 | 0.053 | 4.805 | *** |
| Corporate contact | ↔ | Perceive service quality | 0.442 | 0.069 | 6.453 | *** |
| Corporate contact | ↔ | Communication and convenient quality | 0.290 | 0.063 | 4.634 | *** |

The results of the above table show that the path coefficient CR between the latent variables is greater than 1.96, and the P value is less than 0.05, which can indicate that each path has reached the significance level. In order to optimize the modified model, the fitness of the modified model is tested as follows as shown in the table.

**Table 11** Results of fitness test about Revised model.

| Index name | X2/DF | Absolute fit | | RMSEA | Value-added fit index | | | Parsimony fit index | |
|---|---|---|---|---|---|---|---|---|---|
| | | RMR | GFI | | TLI | CFI | IFI | PGFI | PNFI |
| evaluation | < 3 | < 0.05 | > 0.8 | < 0.08 | > 0.8 | > 0.8 | > 0.8 | > 0.5 | > 0.5 |
| Output results | 1.653 | 0.04 | 0.873 | 0.055 | 0.922 | 0.932 | 0.933 | 0.702 | 0.742 |
| Adaptive | accord | accord | accord | accord | accord | accord | accord | accord | accord |

The results in the above table show that the fit of the model after the correction has been significantly improved compared with that before the correction. All the fitness indicators in the table have reached the standard, indicating that the data and the model fit well.

Based on the above data analysis, the theoretical hypothesis for constructing the structural equation is verified.

**Table 12** Analysis results of Hypothesis

| Hypothesis | Test State | Yes / No |
|---|---|---|
| H1 | Enterprise contact has a positive impact on customer satisfaction. | Yes |
| H2 | Communication and convenient quality have a positive impact on customer satisfaction. | Yes |
| H3 | The expected quality has a positive effect on customer satisfaction. | No |
| H4 | Perceived that service quality has a positive impact on customer satisfaction. | Yes |
| H5 | Service price has a positive effect on customer satisfaction. | No |

| Hypothesis | Test State | Yes / No |
|---|---|---|
| H6 | There is a positive interaction between service prices and business contacts. | No |
| H7 | Perceive the positive interaction between service quality and enterprise contact. | Yes |
| H8 | Convenient communication, quality and business contacts have a positive mutual influence. | Yes |
| H9 | It is expected that there will be a positive mutual influence between quality and business contacts. | Yes |
| H10 | There is a positive interaction between service price and expected quality. | No |
| H11 | There is a positive interaction between the expected quality and the perceived service quality. | Yes |
| H12 | There is a positive mutual influence between the convenient communication quality and the expected quality. | Yes |
| H13 | Perceive the positive interaction between service quality and service price. | Yes |
| H14 | There is a positive interaction between the quality of communication convenience and the perceived service quality. | Yes |
| H15 | Convenient communication, quality and service prices have a positive mutual influence. | Yes |

***Analysis of the impact between latent variables***

The path coefficient expresses the influence relationship between latent variables and between latent variables and observed variables, and the magnitude of its value indicates the degree of influence.

**Table 13** Customer satisfaction path factor.

| | Standardized path coefficients | | Sort |
|---|---|---|---|
| customers satisfaction | Corporate contact | 0.236 | 3 |
| customers satisfaction | Perceive service quality | 0.527 | 1 |
| customers satisfaction | Communication and convenient quality | 0.432 | 2 |

It can be seen from the table above, that all 3 measurement indicators have a positive impact on customer satisfaction, with the most significant effect of perceived service quality on customer satisfaction, and enterprise contact has the smallest impact on customer satisfaction. Therefore, if you want to improve customer satisfaction, because first improve the customer perceived service quality.

***Analysis of the effect of latent variables and observed variables***

**Table 14** Pathway coefficients between the latent and the observed variables.

| | | | Standardized path coefficients | sort |
|---|---|---|---|---|
| Merchandise integrity | ← | | 0.810 | 2 |
| Delivery quantity accuracy | ← | | 0.834 | 1 |
| Arrival rate on time | ← | | 0.609 | 7 |
| Employee business ability | ← | | 0.585 | 8 |
| Employee work efficiency | ← | Perceive service quality | 0.754 | 3 |
| Employee work attitude | ← | | 0.687 | 4 |
| In-route information tracking ability | ← | | 0.611 | 6 |
| Logistics information access situation | ← | | 0.508 | 9 |
| The outer packaging is intact | ← | | 0.671 | 5 |
| Commodity loss rate | ← | | 0.455 | 10 |
| Reasonable communication time | ← | | 0.699 | 3 |
| Communication hotline is smooth | ← | Communication and convenience | 0.666 | 5 |
| Door to door satisfaction service | ← | Quantity | 0.774 | 1 |
| Personalized packaging meets the service | ← | | 0.697 | 4 |
| Number of outlets and coverage rate | ← | | 0.701 | 2 |

From the above analysis, it can be concluded that the accuracy of the quantity of goods purchased by customers, the integrity of the goods purchased, the work efficiency and attitude of employees, the degree of door-to-door satisfaction, the number of business outlets and the scope of delivery, and the time period of communication The impact on customers is more significant. If you want to improve customer satisfaction, you can improve it from the above aspects.

## Conclusions

This paper studies the service quality of e-commerce logistics and distribution from the perspective of customer perception. Based on the theory of customer satisfaction, using a combination of qualitative and quantitative methods, according to the characteristics of e-commerce enterprises, the characteristics of e-commerce enterprises are from enterprise contact, perception of service quality, communication and convenience. The 5 dimensions of quality, service price and expected quality are the starting points to construct a customer satisfaction model for e-commerce logistics distribution services. Finally, taking JD Logistics as an example, SPSS software is used to carry out descriptive statistical analysis and reliability and validity tests. In the structural equation model, AMOS software conducts empirical analysis on the survey data, finds out the most critical path and factors affecting customer satisfaction in logistics services, and proposes countermeasures and suggestions to improve the quality of logistics services.

The results show that (1) Enterprise contact has a positive effect on customer satisfaction; (2) Communication and convenient quality have a positive effect on customer satisfaction; (3) Perceived service quality has a positive effect on customer satisfaction; the most prominent It is the impact of customer perception of service quality on customer satisfaction, followed by the impact of communication and

convenience quality on customer satisfaction. In the perceived service quality, the accuracy of the delivery quantity and the integrity of the product have the greatest impact on the customer's perceived service quality. It can be seen that the integrity of the product and the accurate distribution of the product are the most important to customers. In the quality of communication and convenience, door-to-door satisfaction services, the number and coverage of outlets, and the reasonableness of communication time are all very important to customers. Therefore, if you want to improve customer satisfaction, you should consider the above aspects. Make improvements.

**Give the following suggestions to Jingdong**

First, provide customers with efficient and accurate logistics and distribution services.

Second, to provide customers with high-efficiency and high-quality logistics services.

Third, improve the tracking and positioning system of goods.

Fourth, improve the personalized needs of customers and the convenience of picking up goods.

## References

Bernhardt, K. L., Douthu, N., & Kennett. P. A. (2000). A longitudinal analysis of satisfaction and profitability. *Journal of Business Research, 47*, 161-171.

Bottani, R., & Rozzi, A. (2006). Strategic management of logistics service: A fuzzy QFD approach. *International Journal of Production Economics, 103*(2), 585-599.

Chen, F. (2018). *Research on B2C e-commerce logistics service quality evaluation from the perspective of customer satisfaction*. Zhengzhou, China: North China Water Conservancy and Hydropower University Studies.

Chen, X. (2019). *Research on the relationship between service quality, customer participation and customer satisfaction*. Shanghai, China: East China University of Political Science and Law.

Davis, D. F., Golicic, S. L., & Marquardt, A. J. (2008). Branding a B2B service: Does a brand differentiate a logistics service provider. *Industrial Marketing Management, 37*, 218-227.

Feng, B., & Xin, Y. (2019). Investigation and analysis of express logistics service quality in datong city. *Journal of Yuncheng University, 6*, 22-27.

Feng, Y. X., Zheng, B., & Tan, J. R. (2007). Exploratory study of logistics service quality scale based on online shopping malls. Journal of Zhejiang University-S*cience A*, *6*, 926-931.

Fu, Y., & Ye, X. (2013). An empirical study on the improvement strategy of B2C logistics service satisfaction. *Logistics Technology, 17*, 190-192.

Gao, P., & Zhou, E. (2019). Research on the public opinion guidance and countermeasures of government crisis public relations under the background of big data-taking government microblog as an example. *Yinshan Academic Journal, 32*(6), 88-94.

Guo, C. (2018). *C2C logistics service quality evaluation research on online shopping satisfaction*. Huainan, China: Anhui University of Science and Technology.

Hartmann, E., & Grahl, A. D. (2011). The flexibility of logistics service providers and its impact on customer loyalty-an empirical study. *Journal of Supply Chain Management, 47*(3), 63-85.

He, S. (2019). Research on customer satisfaction of cold chain logistics enterprises based on structural equation model. *Social Scientist, 6*, 31-37.

He, Y., & Lv, Y. (2012). Influencing factors of logistics service quality and customer loyalty. *China Circulation Economy, 7*, 79-81.

Kenneth, K. B. (2005). Extending the supply chain: integrating operations and marketing in the online grocery industry. *Journal of Operations Management, 23*, 642-661.

Luo, Q., Wang, M., Liu, H., Lu, Z., & Liu, J. (2013). An empirical study on the customer satisfaction index model of urban community health services based on SEM. *Chinese Journal of Social Medicine, 6*, 411-414.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequence decisions. *Journal of Marketing Research, 17*(4), 460-469.

Rao, S., Goldsby, T. J., Griffis, S. E., & Iyengar, D. Electronic Logistics Service Quality (e-LSQ): Its impact on the customer's purchase satisfaction and retention. *Journal of Business Logistics, 32*, 167-179.

Rooney, J. P. (1994). *Customer satisfaction* (pp. 376-381). In Proceedings of the Annual Reliability and Maintainability Symposium, Anaheim, CA, USA.

Sheikh, S. M., & Basti, M. (2015). Customer satisfaction in business to consumer (B2C) e-commerce: A comparative study of Turkey and Pakistan. *Eurasian Journal of Business and Economics, 8*(16), 73-100.

Shi, C., Sun, Y., & Zhang, H. (2014). Research on self-driving tourist satisfaction based on structural equation model. *Geographical Research, 4*, 751-761.

Shi, X. (2020). Strategies to improve the service quality of private express delivery. *Modern Marketing* (*Late Issue*)*, 2*, 121-122.

Shi, Y., & Xu, X. (2019). Research on the influencing factors of express service quality. *Journal of Beijing Information Science and Technology University* (*Natural Science Edition*)*, 34*(06), 25-29.

Shi, Z. (2017). *Research on customer satisfaction of express service based on structural equation*. Dalian, China: Dalian Jiaotong University.

Sun, Y. (2018). Research on the impact of e-commerce terminal logistics service quality on rural residents' online shopping behavior. Changchun, China: Jilin University.

Sun, Y. (2018). *Research on the impact of e-commerce terminal logistics service quality on rural residents' online shopping behavior*. Changchun, China: Jilin University.

Vijayabanu, C., Gayathri, R., & Anand, V. Y. (2017). Customer perception towards service encounters and its impact on customer loyalty-an empirical study. *International Journal of Economic Research, 14*(9), 465-472.

Wang, A. (2020). Research on logistics service quality based on customer satisfaction. *Value Engineering, 39*(01), 233-235.

Wang, M. (2017). *Research on the relationship between yz logistics service quality and customer satisfaction*. Shaanxi, China: Xidian University.

Yang, H., & Tsai, F. (2007). General E-S-QUAL scales applied to websites satisfaction and loyalty model. *Communications of the IIMA, 7*(2), 115.

Yang, J. (2013). *Research on the influencing factors of logistics service quality in B2C e-commerce mode*. Nanjing, China: Nanjing Agricultural University.

Yang, Z., & Jun, M. (2008). Consumer perception of e-service quality. *Journal of Business Strategies, 25*(2), 201-202.

Ye, Z., Cai, L., Ye, Z., & Dai, L. (2011). An empirical study on 3PL service quality and C2C customer satisfaction. *Scientific Research Management, 32*(8), 119-126.

Yu, Q. (2014). *Research on customer satisfaction of third-party logistics enterprises based on structural*

*equation model*. Zhuzhou, China: Hunan University of Technology.

Zhang, Z. (2016). Research on the evaluation system of online shopping users' satisfaction with logistics distribution services. *Logistics Technology, 23*(11), 137-140.