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Summer 5-27-2016

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### Recommended Citation

Meng, Qingliang and Zhou, Qingwen, "Assessment of Express Delivery Service Based on SERVQUAL Model" (2016). *WHICEB 2016 Proceedings*. 17.

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# Assessment of Express Delivery Service Based on SERVQUAL Model

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**Abstract:** With the rapid development of electronic commerce, the public demand for express delivery is increasing, however, there are still lack of service quality and high service complaint rate in the process of rapid development. Based on the SERVQUAL model, this paper analyzes the current situation of the whole express service industry quality, From five aspects: tangibles, reliability, responsiveness, assurance, empathy, constructs the express service quality model based on the SERVQUAL model, and use the integration of AHP and fuzzy comprehensive evaluation to evaluate the model construction. Finally, this paper takes the express company as an example to make an empirical study, and puts forward the corresponding improvement strategy. The research has an important reference value for the improvement of the service quality of the major express delivery companies.

Keywords : express delivery; SERVQUAL ; service ; assessment

## 1. INTRODUCTION

Based on the third party logistics service person's express industry is developing rapidly in recent years, logistics industry has become the most potential, the most dynamic and the most promising field. But on the surface of a bright courier industry, there are some problems to be solved. The courier company although there are low fees and flexible and unique advantages, but there are also small, but some disadvantages of anti money. If the courier companies want to compete for customers, improve the quality of service will be the focus problems they need to think about.

From the current point of view the domestic express more intense competition. Because of the gap on all aspects of the brand image, management, quality of service, the development of China's express delivery fell far short of the level of outstanding foreign counterparts. Improve the quality of express delivery service will become the focus of the courier company to make adjustments<sup>[1]</sup>.

Service quality evaluation, as a modern commonly used method, the earliest is put forward by Mr. Finland Granru (Gronroos). At present the evaluation of the quality of service is a lot use in a variety of research, and achieved good results. At the beginning, service quality was defined as: "a tool to measure the level of enterprise service to meet customer expectations,"<sup>[3]</sup>. Lindqvist in the study of cruise ship customers, for the first time using 21 different indicators, which contains an open time, the attitude of the staff, price details, showing the content and service facilities<sup>[4]</sup>.

Express service quality is to improve the market share of express delivery companies, strengthen the important content of enterprise management. By reading a lot of literature and found our experts and scholars to express service quality research is not a lot, they tend to concentrate on the study and analysis of how to improve the competitiveness of express enterprises, the courier industry future development planning and strategies for improving the service quality evaluation at present is used more and more widely, more and more attention, so the express service quality evaluation has certain research significance.

In 1988, experts in the United States PZB Service Quality Gap Theory Based on put forward specific study of service quality gap model, including customer perceived service quality aspects by reliability, response and tangible,

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reliability, accessibility and safety 10 analysis<sup>[5]</sup>. And the 10 evaluation of the quality of the courier service station scale applied in the empirical study. Later, he put forward the concept of SERVQUAL scale, the scale is composed of 22 specific indicators. In 1991, PZB has been improved on the previous scale, and the SERVQUAL method has been widely used in the research of various kinds of service quality, and it is a common method.

In 1990, Carman<sup>[6]</sup> in my research, found the problems, he put forward his own point of view, in fact, SERVQUAL model for research in various aspects of different industries also need to specific issues, specific analysis. In the process of the specific application, we need to modify the model.

Jun Hua sun (2010) in quality of service research on three domestic courier companies, the investigation and factor analysis method, the express service quality dimensions of a separate division for the process and results, the enterprise image of the three quality dimensions to study. In empirical research, based on the model of SERRVQUAL. Through the method of fuzzy comprehensive evaluation for quality of service for comparative analysis of the quality of service delivery, and puts forward the corresponding countermeasures to improve.

SERVQUAL model after a large number of experts and scholars of empirical research, the practical application is also very extensive. In a lot of industries and fields, it is confirmed that this model is suitable for the service quality assessment of different industries, as long as the actual use of the process, the characteristics of the delivery system to make corresponding improvements. SERVQUAL model now seems to be a more suitable for the evaluation of the quality of express service methods. This model is simple and convenient, and it is more practical and operable.

## 2. THE BASIC PRINCIPAL OF SERVQUAL MODEL

### 2.1 SERVQUAL evaluation method

SERVQUAL namely "service quality" is the abbreviation of quality of service, 1988, scholars in the United States by Parasuraman, Zeithaml and Berry proposed SERVQUAL model is for the evaluation method proposed in TQM<sup>[8]</sup> services industry they think were used to evaluate the customer of service quality perception and service quality expectations, then calculated the gap can get the basic situation of the quality of service delivery.

SERVQUAL model service quality by tangibles, reliability, responsiveness, assurance and empathy<sup>[9]</sup> this several dimensions and each level is divided into a few questions, add up to a total of 22, the questionnaires used in this study consists of two parts, simultaneous measurement of customer service quality expectation and perception, including scoring rules 5 said completely agree, 1 denotes disagree completely.

(1) the visible nature: the display of the services provided by the level, such as price, distribution, packaging, and other aspects.

(2) reliability: refers to the customer's commitment to express, accurately provide services.

(3) response: a response to customer requirements and customer expectations.

(4) guarantee: refers to the staff can have high quality and professional level and in the process of work to gradually obtain the trust of customers, enhance the company's image.

(5) empathy: refers to the way through a variety of time, to arrange and understand the customer's advice to make customer satisfaction at the same time, to provide customized services to improve customer satisfaction.

### 2.2 Service quality calculation method

Taking into account the SERVQUAL model in the actual situation, the importance of the five dimensions are not the same, so the later scholars the calculation formula to make improvements through on each dimension and the indexes are given some of the weight of the relationship that the following formula<sup>[11]</sup>:

$$SQ = \sum_{j=1}^5 w_j \sum_{i=1}^R (P_i - E_i)$$

SERVQUAL = Customer perceived service quality in SQ;

$W_j$  = the weight of the first J dimension;

$R$  = number of indicators per dimension;

$P_i$  = I indicator: customer perceived score;

$E_i$  = I customer expectations score.

In the calculation, we can modify the content and index system of the five dimensions appropriately. First calculate the total average customer service quality perception score, and then calculate the weighted average of each customer's evaluation score, multiplied by the dimension of the weight, you can get the courier company customer service quality level.

### 3. CONSTRUCTION OF EXPRESS SERVICE QUALITY EVALUATION SYSTEM BASED ON SERVQUAL MODEL

SEEVQUAL model of service quality evaluation system is relatively perfect, although in the actual study, it is found that the index system can not match all the cases. By using the SERVQUAL model established evaluation system of service quality in the process, often need by combining industry characteristics<sup>[13]</sup>, to improve the index system, for different research objects, the SERVQUAL five dimension, indicators of meaning, composition and the importance of the order and content have obvious change<sup>[14]</sup>.

The creation by of other experts and scholars from the research and revised in express company in more than a year of practice experience summary of the index, so that the scale has higher scientificity, rationality and efficiency of. We interviewed Express staff and consumers contains with express company for many years work experience of the master, and online shopping frequency high students. As the optimization index system provides reference. Then the express use of the general survey, compiled the express service quality evaluation system.

**Table 1. Express service quality evaluation system**

target	Primary dimension	Two level index
Service Quality A	Tangible indicators B1	Express charge price reasonable, open, transparent C1
		Express company service facilities and transportation tools advanced and efficient C2
		Express staff dress code and the image of decent C3
		Express outlets convenient, good environment C4
		Express packaging professional, standard C5
	Reliability index B2	Express delivery service quickly and accurately C6
		Do not appear in the process of express delivery, damage to the phenomenon C7
		There is a good after-sales service guarantee system C8
		Enterprise commitment to customers can be completed in a timely manner, it is worth to trust C9
	Response index B3	Service telephone is clear, can guarantee the customer's communication and the complaint C10
		Be able to provide customer service in a timely manner C11
		Express parcel tracking system is easy to operate, update fast C12
		Response and resolution C13
		Service personnel to the customer first, always willing to help customers, for its service C14
	Guarantee index B4	Good company image, so that customers feel at ease, safe C15
		Express staff to obtain the customer's trust and recognition C16
		Express service personnel with a professional level and good quality C17
		Staff's service attitude is friendly, polite and positive C18
	Empathy index B5	Take (send) goods time and place and mode (SMS, telephone) to make customer satisfaction C19
		To deal with complaints of fast speed, high efficiency C20
		Understand and value the customer's advice and opinions C21
		To provide customers with personalized service (inspection and then sign, on behalf of the signing of custody, etc.) C22

## 4.A COMPREHENSIVE EVALUATION METHOD OF EXPRESS SERVICE QUALITY BASED ON FUZZY

### 4.1 The basic principle of fuzzy comprehensive evaluation method

The fuzzy comprehensive evaluation method was proposed by American scientist L.A.Zadeh<sup>[15]</sup> in the beginning of 1960s. This method is based on the fuzzy mathematics theory, which is a method to quantitatively study the limits of the qualitative indicators. Fuzzy comprehensive evaluation method is the research object according to the membership degree of fuzzy mathematics theory to quantify the qualitative index, that is the evaluation in general by a variety of factors influence each other. Any evaluation index system contains both quantitative and qualitative indicators, these indicators are difficult to quantify the quantitative indicators. Fuzzy comprehensive evaluation method combines the qualitative and quantitative methods, and gives the weight of each evaluation index, and draws a conclusion that is more realistic, reasonable and persuasive.

### 4.2 AHP method to determine the weight

Refers to the weight of the index in the corresponding system of the proportion. In the evaluation system, the content and the meaning of each dimension and each index is not the same, and the important degree is not the same. In the actual research process, according to the characteristics of the research industry, research object, combined with the actual situation to determine the weight of indicators, so as to distinguish between the treatment of each evaluation criteria.

Analytic hierarchy process is a combination of qualitative and quantitative methods to determine the weights. Analytic hierarchy process (AHP) is based on the actual situation of each index in the index system analysis, the secondary indicators of the weight given to each dimension method; needle for all levels of each factors quantitatively the relative importance of, draw the conclusion low levels for higher level relative important degree of weight problems.

The establishment of the hierarchy model, in the AHP method, we are able to through a series of calculated each index for higher dimensions weights and in order to obtain the final express service quality this goal a, tangible (B1), reliability (B2), response (B3), ensure (B4), empathy as the criterion layer (B5), 22 indicators composition index layer C, and form a hierarchical structure.

### 4.3 Fuzzy evaluation index set

By the express service quality evaluation index system to establish a two level index set.

The first level index set:  $U = (U_1, U_2, U_3, U_4, U_5) = (\text{tangible, reliability, responsiveness, assurance, empathy})$

Two level indicators:  $U_1 = (U_6, U_7, U_8, U_9, U_{10})$

$U_2 = (U_{11}, U_{12}, U_{13}, U_{14})$

$U_3 = (U_{15}, U_{16}, U_{17}, U_{18}, U_{19})$

$U_4 = (U_{20}, U_{21}, U_{22}, U_{23})$

$U_5 = (U_{24}, U_{25}, U_{26}, U_{27})$

This thesis adopts 5 grade:

$V = (V_1, V_2, V_3, V_4, V_5) = (\text{very disappointed, not satisfied, in general, more satisfied, very satisfied})$

According to the degree of satisfaction, will be converted to the corresponding percentage of the system (50,60,70,80,90).

## 5. EMPIRICAL RESEARCH

### 5.1 Enterprise introduction

Express every day is a company has more than 20 years of development of the history of the old courier company, the company was founded in 1994, the company is located in Zhejiang, Hangzhou. Daily courier

company is also one of the ten major courier, courier system is relatively sound, with more than 400 franchisee, distributed in more than 1300 cities throughout the country. Company wide distribution network, with more than 3400 to join the network, up to 100 thousand employees. Daily courier company has been formed to the Yangtze River Delta, strains of the triangle, the central Bohai area as the focus of the courier network coverage.

Daily courier company is currently a comprehensive business services to provide courier companies. According to customer demand, can provide a variety of choice of express service, in the provision of domestic express, but also developed the Hong Kong, Macao and Taiwan and foreign mail service. At present, every day express companies in the country or belong to the forefront, to provide ordinary courier at the same time also allows customers to choose to pay and collect money and other services.

### 5.2 Questionnaire investigation

According to the index system of express service quality comprehensive evaluation model established in front, a questionnaire was designed. In the questionnaire, it contains five dimensions and 22 indicators. Customers in the questionnaire scoring, you can express the service from the expectations and perceptions of both aspects to score. In terms of scoring rules, 1-5 points were "very disappointed, not satisfied, in general, more satisfied, very satisfied".

In the process of data collection, we print the 250 questionnaires, all put in Zhenjiang City daily express several outlets, in the familiar staff help completed the data collection. Finally, a total of 240 questionnaires were recovered, which can be used for data processing in the later period.

### 5.3 Evaluation result analysis

#### 5.3.1 Weight calculation

Using the analytic hierarchy process of the judgment matrix method, the construction of express service quality evaluation system to determine the matrix, and calculate the weight.

**Table 2. Levels of single sorting and test results**

A	B1	B2	B3	B4	B5	W(0)
B1	1	1/7	1/3	1/5	1/5	0.0424
B2	7	1	5	3	4	0.4647
B3	3	1/5	1	1/4	1/3	0.0826
B4	5	1/3	4	1	3	0.2544
B5	5	1/4	3	1/3	1	0.1560

$\lambda_{\max} = 5.3088$ ,  $CI = 0.0772$ ,  $RI = 1.12$ ,  $CR = 0.0689$ .

Empathy can be calculated

$$W_1 = (0.2570, 0.0492, 0.0821, 0.4360, 0.1759)^T$$

$$W_2 = (0.3936, 0.3936, 0.0754, 0.1376)^T$$

$$W_3 = (0.0974, 0.4382, 0.1604, 0.0463, 0.2578)^T$$

$$W_4 = (0.3936, 0.1376, 0.3936, 0.0754)^T$$

$$W_5 = (0.4667, 0.1393, 0.0796, 0.3146)^T$$

#### 5.3.2 Fuzzy judgment coefficient matrix

Statistical indicators in the evaluation of the frequency of the rating, and then divided by the total number of indicators can be obtained in the evaluation of the corresponding judgment. All indexes are combined together to form a fuzzy judgment coefficient matrix R.

$$R_1 = \begin{bmatrix} 0.0542 & 0.0583 & 0.0875 & 0.0542 & 0.0708 \\ 0.1208 & 0.1402 & 0.0875 & 0.15 & 0.175 \\ 0.475 & 0.4708 & 0.4292 & 0.5083 & 0.4708 \\ 0.3167 & 0.3375 & 0.3708 & 0.2292 & 0.225 \\ 0.0333 & 0.0292 & 0.025 & 0.0583 & 0.0583 \end{bmatrix}$$

$$R_2 = \begin{bmatrix} 0.0917 & 0.1042 & 0.175 & 0.125 \\ 0.1708 & 0.1625 & 0.1 & 0.0958 \\ 0.4958 & 0.3625 & 0.3958 & 0.4125 \\ 0.2042 & 0.3292 & 0.3 & 0.25 \\ 0.0375 & 0.0417 & 0.0292 & 0.075 \end{bmatrix}$$

$$R_3 = \begin{bmatrix} 0.1208 & 0.0708 & 0.0333 & 0.1333 & 0.0875 \\ 0.0792 & 0.1417 & 0.1458 & 0.0875 & 0.0708 \\ 0.3667 & 0.4625 & 0.4625 & 0.3917 & 0.3792 \\ 0.3917 & 0.2292 & 0.2083 & 0.3458 & 0.4333 \\ 0.0417 & 0.0958 & 0.15 & 0.0417 & 0.0292 \end{bmatrix}$$

$$R_4 = \begin{bmatrix} 0.1208 & 0.0542 & 0.0417 & 0.0458 \\ 0.0792 & 0.125 & 0.1458 & 0.1708 \\ 0.3583 & 0.5083 & 0.4833 & 0.5125 \\ 0.4083 & 0.2625 & 0.1875 & 0.1292 \\ 0.0333 & 0.05 & 0.1417 & 0.1417 \end{bmatrix}$$

$$R_5 = \begin{bmatrix} 0.05 & 0.0375 & 0.0625 & 0.0542 \\ 0.2042 & 0.2042 & 0.175 & 0.1542 \\ 0.475 & 0.4708 & 0.45 & 0.4792 \\ 0.1333 & 0.1417 & 0.1458 & 0.1708 \\ 0.1375 & 0.1458 & 0.1667 & 0.1417 \end{bmatrix}$$

By  $B_i = R_i \times W_i$  and the first level indicators of the fuzzy comprehensive evaluation set, Zhenjiang City, as an example.

$$B = \begin{bmatrix} 0.0601 & 0.1075 & 0.0769 & 0.0749 & 0.0506 \\ 0.1413 & 0.1519 & 0.1155 & 0.1186 & 0.1862 \\ 0.4849 & 0.4244 & 0.4285 & 0.4398 & 0.4738 \\ 0.2679 & 0.2670 & 0.2997 & 0.2804 & 0.1473 \\ 0.0477 & 0.0437 & 0.0796 & 0.0864 & 0.1423 \end{bmatrix}$$

There is a fuzzy evaluation matrix to determine the daily courier.

$$P_1 = BW = (0.0858, 0.1453, 0.4390, 0.2545, 0.0731)^T$$

Then according to the standard, the final score is 70.677 points per day, in general and more satisfactory, close to the general, so every day express service quality needs to be improved.

### 5.3.3 Result analysis

The above data, combined with his own in the daily express a year of practical work experience, draw the

conclusion: we got the data processing result and Zhenjiang daily express the actual level of service quality is consistent. Through the empirical research results show that the model can be used to survey the market most express enterprise service quality.

#### 5.4 Countermeasure

(1) in time to respond to customer requirements and shorten the complaint process

Express delivery speed is the largest private courier company and the courier service provided by the courier service where the maximum difference between EMS. So fast is a major feature of express companies. Express speed is mainly reflected in the express transport and delivery time is short, the each courier company can reach the level is not the same, the express transport delivery rate is according to the courier company's mode of operation, network construction, personnel division and synthesis of the most important last mile sent pieces of speed that, and this is precisely reflects the service level of a company. Such cities as Zhenjiang, Wuxi and Changzhou will generally have a transit center, then the company can do a good job in this part, as well as the contracting zone to send a piece of route planning have played a great impact.

First, the courier company to respond to the needs of customers in a timely manner, to provide customers with convenient, express delivery services. This requires the courier to have sufficient manpower, time to ensure that the time and place in the customer's requirements will be delivered to the hands of customers. And then in the courier door-to-door service process, as much as possible to simplify procedures, reduce the waste of unnecessary time, according to the experience and expertise of the route planning, design reasonable and convenient route, also can greatly reduce the time.

Second, courier companies need to do to improve their own complaints and solutions, so that timely response to customer complaints, the day limit to solve the customer's problems. Which requires shortening the current set of complaint process, so customers can be in on the third day of logistics information query can be directly linked to express themselves responsible for contact network and is responsible for handling the complaints of the contact, and then by direct customer contact area sent a complaint and direct feedback on the system, within the specified time unresolved customer requirements into complaints penalties link, and member's vital interests linked to school. Then improve complaints supervision and punishment system, to have a detailed and strict punishment recognized the responsibility of the book, so good to circumvent the both sides in the responsibility of passing the buck.

(2) to strengthen internal management and reduce the probability of loss of express delivery

Courier can safe and complete sent to customers in and influenced by many aspects, which mainly to pay attention to is the courier at the time of collection, express company in loading and transportation and sent a member in the process of sending pieces of several aspects of this.

First, express courier in the collection of customer sent at the same time and need are classified according to the type of goods packaging and make annotation, especially fragile, easily broken, express packaging should as far as possible, and the more strict, the courier bags and boxes to improve the requirements, to ensure delivery of intact.

Second, the transfer station in the process of transport, the first to ensure that the quality of the staff of all the courier do not throw, do not fall. Then express to the special requirements of the loading process of distinction, on the top of the van, to prevent crushing. And then the overall operational process to supervised personnel, to prevent the loss of courier.

Third, in the hands of the courier to send pieces of the process to strengthen management, to prevent the occurrence of people lost pieces. Specific measures are as follows: to refine the specific delivery of professional sorting process, to avoid scanning after a piece of pie, and can not complete and timely delivery to the network. Then every time from the transfer center of the delivery of the number of courier to do strict records and



comparison, to prevent the emergence of the scan finished, and the courier did not receive, and finally lost the case. Send a good performance evaluation system for the courier, the courier's damage and loss to be linked to the wage. The stringent requirements of the courier delivery process, first inspection before I sign or sign on behalf of, and signed to clear sign on behalf of the people and contact way, prevent others signed on behalf of the end or stores keep the property in the loss problem.

(3) to provide differentiated and customized services according to the customer's individual characteristics

Customers are independent, each customer's requirements and expectations of the service are not the same, the need to meet or exceed customer expectations through personalized service, improve customer satisfaction levels.

Express company to provide services at the same time according to the types of customers, regional, age, etc., to provide personalized service. For example, unit and company generally express need very high timeliness, in familiar with the area and understand their work time and delivery as soon as possible, the community express as far as possible in the recipient in time delivery, and be careful not to disturb their rest. Young people would like to have a distinctive service language and the way to communicate more, and older customers we need to have more patience to answer customer questions, and home delivery, etc. to provide more convenient services.

Express according to the time and the number of active nodes, as well as crowd, providing customized services, such as the company of large quantities of shipments take monthly more convenient, Taobao customers to fixed time and timely send and receive express. In the summer vacation in Colleges and universities and graduates leave school stage, choose to do some baggage promotions, can improve the company's image in their hearts, to retain old customers, access to new customers.

Strengthen customer communication and customer communication. In the customer in the network to send express to special people to be responsible for express delivery of documentary, timely access to trends in customer delivery, and to the customer provide feedback to inform the courier if there is a problem, whether in the commitment of time being served and sign.

(4) pay attention to the service consciousness and quality of express service workers

Express enterprise corporate image, and customer recognition is mainly in charge of logistics in the last mile of the contracted districts faction member who is closely related to send some of the member behavior and the quality will directly affect the customer to the company's overall image, and this is precisely is a lot of courier companies, the quality of personnel, is generally low.

Express company to the contract area of personnel quality strictly, regularly organize relevant skills and operation process of the training, to ensure that express the stability and quality of personnel, as close as possible to the direct delivery outlets, namely contracting mode of straight battalion standardization. Take some specific measures: the courier service level to join the performance appraisal, rather than a single piece of the number of settlement wages. Through the specific rules and regulations and management training to gradually develop the service consciousness of express employees. The area from time to time to carry out unannounced visits, record and evaluate Express staff for specific services and make appropriate rewards and punishment system. Courier companies can consider the replacement of the contractor in the contract area, the priority of young people to consider the high quality, convenient management.

## 6. CONCLUSIONS

This study is based on the SERVQUAL model, combined with the characteristics of express delivery companies, for the establishment of the express service quality evaluation index system, which includes tangible, reliability, responsiveness, assurance and empathy dimensions and corresponding to the 22 indicators. Then

through the analytic hierarchy process to determine the weight of indicators, the use of fuzzy theory, to establish a fuzzy comprehensive evaluation model of express service quality. In empirical research, choose their own practical experience in more than a year of Zhenjiang City express every day as the research object, through the questionnaire survey data, calculations, that every day courier service quality level, and make corresponding analysis, and puts forward the countermeasures and suggestions to express service quality improvement.

There are some deficiencies in this paper, which need to be improved. Among them, the research on the evaluation of the quality of express service is based on the empirical study of Zhenjiang express company. The proposed improvement strategy, in part, is based on personal work experience, the actual application may be partially not applicable to all the people in the courier industry, etc. Hope that in the future research to make the corresponding improvement.

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