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Study on the Influencing Factors of Customer Satisfaction at Cainiao Stations in China

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Abstract: ***Based on the field investigation and observation of Cainiao Stations, and the factors influencing the satisfaction of Cainiao Stations are analyzed and summarized. Through questionnaire to collect data, it uses binary Logistic regression model to find the relationship between independent variables and the satisfaction. Several main influence factors of customer satisfaction are found, and the improvement measures for Cainiao Stations are put forward based on these factors.***

Keywords: Cainiao Stations; satisfaction; binary logistic regression analysis

1. Introduction

In recent years, with the continuous development of international trade and e - commerce, the logistics also maintain rapid growth in China. Express Package Inundation in E - commerce Environment occurs from time to time, which have become the biggest obstacle to development of Alibaba Group in China. Cainiao Network was founded to solve his problem, the purpose of which is to establish a backbone logistics and storage network throughout the country, while Cainiao Stations are to provide the offline services of "last kilometer" to the destination after large - scale logistics dispersion. At present, there are more than 40, 000 Cainiao stations in the city that constitute the urban terminal network of the Cainiao network.

At present, the business types of Cainiao stations have been formed, but the development direction is very diversified. The operation modes of Cainiao stations are different , and, the most successful among them is to develop a variety of comprehensive businesses, and combine various means such as publicity and marketing to achieve profitability. Cainiao stations has brought convenience to people, but at the same time, there are many problems such as long waiting time during the peak period, insufficient post franchise management threshold, unreasonable site location and so on. Wang Siqiang, Chen Li found that there are some problems in the operation of Cainiao Stations, and put forward the way to give full play to the role of Cainiao Stations in logistics terminal distribution is: provide personalized services, improve the franchise threshold of Cainiao Stations, standardized operation of staff. On Site Selection Layout of Cainiao Stations, Tan Rushi and Xu Yilun, studied the distribution of service facilities of Nanjing urban station through questionnaire survey from the perspective of resident behavior, analyzed use GIS and SPSS software, and found that the layout of pickup point is closely related to residents' social attributes, residence, employment, travel and other behaviors. Gao Yuan believes that Cainiao Stations should make site selection decisions according to the hierarchical rules of influencing network layout, give priority to deep - seated influencing factors, and take service level as an important factor for the selection of franchise points and daily evaluation. Give full play to the advantages of the cooperation platform, make comprehensive use of the existing resources of each cooperative enterprise, realize the full coverage of the distribution service scope through the setting of the pick - up point and the self - service pickup equipment, and further standardize the distribution process through the extension of the supply chain business, and reduce the supply cost [8]. In terms of logistics service quality, Xia Hongyan found four factors influenced the operators to join Cainiao Stations from the perspective of operators through empirical research: the extent to which the payment and input are realized, the operator 's expectation of the development prospect of express collection, whether the operator is satisfied with the official settlement plan, and the operator is also very concerned about whether the station is crowded and overcrowded [1]. From the perspective of consumers, Zhu Huiqi studied the joint selection behavior of consumers into the terminal delivery mode, site personnel service quality and when express delivery is delivered, and constructed a cross - nesting model of extreme value (GEV) theory. The parameters indicate that if the terminal delivery time occurs in the morning, consumers will first change their distribution slot, then the distribution mode, and finally consider changing the service mode; if the terminal delivery time occurs in the afternoon, consumers will change the delivery mode, then change the distribution slot, and finally change the service mode. The final elastic analysis shows that customers are sensitive to the waiting delivery time, the service quality of the delivery personnel and the economic loss [7]. About regional Cainiao Stations customer satisfaction, Chen Chuling, Liao Junwei through analysis the relationship between the service quality of the Cainiao Stations in Dongguan and the degree of consumers ’ willingness to use [4]. Guo Fengxiang and Li Mingyuan investigated the

evaluation of residents on the service of Cainiao stations in Kunming, and explored the method to improve the service quality of the stations [5]. Combined with the characteristics of the campus environment, Dong Gongtian conducted an SWOT analysis of the university Cainiao Stations, and obtained the development strategy of the Cainiao Stations for G School [3].

Through on - the - spot investigation and observation of the specific Cainiao Stations in Shanghai of China, the questionnaire was designed to determine the influence factors of Cainiao Stations. It found out the factors that determine the satisfaction of the Cainiao Stations.

2. Analysis of the factors affecting the satisfaction of the Cainiao Stations

With the increasingly close cooperation between Cainiao Stations and the other logistics enterprises, various logistics companies have also fully realized the importance of the pick - up points of Cainiao Stations for for their own development. The distribution efficiency advantage of the last mile of logistics makes the terminal distribution efficiency of the major logistics companies achieve a significant improvement. Whether it is self - owned logistics or third - party logistics companies, the business cooperation with Cainiao Stations is the general trend of future development. Although this model has been affirmed, Cainiao Stations, as a pick - up point serving the public, and the customer satisfaction plays a vital role in the development of Cainiao Stations. If customer satisfaction with Cainiao Stations is not high, then Cainiao Stations will not have the basis for better development. Based on literature analysis, combined with investigation results of express collection business experience for daily use of Cainiao Stations, the factors affecting the continuous cooperation willingness of Cainiao Stations operators are summarized as follows:

First, the convenience of pickup. The convenience of pickup is very important to today's fast - paced life. The convenience of pickup includes many aspects, such as the waiting time, length of road for pickup at the community, campus, office buildings and other places, where are easy to be rush hours, it is very easy to have a pick - up peak, and the waiting time will be too long. Whether can deal with these issues is directly related to customer satisfaction with the Cainiao Stations.

Second, the safety and timeliness of express delivery. Although Cainiao Stations are the last kilometer of express delivery service, the speed of delivery is also an important factor in customer satisfaction. Violent transport does occur during package transportation that will indeed cause damage or loss to the package. Although Cainiao Stations is the last link of express delivery to customers, whether they can do a good job in the aftermath of the damage and loss of express delivery is also one of the factors of customers satisfaction.

Third, the service quality and service attitude. The employees at the pick - up point of Cainiao Stations are those who directly contact customers when they pick up the items. The work attitude and service quality are the most easy to improve among many factors, and also the most convenient link to improve, customers will intuitively understand the service attitude of the staff of the Cainiao Stations, which is directly linked to customer satisfaction.

Fourth, the type of the sites. More and more sites of Cainiao Stations are distributed. There are more and more different station types for Cainiao stations, and the operation of stations is different. Therefore, customers in different types of stations can enjoy different services. Therefore, the type of stations will also affect customers' evaluation of the station.

3. Empirical test of the Influencing Factors

3.1 Variable

This paper extends ten factors that may affect customer satisfaction from the four main factors in Chapter 2, namely, the convenience of taking parts, the safety and timeliness of express delivery, the service quality and attitude of staff, and the type of site. The first variable x1 is age of users, the second variable x2 is frequency of monthly online shopping, the third variable x3 is Monthly pick - up frequency in Cainiao stations, The fourth variable x4 is stations' type, the fifth variable x5 is whether the waiting time is too long, the sixth variable x6 is "have mail parcels been lost and damaged", the seventh variable x7 is service attitude of staff, the eighth variable x8 is length of pick - up path, the ninth variable x9 is hours of service, the tenth variable x10 is "is there any other value - added services", the eleventh variable x11 is problems in stations, the twelfth variable x12 is needed improvements, the thirteenth variable x13 is most satisfactory aspect.

This study takes customer satisfaction with Cainiao Stations as the dependent variable to analyze the impact of customer satisfaction on Cainiao Stations, and to obtain the needed improvement of Cainiao Stations according to customers' suggestions. Whether customers are satisfied with Cainiao Stations is divided into two results, namely satisfaction and dissatisfaction, the value is "0" and "1" respectively, among which, "0" is satisfied with Cainiao Stations, "1" is not satisfied with Cainiao Stations, the variable is a virtual variable.

3.2 Questionnaire formation

Based on the actual situation, the study designed the following steps and finally formed a high reference questionnaire:

First, by summarizing the relevant research literature, the more feasible variables and the measured question database are constructed. Through extensive access to domestic and foreign literature and combining with the research results of

previous scholars, the practicability and flexibility of the core variables in this paper are actually defined according to the actual situation. In addition, the relevant variables that have been correctly demonstrated by domestic and foreign researchers were also collected and sorted out, fully taking into account the practicability and credibility of these research conclusions, thus selecting the correct measurement terms and constructing the initial question database of this study to make the preliminary editing of the questionnaire.

The second is to use the small sample to predict test, effectively revise and improve the questionnaire, and finally obtain the questionnaire with strong feasibility and reliability. Since the questionnaire is incomplete at the initial stage, it is necessary to predict the questionnaire through a small sample to test the feasibility and reliability of the questionnaire in practical studies. Finally, by comprehensively analyzing the test results and the deficiencies in the prediction test process, we can communicate with the relevant scholars, and then effectively correct and supplement the contents of the questionnaire to form a formal questionnaire.

3.3 Model selection and construction

A limitation of the linear regression model is the requirement that dependent variables are only quantitative but not qualitative variables. However, in many practical problems, there are often cases where the dependent variable is categorical variables, there are many statistical methods to deal with the dependent variables as categorical variables, and Logistic regression analysis is one of the most widely used methods. The Logistic regression model is actually a generalization of ordinary multivariate linear regression models, and the error terms obey a binomial distribution. Logistic regression analysis can be divided into binomial logistic regression analysis and multinomial logistic regression analysis depending on the value category of dependent variables. Dependent variables in a binomial logistic regression model take only two values 0 or 1 (virtual dependent variable), while multinomial logistic regression models allow multiple values. Considering that the dependent variables were binoids and had only two classes, the binomial Logistic model was used as a regression model.

The regression equation for the binomial Logistic model is:

$$y = a + \beta_1 x_1 + \mathrm{L} \ + \beta_i x_i$$

Parameter a in the model is a constant term representing the natural pair value of the ratio (ratio of Y = 1 to Y = 0) when the independent variable is all 0, and parameter i is known as the logistic regression coefficient of xi. There are a total of 10 independent variables that can be digitized in this paper, hence i=10 in the regression equation.

Data were collected through the professional questionnaire collection platform —— Questionnaire Star. Questionnaire star has rich network resources. The questionnaire star adopts a professional way, and there are a series of measures to ensure the true accuracy of the data. In this study, questionnaire stars were entrusted to collect data about a Cainiao stations in Shanghai, 450 questionnaires were collected and 432 valid questionnaires.

3.4 Verification of the model and the result analysis

Descriptive statistical analysis of the questionnaire data
The descriptive statistical analysis of the data mainly analyzes the basic situation of the investigation from the shallow level to form the preliminary conclusion for the survey. Since the dependent variables are categorical variables, the descriptive statistical analysis of each independent variable will be analyzed by a crossover with the dependent variables.

Table 3: Cross - analysis Table of Age and Satisfaction with Cattlebird Station

		Satisfaction with Cainiao stations					
Cross - Terms		Satisfaction		Dissatisfied		Total Number	Total Proportion
		number	proportion	number	proportion		
	Below 18	9	2.44%	0	0%	9	2.08%
	18 - 25	162	43.90%	38	60.32%	200	46.30%
age	26 - 40	82	22.22%	12	19.05%	94	21.76%
	41 - 50	71	19.24%	10	15.87%	81	18.75%
	Over 50	45	12.20%	3	5%	48	11.11%
total		369	100.00%	63	100.00%	432	100.00%

As can be seen from the table above, in terms of age of users in Cainiao Stations, the largest population aged 18 - 25 was 200, accounting for 46.19 per cent of the total sample size. The second largest group is 94 people aged between 26 and 40, accounting for 21.71 % of the total sample size. The third largest group of people aged 41 - 50 is 81, accounting for 18.71 % of the total sample size. There were 49 people over the age of 50, accounting for 11.32 % of the total sample size, and 9 people under the age of 18, accounting for 2.08 % of the total sample size. In terms of satisfaction with Cainiao Stations, among the people who think that the Cainiao Station is generally satisfied, 162 are aged 18 - 25, accounting for 43.9 % of the total number of this option. The second largest group was 82 people aged 26 - 40, accounting for 22.22 % of the number of the options. The third is 71 people aged 41 - 50, accounting for 19.24 % of the number of the options. Finally, the number of people over 50 years old and under 18 years old is 45 and 9

respectively, accounting for 12.2 % and 2.44 % of the number of people in this option; Among those who are not satisfied with Cainiao Stations, the largest number is 38 people aged 18 - 25, accounting for 59.38 % of the number of the options. The second largest population is 12 people aged 26 – 40, accounting for 18.75 % of the number of people in this option. The third largest group is 10 people aged 41 - 50, accounting for 15.63 % of the option. The least are those over the age of 50 and those under the age of 18, which are 4 and 0, respectively, accounting for 6 % and 0 % of the options.

Similarly, we also made a cross analysis of site type and whether you are satisfied with Cainiao Stations, online shopping frequency, online shopping frequency, whether there is a long waiting time, whether there is express damage and loss, staff attitude, pickup distance and business hours and whether you are satisfied with Cainiao Stations. From the analysis results, the more times online shopping, the more likely it is to have unsatisfactory evaluation of Cainiao Stations. The waiting time of Cainiao Stations, whether there is lost or damaged delivery, the service attitude of the staff, the distance and the business time of Cainiao Stations are all important factors affecting the customer satisfaction of Cainiao Station.

3.5 Explanation of the regression results of the binomial Logistic model

According to the data requirements of the binomial Logistic model regression, the variable options or answers are formalized, and then the datomized answers are input into the SPSS22.0 software for analysis. The regression results of the binomial Logistic model are shown in Table 3 - 4

Table 3 - 4 Regression results of binomial Logistic model

Variable number	B	S. E.	Wald	df	Significance	Exp (B)
x1	0.369	0.199	3.438	1	0.483	1.584
x2	- 0.348	0.604	0.332	1	0.292	0.864
x3	- 0.348	0.604	0.332	1	0.182	0.864
x4	0.027	0.738	1.338	1	0.694	1.293
x5*	- 0.794	0.218	13.266	1	0.004	0.387
x6*	- 0.531	0.360	2.176	1	0.016	0.577
x7*	1.877	0.237	62.724	1	0.032	3.02
x8*	- 0.883	0.334	6.989	1	0.001	0.324
x9*	2.283	0.544	17.612	1	0.05	1.974
x10	0.177	0.204	0.750	1	0.824	0.598

From the regression results of the binomial Logistic model, the overall regression significance level of the model was 0.000, less than 0.01 respectively, indicating the significant overall regression results at 0.01 confidence level, and 0.567, 56.7% of the regression change of variables, only x5, x6, x7, x8, x9 is below 10%, indicating the analytical significance of the regression coefficient of the other 5 variables.

Besides five variables with non- significant regression coefficients, five variables with significant regression coefficients were summarized in the table and analysis for each variable below in Tables 3 – 5

Table 3: Summary of variables with significant regression coefficients

independent variable	B	S. E.	Wald	df	Significance	Exp (B)
whether the waiting time is too long	- 0.79	0.22	13.27	1	0.004	0.387
have mail parcels been lost and damaged	- 0.53	0.36	2.18	1	0.016	0.577
service attitude of staff	1.87	0.24	62.72	1	0.032	3.02
length of pick - up path	- 0.88	0.33	6.99	1	0.001	0.324
hours of service	2.28	0.54	17.61	1	0.05	1.974

The survey on whether there is a long waiting time shows that the waiting time is directly related to customers' satisfaction with Cainiao stations. Generally speaking, the longer the waiting time, the easier it is for customers to have a negative evaluation of Cainiao stations. Therefore, the shorter the waiting time to pick up, the easier it is to feel satisfied with Cainiao stations as a whole. From the perspective of the option assignment, the larger the assignment indicates that there was a too long waiting time, so this regression coefficient is negative.

The investigation of whether there are lost items and damage shows that there is an inseparable relationship between the safe arrival of express delivery and customer satisfaction. The more express delivery is lost and damaged, the easier customers' satisfaction with Cainiao Stations will decline, so ensuring the integrity of express delivery is an important factor to ensure customer satisfaction. In terms of the option assignment, the greater the assignment indicates the more parcel damage, so this regression coefficient is negative.

The survey of the attitude of the staff shows the feeling of customers being served when receiving the pieces, and the data show that the better the staff's service attitude, the higher the customer satisfaction with Cainiao Stations, the worse the staff attitude, and the lower the customer satisfaction with Cainiao Stations. From the perspective of option assignment, the higher the assignment indicates that the better the attitude of the staff of the station, so the staff attitude on satisfaction is positive, so the regression coefficient of this item is positive.

The distance between customers to Cainiao Stations to pick up items is investigated. Generally speaking, the longer the journey, the lower the customer satisfaction with Cainiao Stations, the closer the distance, the higher the customer satisfaction with Cainiao Stations. From the perspective of the option assignment, the higher the assignment indicates the farther the acquisition distance, so the regression

coefficient of this term is negative.

Hours of service indicate the operating time of Cainiao Stations. Generally speaking, the longer the operating hours, the less easy the customers to make a trip in vain, and the more satisfied with Cainiao Stations. From the option assignment, the higher the assignment indicates the longer the operating hours, so the regression coefficient of this term is positive.

4. Conclusions

With the rapid development of e - commerce, the last kilometer has become a very important link in logistics, this paper investigates the customer satisfaction of Cainiao Stations by questionnaire and uses binomial Logistic function to analyze the data. The following conclusions are drawn: whether the waiting time is too long, whether there have lost or damaged express, staff's service attitude, distance and Cainiao Stations business hours are important factors affecting the rookie station customer satisfaction. Customers believe that the biggest problem of Cainiao Stations is that it cannot deliver goods to the door. The second problem is that the area of the express delivery room is small, and the express delivery is clutter. The third problem is that the pick - up time is long, and the number of staff is too small. Therefore, the Cainiao Stations are required to increase the service of delivery to the door, increase the business hours for residential areas and office areas, increase the number of personnel for the pick - up peak, and reasonably plan the location.

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