Research on Satisfaction Evaluation and Factors of International Express Service in Laos

Viphachack CHANGSAVANG[1] and Yang Chaojun

Faculty of Management and Economics, Kunming University of Science and Technology, China

[1]Corresponding Author:
Viphachack CHANGSAVANG, Faculty of Management and Economics, Kunming University of Science and Technology, China. Tel: +856 2054604567, E-mail: aiyapple5334@gmail.com

Article Info:
Submitted: Feb 05, 2021.
Revised: Feb 27, 2021.
Accepted: Mar 25, 2021

Abstract

This paper, AHP is used to determine the index weight value, and the service quality of TNT International Express Service Company in Laos is evaluated and analyzed by fuzzy comprehensive evaluation method. Finally, on the premise of customer satisfaction, the service quality of TNT International Express Service Company in Laos is good. According to the results of the questionnaire scores, researchers find the service quality problems of TNT International Express Service Company in Laos that has to deal with many performance items every day, thus it has a lot of housework to solve customers' problems. If it's not serious, it will cause customer dissatisfaction. In terms of types, customers generally agree that the fees of TNT International Express Service Company in Laos are open and reasonable, but it reflects the fact that the fees of TNT International Express Service Company in Laos are higher. This is mainly due to the fact that TNT International Express Service Company in Laos uses air transport to deliver express, which greatly increases the transportation cost. The environment is not sufficient, the staff's clothes are uneven, and some staff are not in a mess. For the sake of guarantee, customers generally believe that TNT International Express Service Company in Laos can quickly deliver and deliver goods within the specified time. But customers are not satisfied with the express delivery points of TNT International Express Service Company in Laos. They think there are several express delivery points. This is a direct selling model of TNT International Express Service Company in Laos, which has a large proportion of combined construction capital, less developed economic development and many remote areas. TNT International Express Service Company s in Laos has no circulating fulcrum, so it can develop opportunities for TNT International Express Service Company in Laos. Laos TNT International Express Service Company distribution management is not standardized, the quality of professionals is low, and the lack of professionals is due to the low technical content of the super distribution industry, high profits of large enterprises, easy access, and full of cheap labor market. The average score of reliability dimension is the lowest. Therefore, TNT International Express service companies in Laos still need to be enhanced their trust. Among them, the postman sometimes divulges the customer's privacy, while the customer is not satisfied with the customer's information confidentiality, and sometimes the postal logistics information will not be updated.

Keywords

Services, Judgement Matrix, Fuzzy Evaluation

1. Introduction

As early as 1988, the world's four powerful express companies have entered the Chinese market by way of agents, and have carried out business in China's broad market and made relatively rich profits. With the in-depth development of reform and opening up, they pay more attention to the Chinese market, increase the investment and business expansion in the Chinese market, and strive to obtain a greater market share in the international express market. At the same time, the rise and growth of EMS, SF express and other domestic express companies have brought great impact and challenges to the international express industry. Today, in the international express industry, the development of the industry is led by the four major express companies in the world. With the global economic integration and the division of technology and manufacturing, including the development of e-commerce, the demand of international express business is also growing rapidly.

TNT International Express is a world-class service company headquartered in the Netherlands. TNT, an international organization of express companies, operates road and air transportation networks in Europe, Africa, Asia Pacific, the Middle East and the United States, and distributes millions of documents, parcels and palette products every day. TNT International Express Company has 43 aircraft, 200000 trucks and other transportation equipment. There are about 1000 branches and more than 400000 employees in the world. At the same time, TNT also has a variety of high-end international classification centers and perfect equipment resources, providing customers with the most convenient and stable distribution services in the industry. Lao PDR is an important branch of TNT International Express service, which provides economic and stable services, including Laos. The services provided by TNT International Express Service in Laos include international super service and domestic expressway super service. International express service has 26 branches and 2 international express ports. In terms of domestic expressway express, "TNT International Express Service Company" has launched the first batch of fixed daily express products in China's expressway express market, which has been highly praised in Laos and attracted its development. At present, the product is oriented to many small and medium-sized cities in Laos. TNT International Express Service Laos company has about 20000 service experts in Laos. It is the first international super company in Laos to obtain the International Human Resource Certification of “human investment” “TNT International Express Service Laos area has made unremitting efforts to provide high-quality products and services and cultivate professsionals for a long time, and this reputation is also an important confirmation and praise for the company's philosophy”.

TNT International Express Service in Laos has conducted market research before, and its structure pays more attention to whether more customers have obtained the transportation time and cost, and whether they continue to believe. Therefore, TNT international express service in Lao starts from customer satisfaction, does a good job on the basis of research, improves the original work, and improves customer satisfaction and loyalty.

2. Materials and Methods

2.1 Analytic hierarchy process

This paper, the main method of judgment matrix and the following formula can be used to show that there is one less column of judgment team in the previous column under the diagonal of the matrix.

$$U = (U_{ij}),\ (i,\ j = 1, 2, ..., n \qquad (1)$$

Where the matrix is represented as follows:

$$u_{ij} = 1,\quad u_{ij} = \frac{1}{u_{ji}} \qquad (2)$$

Table 1. scale meaning of judgment matrix

u_{ij}	Meaning
1	u_i and u_j are equally important
3	u_i is slightly more important than u_j
5	u_i is more important than u_j
7	u_i is more important than u_j
9	u_i is more important than u_j
2,4,6,8	The intermediate value of the above adjacent values

The judgment matrix obtained by scale method does not necessarily meet the consistency, so it is necessary to test the consistency of the judgment matrix. Hierarchical single sorting is to normalize the largest eigenvector W, and sort the importance of a layer factor relative to the previous factor. The weight is determined by the feature vector. The specific calculation is as follows:

$$\begin{bmatrix} 1 & u_{12} & \dots & u_{1n} \\ u_{21} & 1 & \dots & u_{n2} \\ . & . & & . \\ . & . & \dots & . \\ . & . & & . \\ u_{n1} & u_{n2} & \dots & 1 \end{bmatrix}_{n\times n} \quad (3)$$

Add the lines of the matrix U to get:

$$\overline{U} = (\overline{u}_{ij}),\ \overline{u}_{ij} = \frac{u_{ij}}{\sum_{j=1}^{n} u_{ij}};\ i, j = 1, 2, \dots, \mathrm{n} \quad (4)$$

Normalization processing:

$$\overline{U} = \left[\overline{w}_1, \overline{w}_2, \dots, \overline{w}_n\right] \overline{w} = \sum_{j=1}^{n} \overline{u}_{ij} \quad (5)$$

The consistency test of judgment matrix is mainly helpful to judge the rationality of the matrix composed of decision-makers. The judgment matrix formula means that when the consistency requirement is met, the judgment of the referee will be consistent, otherwise the judgment conclusion of the referee will lead to non-compliance requirements and need to be modified because of the complexity of the quality problem, it is difficult to ensure the consistency of the final conclusion, so the concept of CR (consistency judgment index) is introduced in the analysis matrix process to evaluate the consistency of the judgment matrix.

$$CI = \frac{\lambda_{\max} - n}{n-1} \quad (6)$$

$$CR = \frac{CI}{RI} \quad (7)$$

$$\lambda_{\max} = \frac{1}{n} \sum_{i=1}^{n} \left[\frac{\sum_{i=1}^{n} a_{ij} w_j}{w_j} \right] \quad (8)$$

Among them, RI is the average value of the random consistency index, and the corresponding RI of different order matrices is also different, as shown in Table 2. CI is the consistency index value, and Max is the largest eigenvalue of the judgment matrix.

Table 2. RI values corresponding to different matrix orders

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46

When the judgment matrix is higher than the third order and the CR is less than or equal to 0.1, it can be considered that the error is within the allowable range and the consistency of the matrix is good.

2.2 Fuzzy comprehensive evaluation

In essence, most comprehensive evaluation problems are uncertain. In order to solve these problems, American professor Zadeh puts forward fuzzy set theory in 1965. In this

evaluation system, the performance function of the first subsystem is membership; the second is to choose the big from the small and; the third system is the biggest standard of membership. The fuzzy comprehensive evaluation model based on Analytic Hierarchy Process.

(1) There are n evaluation indexes $U = u_1, u_2, ..., u_n$; The factor set U = empathy, tangibility, assurance, reliability, responsiveness. U_1 = service attitude of express delivery personnel, diversity of payment methods, satisfaction of problem solving, advanced and efficient equipment ; U_2 = uniform and tidy staff, good network environment, open and reasonable charges, quick response to customer requests ; U_3 = express delivery on time, promised delivery time, many express delivery points, good professional level of service personnel; U_4 = express logistics information, express distribution is correct, enterprise reputetion, customer information confidentiality U_5 = enterprise insurance compensation mechanism, timely and effective settlement of complaints, timely handling of cargo damage, active recommendation service function to meet customer needs.

(2) Set $V = v_1, v_2, ..., v_{nm}$ is taken as the index number, and each comment set is equivalent to a fuzzy subset.

(3) After determining the grade fuzzy subset, each evaluation factor is quantified one by one, that is, the membership subset of the grade fuzzy subset is determined, and the fuzzy relation matrix R is established.

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix} \qquad (9)$$

r_{ij} is the membership degree of fuzzy subset of u_i level from the aspect of factors

(4) The weight vectors W, $W = w_1, w_2, ..., w_m$ of evaluation factors are obtained by analytic hierarchy process, and the weight values are determined and normalized according to the mutual importance of each index.

(5) The fuzzy comprehensive membership vector is calculated, and the weight vector w is multiplied by the fuzzy relation matrix R to obtain the comprehensive membership vector B, that is:

$$WR = (w_1, w_2, ..., w_m) \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix} = (b_1, b_2, ..., b_m) = B \qquad (10)$$

(6) Analysis of fuzzy comprehensive evaluation result vector, in practical application, the most commonly used is the maximum membership principle, but it is likely to appear information loss or unreasonable evaluation results, so this paper will use the weighted average method to calculate its membership level.

3. Results

3.1 Determine index weight

The scale method compares each index under the five dimensions and obtains the judgment matrix. Table 3 is the judgment matrix of empathy related indexes.

The judgment matrix is:

$$U_1 = \begin{bmatrix} 1 & 1 & 1 & 2 \\ 1 & 1 & 2 & 1/2 \\ 1 & 1/2 & 1 & 2 \\ 1/2 & 2 & 1/2 & 1 \end{bmatrix}$$

$$\bar{U}_1 = \begin{bmatrix} 0.29 & 0.22 & 0.22 & 0.36 \\ 0.29 & 0.22 & 0.44 & 0.1 \\ 0.29 & 0.12 & 0.22 & 0.36 \\ 0.13 & 0.44 & 0.12 & 0.18 \end{bmatrix}$$

$$\bar{W}_1 = (0.235 \quad 0.265 \quad 0.260 \quad 0.240)^T$$

After normalization, the eigenvector of U1 is obtained and normalized, the maximum eigenvalue is:

$$\lambda_{\max} = 4.2656$$

Its consistency index:

$$CI = \frac{\lambda_{\max} - n}{n-1} = 0.0885$$

$$CR = \frac{CI}{RI} = 0.01$$

The consistency test shows that U1 constructed in this paper is reasonable and the weight distribution is reasonable. Therefore, the weight value of each index in this dimension is:

$$\bar{W}_1 = (0.235; 0.265; 0.26; 0.24)^T$$

Similarly, the tangibility, responsiveness, reliability and assurance are calculated respectively, and the results are shown in table 4 below.

The weight of five dimensions is determined by AHP. Firstly, the judgment matrix is constructed by using 1 scale method:

$$U = \begin{bmatrix} 1 & 3 & 1/2 & 1 & 1/3 \\ 1/3 & 1 & 1/3 & 1/3 & 1/2 \\ 2 & 3 & 1 & 1 & 2 \\ 1 & 3 & 1 & 1 & 1/2 \\ 3 & 2 & 1/2 & 2 & 1 \end{bmatrix}$$

The results of normalization are as follows:

$$\bar{U} = \begin{bmatrix} 0.14 & 0.25 & 0.15 & 0.19 & 0.07 \\ 0.05 & 0.05 & 0.1 & 0.05 & 0.12 \\ 0.27 & 0.25 & 0.3 & 0.19 & 0.46 \\ 0.14 & 0.25 & 0.3 & 0.19 & 0.12 \\ 0.4 & 0.17 & 0.15 & 0.38 & 0.23 \end{bmatrix}$$

The eigenvectors of judgment matrix U are obtained and normalized:

$$W = (0.16; 0.08; 0.3; 0.2; 0.26)^T$$

The maximum eigenvalue is:

$$\lambda_{\max} = 5.3207$$

The consistency index is:

$$CI = 0.0802, \; CR = \frac{CI}{RI} = 0.0716$$

1.2 Fuzzy comprehensive evaluation

The membership matrixes of empathy, tangibility, assurance, reliability and responsiveness are as follows

$$R_1 = \begin{bmatrix} 0.31 & 0.42 & 0.24 & 0.02 & 0.01 \\ 0.28 & 0.46 & 0.22 & 0.03 & 0.01 \\ 0.26 & 0.37 & 0.31 & 0.04 & 0.02 \\ 0.38 & 0.45 & 0.14 & 0.03 & 0 \end{bmatrix}$$

$$R_2 = \begin{bmatrix} 0.3 & 0.52 & 0.09 & 0.06 & 0.03 \\ 0.22 & 0.3 & 0.33 & 0.12 & 0.03 \\ 0.26 & 0.45 & 0.14 & 0.15 & 0 \\ 0.25 & 0.31 & 0.23 & 0.12 & 0.09 \end{bmatrix}$$

$$R_3 = \begin{bmatrix} 0.43 & 0.31 & 0.2 & 0.05 & 0.01 \\ 0.33 & 0.61 & 0.05 & 0.01 & 0 \\ 0.2 & 0.28 & 0.29 & 0.11 & 0.12 \\ 0.24 & 0.28 & 0.13 & 0.21 & 0.12 \end{bmatrix}$$

$$R_4 = \begin{bmatrix} 0.16 & 0.26 & 0.4 & 0.1 & 0.08 \\ 0.3 & 0.32 & 0.24 & 0.08 & 0.06 \\ 0.21 & 0.5 & 0.19 & 0.1 & 0 \\ 0.15 & 0.24 & 0.36 & 0.13 & 0.12 \end{bmatrix}$$

$$R_5 = \begin{bmatrix} 0.2 & 0.36 & 0.27 & 0.09 & 0.08 \\ 0.25 & 0.45 & 0.22 & 0.08 & 0 \\ 0.28 & 0.36 & 0.16 & 0.1 & 0.1 \\ 0.21 & 0.31 & 0.33 & 0.15 & 0 \end{bmatrix}$$

The fuzzy vector membership b_i and empathy membership b_1 of each dimension are calculated respectively :

$$b_1 = w_1 R_1 = (0.235; 0.265; 0.26; 0.24)\begin{bmatrix} 0.31 & 0.42 & 0.24 & 0.02 & 0.01 \\ 0.28 & 0.46 & 0.22 & 0.22 & 0.01 \\ 0.26 & 0.37 & 0.31 & 0.31 & 0.02 \\ 0.38 & 0.45 & 0.14 & 0.14 & 0 \end{bmatrix}$$

$$= (0.3095; 0.4248; 0.2289; 0.0302; 0.0102)$$

Tangible membership b_2 :

$$b_2 = w_2 R_2 = (0.12; 0.23; 0.26; 0.39)\begin{bmatrix} 0.3 & 0.52 & 0.09 & 0.06 & 0.03 \\ 0.22 & 0.3 & 0.33 & 0.12 & 0.03 \\ 0.26 & 0.45 & 0.14 & 0.15 & 0 \\ 0.25 & 0.31 & 0.23 & 0.12 & 0.09 \end{bmatrix}$$

$$= (0.2533; 0.3917; 0.1984; 0.1254; 0.0312)$$

Guaranteed membership b_3 :

$$b_3 = w_3 R_3 = (0.42; 0.34; 0.1; 0.14)\begin{bmatrix} 0.43 & 0.31 & 0.2 & 0.05 & 0.01 \\ 0.33 & 0.61 & 0.05 & 0.01 & 0 \\ 0.2 & 0.28 & 0.29 & 0.11 & 0.12 \\ 0.24 & 0.28 & 0.13 & 0.21 & 0.14 \end{bmatrix}$$

$$= (0.3464; 0.4048; 0.1428; 0.0648; 0.0358)$$

Reliability membership b_4

$$b_4 = w_4 R_4 = (0.1; 0.12; 0.26; 0.52)\begin{bmatrix} 0.16 & 0.26 & 0.4 & 0.1 & 0.08 \\ 0.3 & 0.32 & 0.24 & 0.08 & 0.06 \\ 0.21 & 0.5 & 0.19 & 0.1 & 0 \\ 0.15 & 0.24 & 0.36 & 0.13 & 0.12 \end{bmatrix}$$

$$= (0.1846; 0.3192; 0.3054; 0.1132; 0.0776)$$

Responsive membership vector b_5 :

$$b_5 = w_5 R_5 = (0.47; 0.14; 0.3; 0.09)\begin{bmatrix} 0.2 & 0.36 & 0.27 & 0.09 & 0.08 \\ 0.25 & 0.45 & 0.22 & 0.08 & 0 \\ 0.28 & 0.36 & 0.16 & 0.1 & 0.1 \\ 0.21 & 0.31 & 0.33 & 0.15 & 0 \end{bmatrix}$$

$$(0.16; 0.08; 0.3; 0.2; 0.26)\begin{bmatrix} 0.3059 & 0.4248 & 0.2289 & 0.0302 & 0.0102 \\ 0.2533 & 0.3917 & 0.1984 & 0.1254 & 0.0312 \\ 0.3466 & 0.4048 & 0.1482 & 0.0648 & 0.0358 \\ 0.1846 & 0.3192 & 0.3054 & 0.1132 & 0.0776 \\ 0.2319 & 0.3681 & 0.2354 & 0.097 & 0.0676 \end{bmatrix}$$

$$(0.2703; 0.3803; 0.2192; 0.0822; 0.048)\begin{bmatrix} 95 \\ 85 \\ 75 \\ 55 \end{bmatrix} = 82.427$$

The second level fuzzy comprehensive evaluation is calculated according to the weight value of each dimension calculated above Evaluate the final score and analyze

According to the calculation results, the final score of TNT International Express service customer satisfaction evaluation in Laos based on AHP and fuzzy comprehensive evaluation is 82.427, which is a good level.

4. Discussion

According to the results it is align with Menter et al (1989), three factors that affect the quality of express service, namely, whether the goods can be used, whether they can be delivered within a specified time, and whether the products are defect free and Anderson et al (1996) believed that there were six aspects include learning efficiency, service management level, coordination of employee cooperation, employee achievement, strong leadership and organizational achievement. In addition, Yououghwa Park (2009) put forward that the influencing factors are the safety, time and speed, accuracy and speed of express delivery. Compared with previous studies, convenience and economy are considered.

5. Conclusion

According to the results of the questionnaire scores, we find the service quality problems of TNT International Express Service Company in Laos. From the perspective of empathy, the average score is relatively high, which shows that the company has done a good job of respecting customers. But the average score shows that compared with the other four indicators for instance the satisfaction of TNT International Express Service Company in Laos is not much help. TNT International Express Service Company in Laos has to deal with many performance items every day, so it has a lot of housework to solve customers' problems. If it's not serious, it will cause customer dissatisfaction. In terms of types, customers generally agree that the fees of TNT International Express Service Company in Laos are open and reasonable, but it reflects the fact that the fees of TNT International Express Service Company in Laos are higher. This is mainly due to the fact that TNT International Express Service Company in Laos uses air transport to deliver express, which greatly increases the transportation cost. The environment is not sufficient, the staff's clothes are uneven, and some staff are not in a mess. For the sake of guarantee, customers generally believe that TNT International Express Service Company in Laos can quickly deliver and deliver goods within the specified time. But customers are not satisfied with the express delivery points of TNT International Express Service Company in Laos. They think there are several express delivery points. This is a direct selling model of TNT International Express Service Company in Laos, which has a large proportion of combined construction capital, less developed economic development and many remote areas. TNT International Express Service Company s in Laos has no circulating fulcrum, so it can develop opportunities for TNT International Express Service Company in Laos. Laos TNT International Express Service Company distribution management is not standardized, the quality of professionals is low, the lack of professionals is due to the low technical content of the super distribution industry, high profits of large enterprises, easy access, and full of cheap labor market. The average score of reliability dimension is the lowest. Therefore, TNT International Express service companies in Laos still need to enhance their trust. Among them, the postman sometimes divulges the customer's privacy, while the customer is not satisfied with the customer's information confidentiality, and sometimes the postal logistics information will not be updated.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

7. References

Lewin. K. (1936). Principles of topological psychology [M], New York, McGraw Hill

Cardozo & Richard. N. (1965). An experimental study of consumer effort, expectation and

satisfaction, Journal of Marketing Research.

Howard, John & J.N. Sheth. (1969). The theory of buyer behavior [M]. New York: John Wiley and Sons.

Woodruff, R.B., Ernest, R.C. & Jenkins, R.L. (1983). Modeling consumer satisfaction processes using experience-based norms, Journal of Marketing Research.

Class Fornell & Fred. (1983). Book stein two structural equation models: LISREL and PLS Applied to Consumer Exit-voice Theory [J], Journal of Marketing Research.

Table 3. Judgment matrix of index factors related to empathy

Judgment matrix	x_1	x_2	x_3	x_4
x_1	1	1	1	2
x_2	1	1	2	½
x_3	1	1	1	2
x_4	1/2	2	1/2	1

Table 4. weight of each index

First level indicators	**weight**	**max**	***n***	***CI***	***CR***
empathy	(0.235,0.265,0.26,0.24)	4.2656	4	0.0885	0.01
tangibles	(0.12,0.23,0.26,0.39)	4.1076	4	0.036	0.04
Guarantee	（0.42,0.34,0.1,0.14）	4.264	4	0.88	0.098
reliability	(0.1,0.12,0.26,0.52)	4.2226	4	0.0742	0.08
Responsiveness	(0.47,0.14,0.3,0.09)	4.0648	4	0.0216	0.024