

# Research on Performance Appraisal of Customer Service Personnel in Tourism Companies Based on Entropy Method

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**Abstract:** Performance appraisal, as an important means of motivating employees to create value, plays an important role in stimulating team work enthusiasm, achieving goals, improving performance, and enhancing enterprise competitiveness. C Tourism Company is an online tourism company in China. The main job responsibilities of the customer service center of C Tourism Company are to provide pre-sales consultation and reservation services for various tourism products and after-sales problem handling services for platform users online. Based on the current performance appraisal status of customer service personnel at C Tourism Company and the actual situation of the company, a performance appraisal index system has been reconstructed; By random sampling, 10 customer service personnel were selected and their work performance data was analyzed using the entropy method. The weights of the first and second level indicators were recalculated, and the original appraisal index weights were optimized. An indicator system with a focus on the assessment of employees' work process was established to provide a more reasonable and objective evaluation of the work performance of customer service personnel.

**Keywords:** Customer service staff, Performance appraisal, Entropy method, Evaluating indicator

## 1. Introduction

Since the release of the Tourism Law in October 2013, online booking has become a mainstream travel booking method for tourists due to the advantages of clear pricing, diverse types, and time-saving and labor-saving of online travel companies, forcing traditional offline travel agencies to suffer a significant impact. In today's increasingly competitive online travel market, online travel companies have shifted from product competition to service competition, and good reputation and image have become more important content for tourists when choosing online travel companies. Therefore, how to improve the quality of online tourism services and enhance brand image has become the direction pursued by online tourism companies in their future development. The frontline customer service personnel who have the most direct contact with users are their service quality, which directly affects the company's reputation and determines the length and depth of the enterprise's lifeline. Therefore, optimizing the human resource allocation of the customer service department has become particularly important. Performance evaluation is a very core content of human resource management, playing an important role in improving employees' enthusiasm and stimulating their potential. Therefore, an objective and fair performance appraisal system has certain practical value for the development of online tourism companies.

This article introduces the entropy method as a performance evaluation method for customer service personnel, and establishes a new appraisal index system. The purpose is to provide a new method for the performance appraisal of customer service personnel in online tourism companies, promote the improvement of service quality in online tourism companies, and assist in achieving corporate strategic goals.

## 2. Literature review

### 2.1. Abroad Research Status

The research results on performance evaluation in foreign countries are relatively rich, and the research directions are also diversified. Barreto Nigel, Silveira Cedric Thomas and Carvalho Valerie used a randomized direct structured questionnaire, in which individual interviews were conducted. Research

has found that the most desirable performance evaluation method for service managers is the 360-degree method, followed by the Management by Objectives (MBO) method and the Evaluation Center. There is a high negative correlation between traditional performance appraisal forms and employee promotion, while there is a moderate positive correlation between modern performance appraisal forms and employee promotion<sup>[1]</sup>. Mufeeda Shadiya used Structural Equation Modeling (SEM) to significantly validate the effectiveness of the employee performance appraisal system using work motivation and satisfaction. The research results indicate that employee performance appraisal has a positive impact on work motivation and satisfaction, and work motivation and satisfaction also have a positive impact on employee performance<sup>[2]</sup>. Noer SOETJIPTO, Djoko SOELISTYA and others analyzed using Structural Equation Modeling (SEM), and found that institutional culture has an impact on employee motivation, while employee motivation has an impact on performance evaluation. Performance improvement goal orientation has no significant impact on employee motivation. When testing the mediating effect, the results showed that employee motivation had a significant impact on bridging the relationship between organizational culture and performance appraisal, performance proof goals, and performance appraisal<sup>[3]</sup>. Ramu M.; Khan Akbar Ali and others used bivariate correlation analysis to understand the relationship between performance appraisal and employee job satisfaction, and found that work conditions are moderately correlated with job satisfaction, while career planning is negatively correlated with job satisfaction. Construct a structural equation model to identify the impact of various components of performance appraisal on job satisfaction. The results indicate that financial benefits have a significantly higher impact on the job satisfaction level of TSSPDCL employees<sup>[4]</sup>.

## **2.2. Domestic research status**

The research on performance evaluation in China focuses on two aspects. The first is the construction of an evaluation index system. Based on the work characteristics of procurement personnel in insurance companies, Wang Yang constructed a personal strategic map for procurement personnel from the perspectives of value, customer, value creation process, and learning and growth. Based on the personal strategic map, he established a personal balanced scorecard performance evaluation index system for procurement personnel. The use of vague set based fuzzy multi-attribute decision-making method to evaluate the work performance of procurement personnel reduces the difficulty of evaluation for each evaluator and improves the operability of performance evaluation<sup>[5]</sup>. Chen Jiayu uses the Management by Objectives (MBO) approach, guided by the company's strategic transformation positioning and goals; Quantify different performance evaluation indicators using the Key Performance Indicator Assessment (KPI) method; The weight factor judgment method was used to design indicator weights, and five optimization contents were designed, including frontline employee performance evaluation plan, frontline employee performance evaluation indicators, frontline employee performance coaching, frontline employee performance feedback mechanism, and the application of frontline employee performance evaluation results<sup>[6]</sup>. The second is to explore the correlation mechanism between performance appraisal and employee behavior. Qiu Min used various research methods such as literature research, in-depth interviews, and questionnaire surveys to construct a theoretical research framework for the correlation mechanism between performance appraisal objectives, employee proactive behavior, and employee innovation performance, revealing that performance appraisal can promote employee proactive behavior and improve employee innovation performance<sup>[7]</sup>. Men He, Zhao Huijun, and Duan Xu, based on social exchange theory and social cognition theory, used two-stage tracking survey data to explore the differential impact of performance appraisal with different purpose orientations on employee deviant innovation. The results showed that developmental performance appraisal positively affects employee deviant innovation, while evaluative performance appraisal negatively affects employee deviant innovation<sup>[8]</sup>.

## **3. The concept, purpose, and role of performance appraisal**

### **3.1. The concept of performance appraisal**

Performance appraisal refers to the process of objectively evaluating and providing feedback on the performance, abilities, attitudes, and status of organizations, departments, and individuals in the work process using effective evaluation methods based on the evaluation cycle and evaluation indicators agreed in the performance target agreement. It is an important part of performance management, which is the process of evaluating and determining the level of work achievements of a certain department or individual within an organization at a certain stage.

### 3.2. *The purpose and role of performance appraisal*

The purpose of performance appraisal is to accurately identify the performance of departments or individuals and effectively classify the levels of evaluation results, in order to play a role in achieving established goals, identifying problems, promoting enterprise growth, and motivating personnel.

Performance appraisal can closely link the performance of organizations, departments, and individuals, improve individual performance of employees while promoting the overall performance of the organization, thereby ensuring the achievement of organizational strategic goals. Performance appraisal aims to identify problems and improve them through evaluation, so that employees can complete their work more effectively. Performance appraisal results are an important basis for organizations to make human resource management decisions such as training, salary adjustment, promotion, retention, and dismissal.

## 4. Methods and Evaluation of Performance Appraisal

### 4.1. *Comparison method*

Comparison method is a relative assessment method that obtains assessment results by comparing employees with each other. Due to the difficulty in establishing standards using the absolute assessment method, many organizations choose to determine a relative evaluation standard for evaluation through mutual comparison and analysis. The comparative method has the advantages of easy operation and clear evaluation results, and is widely used by many organizations.

The comparative method has the following drawbacks: firstly, it is unable to identify the reasons for performance gaps and make improvements; Secondly, the evaluation results cannot be compared horizontally among different employees; Thirdly, it is difficult to find sufficient evidence to justify the evaluation results, making it difficult for employees to accept them as a basis for decision-making such as bonus distribution.

### 4.2. *Scale method*

The scale method is an absolute assessment method that uses standardized scales to assess employees. A scale refers to a table designed using four elements of evaluation indicators: indicator name, definition, symbol, and scale. There are many types of scale methods, and the difference between different types of scale methods lies in the types of evaluation scales used.

The scale method has the following advantages: firstly, the evaluation results are more accurate; Secondly, it can be evaluated individually and compared horizontally among individuals; Thirdly, it can be applied to various human resource management decisions such as salary and personnel promotion. However, the scale method also has its drawbacks: firstly, designing a scale requires manpower, material resources, and time, and even requires the assistance of external experts, resulting in high development costs; Secondly, evaluation indicators are often evaluated subjectively, which can lead to errors.

### 4.3. *Descriptive method*

Descriptive approach refers to using descriptive language to describe employees' work performance, abilities, attitudes, strengths and weaknesses, and key behavioral events. The descriptive method is relatively easy to design and use, with strong practicality, and can be applied to individual evaluations by anyone. However, due to the lack of unified standards for descriptive methods, it is difficult to objectively and fairly compare multiple objects. And its evaluation results are easily influenced by the evaluator's written proficiency and writing level, so its scope of application is limited and more suitable for developmental evaluation, but not suitable for evaluative evaluation.

### 4.4. *Entropy method*

Entropy method is a method of comprehensive evaluation for multiple indicators that assigns different weights based on the entropy value of the indicators. It can obtain a comprehensive evaluation result by weighting and summing different indicators. For data matrices  $A = \begin{bmatrix} X_{11} & \dots & X_{1m} \\ \vdots & \vdots & \vdots \\ X_{n1} & \dots & X_{nm} \end{bmatrix}_{n \times m}$ , the specific

process of entropy method is as follows:

Before establishing the entropy method calculation model, it is necessary to consider whether there is heterogeneity in the indicators. If present, homogenization treatment is required. For positive indicators, the processing method is:

$$X_{ij} = [X_{ij} - \min(X_{1j}, X_{2j} \dots X_{nj})] / [\max(X_{1j}, X_{2j} \dots X_{nj}) - \min(X_{1j}, X_{2j} \dots X_{nj})] + 1$$

For inverse indicators, the processing method is:

$$X_{ij} = [\max(X_{1j}, X_{2j} \dots X_{nj}) - X_{ij}] / [\max(X_{1j}, X_{2j} \dots X_{nj}) - \min(X_{1j}, X_{2j} \dots X_{nj})] + 1$$

Then determine the proportion of the  $i$ -th plan in the  $j$ -th indicator  $P_{ij} = X_{ij} / \sum_{i=1}^n X_{ij}$ . Thus, the entropy value of the  $j$ -th indicator can be calculated  $e_j = -k \times \sum_{i=1}^n P_{ij} \log(P_{ij})$ , ( $k = \ln(m) > 0$ ). Determine the weight of each indicator  $W_j = g_j / \sum_{j=1}^m g_j$ . Finally, obtain a comprehensive score  $S_i = \sum_{j=1}^m W_j \times P_{ij}$ .

When using entropy method for comprehensive evaluation, it has the following advantages: Firstly, one of the advantages of entropy method is that it can avoid the influence of subjective factors. Traditional comprehensive evaluation methods often use expert scoring or subjective assignment to determine the weight of indicators, which is easily influenced by subjective factors. The entropy method assigns weights based on the characteristics of the data itself, which can avoid the influence of subjective factors. Secondly, the entropy method can be used to handle the correlation between indicators. In practical problems, there may be correlations between different indicators, which can have an impact on the comprehensive evaluation results. The entropy method can eliminate this impact by conducting correlation analysis on indicators, thereby improving the accuracy of comprehensive evaluation. Therefore, using entropy method for performance appraisal of customer service personnel in online tourism companies can avoid the influence of subjective factors, improve the accuracy of evaluation, and obtain more objective evaluation results.

## 5. Reconstruction and Result Analysis of Performance Appraisal System under Entropy Method

### 5.1. Establishment of evaluation index system

Performance evaluation indicators refer to the use of scientific methods by enterprises based on their own characteristics to divide the quality, ability, attitude, and performance of employees into corresponding items and define indicators, in order to make performance evaluations and improvements. Based on the nature and content of the customer service position at C Tourism Company, the performance evaluation indicators for customer service personnel are formulated into the following four aspects: The first is the implementation of service work (A), mainly including timeliness and accuracy of order processing (A1), number and frequency of customer follow-up visits (A2), complaint satisfaction rate (A3), after-sales service tracking and feedback (A4), service attitude (A5), work summary and report (A6). The second is the achievement of service goals (B), mainly including the achievement rate of customer secondary development sales target (B1), customer secondary development success rate (B2), control of key customer churn (B3), and customer service satisfaction (B4). The third is daily work management (C), mainly including sales data information management (C1) and other daily work (C2). The fourth is knowledge, skills, and qualities (D), mainly including knowledge and skills (D1), desires and attitudes (D2).

Table 1 presents the weights of performance evaluation indicators for customer service personnel of online tourism companies. As shown in Table 1, the weight calculation results of the entropy method show that the weight of order processing timeliness and accuracy is 9.338%, the weight of customer follow-up quantity and frequency is 7.92%, the weight of customer consultation and complaint processing timeliness and effectiveness (complaint satisfaction rate) is 6.972%, the weight of after-sales service tracking and feedback is 7.516%, the weight of service attitude is 5.44%, and the weight of work summary and report is 15.939%. The weight of achieving the sales target for customer secondary development is 4.558%, the weight of success rate for customer secondary development is 3.292%, the weight of customer service satisfaction is 6.481%, the weight of sales data information management is 11.143%, the weight of other daily work is 4.202%, the weight of knowledge and skills is 5.438%, the

weight of wishes and attitudes is 3.292%, and the weight of controlling key customer turnover is 8.471%, The maximum value of indicator weight is work summary and report (15.939%), and the minimum value is customer secondary development success rate (3.292%).

Table 1: Weights of performance evaluation indicators for customer service personnel of online tourism companies.

Primary indicators	Primary index weight (%)	Weight ranking	Secondary indicators	Secondary indicator weight (%)
The implementation of service work (A)	53.125	1	A1	9.338
			A2	7.92
			A3	6.972
			A4	7.516
			A5	5.44
			A6	15.939
The achievement of service goals (B)	22.802	2	B1	4.558
			B2	3.292
			B3	8.471
			B4	6.481
Daily work management (C)	15.345	3	C1	11.143
			C2	4.202
knowledge, skills, and qualities (D)	8.73	4	D1	5.438
			D2	3.292

5.2. Performance evaluation results

As shown in Table 2, the performance evaluation results of 10 customer service personnel were calculated using the entropy method, and compared with the historical evaluation results of the company, they are generally consistent. Through comparison, it can be found that the entropy method can objectively determine the weight of employee performance evaluation indicators, improve the accuracy of comprehensive evaluation by conducting correlation analysis on indicators, effectively avoid the influence of some subjective factors in performance evaluation, and is conducive to solving employees' doubts and conflicts in performance evaluation.

Table 2: Performance evaluation results of customer service personnel in online tourism companies.

Personnel	Comprehensive evaluation score	Ranking
Customer service 1	0.8688824097409521	1
Customer service 2	0.48272485286752514	7
Customer service 3	0.4087081398326894	8
Customer service 4	0.7962603720367613	3
Customer service 5	0.35561809371804903	9
Customer service 6	0.8651255682928538	2
Customer service 7	0.7777256846797562	4
Customer service 8	0.3401796497706783	10
Customer service 9	0.7278876901580097	5
Customer service 10	0.5183281115768927	6

6. Conclusion and revelation

Performance appraisal is the core link of performance management. The selection of evaluation methods is the focus and difficulty of performance appraisal, and it is also an urgent issue that online tourism companies need to improve. After analyzing the advantages and disadvantages of various performance evaluation methods, a new performance evaluation index system was designed based on the existing performance evaluation methods of customer service personnel at C Tourism Company. The entropy method was used to evaluate the performance of customer service personnel, and the main conclusions were as follows:

Firstly, improvements should be made on the focus of C company's performance evaluation. The performance evaluation of Company C focuses more on assessing employees' work goals and results. Based on employee research and actual work content, the entropy method was used to recalculate the

weight of evaluation indicators. The results showed that in the new evaluation indicator system, the implementation of service work had a greater weight. Therefore, the established indicator system focuses more on assessing the work process of employees, which is conducive to stimulating their work motivation and enhancing their service awareness. Compared to the previous assessment that focused on results, the weight of this indicator system is more reasonable.

Secondly, performance evaluation is a dynamic process, and tourism companies need to continuously optimize and improve their performance evaluation methods based on their own conditions. No performance evaluation method can be considered optimal or meet all the requirements in practice, so it needs to be continuously optimized to meet the needs of different development stages, evaluation purposes, and evaluation indicators.

Thirdly, the human resources management department of a tourism company should comprehensively consider factors such as the characteristics of evaluation indicators, the availability of data, the application purpose of evaluation results, and the cost of using evaluation results, in order to develop a performance evaluation system for customer service personnel that matches itself.

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