Research on Service Quality Risk Evaluation Method

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Abstract. China has entered the service economy era, the people's expectations for service quality is higher and higher. Unlike the manufacturing industry, the process of service production is accompanied by the customer experience process, the quality of service is generally measured by the customer experience. Service quality risk management is a concept of identifying service problems in advance, which considers and eliminates the service quality risks, changes passive to active. There are many kinds of risk evaluation methods commonly used in manufacturing, but most of them are not suitable for the service industry. This study identifies the source of service quality risk information from the customer experience process, determines the service quality factors and customer perception indexes (customer dissatisfaction rate, customer comment volume, customer complaint volume, customer reporting volume), quantitatively calculates these indexes, and forms a method for service quality risk evaluation. Through calculation, the method is applicable to many industries.

Keywords: service quality; risk evaluation; service blueprint

1.Introduction

With the rapid development of China's economy, the consumption level of residents has been rapidly improved, and people's requirements for service quality have been increasing. In the field of service industry, service quality is the result of the comparison between the expected service and the actual experienced service by customers. Based on the stakeholder theory, service quality and customer perception have a strong correlation[1]. Therefore, from the perspective of customers, the risk evaluation index of the factors that have the greatest impact on enterprises has practical significance and theoretical value[2]. Digital economy has played a significant role in promoting the upgrading of China's urban service industry structure[3]. The improvement of the accuracy and reliability of service quality risk evaluation under the background of global digitalization has strong practical significance. The application of quantitative methods to evaluate the risk degree of service quality can help managers judge the status of service quality more accurately, strengthen risk prevention, and change passive service into active service[4-5].

There are many risk evaluation techniques, such as failure mode and effect analysis (FMEA), hazard analysis and critical control point (HACCP), analytic hierarchy process (AHP), Bayesian

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analysis, etc. These techniques and methods are widely used in the risk management activities of manufacturing industry and play an important role, but rarely used in the service industry. Service industry is different from manufacturing industry, the process of service production is accompanied by the customer's experience, the service quality results depend on the customer's experience, so the service quality risk also needs to focus on the customer's feelings that generally can be obtained from the following aspects: customer satisfaction survey, customer comments, customer complaints, customer reports, etc. In the service risk evaluation, some scholars combined with industry characteristics, proposed a service risk index model for marketing business, aiming to calculate the degree of impact on customers after service interruption. This method is poor in popularization, and needs to be specifically studied and formulated in combination with industry characteristics. The most commonly used method is the risk matrix, that is, the field experts develop severity and possibility tables according to industry experience, and find the corresponding risk level through the risk matrix according to the actual severity and possibility of business. This method is a semi-qualitative method, and in the actual operation process, the reliability of the results is poor, and there are high requirements for the professionalism of the people.

This study first draws the service blueprint, and then identifies the interactive touchpoint and the source of service quality risk information from the whole process of customer experience, determines the service quality factors and quantitative customer perception indicators, and ranks these indicators according to the importance of the possible losses to the enterprise. Quantitative customer perception indicators include (in order of influence on the enterprise from low to high): customer dissatisfaction rate, customer opinion volume, customer complaint volume, customer reporting volume, and others. Through comprehensive calculation, the service quality risk index of a certain service quality factor is obtained

2. Calculation process of service quality risk

2.1 Determination of service blueprint

Different service industries produce different service interactions and implement different service procedures. Therefore, the corresponding service blueprint can be drawn according to the actual situation. For example, in the catering industry, the service process includes: waiting, ordering, serving, dining, and checking, etc. In the banking industry, the service process includes hall consultation, number taking, number platform service, self-service, etc.

2.2 Determination of interactive touchpoints

To obtain the perception data generated by customers in services process, and predict the risk degree and weakness of service factors based on customer perception data. Therefore, this step needs to determine the touchpoints where service interaction can occur with customers. For example: in the catering industry, service interaction will occur in waiting, ordering, serving, dining, and checking, but not in processing dishes and personnel management. In airport services, ticket purchase, storage, boarding reminder, security check, cabin service and other links are all touchpoints where service interaction can occur, while equipment maintenance, personnel management, programming and other links will not.

2.3 Determination of service quality factors

Service quality factors refer to all aspects that affect service quality, such as personnel, service equipment, service system, service technology, etc. The service quality factors database will generally be pre-set and stored in advance. In the matching process, according to the characteristics of the touchpoint, the factors that generate service interaction and affect service quality at the touchpoint are found, such as dining tables and chairs, ordering devices, cups and saucers, service personnel and other factors.

2.4 Acquisition of perceived feedback

When customers have a bad experience in service interaction, they will give perceived feedback, such as complaints, reports, suggestions, and filling in dissatisfaction questionnaires. The problems of customer feedback need to be matched with service quality factors. These customer feedback data constitute the big data that directly reflects the service quality, which can directly reflect the quality of each factor in the service link.

2.5 Determination of perceived indicators

Considering the characteristics of the service industry, and according to the principle of obtainable and quantifiable index data, this paper sets perceived indicators including customer dissatisfaction rate, customer comment volume, customer complaint volume, customer reporting volume, etc.

3.The concept and measurement of perception index

When designing indicators, we first focus on the customer experience, and then consider the data can be obtained through questionnaires, administrative work or other means.

3.1 Concept and measurement of customer dissatisfaction rate

Customer dissatisfaction rate is a measure of customer dissatisfaction with a certain indicator. It indicates that the service or factor is of poor quality.

1) Prepare questionnaires according to service quality factors.

2) The questionnaire is set as, Are you satisfied with XX (service quality factor)? The answers were set on a 5-level Dickert scale, i.e., very satisfied, somewhat satisfied, average, dissatisfied, and very dissatisfied.

3) Calculate the customer dissatisfaction rate, that is, the percentage of the number of dissatisfied and very dissatisfied.

$$S_i = \frac{S1_i + S2_i}{T} \times 100\% \quad (1)$$

S_i—the dissatisfaction rate of service quality factor i;

$S1_i$—the number of highly dissatisfied users for service quality factor i;

$S2_i$—the number of dissatisfied users of the service quality factor i;

T—the total number of accessed users.

3.2 Concept and measurement of customer comment volume

The customer comment volume reflects the situation of customers' consultation and feedback to the enterprise. Generally, the point of consultation and feedback is that there are service problems or potential risks.

Based on the frequency of each factor, the quantitative results in three dimensions were calculated by 0-1 standardization method.

$$X_i = \frac{X_i^* - X_{min}}{X_{max} - X_{min}} \quad (2)$$

X_i—the customer comment volume for factor i;

X_i^*—the total number of customer comments for factor i;

X_{min}—the lowest number of customer comments on all factors;

X_{max}—the highest number of customer comments on all factors.

3.3 Concept and measurement of customer complaint volume

The customer complaint volume reflects the activities of customers complaining to enterprises or relevant departments for unsatisfactory service matters. This indicator can be collected through the call center.

$$Y_i = \frac{Y_i^* - Y_{min}}{Y_{max} - Y_{min}} \quad (3)$$

Yi—the customer complaint volume for factor i;

Y_i^*—the total number of customer complaints for factor i;

Y_{min}—the minimum number of customer complaints among all factors;

Y_{max}—the highest number of customer complaints of all factors.

3.4 Concept and measurement of customer reporting volume

The customer reporting volume reflects the reporting activities of customers to enterprises or relevant departments for illegal and disciplinary violations of enterprises in a certain matter. The importance of this index is enormous.

$$Z_i = \frac{Z_i^* - Z_{min}}{Z_{max} - Z_{min}} \quad (4)$$

Zi—customer reporting volume for factor i;

Z_i^*—the total number of customer reports for factor i;

Z_{min}—the smallest number of customer reports among all factors;

Z_{max}—the highest number of customer reports of all factors.

Other quantitative indicators related to customer experience, different industries, different enterprises have different indicators, as long as they can reflect the customer's degree of service experience, can be included in the calculation.

3.5 Service quality risk index

Service quality risk index is calculated by weighted sum of each index.

$$R_i = w_i^1 S_i + w_i^2 X_i + w_i^3 Y_i + w_i^4 Z_i \quad (5)$$

Ri—the service quality risk index for factor i;

w_i^1—the weight of the factor i and the first experience quantitative index.

The weight calculation is related to the problem to be solved, and is generally determined by Delphi method and analytic hierarchy process.

4.Experiment

Table 1 shows the data of indicators corresponding to service quality factors in a certain service industry.

Table 1. Service quality factors data

service quality factor	customer reporting volume	customer complaint volume	customer comments volume	customer satisfaction survey	
				not satisfied	very dissatisfied
personnel	25	75	215	245	340
equipment	235	220	38	139	216
technology	84	96	451	56	23
system	312	101	67	59	121

Customer dissatisfaction rate is obtained by satisfaction questionnaires. The satisfaction questionnaire for obtaining customer feedback includes: preparation of the satisfaction questionnaire according to the matching service quality factors; promoting the satisfaction questionnaire to the customers who have service interaction; extraction of the dissatisfaction amount in the satisfaction questionnaire filled in by all customers, and assignment of the value to the elements of the matrix according to the dissatisfaction amount. The dissatisfaction rate of personnel, equipment, technology and system is calculated through Formula 1. The total number of customers who have filled in the satisfaction questionnaire is 800. The dissatisfaction rates are as follows:

$$S_{\text{personnel}} = 73\%, S_{\text{equipment}} = 44\%, S_{\text{technology}} = 10\%, S_{\text{system}} = 23\%$$

Customer reporting volume, customer complaint volume, customer comments volume take the assignment method as formula 6.

$$M_{i,j} = \frac{M_{i,j}^{*} - M_{\min}}{M_{\max} - M_{\min}} \quad (6)$$

$M_{i,j}$ is the value of the service quality factor i and the perception index j; M_{min} is the minimum amount of customer indicators among all service quality factors; M_{max} is the maximum amount of customer indicators among all service quality factors. Table 2 shows the measurement results of each perception index.

$$M_{personnel,\ reporting} = 0, M_{personnel,\ complaint} = 0, M_{personnel,\ comments} = 0.43$$
$$M_{equipment,\ reporting} = 0.73, M_{equipment,\ complaint} = 1, M_{equipment,\ comments} = 0$$
$$M_{technology\ ,reporting} = 0.21, M_{technology\ ,complaint} = 0.14, M_{technology,comments} = 1$$
$$M_{system,reporting} = 1, M_{system,complaint} = 0.18, M_{system,comments} = 0.07$$

Table 2. Measurement results of each perception index

service quality factor	customer reporting volume	customer complaint volume	customer comments volume	customer dissatisfaction rate
personnel	0	0	0.43	0.73
equipment	0.73	1	0	0.44
technology	0.21	0.14	1	0.1
system	1	0.18	0.07	0.23

The weight, shown in table3, is related to the perception index and the feedback form of the perception feedback. In terms of risk and severity, customer reports > customer complaints > customer comments > customer dissatisfaction. Therefore, the comparison of weights is as follows:

$$W_{reports} > W_{complaints} > W_{comments} > W_{dissatisfaction}$$

Table 3. Weight of perceived indicators

perception index	$W_{reports}$	$W_{complaints}$	$W_{comments}$	$W_{dissatisfaction}$
weight	0.4	0.3	0.2	0.1

The service quality risk index of this factor is obtained by formula 5:

$$R_{personnel} = 0.159, R_{equipment} = 0.636, R_{technology} = 0.336, R_{system} = 0.491$$

Thus, the service quality risk index of equipment is the highest, and the service quality risk index of system is in the second place. When solving service problems, equipment and system problems should be solved first.

5.Conclusion

This paper mainly studies a method for service quality risk evaluation. Based on the customer's whole process experience perspective, the method captures the perception indicators in the customer touchpoint and correlates them with customer service quality factors. The overall situation of each service quality factor is quantitatively measured by calculating the service quality risk index. For the factors with lower results, risk prevention and control measures need to be formulated to improve the service quality. The method proposed in this paper has certain promotion value.

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