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An Improved Customer Value Comprehensive Evaluation Model and its Applications for Tourism Enterprises

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Abstract: The study first defines the conception of customer value, then set up customer value index system and comprehensive evaluation model after analyzing the existing evaluation methods for tourism enterprises. The model adopts the analytic hierarchy process method to determine the weight of each index and appraise the customer value by grey relational analysis. The validity of the model is proved with practical example of Baoding Kanghuai tourism Co.,Ltd.

Key words: Tourism enterprises, customer value, grey relational analysis, analytic hierarchy process method

INTRODUCTION

With the rapid development of economy, people's living standard has been greatly improved. More and more urban and rural residents pay much attention to their quality of life. So, the vacation, leisure and tourism demand has been increased. Domestic tourism has entered a new stage of rapid development. In some tourism resources province, the tourism expands from a new economic growth point to a new pillar industry. China is also developing towards the tourism country. Tourism companies burgeon such as bamboo after a spring rain. All of them show their superiority, intensity propaganda and attract tourists. This forms fierce competition in the tourism market. Many tourism companies have introduced the concept of customer relationship management in management through the link of enterprise marketing, customer service, etc. Customer relationship management require the enterprises to analysis and evaluation their customer value. Then tourism companies can provide different service for their customers. This will reach win-win of the maximization between the enterprise profit and the customer benefit (Bai and Fu, 2011).

CONCEPT OF TOURISM ENTERPRISE AND CUSTOMER VALUE

Concept of tourism enterprise: The whole process of tourism economic activities is completed by the relevant department and common industry. They are roughly divided into three categories. One is the direct tourism enterprises (including travel, hotel, transport, store, tourist attractions and places of entertainment, etc.). The two is the assistant tourism enterprises (including company about management, corporation about service, film companies, publishing units, communication facilities

and food, health and other service sectors and industries). The three is the development of organizations (including government agencies, related tourism colleges, tourism research institutions). In this study the tourism enterprises refers to the travel agency providing comprehensive services and playing a key role for tourists. The main function of travel agency consists of the development of tourism products, the sales of tourism products, tourism service procurement and tourism reception etc. At present, the travel company is divided into the travel agency, office (also known as: wholesalers, distributors, agents, peer) and tourism agency based on the business. In this study, the tourism enterprises refer to the travel agency facing client terminal.

The concept of customer value: At present the explanation of customer value involves two aspects in academic views (Kumar *et al.*, 2010). One is the value enterprises provide to customers, the other is that customers provide to enterprises. Customer value in this study is the latter one.

Customer identification and evaluation must be sorted because the travel agency customers are divided into individual and group. A tour group and an ordinary individual traveler can not use the same standard to measure. The customer value in this thesis refers to the contribution that group tourists to the tourism enterprise.

Due to the diversity of the customers, appraising the customer value must have to be done through classifying customers at first. The study sets up the index system and the evaluation model of tourism enterprise customers.

CUSTOMER VALUE INDEX SYSTEM

The study chooses ten indexes as the index system to evaluate tourism enterprise customers among all sorts of characteristics as shown in Table 1 (Zuo and Zheng, 2012):

Table 1: Customer value evaluation index system for tourism enterprises

Guideline layer	Guideline layer	Sub-guideline layer
Current value B ₁	Gross profit C ₁	Amount of consumption C ₁₁
		Amount of consumption growth rate C ₁₂
	Purchase quantity C ₂	Contract number per year C ₂₁
Potential value B ₂	Cost C ₃	Population growth rate C ₂₂
		Direct cost C ₃₁
	Loyalty degree C ₄	Indirect cost C ₃₂
Degree C ₄₂	Credit degree C ₅	Frequency of purchase C ₄₁
		Satisfaction
		Rate of contract performance C ₅₁
		Method of payment C ₅₂

- Gross profit C₁ consists of all the amount of consumption of some customer in a cycle (in this study an evaluation period is a year) and its growth rate compared with the previous year. The amount of consumption is the amount of money signed in the contract of tourism enterprises and its customers. It reflects the total and its growth rate reflects the relative growth. If a new customer, the growth rate is one in the first year
- Cost C₃ includes direct cost C₃₁ and indirect cost C₃₂. Direct costs include the communication cost and advertising costs of various media. Indirect cost includes maintenance cost to the customer. Both of them are cost data, so they are different from other data when dimensionless
- Loyalty degree C₄ includes frequency of purchase C₄₁ and satisfaction degree C₄₂. Frequency of purchase refers to the travel times of a customer in a cycle. Satisfaction degree is the score the tourists played to tourism enterprises in the trip. It expresses satisfaction for tourism enterprises
- Credit degree C₅ includes rate of contract performance C₅₁ and method of payment C₅₂

Rate of contract performance C₅₁ = 1 - breach of contract number / contract number.

Method of payment includes two ways of part payment and the full amount payment before the customer starts a journey. According to the customer's payment proportion, the index will be different fraction.

CUSTOMER VALUE COMPREHENSIVE EVALUATION MODEL

The comprehensive evaluation model of customer value adopts the improved grey relational analysis method (Liu and Wu, 2006). The traditional grey relational analysis determines the weight of each index with mean value. In this study, the model adopts analytic hierarchy process (AHP) method instead to determine the weight. Related degree calculated with improved grey relational analysis shows not only the order of customer value but also the importance of each customer compare to the ideal one. Evaluation steps are as follows.

Firstly, sequences to be analyzed are determined.

Provided that indexes m composes the index system of customer value evaluation and customers n are to be appraised, the original index value of every customer constitutes an m-dimension-arrange vector. Then n vectors constitute a matrix:

$$(X'_1, X'_2, \dots, X'_n) = \begin{bmatrix} X'_1(1) & X'_2(1) & \dots & X'_n(1) \\ X'_1(2) & X'_2(2) & \dots & X'_n(2) \\ \vdots & \vdots & \ddots & \vdots \\ X'_1(m) & X'_2(m) & \dots & X'_n(m) \end{bmatrix} \quad 2$$

Secondly, dis-dimension is derived:

$$(X_1, X_2, \dots, X_n) = \begin{bmatrix} X_1(1) & X_2(1) & \dots & X_n(1) \\ X_1(2) & X_2(2) & \dots & X_n(2) \\ \vdots & \vdots & \ddots & \vdots \\ X_1(m) & X_2(m) & \dots & X_n(m) \end{bmatrix}$$

Thirdly, consulting sequence is determined:

All maximums of the evaluation indexes chosen from its m-dimension-arrange vector constitute the consulting sequence.

$$X_0 = [X_0(1), X_0(2), \dots, X_0(m)]^T$$

Therein:

$$X_0(i) = \max_{1 \leq j \leq n} \{X_j(i)\}, i = 1, 2 \text{ and } m$$

Fourthly, grey relational coefficient, maximum difference and least difference are determined.

According to equation:

$$\Delta_{0i}(k) = |X_0(k) - X_i(k)|$$

Therein: i = 1, 2, ..., n; k = 1, 2, ..., m. Difference matrix is obtained:

$$\begin{bmatrix} X_{01}(1) & X_{02}(1) & \dots & X_{0n}(1) \\ X_{01}(2) & X_{02}(2) & \dots & X_{0n}(2) \\ \vdots & \vdots & \ddots & \vdots \\ X_{01}(m) & X_{02}(m) & \dots & X_{0n}(m) \end{bmatrix}$$

$$\Delta(\max) = \max \{\Delta_{0i}(k)\}, \Delta(\min) = \min \{\Delta_{0i}(k)\}$$

Therein: i = 1, 2, ..., n; k = 1, 2, ..., m. Fifthly, relational coefficient is determined. Relational coefficient is determined according to Eq. 1:

$$\xi_{0i}(k) = \frac{\Delta(\min) + \rho\Delta(\max)}{\Delta_{0i}(k) + \rho\Delta(\max)} \quad (1)$$

Therein: $\rho = 0.5, I = 1, 2, \dots, n$

Then the relational coefficient matrix is obtained as follows:

$$\begin{bmatrix} \xi_{01}(1) & \xi_{02}(1) & \dots & \xi_{0n}(1) \\ \xi_{01}(2) & \xi_{02}(2) & \dots & \xi_{0n}(2) \\ \vdots & \vdots & \ddots & \vdots \\ \xi_{01}(m) & \xi_{02}(2) & \dots & \xi_{0n}(n) \end{bmatrix}$$

Sixthly, the Gray Relational Degree (GRD), which is determined according to the following formula, is calculated:

$$\gamma_{0i} = \sum_{k=1}^m \xi_{0i}(k)\omega_k, i=1, 2, \dots, n$$

Therein: ω_k is confirmed by AHP method.

APPLICATIONS

Baoding Kanghuai tourism Co, Ltd was founded in 2001. It is a large travel agency in Baoding. In recent years this company has developed many new tourism products to adapt to the demands of various tourists. Outstanding performance, its operating income is top three in Baoding travel agency. The company always keeps customers as god and provides high quality service to them, not only to give tourists physiologically, material satisfaction but also to give tourists psychological, spiritual satisfaction. In the past, no enough attention to analysis and evaluate on customer to be paid. In order to improve customer service system, this company introduces customer relationship management. Now it attaches great importance to the work of analysis and evaluation of the customer.

Ten customers of Kanghuai are evaluated with the comprehensive evaluation model in 2012. Each parameter of the index is confirmed through calculation and consulting experts in tourism market. The appraisalment results are listed in Table 2 as follows.

In the calculation grey relational degree, ω_k is confirmed by AHP method and listed in Table 3 as follows.

The order of customers can be gotten through comparing γ_{0i} . According to the results shown in Table 2, valuable customers can be found and provided with higher quality service to improve customer satisfaction and customer loyalty.

Table 2: Grey relational degree of each customer ($\rho = 0.5$)

Tourist	1	2	3	4	5	6	7	8	9	10
GRD	0.84	0.70	0.64	0.65	0.60	0.71	0.63	0.78	0.59	0.62
Order	1	4	6	5	9	3	7	2	10	8

Table 3: Weight of each index by AHP

Guideline layer	Guideline layer	Sub-guideline layer	Compositive weight of each index ω_i
B ₁ 0.67	C ₁ 0.62	C ₁₁ 0.68	0.282
		C ₁₂ 0.32	0.133
	C ₂ 0.18	C ₂₁ 0.76	0.092
		C ₂₂ 0.24	0.028
		C ₂₃ 0.22	0.029
B ₂ 0.33	C ₃ 0.20	C ₃₂ 0.78	0.105
		C ₃₁ 0.33	0.044
	C ₄ 0.40	C ₄₂ 0.67	0.088
		C ₄₁ 0.75	0.149
		C ₄₃ 0.25	0.050

CONCLUSION

The validity of the index system and the evaluation model established in this thesis are proved with practical example of Kanghuai. Tourism enterprises can adopt the comprehensive evaluation model to appraise customer value. The result of evaluation can classify customers and provide the basis for setting up marketing and service strategy. With the development of tourism environment, the requirements of customers will be changing, so the methods in this study should be adjusted accordingly to reflect the objectivity of customer value.

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