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E-TOURISM SUPPLY CHAIN EVALUATION BASED ON AHP AND FCE METHOD

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ABSTRACT

Since 21st century, developing E-commerce has overthrown the traditional tour operation. Tourism supply chain is an alliance established on confidence between each tour operator. And it also changes the traditional business mode. In this paper, the authors make the E-commerce as the breakthrough point, and analyze the traditional tourism supply chain mode, and then propose an evaluation index system of e-tourism supply chain. This research is based on AHP and Fuzzy Comprehensive Evaluation (abbr. *FCE*). The authors believe that the application of this mode may greatly enhance the coordination capacity and flexibility of tourism supply chain, and can also raise the tourists' satisfaction and meet visitors' personalized demand. Evaluation model of e-tourism supply chain has been applied to scenic spots in Jiangxi.

Keywords: *E-Tourism Supply Chain, Evaluation Model, Network Intermediary, AHP, FCE*

1. INTRODUCTION

1.1 Related Concept

In 1990s,the famous tourist scholars Richard Tapper and Xavier Font make the concept of supply chain be applied in tourism, they think that tourism supply chain includes all goods and service providers, and all these can be used for meeting the consumers' demands, these firms directly or indirectly cooperate with tour operators, travel retailers, supplier that only providing accommodation or other suppliers for destination. In transit, the tourists directly buy some goods from the suppliers of destination. suppliers of destination include all systems of accommodation, transport, bars, restaurants, souvenirs, attracting objects, handicrafts, food production and waste disposal and supportive infrastructures. That means tourism supply chain is tourism organization network which is constituted by the participants, those participants provide different tourism products and services for tourists, they are consist of enterprise, government, direct or indirect supplier for the products.

1.2 Research Background

In performance evaluation of tourism supply chain, there are mainly two aspects :financial performance and evaluation of tourists' satisfaction for supply chain, Ymlaz and Bititcd have constructed the index system to evaluate financial performance of hotel supply chain[2],the foreign scholars mainly focused on the evaluation of tourists' satisfaction for supply chain, the researches on tourists' satisfaction originated in the 1970s on aboard, the researches mainly included connotation and influence factors of tourists' satisfaction, tourists' satisfaction of heritage and assessment of tourists' satisfaction. Pizam has proposed factors which influence tourist satisfaction for seaside tourism destination cost, hospitality degrees, catering facilities, accommodation facilities, environment, commercial degree, Pizam's conclusion have laid a foundation for research about theory of tourists' satisfaction[3].Bread thought tourists' satisfaction was a positive perception, it was based on mutually comparable result between tourists' expectations and practical experience[4]. Mazursky has pointed out that visitors' past experiences would impact on tourists' satisfaction[5],Chen and Gursoy have indicated that the factors which affect tourists' satisfaction include security perception, cultural differences, experience perception, transportation convenient perception[6].Bowen thought there were six factors

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which affected tourists' satisfaction, including expectations, performance, not consistent, characteristics, emotion and fair[7].*SERVQUAL*, *SERVPERF*, *IPA* (Importance-Performance Analysis) has been applied on evaluating tourists' satisfaction[8].

In IT's application of the tourism supply chain: the developments of IT have had deep impact on tourism service supply chain management. In 2008, Buhalis and Law have described and researched the application that IT is on tourism development in recent 20 years [9].So it is manifested that there are many foreign scholars to study on the necessity of IT applied on supply chain management and how to improve the efficiency of the use of information technology.

Performance evaluation of tourism supply chain in China: There are few researches on performance evaluation of tourism supply chain, researches were expounded from customer satisfaction and scenic attraction, Huang Jin, Lv Wei Xia, Liu Yu Qing thought that 7 indicators would have impact on customer satisfaction including tourism soft environment, supply of destination tourism attraction elements, supply of tourist information and intermediary service, supply of tourism facilities, supply of basic tourism services, supply of the basic tourism services, supply of tourism commodity. 8 factors played important role in customer satisfaction including food quality, destination environment condition, travel agency service quality, transportation service quality, the destination of the tourism market order, accommodation reception service quality, scenic resource value and service quality. The most important factors were tourism soft environment and travel service quality of destination for customer satisfaction [10].

1.3 Research Significance

As is known, China's tourism industry started lately, application research for e-tourism supply chain is less in china than in foreign, this paper discusses on applying electronic commerce technology to construct e-tourism supply chain mode and then applies its evaluation model in Jiangxi according to our country's situation.

Tourism enterprises provide all kinds of services for tourists, they could be restaurant, hotel, transportation firms, scenic spots, shop or public place of entertainment, by e-commerce technology, these firms may be rapid access to information to reduce paper work to communicate with each other so as to provide personalized tourism product and high quality service, that can reduce the cost and bring substantial or strategic benefits to tourism firms, such as improving customer satisfaction, increasing scenic attraction, shortening the cycle of things for tourists traveling, reducing the uncertainty of the supply chain. Because tourists' demand information is immediately transferred to each firm in supply chain, there is no delay for transportation of information, which would greatly improve the response speed.

The above analysis raises each node enterprise's information integration mode in the tourism supply chain, but a method of realizing the information integration is to establish a trading network information center, the center is information sharing system, it has abilities of data storage, data processing, depositing / reading and data integration, the data is caused by interaction with each organization in tourism supply chain, each node enterprise's internal information system is as center's subsystem, each node enterprise in supply chain can be connected and all information is parallel processed in center. The center can timely treats and links all relevant information to all appropriate tourism service providers. Because there mainly are red tourism and ecological tourism area in China, these resources are needed to be reasonable and prudent used, so this paper argues that the local government as an independent third party who should set up open networks information center and become network intermediary to introduce expert in order to check the tourism suppliers for their credit and service quality, so the travel service provider 's capacity is guaranteed, while the government has reputation as guarantee to make effectively reduce the trade friction and transaction risk in the process of e-tourism supply chain, so this can improve market efficiency. once the tourist demand changes, the network intermediary can agilely organize available firms thus, a dynamic collaboration of tourism supply chain is successfully constructed.

So, according to above analysis, for performance evaluation of e-tourism supply chain, some new factors are added in evaluation model based on evaluation of tourists' satisfaction. These new indicators can reflect response speed, ability of meeting diversified demand and quality of tourism product for e-tourism supply chain.

2. EVALUATION MODEL

2.1 Evaluation Index System Of E-Tourism Supply Chain

As it mentioned above, the e-tourism supply chain based on network intermediary is dynamic

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network structure which connect all firms in the chain through the information. In order to help the network intermediary to know the operational performance of the chain, the improved Fuzzy Comprehensive Evaluation (abbr. *FCE*) method is applied on explaining the performance of the chain to improve the overall reconstruction effect, there are some evaluation indicators from the perspective of e-tourism supply chain organization. Table I is given based on the above description:

Table I: Index System Of E-Tourism Supply Chain Mode

Level 1	Level 2
Flexible (A1)	Response time x1 Diversity of tourism products x2 Visitors experience x3 Listed time x4 Order visibility x5 Difficulty Level of returning order x6
Integration (A2)	Accessibility of the supply chain y1 Compactness among in supply chain y2 Integrated ability y3
Coordination (A3)	Ability of coordinating interest p1 Management coordination capacity p2 Dominant power of core firm p3
Service level (A4)	Service efficiency q1 Service attitude q2 Service behavior q3 Service commitment q4
Scenic Attractiveness (A5)	Historical value m1 Artistic value m2 Cultural value m3 Ornamental value m4 Leisure values m5 Educational value m6 Rare or exclusive m7 Popularity m8 Technology simulation m9 Participating in interactive m10 Graphic display m11 Educational atmosphere m12 Scenic scale m13 Extent of attractions fullness m14 Scenic route design m15 Price of tickets m16 Natural environment m17 Tourist Souvenirs m18 Environment and facilities of tour m19
Cost (A6)	Communication expenses n1 Expenses for developing and maintaining n2 Operation cost of service providers n3
Tourist' satisfaction (A7)	Satisfaction of itinerary and time j1 Overall impression of accommodation j2 Impression of service management j3

Some indicators are explained as follows:

(1) x2 (Diversity of tourism products): It is the number of different tourist routes and different service configuration in the chain.

(2) x3 (Visitors' experience): It is the difficulty that the travelers send out the order and receive the information of order completed and experience the personalized service. For Example, some travelers want to play both some red landscape and green landscape, but due to geographical span, it is difficult to go sighting in red attractions and green attractions in one trip.

(3) x6 (Difficulty Level of returning order): The travelers should have gone to the landscape to know whether or not they are content with the tourism product, but due to personal reasons or the change of local political situation, it is possible to change predetermined travel plans, they want to refund orders, for example, in 2012, the political situation is turbulent in Maldives, that cause many visitors have canceled the travel plan to the Maldives.

(4) m1~m6 (Value-added): When network intermediary dynamically construct the supply chain according to travelers' demand, the intermediary must carefully choose the service suppliers to ensure every link is value-added. The Value-added is studied from service level of the firms in the chain and scenic attraction.

$R_i\ (i=1,2,....,7)$ is defined as follow:

$$R_1=\begin{bmatrix} r_{x_1v_1} & r_{x_1v_2} & r_{x_1v_3} & r_{x_1v_4} \\ r_{x_2v_1} & r_{x_2v_2} & r_{x_2v_3} & r_{x_2v_4} \\ r_{x_3v_1} & r_{x_3v_2} & r_{x_3v_3} & r_{x_3v_4} \\ r_{x_4v_1} & r_{x_4v_2} & r_{x_4v_3} & r_{x_4v_4} \\ r_{x_5v_1} & r_{x_5v_2} & r_{x_5v_3} & r_{x_5v_4} \\ r_{x_6v_1} & r_{x_6v_2} & r_{x_6v_3} & r_{x_6v_4} \end{bmatrix}$$

$$R_2=\begin{bmatrix} r_{y_1v_1} & r_{y_1v_2} & r_{y_1v_3} & r_{y_1v_4} \\ r_{y_2v_1} & r_{y_2v_2} & r_{y_2v_3} & r_{y_2v_4} \\ r_{y_3v_1} & r_{y_3v_2} & r_{y_3v_3} & r_{y_3v_4} \end{bmatrix}$$

$$R_3=\begin{bmatrix} r_{p_1v_1} & r_{p_1v_2} & r_{p_1v_3} & r_{p_1v_4} \\ r_{p_2v_1} & r_{p_2v_2} & r_{p_2v_3} & r_{p_2v_4} \\ r_{p_3v_1} & r_{p_3v_2} & r_{p_3v_3} & r_{p_3v_4} \end{bmatrix}$$

$$R_4=\begin{bmatrix} r_{q_1v_1} & r_{q_1v_2} & r_{q_1v_3} & r_{q_1v_4} \\ r_{q_2v_1} & r_{q_2v_2} & r_{q_2v_3} & r_{q_2v_4} \\ r_{q_3v_1} & r_{q_3v_2} & r_{q_3v_3} & r_{q_3v_4} \\ r_{q_4v_1} & r_{q_4v_2} & r_{q_4v_3} & r_{q_4v_4} \end{bmatrix}$$

$$R_5=\begin{bmatrix} r_{m_1v_1} & r_{m_1v_2} & r_{m_1v_3} & r_{m_1v_4} \\ r_{m_2v_1} & r_{m_2v_2} & r_{m_2v_3} & r_{m_2v_4} \\ \vdots & \vdots & \vdots & \vdots \\ r_{m_iv_1} & r_{m_iv_2} & r_{m_iv_3} & r_{m_iv_4} \end{bmatrix}$$

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$$R_6=\begin{bmatrix} r_{n_1v_1} & r_{n_1v_2} & r_{n_1v_3} & r_{n_1v_4} \\ r_{n_2v_1} & r_{n_2v_2} & r_{n_2v_3} & r_{n_2v_4} \\ r_{n_3v_1} & r_{n_3v_2} & r_{n_3v_3} & r_{n_3v_4} \end{bmatrix}$$

$$R_7=\begin{bmatrix} r_{j_1v_1} & r_{j_1v_2} & r_{j_1v_3} & r_{j_1v_4} \\ r_{j_2v_1} & r_{j_2v_2} & r_{j_2v_3} & r_{j_2v_4} \\ r_{j_3v_1} & r_{j_3v_2} & r_{j_3v_3} & r_{j_3v_4} \end{bmatrix}$$

Fuzzy matrix product definition is :

$$C=W\times R\Rightarrow c_{ij}=\bigcup_k(w_{ik}\bigcap r_{kj}) \qquad (1)$$

Due to influence degree of each factors in U_1 for flexible A_1 is different, so there is Fuzzy set for U_1 to be described the influence degree, $W_1=(w_{A_1x_1},w_{A_1x_2},w_{A_1x_3},w_{A_1x_4},w_{A_1x_5},w_{A_1x_6})$, $w_{ij}(i=A_1,j=x_1,x_2,\cdots x_6)$ means x_j weight to A_1 .By parity of reasoning, the weight vectors of U_2 for A_2 is $W_2=(w_{A_2y_1},w_{A_2y_2},w_{A_2y_3})$,the weight vectors of U_3 for A_3 is $W_3=(w_{A_3p_1},w_{A_3p_2},w_{A_3p_3})$,the weight vectors of U_4 for A_4 is $W_4=(w_{A_4q_1},w_{A_4q_2},w_{A_4q_3},w_{A_4q_4})$ .the weight vectors of U_5 for A_5 is $W_5=(w_{A_5m_1},w_{A_5m_2},\cdots,w_{A_5m_i})$,the weight vectors of U_6 for A_6 is $W_6=(w_{A_6n_1},w_{A_6n_2},w_{A_6n_3})$,the weight vectors of U_7 for A_7 is $W_7=(w_{A_7j_1},w_{A_7j_2},w_{A_7j_3})$ .Weight algorithm of AHP is applied to calculate $W_i(i=1,2,3,4,5,6,7)$ .For W_1 ,the factors in U_1 are made pair wise comparisons, there are 1-9 scale, b_{ij} means the i-th factor is relative important for the j-th factor,

$$b_{ij}=\frac{1}{b_{ji}} \qquad (2)$$

$B_i(i=1,2,.....,7)$ is Pair wise comparison matrix as the following matrix:

$$B_i=\begin{bmatrix} b_{m_1m_1} & b_{m_1m_2} & \cdots & b_{m_1m_i} \\ b_{m_2m_1} & b_{m_2m_2} & \cdots & b_{m_2m_i} \\ \vdots & \vdots & \vdots & \vdots \\ b_{m_im_1} & b_{m_im_2} & \cdots & b_{m_im_i} \end{bmatrix}$$

Where, comparison scales have the following meanings in TABLE II.

Table II: Comparison Scales

Criterion	Implication
1	Influence of the i-th factor and the j-th factor is the same
3	Influence of the i-th factor is slightly stronger than that of the j-th
5	Influence of the i-th factor is stronger than that of the j-th
7	Influence of the i-th factor is obviously stronger than that of the j-th
9	Influence of the i-th factor is absolutely stronger than that of the j-th
2,4,6,8	Influence of the i-th factor and the j-th factor is between the two adjacent grades

In this paper, eigenvector of the largest eigenvalue of pair wise comparison matrix is as weight vector for $A_j(j=1,2,3,4,5,6,7)$, the more inconsistent, and the more much deviation. Therefore, CI is consistency index,

$$CI=\frac{\lambda-n}{n-1} \qquad (3)$$

Random consistency index RI values in the following table III:

Table III: Random Consistency Index RI Values

n	1	2	3	4	5	6	7	8	9	10	11
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51

When CR<0.1, the weight vector can be considered to be reasonable, otherwise, pair wise comparison matrix must be reconstructed.

$$CR=\frac{CI}{RI} \qquad (4)$$

2.2 Format Of Manuscript Setting Up The E-Tourism Supply Chain Mode

We make use of summation method to solve the largest eigenvalue of pair wise comparison matrix B_i , and steps of setting up the e-tourism supply chain mode are as follows:

(1) Each column vector in B_i is normalized,

$$\tilde{w}_{ij}=\frac{b_{ij}}{\sum_i b_{ij}} \qquad (5)$$

(2) $\tilde{w}_{ij}$ is computed by row as follows,

$$\tilde{w}_i=\sum_j \tilde{w}_{ij},\tilde{W}=(\tilde{w}_1,\tilde{w}_2,\cdots\tilde{w}_n) \qquad (6)$$

(3) According to formula (7), weight vector is normalized to be $W=(w_1,w_2,\cdots w_n)$.

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$$w_i = \frac{\tilde{w}_i}{\sum_i \tilde{w}_i} \quad (7)$$

(4) λ is calculated according to formula (8), and BW is Approximation of the maximum eigenvalue.

$$\lambda = \frac{1}{n}\sum_i \frac{(BW)_i}{w_i} \quad (8)$$

(5) We define that Fuzzy evaluation vector D_i is for A_i in domain V.

$$D_i = W_i \times R_i (i = 1,2,3,4,5,6,7) \quad (9)$$

(6) According to weighting algorithm in AHP, weight vector W' is from flexible, integration, coordination, service level of tourism service enterprises, scenic attraction, cost, tourist satisfaction to performance of e-tourism supply chain based on network intermediary can be calculated.

(7) $D_i (i = 1,2,3,4,5,6,7)$ is as row vector of the FCE matrix D for $A_i (i = 1,2,3,4,5,6,7)$ in domain V. thus, *FCE* vector D' for Z in domain V is defined as follows:

$$D' = W' \times D \quad (10)$$

(8) Components in D' are compared, that can explain the performance is on which assessment level, then some experts quantify the evaluation set to be $N = (n_1, n_2, n_3, n_4)$. So the performance value of the supply chain is:

$$E = D' \times N^T \quad (11)$$

3. APPLICATION ANALYSIS

3.1 The Construction Of Evaluation Model Of E-Tourism Supply Chain In Jiangxi

In this paper, 20 tourism experts from Jiangxi were invited to score for the importance of the indicator and they did not meet each other. Pair wise comparison matrix is constructed according to the scores to weight vectors for every factor. The score for U_i on the domain V are given by the experts and questionnaire investigation. So the results is based on the above analysis:

$$R_1 = \begin{bmatrix} 0.35 & 0.45 & 0.1 & 0.1 \\ 0.36 & 0.56 & 0.08 & 0 \\ 0.12 & 0.56 & 0.28 & 0.04 \\ 0.2 & 0.6 & 0.2 & 0 \\ 0.2 & 0.56 & 0.24 & 0 \\ 0.44 & 0.48 & 0.08 & 0 \end{bmatrix}$$

$$R_2 = \begin{bmatrix} 0.6 & 0.3 & 0.1 & 0 \\ 0.4 & 0.3 & 0.2 & 0.1 \\ 0.3 & 0.5 & 0.1 & 0.1 \end{bmatrix}$$

$$R_3 = \begin{bmatrix} 0.4 & 0.2 & 0.3 & 0.1 \\ 0.35 & 0.45 & 0.1 & 0.1 \\ 0.32 & 0.48 & 0.12 & 0.08 \end{bmatrix}$$

$$R_4 = \begin{bmatrix} 0.12 & 0.32 & 0.48 & 0.08 \\ 0.16 & 0.24 & 0.52 & 0.08 \\ 0.2 & 0.24 & 0.56 & 0 \\ 0.08 & 0.44 & 0.48 & 0 \end{bmatrix}$$

$$R_5 = \begin{bmatrix} 0.55 & 0.14 & 0.19 & 0.12 \\ 0.2 & 0.3 & 0.33 & 0.17 \\ 0.35 & 0.2 & 0.27 & 0.13 \\ 0.1 & 0.6 & 0.2 & 0.1 \\ 0.2 & 0.3 & 0.17 & 0.33 \\ 0.48 & 0.28 & 0.19 & 0.15 \\ 0.6 & 0.2 & 0.2 & 0 \\ 0.1 & 0.3 & 0.36 & 0.24 \\ 0.15 & 0.29 & 0.22 & 0.34 \\ 0.14 & 0.17 & 0.55 & 0.14 \\ 0.2 & 0.27 & 0.3 & 0.33 \\ 0.63 & 0.2 & 0.17 & 0 \\ 0.1 & 0.2 & 0.6 & 0.1 \\ 0.6 & 0.3 & 0.1 & 0 \\ 0.02 & 0.40 & 0.56 & 0.02 \\ 0.13 & 0.17 & 0.68 & 0.02 \\ 0.13 & 0.30 & 0.44 & 0.13 \\ 0.57 & 0.10 & 0.30 & 0.03 \\ 0.18 & 0.53 & 0.28 & 0.01 \end{bmatrix}$$

$$R_6 = \begin{bmatrix} 0.15 & 0.42 & 0.31 & 0.12 \\ 0.13 & 0.24 & 0.31 & 0.32 \\ 0.22 & 0.18 & 0.42 & 0.18 \end{bmatrix}$$

$$R_7 = \begin{bmatrix} 0.15 & 0.25 & 0.46 & 0.14 \\ 0.17 & 0.27 & 0.34 & 0.22 \\ 0.17 & 0.11 & 0.62 & 0.1 \end{bmatrix}$$

According to experts' advice, Pair wise comparison matrix is built, its largest eigenvalue and the normalized eigenvectors corresponding with the eigenvalue can be calculated as follows.

$W_1 = (0.16, 0.19, 0.19, 0.05, 0.12, 0.30)$

$W_2 = (0.46, 0.46, 0.08)$,

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$W_3 = (0.59, 0.35, 0.06)$

$W_4 = (0.351, 0.351, 0.109, 0.189)$

$W_5 = (0.0773, 000391, 0.0612, 0.0408, 0.02995, 0.0474, 0.048, 0.0403, 0.0178, 0.0235, 0.013, 0.03005, 0.0127, 0.0189, 0.02, 0.045, 0.265, 0.055, 0.115)$

$W_6 = (0.32, 0.34, 0.34)$, $W_7 = (0.105, 0.637, 0.258)$

Weight vector of $A_i (i = 1, 2, 3, 4, 5, 6, 7)$ to Z is $W' = (0.3255, 0.0573, 0.0387, 0.1746, 0.2097, 0.1060, 0.0882)$

Fuzzy evaluation vectors $C_i (i = 1, 2, 3, 4)$ for $A_i (i = 1, 2, 3, 4, 5, 6, 7)$ on domain V are calculated by formula (1) and then is considered as row vector to construct the fuzzy evaluation matrix.

$$D = \begin{bmatrix} 0.33 & 0.33 & 0.22 & 0.12 \\ 0.43 & 0.28 & 0.19 & 0.1 \\ 0.35 & 0.3 & 0.26 & 0.09 \\ 0.21 & 0.34 & 0.37 & 0.08 \\ 0.16 & 0.34 & 0.34 & 0.16 \\ 0.18 & 0.27 & 0.28 & 0.27 \\ 0.17 & 0.27 & 0.34 & 0.22 \end{bmatrix}$$

Then fuzzy evaluation vector D' for Z on domain V is calculated by formula (1) and (10): $D' = (0.32, 0.31, 0.21, 0.16)$, Fuzzy evaluation set V is quantified to be $N = (0.4, 0.3, 0.2, 0.1)$,So the performance Z in Jiangxi is calculated by formula (11) and vector multiplication principle to be Z=0.279. From fuzzy evaluation vectors for $A_i (i = 1, 2, 3, 4, 5, 6, 7)$ on domain V ,the pattern of e-tourism supply chain in Jiangxi is "Good", the performance is high, in general, the pattern is feasible.

3.2 Analysis For The Pros And Cons Of E-Tourism Supply Chain In Jiangxi

Factors-important model is widely applied in International service industry, through the model, opportunities, strengths, threats, weaknesses of e-tourism supply chain are clearly expressed and the improvement for the chain's performance can be decided as Figure 1.

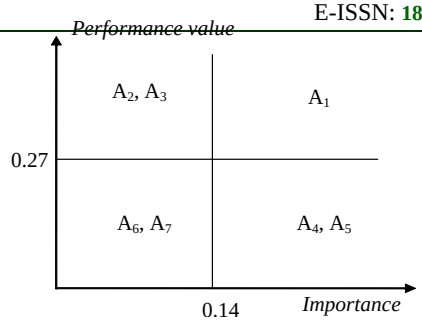

Figure 1: Factors-Important Model

As is shown in Figure 1, relative position of flexible, integration, coordination, service level of tourism enterprise, scenic attractiveness in Jiangxi, cost, tourist satisfaction in coordinate system can reflect which have priority to need to be improved for the performance of the chain in Jiangxi. Weight coefficients of each target are shown in the horizontal axis, the performance of each target for the chain in Jiangxi is shown in the vertical axis.20 experts analysis the importance and performance of each target for the e-tourism supply chain . There are four areas in the coordinate system. In the first areas, the indicators need to be improved, the experts think the indicators are more important, but theirs performance for the mode is lower. In the second area, the indicators are the main advantages; the importance and performance of indicators are both higher. In the second area, the importance and performance of indicators are both lower. In the fourth area, the experts think the indicators are relatively low, but theirs performance for the mode is higher. Y is considered as ordinate values of the indicators, W' is considered as abscissa value of the indicators. Y is computed as formula (12).

$$Y = D \times N^T \quad (10)$$

According to formula (3) to (6) and formula (12) , the result of calculation are shown as follows.

$Y = (0.289, 0.3057, 0.2913, 0.2674, 0.250, 0.2367, 0.239)^T$

$W' = (0.3255, 0.0573, 0.0387, 0.1746, 0.2097, 0.106, 0.0882)$

4. CONCLUSION

We can draw some conclusions from the above analysis:

(1) The flexible of e-tourism supply chain is "Good", that means the problem for single tourism product can be solved and tourists' diversified demand can be met. Difficulty level of return the tourism order is the most important for flexible, the authors think the reason is the rapid change of tourists' demand and the smooth information channel. From table I, the evaluation of difficulty

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level of return the tourism order is very high in the pattern of tourism e-supply chain based on network intermediary. Integration and coordination are less important than flexible, but in e-tourism supply chain mode, their performance also is "good".

(2) Service level of tourism enterprise and scenic attractiveness in Jiangxi are considered to be important by experts but have lower performance value, and this can reflect the status of tourism resources in Jiangxi. As can be seen from Table 1, Evaluation of historical value and cultural value is the highest in scenic attractiveness in Jiangxi, whose tourism resources are unparalleled compared with other places. But the evaluation of some factors like popularity is relative poor, it is insufficient for "red" tourism resources in Jiangxi to promote in media, the authors think the government as network intermediary may advertise in CCTV in order to improve the visibility of tourism resources in Jiangxi Province. The evaluation of the factors like technology simulation, Participating in interactive is low, but the weight of technology simulation and participating in interactive is not large, that means it is not necessary to invest to build technology facilities or equipment in red tourism resources in Jiangxi to construct e- tourism supply chain based on network, however, it is emphasized that cultural heritage is publicized and the revolutionary spirit is carried forward. The culture and the spirit really can improve red scenic attraction in Jiangxi. Thus, the value-added will be increased and the operational cost will be reduced in this mode. Supporting facilities just like high-star hotel and catering, entertainment need to be rapidly constructed in order to improve the service ability of tourism service firms. Traffic condition between tourist market and the scenic area should be improved, and the traffic between different scenic areas can also be improved. Those could increase the service level of tourism service providers. "red" tourism and "green" tourism should be comprehensively integrated in order to make Jiangxi become tourism resort. Value added of e-tourism supply chain should be essentially improved due to the improvement of service level of tourism enterprise and scenic attractiveness in Jiangxi.

(3) Improvement of value added e-tourism supply chain in Jiangxi would lead to tourist satisfaction improved, So the importance of tourist satisfaction is thought to be relatively low. A large amount of money need to be invested to construct the mode of e-tourism supply chain in Jiangxi but it is hard to increased performance in a short time for tourism supply chain , so the expence is considered to be less important by experts. However, the author's basic argument is that the performance value of tourism supply chain in Jiangxi would maximize under the given cost.

(4) In order to improve comprehensive service and management decision-making ability of the tourism industry, the authors intend to design an e-commerce of tourism supply chain platform based on the network intermediary, the principle by which we establish the platform is that the government should act as the network intermediary and make the overall planning for strategic considerations. To establish the platform, we need integrate the resources, layout scientifically, stand out the keys and form resultant force. We need combine the red tourism and ecological tourism in an organic whole, in which case these two tourisms would promote each other. If we can design this platform, it would be unique scenery.

(5) There are still somethings that need to be improved in this paper, such as how to design different travel routes to meet all kinds of demands for the visitors, and how to design the mechanism to balance the interests among all enterprises in e-tourism supply chain, and how to appraise the control power of the core firm in supply chain, and so on. These problems would be studied in the later time.

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