Research on the Evaluation of Tourist Satisfaction in Wuhan City Tourism Destinations Based on the Quadrant Graph Model

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Abstract. Based on the research review of urban tourism and tourist satisfaction, this paper builds a tourist satisfaction evaluation model for urban tourism destinations to obtain tourist satisfaction and importance values of different evaluation indicators, and uses the quadrant graph model to evaluate the urban tourism status of Wuhan. Conducted empirical research, analyzed various factors influencing tourist satisfaction and included them in the advantage zone, maintenance zone, opportunity zone and repair zone respectively, and put forward corresponding suggestions for improvement.

Key words: Urban Tourism; Tourist Satisfaction; Four-Part Graph Model; Wuhan

1. Introduction

With the gradual improvement of China's urbanization rate, urban tourism has come into people's vision. In the 1960s, American scholar Stansfield first raised the issue of "urban tourism" in his book "Urban-rural Development Imbalance in American Tourism Research" and explained its important role in tourism development. However, the focus of research by foreign scholars is on demand and generation of consumer. In recent years, it has begun to be subdivided into specific things, such as famous urban buildings and urban characteristic scenic spots. Domestic scholars' research on tourist satisfaction began in the 1990s. The research direction is relatively rich, but relatively scattered [1]. Most of the research is on urban tourism image and positioning, and urban tourism development planning [2]. Zhang C H, Bai K, Ma Y F and Zhuang Y discussed the theory and practice of urban tourism by taking various localities as examples [3]. Zhang Z Y studied the urban tourism industry and the mode and development orientation of urban tourism, and also pointed out the characteristic themes of urban tourism [4]. The intensification of the modern tourism industry makes the competition between single tourist destinations have risen to the competition among the overall tourist destinations of the city. Mastering the satisfaction of tourists in urban tourist destinations is the basis for developing the tourism industry and enhancing the competitiveness of tourism destinations [5].
2. Construct an index system
Based on users’ comments on major network platforms and analysis of literature data, this paper uses analytic hierarchy process and questionnaire survey to construct an index system for the evaluation model of tourist satisfaction at tourist destinations in Wuhan [6], as shown in Table 1.

| Evaluation Index                  | Second Index                                      | Third Index                                      |
|-----------------------------------|---------------------------------------------------|-------------------------------------------------|
| Tourist Satisfaction Evaluation System | Urban Image                                      | Local security situation (1)                   |
|                                   |                                                   | The degree of civilized behavior of the locals (2) |
|                                   |                                                   | The degree of regulation of travel transactions (3) |
|                                   |                                                   | Tourist order (4)                               |
| Environment Atmosphere            | Local characteristic scenery (5)                  |                                               |
|                                   | Local life rhythm (6)                             |                                               |
|                                   | City air quality (7)                              |                                               |
|                                   | Completeness of urban infrastructure (8)         |                                               |
| Traffic Condition                 | Urban external traffic (9)                        |                                               |
|                                   | Urban internal traffic (10)                       |                                               |
|                                   | Urban traffic order (11)                          |                                               |
| Accommodation Condition           | Accommodation hygiene (12)                       |                                               |
|                                   | service quality of staff (13)                     |                                               |
|                                   | Accommodation location (14)                      |                                               |
|                                   | Accommodation Transportation (15)                |                                               |
| Catering Services                 | Catering performance-price ratio (16)            |                                               |
|                                   | Special Catering Service (17)                    |                                               |
|                                   | special snack (18)                               |                                               |
| Tourist Attraction                | Attraction consumption (19)                      |                                               |
|                                   | Number of visitors (20)                          |                                               |
|                                   | Tourism supporting services (21)                 |                                               |
| Entertainment Shopping            | Convenience of shopping (22)                     |                                               |
|                                   | Richness of nightlife (23)                        |                                               |
| Cultural Perception               | Local cultural characteristics (24)              |                                               |
|                                   | Cultural heritage (25)                           |                                               |
| Price Perception                  | Ticket price (26)                                |                                               |
|                                   | Food prices (27)                                 |                                               |
|                                   | Accommodation price (28)                         |                                               |
|                                   | Souvenir price (29)                              |                                               |
| Overall Evaluation                | Travel complaint resolution (30)                 |                                               |
|                                   | Ability and service attitude of tour guide (31)  |                                               |
|                                   | Convenience of tourist information (32)          |                                               |
|                                   | Willingness of revisit (33)                      |                                               |

3. Reliability and validity analysis

3.1. Reliability analysis
This article uses the Cronbach α coefficient suitable for attitude and opinion questionnaires to test the reliability of the questionnaire. The α coefficient is between 0 and 1, and the greater the alpha value, the higher the reliability. When Q is greater than 0.7, the reliability is quite high.
Table 2. Importance reliability analysis.

| Cronbach Alpha | Cronbach based on standard terms Alpha | Terms |
|----------------|--------------------------------------|-------|
| 0.856          | 0.856                                | 33    |

From Table 2, it can be seen that the reliability coefficient is 0.856 and greater than 0.8, which shows that the reliability quality of the research data is relatively high. Regarding "the α coefficient with the item deleted", the reliability coefficient value after the analysis item is deleted has not changed significantly, so it shows that all the items should be kept, and it further shows that the reliability level of the research data is relatively high.

3.2. Validity analysis

Sampling is shown in Table 3. The value of KMO is 0.767 > 0.7, indicating that the data is still suitable for factor analysis. At the same time, the significance probability of BartlettP value is 0.000, which is less than 0.01, indicating that the data also has a good correlation and appropriateness measure.

Table 3. Test tables of KMO and Bartlett

| KMO Sampling suitability measure | 0.767 |
|---------------------------------|-------|
| Bartlett Spherical Test         |       |
| Approximate chi-square          | 5347.243 |
| Degree of freedom               | 528   |
| Significance                    | 0.000 |

3.3. Measurement results of overall tourist satisfaction index

3.3.1. Evaluation methods and specific steps. (1) Calculate the tourists’ satisfaction with each indicator of Wuhan city tourism. The following formula (1) can be used to express the evaluation method and specific steps [7].

\[
S_i = \sum_{j=1}^{n} x_j y_{ij} \tag{1}
\]

Where, \( i \) is the number of indicators that affect the satisfaction of tourists; \( j \) is the classification level for evaluating the relative satisfaction of each indicator; \( S_i \) is the degree of satisfaction of tourists with the \( i \) indicator; \( y_{ij} \) is the proportion of the total number of tourists whose importance of the \( i \) index is level \( j \); \( x_j \) is the score when the indicator corresponds to \( j \).

(2) Calculate the importance of each index of Wuhan city tourism to tourists, which can be expressed by the following formula (2):

\[
V_i = \sum_{j=1}^{k} S_j t_{ij} \tag{2}
\]

Among them, \( V_i \) is the degree of importance of the \( i \) index; \( t_{ij} \) is the proportion of tourists whose importance of the \( i \) index is \( j \) to the total number of tourists; \( s_j \) is the corresponding score when the importance degree is \( j \).

(3) Calculate the overall satisfaction degree of tourists with Wuhan city tourism, which can be expressed by the following formula (3):

\[
P = \frac{\sum_{i=1}^{n} S_i V_i}{x_m \sum_{i=1}^{n} V_i} \tag{3}
\]

Among them, \( x_m \) is the score corresponding to the highest degree of satisfaction; \( s_j \) is the degree of satisfaction of tourists with the \( i \) index; \( V_i \) is the importance of the \( i \) index. The specific calculation data is shown in Table 4 below.
3.4. Analysis of evaluation results based on the Quadrant Graph Model

Summarize the information of "visitor satisfaction indicators" and "importance of tourist satisfaction" in the questionnaire, and obtain tourist satisfaction and importance data [8] (see Table 4), and include the data in the quadrant graph model. Get the quarter graph model shown in Figure 1 below [9].

Table 4. Tourist satisfaction evaluation index calculation results.

| Evaluation index                                      | Satisfaction $S_i$ | Importance $V_i$ |
|-------------------------------------------------------|--------------------|-----------------|
| Local security situation (1)                          | 3.43               | 4.12            |
| The degree of civilized behavior of the locals (2)    | 3.35               | 4.26            |
| The degree of regulation of travel transactions (3)   | 2.75               | 3.65            |
| Tourist order (4)                                     | 2.58               | 3.57            |
| Local characteristic scenery (5)                      | 3.39               | 3.78            |
| Local life rhythm (6)                                 | 3.53               | 3.74            |
| City air quality (7)                                  | 2.57               | 4.67            |
| Completeness of urban infrastructure (8)             | 3.23               | 3.45            |
| Urban external traffic (9)                            | 4.13               | 4.35            |
| Urban internal traffic (10)                           | 4.37               | 4.46            |
| Urban traffic order (11)                              | 3.38               | 4.13            |
| Accommodation hygiene (12)                            | 3.35               | 3.89            |
| Service quality of staff (13)                         | 3.52               | 3.86            |
| Accommodation location (14)                           | 3.42               | 3.79            |
| Accommodation Transportation (15)                    | 4.17               | 4.36            |
| Catering performance-price ratio (16)                 | 3.40               | 3.69            |
| Special Catering Service (17)                        | 3.66               | 3.86            |
| Special snack (18)                                   | 3.78               | 4.12            |
| Attraction consumption (19)                           | 3.41               | 3.74            |
| Number of visitors (20)                               | 3.68               | 3.93            |
| Tourism supporting services (21)                      | 3.44               | 3.79            |
| Convenience of shopping (22)                          | 3.74               | 4.12            |
| Richness of nightlife (23)                            | 3.81               | 3.95            |
| Local cultural characteristics (24)                   | 3.71               | 4.24            |
| Cultural heritage (25)                                | 4.16               | 4.35            |
| Ticket price (26)                                     | 3.41               | 4.10            |
| Food prices (27)                                      | 3.61               | 3.87            |
| Accommodation price (28)                              | 3.43               | 3.98            |
| Souvenir price (29)                                   | 3.15               | 3.78            |
| Travel complaint resolution (30)                      | 3.35               | 3.47            |
| Ability and service attitude of tour guide (31)       | 3.55               | 3.79            |
| Convenience of tourist information (32)               | 3.39               | 4.15            |
| Revisit Willingness (33)                               | 3.12               | 4.24            |
Figure 1. Quarter graph model.
Note: 1-33 respectively represent the three levels of indicators

A area-Advantage area (high satisfaction, high importance). The seven evaluation indicators in the figure appear in this area, especially the three indicators of urban external transportation, urban internal transportation, and accommodation transportation are very prominent, indicating that the convenience of urban transportation facilities in Wuhan is still very good. Secondly, the reflection of cultural heritage is also more important, representing that Wuhan is still a city with a lot of history and culture.

B area-Repair area (low satisfaction, high importance). In the figure, six indicators of urban air quality, local people's civilized behavior, urban traffic order, convenience of tourism information, local public security and willingness to revisit are distributed in this area.

C area-Opportunity area (low satisfaction, low importance). In the figure, 13 indicators such as the degree of resolution of tourism complaints, the completeness of urban infrastructure, the cost-effectiveness of catering, and the price of souvenirs are distributed in the area.

D area-Maintenance zone (high satisfaction, low importance). In the figure, 7 indicators such as catering prices, local life rhythm, and shopping convenience are distributed in this area.

4. Suggestions on Improving Tourist Satisfaction in Wuhan City Tourism Destinations Based on the Quadrant Graph Model

4.1. Strengthen urban infrastructure
(1) Improve road traffic conditions
In terms of improving road traffic conditions, some advanced foreign experience and methods can be used for reference. For example, large cities in the United States generally adopt the method of scientifically setting traffic signs at intersections to solve intersection congestion, thereby improving urban road traffic conditions. Second, the transportation department should rationally plan urban roads and further strengthen traffic guidance services.

(2) Standardize the price management of scenic spots
Relevant departments can launch package discount activities between attractions and take measures such as reducing prices during holidays. Secondly, it must be managed in strict accordance with the "Government Price Decision Hearing Measures" and the "Business Service Price (Charge) Certificate" promulgated by the state. According to the principle of pricing by quality, the ticket prices of urban tourist attractions are subject to a two-way regulation system of high-quality upward adjustment and low-quality downward adjustment.

(3) Rectify the order of the tourism market
Improve the professionalism of staff in scenic spots, and provide enough scenic service stations to provide tourists with a relaxing and pleasant travel environment.

4.2. Self-improvement of city image
(1) Create a clean and tidy urban environment
The dust pollution caused by urban construction in Wuhan in recent years, as well as the messy mess caused by poor city management, have indeed left a bad impression on tourists. Government departments should pay attention to it, pay attention to protection and isolation during construction, actively carry out and supervise garbage classification, refuse to appear in disorder, and strive to create a cleaner and beautiful city;

(2) Improve the overall quality of residents
Government departments should strictly supervise and manage, actively promote civilized behavior activities, encourage citizens to speak Mandarin for foreign tourists, and treat them with a very friendly attitude. At the same time, you can also use the public places in the community or the educational bases of large, middle and elementary schools to regularly hold lectures or fun activities on traffic-related knowledge, so that the general public, especially the students, can establish a sense of responsibility for traffic regulations.

4.3. Improve the overall coordination ability of urban tourism
(1) Recommend that each scenic area can cooperate with each other
Joint promotions between scenic spots and scenic spots, and launch discount packages. Each district government shall conduct in-depth research on local advantageous tourism resources, analyze the differences between local tourism resources, and integrate and develop some characteristic tourist routes.

(2) Consider providing a direct shuttle bus between attractions and attractions
This can also effectively alleviate the traffic pressure on residents during peak hours. In this regard, you can refer to the through-train service of scenic spots in Chengdu.

4.4. Maintain the sustainable development of urban tourism
(1) Protect the integrity of tourism resources
As much as possible to provide tourists with a kind of original ecological development scenery, and at the same time, consider the effective evaluation of tourists to make environmental protection and tourism resource development coordinated development.

(2) Strengthen tourists and residents' awareness of tourism environmental protection
Everyone supervises each other to provide residents with a comfortable living environment and create a good viewing environment for tourists. First of all, local residents should set an example and take the lead. As with volunteers in intersection traffic command, some social volunteers (residents near each scenic spot) are assigned to protect the scenic environment and supervise the civilized behavior of tourists in real time.
5. Conclusion
The study found that tourists are very satisfied with the convenience of urban transportation facilities in Wuhan, while giving very low evaluations on the city's air quality, local people's civilized behavior, urban traffic order and local public security. However, there is still a lot of room for development in terms of the completeness of urban infrastructure, the cost-effectiveness of catering and the convenience of shopping.

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