

# Research on Tourism Resources Evaluation of The Palace Museum: Based on the AHP Method

Kehan Li

School of Management, Shanghai University, Shanghai, China

## Abstract

People's material and cultural living standards are continuing to improve with the rapid development of economy, meanwhile, the spiritual and cultural demands are also increasing. As an important carrier of history and culture, museums have become an important choice for cultural consumption of people. As the largest museum of in our country, the scientific evaluation of resources of the Palace Museum is helpful to provide thoughts and suggestions for managers in improving the quality of museum tourism. This paper tries to build an evaluation system for tourism resource of The Palace Museum by using Analytic hierarchy process (AHP). Based on a survey of tourism management professionals, this paper determines 18 specific evaluation indicators and factor weights by constructing a judgment matrix for pairwise comparison.

## Keywords

The Palace Museum, Tourism Resources Evaluation, Analytic Hierarchy Process.

## 1. Introduction

With the development and prosperity of cultural tourism, as an important cultural tourism resource, the museum has become a huge attraction for tourists because of its own complete tourism functions and superior traffic location conditions. Especially with the advent of the "free ticket era" for museums in 2008, the comprehensive development and utilization of museums and the development of cultural tourism have become important research concerns for the expansion of space and joint development of museums and tourism. In order to speed up the joint development of museums and tourism, scientifically define the statistical scope of museums and tourism, and conduct tourism statistical surveys and monitoring activities in accordance with the law, the National Bureau of Statistics compiled the "National Tourism and Related Industries Statistical Classification (2015)", the contact between museum and tourism are closer, the development are stronger, and the advantages are more distinct.

The Palace Museum was built on October 10, 1925, which is based on the Forbidden City. The palace covers an area of 720,000 square meters, possesses 9,371 buildings, 1,862,690 collections and a large number of precious public cultural relics resources. It is the largest and the most complete wooden palace complex in the world. The annual total number of visitors to the Palace Museum exceeds 10 million, and the number of visits to the Palace Museum reached 17 million in 2018.

Reviewing the previous literature, it is found that the evaluation of tourism resources is mostly focused on the evaluation of natural tourism resources, while the evaluation of humanistic tourism resources is deficient. This paper selects The Palace Museum as the research object, which is rich in humanistic resources, aims to provide some ideas and suggestions for the further development of museum tourism in China by evaluating its tourism resources.

Literature on tourism resource evaluation at home and abroad are studied in this article. It also elaborates the relevant theories of tourism resource evaluation, and combines the characteristics of humanistic tourism resources to construct a tourism resource evaluation

system for The Palace Museum, evaluate the tourism resources of The Palace Museum by using Analytic Hierarchy Process (AHP).

## 2. Literature References

In the early 20th century, western developed countries had already carried out research on museum tourism. Since the 1970s, there had been a situation where museums and tourism are closely integrated and developed abroad. At the same time, researches on museums had gradually formed many branches. Experts' research on the integration of museums and tourism began to flourish, and numerous papers and theoretical monographs continued to emerge. Compared with foreign countries, the research on museum tourism in China started late, after generations of research, a wealth of literature and monographs had been formed. In general, the research on museum tourism in China follows the trend of foreign countries. Although the research has been combined with domestic reality in practice, it is still lack of innovation and has a big gap.

### 2.1. The evolution of museum functions

In the long process of adapting to social development, the museum has become a cultural carrier with multiple functions. The original function of the museum was to collect and preserve precious cultural relics, and to properly display cultural relics for people to appreciate. Later, as diverse demands of people changed, the museum possessed more functions such as social education, scientific research, etc. With the appearance of the knowledge-based economy in the 21st century, in order to adapt to the increasing demand for leisure time and the pursuit of spiritual relaxation, museums have gradually expanded their entertainment functions. European and American countries proposed the "3E functions" of museums, namely, cultural and educational functions, leisure and recreation functions, and life-enriching functions. Stephen believes that the research on museums is shifting towards the "people-oriented" direction, should provide visitors with a comfortable public environment, service and activities. Research of Yang shows that museums spread excellent national spirit through historical relics, revolutionary stories, etc. Museums have become tourist attractions and develop towards providing all-round services with the progress of the times.

### 2.2. Behavior of Museum Tourists

The research on the behavior of museum visitors first started in Western countries, which focused on people. The research content involved the conditions and motivations of museum tourists. The questionnaire studied the perception of tourists and the satisfaction of each stage of the tour process. The research of Mclean found that tourists visited museum more to learn knowledge, enrich their own experience, and improve their knowledge. From the perspective of universities in Chengdu, Ma Liang put forward the preference of college students for museum tourism. He believed that college students have strong preferences in museum tourism and are eager to obtain high-quality tourism supplies and unique museum goods and services.

### 2.3. Development of Museum Tourism Resources

Silberberg discussed the development of tourism functions of museum from the perspective of cultural display. He constructed a system to evaluate the elements of museum tourism display, and proposed that museum tourism products should be combined with similar cultural products, different cultural products or other types of products to realize the promotion of museum cultural value. From the macro perspective of city development, Myriam believed that museums could use various methods to create a high-quality urban tourism environment, which is a core attraction of urban tourism. Liu Qinghua and Xu Jiahui analyzed the Guilin Museum and concluded that the development of museum tourism products should incorporate

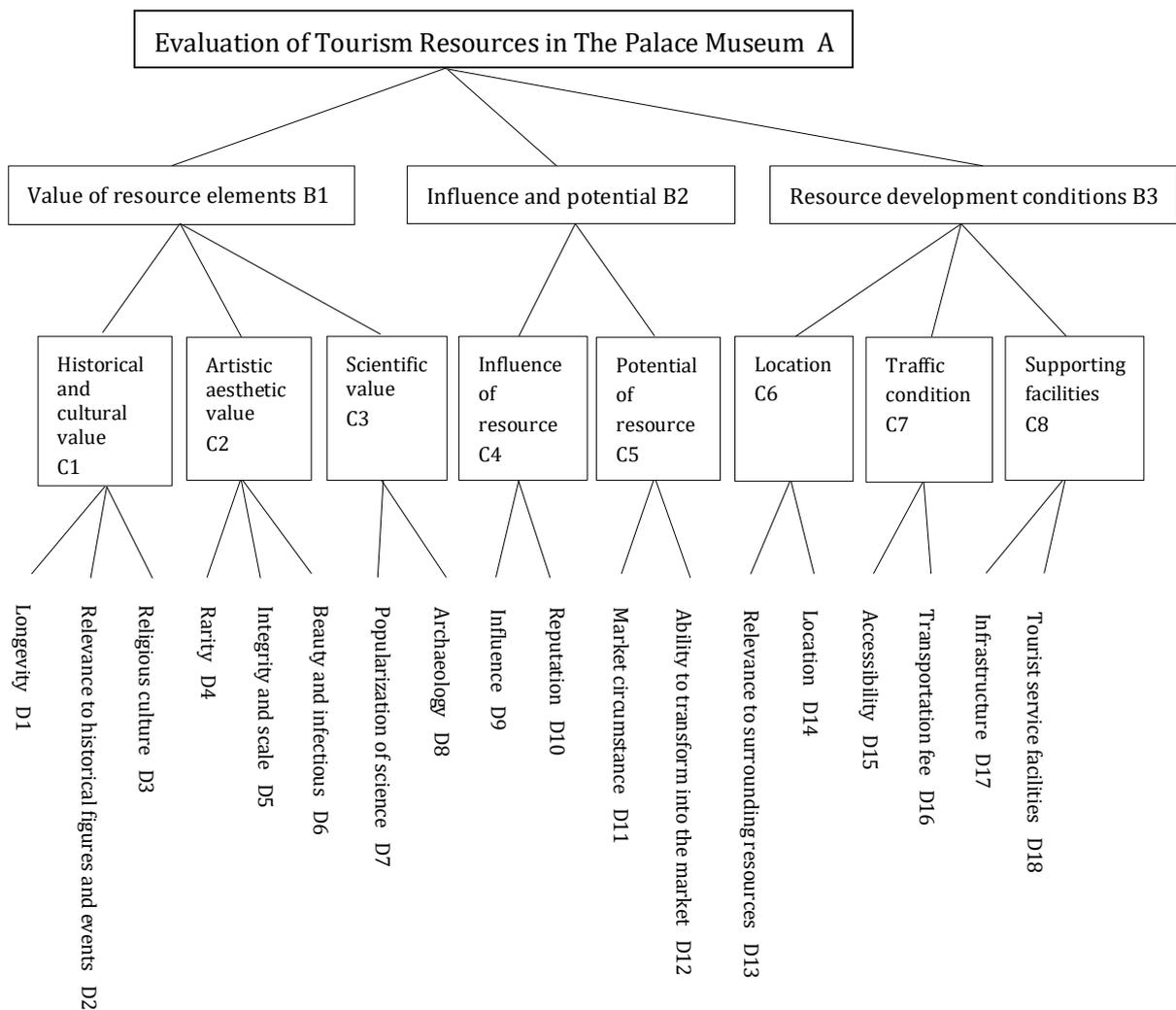
the characteristics of museum cultural relics, conform to the aesthetic vision of the times, and develop tourism products of different level.

### 3. Evaluation of Tourism Resources in The Palace Museum

The basis for scientific prediction and accurate evaluation is to construct a reasonable index system. Specifically, it is to construct a practically feasible system according to the characteristics of the research object, and assign corresponding weights to each of the basic factors in this system. Based on the current situation of the tourism resources of the Palace Museum, this study combined with the tourism resource evaluation index system established by Bao Jigang, Chu Yifang, Guo Laixi and others, and selected appropriate evaluation factors to establish the tourism resource evaluation index system of the Palace Museum (Diagram 1).

Layer A is the overall target layer, and the tourism resource evaluation of The Palace Museum is used as the overall evaluation target to measure the comprehensive level of tourism resources of The Palace Museum. Layer B is the comprehensive evaluation layer, which selects the value of resource elements, resource influence, potential, and resource development conditions as the evaluation criteria. Layer C is the project evaluation layer, and Layer D is the evaluation factor layer.

Diagram 1 Hierarchical Model of Comprehensive Evaluation of Museum Tourism Resources



The Analytic Hierarchy Process (AHP) was first defined by the American operational researcher A.L.Saaty in the 1970s. This method combines qualitative analysis and quantitative analysis. It systemizes complex issues through a hierarchical structure and obtains the best solution from the analysis results.

By using this method, the decision-maker decomposes the original complex research problem into multiple levels, decomposes the multiple levels into multiple influencing factors, then compares and calculates each basic element, calculates the weight value, then can propose the most practical solution. The train of thought of the AHP is clear, it has clear requirements for the basic elements and relationships included in the research object, but does not have strict requirements for quantitative data.

The AHP has the following specific steps:

- 1) Establish a hierarchical relationship, set up a general goal level A, which corresponds to the criterion level Bi and index level Ci;
- 2) Make pairwise comparisons of different target layers, and finally compare the importance of specific indicators in the target layer to form a judgment matrix:

$$R = \begin{pmatrix} R_{11} & \cdots & R_{1j} \\ \vdots & \ddots & \vdots \\ R_{i1} & \cdots & R_{ij} \end{pmatrix}$$

The judgment matrix refers to the comparison of the relative necessity between the high-level elements and the low-level elements. Rij represents the ratio of the importance of the i-th item to the j-th item of the judgment matrix R. In order to quantify the judgment, the AHP adopts the method of scale (1-9), and the corresponding quantitative scale is given for different situations (Table 1).

Table 1 Scale and definition of the judgment matrix

Rij	Definition
1	Index i and index j are equally important
3	Index i is slightly more important than index j, conversely it is 1/3
5	Index i is more important than index j, conversely it is 1/5
7	Index i is much more important than index j, conversely it is 1/7
9	Index i is absolutely more important than index j, conversely it is 1/9
2、4、6、8	Between the above ratios

- 3) Calculate the weight value

Firstly, according to the judgment matrix R, multiply the elements of each level, and find the N-th root of the calculation result.

$$\bar{W}i = \left( \prod_{j=1}^n Rij \right)^{\frac{1}{n}} \quad (i = 1, 2, 3, \dots, n)$$

Normalize the  $\bar{W}i$  obtained by the above formula to obtain the feature vector:

$$ri = \frac{\bar{r}i}{\sum_{j=1}^n \bar{r}i}$$

Finally, calculate the maximum feature root( $\lambda_{max}$ ), where  $(Ar)_i$  is the i-th element of the vector Ar.

$$\lambda_{\max} = \frac{1}{n} \sum_{i=1}^n \frac{(Ar)_i}{r_i}$$

4) Sorting and consistency check

For the rationality of the indicator weight value, the consistency ratio CR of the matrix R should be tested: CR=CI/RI. CI is an indicator of the general consistency of the judgment matrix.

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

RI is the average random consistency indicator (Table 2).

Table 2 Random consistency indicator

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

When CR = 0, it indicates that the judgment matrix meets the consistency. When CR <0.10, it indicates that the weight distribution is reasonable. If the calculation result cannot meet the consistency, the judgment and matrix scales can be rearranged.

5) Calculate comprehensive weight

In this paper, through questionnaire survey of a number of tourism professional researchers, the consistency of each judgment matrix is tested, the weight of the evaluation index is determined, and the comprehensive weight value is calculated by the AHP (Table 3).

Table 3 The Comprehensive Weights of Evaluation Indexes of Tourism Resources of The Palace Museum

Comprehensive evaluation layer (B)	Weight	project evaluation layer (C)	Weight	evaluation factor layer (D)	Weight
Value of resource elements	0.6555(1)	Historical and cultural value	0.4085 (1)	Longevity	0.2406 (1)
				Relevance to historical figures and events	0.1029 (2)
				Religious culture	0.0651 (5)
		Artistic aesthetic value	0.1570 (2)	Rarity	0.0673 (4)
				Integrity and scale	0.0224 (12)
				Beauty and infectious	0.0673 (4)
		Scientific value	0.0900 (5)	Popularization of science	0.0450 (7)
				Archaeology	0.0450 (7)
Influence and potential	0.1578 (3)	Influence of resource	0.1052 (3)	Influence	0.0526 (6)
				Reputation	0.0526 (6)
		Potential of resource	0.0526 (7)	Market circumstance	0.0175 (14)
				Ability to transform into the market	0.0351 (9)
Resource development conditions	0.1867 (2)	Location	0.0582 (6)	Relevance to surrounding resources	0.0194 (13)
				Location	0.0388 (8)

		Traffic condition	0.0916 (4)	Accessibility	0.0687 (3)
				Transportation fee	0.0229 (11)
		Supporting facilities	0.0369 (8)	Infrastructure	0.0277 (10)
				Tourist service facilities	0.0092 (15)

The final comprehensive weight has the following characteristics:

1) In the comprehensive evaluation layer, the weight value of resource element value is the highest (0.6555), followed by resource development conditions (0.1867) and resource influence and potential (0.1578). The value of resource elements refers to the value rich in the tourism resources of the Palace Museum itself. As the object of tourism activities, it is the foundation of the development of museum tourism.

2) In the project evaluation layer, the historical and cultural value weight value is the highest (0.4085), followed by the artistic aesthetic value (0.1570) and resource influence (0.1052), and the supporting facilities are the least (0.0369). For humanistic tourism resources, especially museum tourism resources, the historical and cultural value contained in it is the core competitiveness and the key factor for tourism development.

3) In the evaluation factor layer, the top three comprehensive weight values are the longevity of the age (0.2406), the relevance to historical events (0.1029), and the convenience and accessibility of transportation (0.0687). Whether the museum collection is old or not and whether it is related to the well-known historical figures and events are all factors that affect the value of tourism resources. In addition, the convenience and accessibility of the transportation of the museum tourism resources will also greatly affect its value of resources.

#### 4. Conclusion

History and culture are the soul of museum tourism development. Tourism is the carrier of history and culture. To enhance the attraction of museums, it is important to dig into the history and culture of museums. In the process of its development, it is necessary to pay attention to the ornamental nature of the development resources, integrate outstanding tourist resources and increase visibility.

The Palace Museum has been very successful in the development of specialty products, and it is worth learning from other museums. The cultural and creative products of The Palace Museum are not simply copied and imitated, but through bold attempts to bring cultural relics to life and integrate culture into life, upholding the mission of "promoting traditional culture as our own responsibility, guided by the needs of the public, and Based on science and technology and supported by academic research results, the development concept has made its characteristic products full of vitality.

This paper has established three research dimensions, finally determined historical and cultural value, artistic aesthetic value, etc. as evaluation elements, and constructed the tourism resource evaluation system of the Palace Museum. This article adopts the analytic hierarchy process, and finally determines 18 specific evaluation indicators and factor weights through the investigation of some scholars in the tourism major, and puts forward some targeted suggestions on the development of museum tourism resources based on the resource evaluation results.

Due to the huge workload of the evaluation of tourism resources and the difficulty in the selection of indicators, the evaluation index system of the tourism resources development value of The Palace Museum constructed in this paper is not perfect. To make the evaluation results more objective and scientific, further tests and supplements are needed in practice development. In addition, although the AHP is adopted in this article, the subjectivity of the

research is still strong. In future research, more objective or quantitative analysis methods in other fields are needed to discuss the value of museum tourism resources.

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