Research on Cultural Value Evaluation of Ciqikou Architecture based on AHP Method

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Abstract. This paper uses AHP to evaluate the cultural value of Ciqikou architectural elements. Based on constructing the evaluation system of the cultural value of Ciqikou building elements, this paper uses the analytic hierarchy process (AHP) to determine the weight of each index and obtains the cultural value of Ciqikou building, the value of humanistic spirit,the value of regional characteristics, the value of cultural memory, the value of scientific research. The results showed that the value of place memory, experience participation, architectural cultural background, educational value,and professional research value were slightly lower. Put forward the countermeasures for the deep development of cultural tourism in Ciqikou ancient town of Chongqing.

Keywords: Magnetic mouth building; Cultural value; Evaluation research.

1. Introduction

Ciqikou is in the northwest of Shapingba District, Chongqing City, which is 3 km away from the center of the Shapingba District and covers an area of 1.18 km2. CIQIKOU has a long history, and its distinctive cultural imprint and architectural remains with regional characteristics of Bayu are the epitome and symbol of Chongqing's ancient city[1]. Therefore, the depth and breadth of research on the magnetic nozzle are gradually increasing. Zhou Qian, Liu Guiwen, and so on have made correlation research to the Ciqikou block suitability, proposed the protection history block strategy [2]. Liu Zhenghao discusses the research paths of the evolution of urban block space and tries to generalize the cultural elements and historical evolution of Ciqikou's ancient town under these paths[3]. Some scholars apply traditional elements to modern architecture, expanding the perspective of diversity. However, the research on the cultural value of Ciqikou building itself is still scarce, and the methods of combining qualitative research and quantitative research are also few. Therefore, this paper will be based on AHP, combined with quantitative and qualitative research methods. It evaluates the cultural value of Ciqikou building under the condition of ensuring scientific and validity.

This article aims to evaluate the cultural value of ciqikou ancient town architecture. The main objective of this paper are (1) to establish an index system for evaluating the cultural value of Ciqikou architecture. (2) The weight of each indicator was surveyed through an expert consultation questionnaire. (3) Evaluate the cultural value of Ciqikou architectural elements. This article collects elements from 87 buildings, including 242 doors, 269 windows, 57 columns, and 306 cornices. Questionnaires were conducted by 8 experts. The above objectives are achieved using the analytic hierarchy method. The results of the discussion that combined cultural values predicted its significance and suggested improvements to the current policy framework..

This article is divided into Five parts.section 1 introduction. 2 describes the architectural background of Ciqikou Ancient Town. 3 describes the research methods and procedures.4 presents the results of quantitative analysis and evaluation. 5 summarizes the full text.

2. Ciqikou Ancient Town

Ciqikou Ancient Town, formerly known as Longyin Town. AAAAA-level scenic spot,It is located at longitude 116°42′ E at 39°89′ N. In the northeast of Shapingba District, the main city of Chongqing[4]，In the northwest of Shapingba District, Chongqing City, on the banks of the Jialing River, 3km from the center of Shapingba District，The municipality covers an area of 1.18 km2[5]It is an ancient town of dock folk culture with a history of more than 1,000 years. It provides shelter and commercial places for the endless flow of business travelers. It has witnessed the historical and cultural changes in bayu area, and has high historical significance and research value[6] .Ciqikou has a rich historical and cultural heritage and is an extremely important part of Chongqing's famous historical　cultural city. Bayu culture, religious culture, Shaci culture, Hongyan culture and folk culture have their own characteristics [7].." Its distinctive cultural imprint and architectural relics with the characteristics of bayu region are the epitome and symbol of Chongqing's ancient city. （Figure 1）
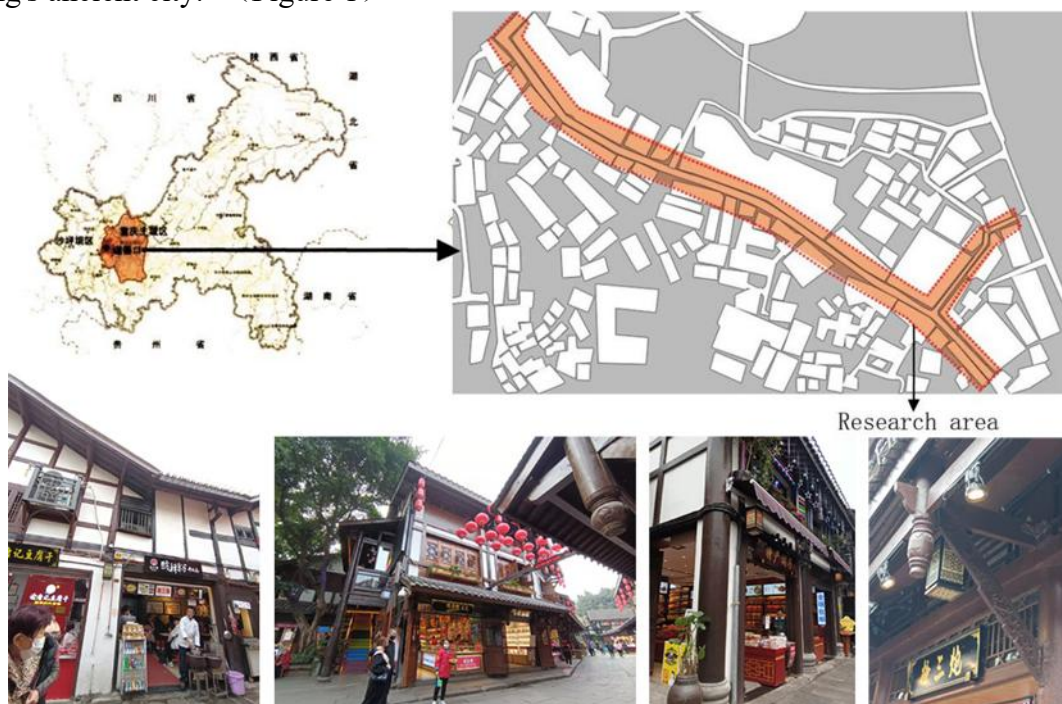

Figure 1. Sketch map of architectural research area of Ciqikou ancient town.

3. Research Methods and Steps.

3.1 AHP

The AHP model is established by MATLAB software, and the qualitative and quantitative analysis is combined to reflect the scientific and objective evaluation factors and evaluation process. Reduce the subjective deviation, enhance the credibility of the evaluation results..

3.2 Evaluation Procedure

Step 1: Establish Ciqikou architectural cultural evaluation index system. Ciqikou architectural cultural value is the target layer. Architectural culture value, leisure tourism value, inheritance value, and scientific research and educational value are the criteria layer. Regional characteristic value, humanistic spirit value, professional research value, place memory value, aesthetic appreciation value, experience participation value, cultural memory value, architectural cultural background, scientific research value, the educational value is the index layer.

Step 2: First, make the judgment matrix A= {a11, a12... A1n}, A = {a21, a22, ... A2n}, A = {an1, an2, Ann}. If the former is more important, then > 1. If the two are equally important, then =1.

Secondly, make a scale to judge the importance of matrix elements. The 1 represents the comparison of two factors with the same importance. The 3 represents the comparison of two factors, the former factor is slightly more important than the latter. The 5 represents the comparison of two factors, the former factor is significantly more important than the latter. The 7 represents the comparison of two factors, the former factor is strongly more important than the latter factor, the former factor is extremely more important than the latter factor. The 2, 4, 6 and 8 represent the intermediate values of two adjacent factors, and the reciprocal of the above values is the reciprocal of the original comparison value when the two factors are compared in reverse.

Step 3: Use the formula to calculate the weight vector of the index. First, use the formula: $\overline{a_{ij}} = a_{ij} / \sum_{k=1}^{n} a_{ij} (i, j = 1, 2, \cdots n)$ to normalize the disposal of proof. Second, add the elements in the matrix: $\overline{w_i} = \sum_{j=1}^{n} a_{ij} (i, j = 1, 2, \cdots n)$, and normalize the treatment of $w_i = w_i / \sum_{i=1}^{n} \overline{w_i} (i = 1, 2, \cdots n)$ in the above equation by using the formula $\overline{w_i}$. Finally, the operation method $CI = \frac{\lambda_{max} - n}{n-1}$ is used to assume that CI represents the consistency index. For the previously obtained vectors and eigenvalues, consistency detection is carried out. If the detection can be passed, it means that the judgment matrix is reasonable, that is, there is explanatory value.

3.3 Quantitative Analysis and Evaluation Results

According to the index system, this study uses the scale method mentioned above and questionnaires conducted by expert consultation method to select 8 experts in this field to score the importance of the index respectively. After internal discussion and induction of the scoring results, a pin-pide discriminant matrix is obtained (FIG. 1). Then conduct consistency test and calculate consistency index $CI = \frac{\lambda_{max} - n}{n-1} = \frac{4.0145 - 4}{4-1} = 0.0048$. Since the random consistency index $RI = 0.9$, the random consistency ratio: $CR = \frac{CI}{RI} = \frac{0.0048}{0.9} = 0.0054 < 0.10$, CR is less than 0.1, so it can be considered that the construction of the judgment matrix is reasonable, and the weight of the calculated index can be seen again (Table1).

Table 1. Discriminant moment weight table of criterion layer and weight table of index layer.

Discriminant matrix	Humanistic value of architecture	Value of leisure tourism	Heritage value	Value of scientific research and education	Index layer	The weight
Humanistic value of architecture	1	3	2	5	Regional characteristic value	0.2761
Value of leisure tourism	1/3	1	1/2	2	Humanistic value	0.4952
Heritage value	1/2	2	1	3	Value of professional research	0.1643
Value of scientific research and education	1/5	1/2	1/3	1	Place memory value	0.0644

As for the weights of regional characteristics value, humanistic spirit value, professional research value, and site memory value of the index layer, we use the method of hierarchy analysis to calculate the weight of the index, construct a judgment matrix, and calculate the weight table with the consistency test above (Table 2).

Table 2. Discriminant moment weight and index weight table of index layer.

Judgment matrix	Regional characteristic value	Regional characteristic value	Regional characteristic value	Regional characteristic value	The weight
Regional characteristic value	1	1/2	2	4	0.2761
Humanistic value	2	1	3	7	0.4952
Value of professional research	1/2	1/3	1	3	0.1643
Place memory value	1/4	1/7	1/3	1	0.0644

For the index layer's aesthetic value, experience participation value, cultural memory value, architectural cultural background, scientific research value and educational value, analytic hierarchy process is adopted to calculate the index weight, construct matrix $S = \left(u_{ij} \right)_{p \times p}$, use MATLAB software to calculate the maximum eigenvalue of judgment matrix S $\lambda_{max} = 2$, and calculate the index weight (Table 3).

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Table 3. Discriminant moment weight and index weight table of index layer.

judge matrix	Aesthetic appreciation value	Experience participation value	The weight	judge matrix	Value of cultural memory	Value of cultural memory	The weight	judge matrix	Scientific research value	Scientific research value	The weight
Aesthetic appreciation value	1	2	0.6667	Value of cultural memory	1	4	0.8	Scientific research value	1	3	0.75
Experience participation value	1/2	1	0.3333	Architectural cultural Background	1/4	1	0.2	Education value	1/3	1	0.25

From the perspective of the weight of each index in the total cultural value, leisure tourism value accounted for the largest weight, architectural cultural value, heritage value, scientific education value . It shows that the leisure tourism value ranks first in Ciqikou architectural cultural value,

making a great contribution, while the architectural cultural value is relatively weak, while the heritage value and scientific education value are still ignored.

From the index weight of architectural humanistic value is: humanistic spirit value > Regional C ha bacteria value ＞ professional research value > locus memory value . Humanistic spirit is the soul transmitted through architecture, which not only endows architecture with its soul form, but also endows architecture with cultural and historical changes. Therefore, the value of humanistic spirit has higher cultural value. The index weight of leisure tourism value is AE artificial value added ＞ experience participation value . The index weight of inheritance value is cultural memory value > traditional architectural cultural background . The weight of scientific research and educational value is scientific research value ＞ educational value . Through the analysis of the above data, this study found that the higher contribution value of the current cultural situation is the value of humanistic spirit, aesthetic value, cultural memory value and scientific research value. At the same time, this study also found that people ignore the traditional architectural culture and lack the inheritance of traditional architectural culture.

4. Expert Scoring Results and Suggestions

Eight experts were invited to evaluate the cultural values of the criterion layer and index layer of Ciqiaku building. Percentage statistics were adopted to calculate the percentage of the evaluation results of the evaluated objects, and a comprehensive index weight table (Table4) was obtained.

Table 4. Comprehensive weight table of indicators.

Level indicators	The weight	The secondary indicators	The weight	The comprehensive weights
Humanistic value of architecture	0.4829	Regional characteristic value	0.2761	0.13332869
		Humanistic value	0.4952	0.23913208
		Value of professional research	0.1643	0.07934047
		Place memory value	0.0644	0.03109876
Value of leisure tourism	0.157	Aesthetic appreciation value	0.6667	0.1046719
		Experience participation value	0.3333	0.0523281
Heritage value	0.272	Value of cultural memory	0.8	0.2176
		Architectural cultural Background	0.2	0.0544
Value of scientific research and education	0.0882	Scientific research value	0.75	0.06615
		Education value	0.25	0.02205

Through the analysis of the comprehensive weight table, the humanistic spirit value, aesthetic appreciation value, cultural memory value, and scientific research value are relatively high, while the inheritance, professional research, and experience participation of architecture are relatively weak. Therefore, this paper suggests that, in response to the requirements of the fifteen plan, cultural innovation and cultural heritage can be realized. At the same time of developing the leisure tourism value, popularizing the architectural culture. First of all, carry out the popular science

education of CIQIKOU building, hold the drawing competition and writing activities of CIQIKOU building, let more students and adults participate, fully understand and know CIQIKOU building. Secondly, the establishment of a tour guide team, regular schools of students or the company to conduct in-depth explanation of the team, so that we have a deep understanding of ancient buildings. Finally, the Ciqikou building is symbolized and illustrated, so that visitors can intuitively understand and understand the cultural connotation of each building. To enhance the understanding of ancient Chinese architecture. To enhance the cultural value of all aspects of ancient Chinese architecture.

5. Conclusion

AHP is used to evaluate the cultural value of Ciqikou architecture in Chongqing. This research uses qualitative and quantitative methods to objectively evaluate the advantages and disadvantages of each cultural value. It can comprehensively inspect each factor of CIQIKOU architectural culture value, and synthetically evaluate each subject's opinion. It makes the results scientific. Moreover, this study provides a reference for the evaluation of CIQIKOU's architectural cultural value. Therefore, the objective suggestions for the development and inheritance of Ciqikou architecture are put forward..

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