Research on the Protection and Utilization of Historic Buildings in the Background of the Renaissance

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Abstract — Objective: In order to better promote the revitalization work of historical buildings. Method: to establish the authenticity-index evaluation system of the historical building. Process: the article described the function and necessity of protecting the historical building, expounded the concept and theory of the protection and utilization of historical architecture, and established the corresponding evaluation system of the authenticity-index combining the mathematical theory. Results & Analysis: This paper studied the general rejuvenation model of urban historic building, analyzed the related data of the authenticity-index evaluation system, and found that the evaluation system can make a more objective and comprehensive evaluation of historical buildings. Result: The establishment of authenticity-index evaluation system can promote the rejuvenation work of historical buildings.

Keywords - historical building; revitalization; authenticity-index; evaluation system

I. INTRODUCTION

Since the reform and opening up, China's urbanization process has been carried out in a rare and amazing speed, the city has changed a lot, the structure of the city, the layout of the space and the architectural features of the city have also changed greatly. These massive urban construction activities and the emergence of new urban central areas, cause the old city lost the original vitality and vitality, historical architecture has lost its vitality and significance, even a lot of "development" and "constructive destruction". Historical block and historic building are the carrier of urban historical information and have rich value, is a valuable cultural heritage of the city. The old buildings can not only shine again for the old city back into business opportunities, and it is good for the development of the whole city. From the last century seventy's in the western countries began to reform the history of the construction of the practice, and received an amazing effect [1]. With the increase of the value of historical buildings and the requirements of the current sustainable development, people began to think about the way of thinking and methods in urban renewal, social parties to protect the historic district and the important position in the city construction, the protection and utilization of historical buildings has gradually become the focus of attention and research. Figure 1 (a) - (d) shows a variety of styles of historic buildings.
With the rapid development of the city, the activity of the historic district has been carried out, the protection and utilization of historical buildings are getting more and more attention. As the main body of the historic district, the conservation and utilization of historic buildings not only related to the vitality of the blocks, the continuity of the urban historical context, but also a concept of sustainable development. Therefore, the transformation of historical buildings has become the focus of attention of the community, people continue to explore the design method of the protection and utilization of historical buildings from various practices [2].

II. THE CONCEPT AND THEORY OF CONSERVATION AND UTILIZATION OF HISTORIC BUILDINGS

In the past, the protection of historical buildings is often directly understood as preservation, that is to maintain their original appearance of buildings or buildings, in fact, the protection of historical buildings has double meaning, one is the preservation of the meaning; Another layer is to maintain its characteristics and scale of the premise, to revise, update, or modernize. The definition of historical buildings' re-use refers to the value of historical materials, cultural and emotional value of the building.

on the basis of material function, according to the space form and the demand of the current social development, to maintain or rebuild the building, to give its new use, the building can play an appropriate role in urban social life, development and regression. Construction and extension of the use of three aspects: One is the reinforcement, repair the main building, building renovation, building two, three is to retain some of the existing body in the new building recycling. We can understand the meaning of the two, the protection is to use, is a guide to the update, and "use" is the fundamental purpose of the existence of historical buildings. Then the use of the essence of the meaning of protection, is a positive thinking of building protection, is active; and the simple to talk about protection, preservation is passive[3]. And the "Burra charter" explicitly put forward the concept transformation of the, that is, some of the social material function is obviously not suitable should the historical building of the contemporary social needs to be fully functional and adjust. To find the proper use of architectural heritage, in line with the social and economic, cultural overall development goals of the use of this valuable heritage sites, through the collection of a variety of meanings in a particular situation, buildings will be able to go beyond their physical and functional requirements”. In the historic building protection and utilization, we not only need to respond to the so-called "context", but should focus on the construction and location of the various links. The protection and utilization of historic buildings are shown in Figure 2.

![Figure 2. Method of Historical Building Protection](image)
Minimalism is centered to American art schools in the 1970s, from the abstract expressionism, generally according to Duchamp's "reduction, reduction, and then reduced" principle to picture processing and concept performance. Expression of minimalism architecture, simple, concise, lauding modesty abstract, they, in order to reduce the negative, purifying abandon trivial, from simple to complicated, in order to obtain the most essential elements of building regeneration [4]. In Holland, it seems "architectural theorist Juhani Paalasmaa didn't have a lot of expression, but is not empty, is a special form of existence, it can make people realize the existence of individual uniqueness, and "when a person close to the essence of things, it will inevitably be concise". In the construction, expansion or reconstruction and construction, the principle of minimalism, to make a new addition to the construction of a new building, abstract, and to build a simplified structure of the relationship, seeking adaptability in new and old space, it can be as much as possible to reduce the historical buildings and the overall environment of the central plains, to maximize the maintenance of historic buildings of the original, and highlights the potential elements and value of the original historic building and environment. Regionalism is diverse in contemporary development, one of the most energetic and a kind of integration with the times is the "critical regionalism" [5]. Critical regionalism is a dialectical and critical architectural thoughts, it has a strong criticalism of the concept of "local" in the modern architecture, the traditional romantic scenery, regionalism and commercialization of criticism and correction, it emphasizes the role of specific location, topography, climate, etc. in the architectural design. In the history of architecture and reuse, the critical regionalism demands full respect for the natural environment and cultural landscape of the history and reality, support for the use of special and local design elements, at the same time, focus on building from the specific base of the terrain, and the establishment of a close relationship between the base, so that the new building in a flexible approach to the integration of the original environment and architecture, real and full embodiment of natural environment, human environment, the construction of culture and other characteristics [6].

III.  HISTORIC RESOURCES AUTHENTICITY PROTECTION THEORY

A. The Authenticity Indicator System Operation

Historic district resource authenticity resources protection evaluation system according to the hierarchical structure of weight, divided into the target layer, the middle layer, the project layer. Using the Delphi method to compare the two elements, the matrix is obtained. A comparison with each other matrix for the formation of n elements be compared:

$$A = \begin{pmatrix} a_{ij} \end{pmatrix}_{n \times m}$$  \hspace{1cm} (1)

In the formula: $a_{ij}$ represents the importance of the element $u_i$ and $u_j$ relative to the estimate of the C.

The weight of elements in a single criterion is calculated by using the root method. If the A of the matrix is carried out by the geometric mean, then normalized or expert scoring method for parallel processing, the resulting vector is the weight vector. The formula is:

$$W' = \frac{\prod_{j=1}^{n} a_{ij}}{\sum_{j=1}^{n} \prod_{i=1}^{m} a_{ij}}$$  \hspace{1cm} (2)

The comprehensive evaluation of the historic district, which involves a wide range of indicators, is not available, namely, there is no uniform standard of measurement, it is difficult to directly compare. Therefore, no matter what kind of evaluation method, before the comprehensive evaluation, the raw data of each index is needed, the numerical value of the evaluation index is non - dimensional. As the evaluation index of the type is often different, therefore, the method of non dimensional treatment of the indicators is also different[7].

(1) the smaller the better:

$$y = \begin{cases} 1 & x \leq x_{\min} \\ \frac{x_{\max} - x}{x_{\max} - x_{\min}} & x_{\min} < x < x_{\max} \\ 0 & x \geq x_{\max} \end{cases}$$  \hspace{1cm} (3)

(2) the bigger the better:

$$y = \begin{cases} 1 & x \geq x_{\max} \\ \frac{x - x_{\min}}{x_{\max} - x_{\min}} & x_{\min} < x < x_{\max} \\ 0 & x \leq x_{\min} \end{cases}$$  \hspace{1cm} (4)

(3) the suitable medium:

$$y = \begin{cases} 1 & x_{\min} < x \leq x_{\min} \\ \frac{x - x_{\min}}{x_{\max} - x_{\min}} & x_{\min} < x < x_{\max} \\ \frac{x_{\max} - x}{x_{\max} - x_{\min}} & x_{\min} < x \leq x_{\max} \\ 0 & x \leq x_{\min} \text{ and } x \geq x_{\max} \end{cases}$$  \hspace{1cm} (5)

In the formula, $x$ is a dimensionless index data; the $x_{\max}$ has the maximum value of the dimension index data; $x_{\min}$ is the minimum value of the dimensionless index data; $x_m$ is the average of the previous two [8].

B. The Authenticity Principle of the Protection of Historical Cultural Heritage

The principle originally comes from the principle of authenticity in the protection of historical and cultural heritage of the United Nations Educational, scientific and cultural organization and other international organizations in drafting and through a series of cultural heritage protection.
of important legal documents. In 1933 International Modern Architectural Association of the Athens charter, the protection of the building and area of historic value, the first internationally recognized programmatic document in the area of urban planning; In 1964 third historical monuments architect and technicians International Conference on the protection and restoration of international monuments, the Venice charter, in view of the world economic recovery after World War II, the construction of cultural relics its environment has been rapidly destroyed, and the contradiction between city protection and development is becoming more and more outstanding[9]; There is a "note that the whole world is under the pretext of expanding the demolition and unreasonable, inappropriate reconstruction projects are being brought to the historic legacy of serious damage to the background of the 1976 "Nairobi proposal"; And in 1977 "and the" Athens Charter ", we are convinced that the interaction and communication of people is the basic existence of "according to the" city of Machu Picchu constitution "; As well as the Charter for the protection of historic cities and urban areas of the International Council of 1987, the Charter of the Washington, d., to adapt to the needs of modern life, to solve and protect the requirements of modern life; And the 1987 World Heritage Convention Implementation Guide and the 1994 "about the authenticity of the Nara document" etc.. These international documents have been put forward in a specific period, the development and perfection of the authenticity of the principle of the protection of historical and cultural heritage [10]. The authenticity protection principle of our country is also reflected in the legal norms, Wang Xiaoming, a professor of Huazhong University of Science and technology, has conducted a long-term study and Practice on the protection and utilization of historic city, has completed the national "Nine Five" major scientific and technological projects, the national "fifteen" key scientific and technological projects, China - the EU environmental management cooperation program (EMCP/LMD), the national Ministry of construction projects and other important national key projects, published "urban residential area environmental quality sustainable improvement planning guide", "Research on the renewal of the old city based on sustainable development", research on comprehensive evaluation of historical buildings based on orthogonal design, participation mechanism of the interests of the transformation of the old city based on the complex adaptive system, "The old city residential protection and utilization and sustainable improvement" and a series of papers, to lay a good foundation for the research of this thesis. The study demonstrates the research and application of Chinese scholars to protect historical and urban resources in different regions, but in terms of authenticity has not yet formed a full system method, the historical heritage as the intrinsic mechanism of the connotation of the authenticity protection of the value of resources can be enriched, and the establishment of mining [11].

C. Genetic Algorithm for Resource Factor Evaluation

If the environment and resources are compared to two of the silver coins, a profile of resource is the prism of human society reflected. From the relationship between resources and the nature, the first nature, and then there are human, human beings in order to meet the needs of survival and development through the harmony of nature, created human culture (including science and Technology), by means of culture, human resources are extracted from the environment. Resources are dynamic, it depends on people's achievements and behavior to expand or reduce, closely related to human needs or the ability of human beings. In this paper, the resources more prominent its human connotation [12]. The evolution of historical city is the process of breaking the balance to a higher level, this process is actually a process of evolution, along with the genetic variation, the struggle for existence and survival of the fittest. Genetic algorithm (GA) mimics the mechanism of biological genetics and natural selection, an optimized search algorithm is constructed by means of artificial means", mathematical simulation of biological evolution, which is different from the traditional mathematical model, it is difficult to find the traditional mathematical model of the problem to find a new solution [13]. This algorithm is powerful, very suitable for complex optimization, more and more become the research hotspot. The genetic algorithm is essentially adaptive algorithm, which is applied to the system optimization. A study by the end of 1993, Germany's Dortmund University, suggests that according to incomplete statistics, genetic algorithm is the source of evolutionary computing in the machine learning, process control, economic forecasting, engineering optimization and other areas of success, has caused the mathematics, physics, chemistry, biology, computer science, social science, great interest in fields such as economics and engineering applications [14].

IV. GENERAL MODEL FRAMEWORK FOR THE REVIVAL OF URBAN MEMORY

Life in the city is the memory of the past events. These substantial connection is attached to the texture and background of the city and the city became the story, it is a sign of city with texture details rely on these stories to maintain their life. The author thinks that only by activating the urban memory carriers that have been forgotten in the process of people's cognition and reconstruction, cause and deepen the recognition of the people, the process of cognition and reconstruction of the urban memory, to achieve the revitalization of urban memory [15]. And because the carrier is different, the requirements and the degree of different. Only to retain the essence of history, the spirit of the history of the remodeling, set aside the future development of space, do not regret in the ancients more than no regrets in the future, can really make us today's urban construction, to leave the city of memory. The author believes that the protection of the urban memory carriers is the most valuable part of architectural culture heritage, is the quintessence of Chinese culture, because of its valuable,
therefore, the revitalization of the city memory carrier protection part mainly emphasizes the continuity of life. Updated part because of its larger size and the most closely related to people's lives, therefore, the revitalization of the city's memory carrier is mainly emphasized on the renewal of the renewal of the part of the city. Jeff Saul said, an old building has been preserved as cultural relics, but they alone submerged in neither the personality and with them is not harmonious modern reinforced concrete jungle, don't see that they represent the kind of cultural background and traditional. To become a source of water, without trees, has embodied cultural meaning. Therefore, a new part of the urban memory carrier of the vitality of the renaissance, in particular, the new part of the traditional area due to the close relationship with historical buildings, the main emphasis of old and new buildings, dialogue and symbiotic harmony. The author tries to through the protection of the city memory carrier, the part of the update, new parts of the different levels of energy to achieve the vitality of the city to achieve a comprehensive revitalization of the vitality of the city. The basic model of the urban memory dynamic renewal is shown in Figure 3.

![Figure 3. Basic Model Framework Picture of Vigor Rejuvenation of City Memory](image)

V. CASE ANALYSIS

Historic district resource authenticity protection purpose of the evaluation is to find out the authenticity protection degree value, through resource authenticity degree evaluation can know the formation of the internal and external driving forces of historic block resource utilization status and living condition. Through the adjustment and maintenance action analysis system to convey information authenticity protection system to answer the. Here you can use "bucket principle" refers to a number of buckets: wood, how many buckets of water amount of the, it is not determined by the most long pieces of wood, but rather depends on the shortest piece of wood. To make a little more water in the bucket, should lengthen the short or change to the length of wood chips. The basic idea is to improve the weakest link in the system, t take advantage of the overall system in the evaluation of the history of the Li Huangpi Road, the historical block of resources as an example, as shown in Table 1.

<table>
<thead>
<tr>
<th>The field of weft</th>
<th>Weight</th>
<th>Time weft</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical culture and ecological landscape resources</td>
<td>0.746261</td>
<td>Talent</td>
<td>0.57496</td>
</tr>
<tr>
<td>Historical block and block style resources</td>
<td>0.689160</td>
<td>Process</td>
<td>0.78150</td>
</tr>
<tr>
<td>Heritage utilization and resources of economic industry</td>
<td>0.648525</td>
<td>Current state</td>
<td>0.63828</td>
</tr>
</tbody>
</table>

Total system resource authenticity degree each resource authenticity of minimum, may see from table Li Huangpi Road Historic District resources authenticity evaluation value is 0.648525 (with the maximum value of 1 as a reference), the degree of protection is good.

VI. CONCLUSION

Rejuvenation is a method of protecting and utilizing the historic buildings, it's conducive to the realization of the historical value of the building itself. This paper referenced to authenticity protection system and made actual investigation to historic blocks of Li Huangpi Road Historic District, established the authenticity-index evaluation system of the historical building, which can better conducive to the protection and utilization of historical buildings.

ACKNOWLEDGMENT

This work is supported by the Chinese Universities Scientific Fund (No. 2452015041), Principal Investigator, The Doctoral Scientific Research Foundation of Northwest A & F University (No. 2014BSJJ031), Principal Investigator.

REFERENCES

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