Landscape Design System of Industrial Heritage Based on Big Data and web Technology

Zhihong Wang\textsuperscript{1,2,*}

\textsuperscript{1}College of Art, Hubei Polytechnic University, Huangshi 435003, Hubei, China
\textsuperscript{2}Research Center for Mining and metallurgy culture and Social-economic Development in the Middle Reaches of Yangtze River, Hubei Polytechnic University, Huangshi 435003, Hubei, China

*Corresponding author E-mail: 205029@hbpu.edu.cn

Abstract. With the rapid transformation of industrial structure, most of the abandoned old industrial buildings left over from history have been abandoned, which is difficult to get people's attention. However, industrial heritage has important aesthetic, historical and architectural heritage value. In the transformation of parks around the world, they often attach importance to their industrial layout and architectural landscape space design. The research on public commercial supporting space starts late and the starting point is relatively low. As a result, the construction of commercial facilities in China is not mature and perfect, lack of relevant basic commercial supporting materials. Therefore, how to improve the reuse rate of industrial waste, realize the continuation of industrial memory, improve the construction of public facilities, and meet all kinds of conditions required by tourists has become an important research topic. The purpose of this project is to make a reasonable allocation of landscape space for a certain place in our city. The results show that 12 people over 45 years of age are very dissatisfied with the design of industrial heritage.

Keywords: Industrial Structure, Architectural Relics, Industrial Heritage, Redesign Technology

1. Introduction

In recent years, with the acceleration of urbanization and the Internet revolution, Europe and the United States and other developed countries first entered the post-industrial society. Under the impact of the tide of economic globalization, traditional industry is facing the situation of decline or even bankruptcy. With the rapid development of the city, artificial intelligence, Internet, AR, sharing travel and other intelligent urban auxiliary systems bring fast to the city, but also further contrast the difficulties faced by many traditional industries with resource consumption. These urban industrial wastelands that are about to disappear in people's vision are in urgent need of our transformation and
renewal\[1\].

The transformation of industrial wasteland and landscape upgrading involve many related professional fields. How to deal with the problem of renewal and retention is an important problem at present. It is an important problem to revitalize the local economy and show the industrial culture and restore the good ecosystem in the site \[2\]. At present, there are many successful cases for reference in the theoretical research and project construction of industrial wasteland, but there are still many problems in the whole site planning and landscape space and cultural extraction: less public participatory landscape, insufficient extraction of local elements of cultural landscape, too single landscape style and form, lack of humanistic care and sense of belonging. The research and development of industrial wasteland began in the late 1880s. With the adjustment of industrial structure and the development of tertiary industry, China also began to study and explore industrial wasteland. Domestic cultural and creative industrial parks transformed from industrial wasteland are also very large, mainly concentrated in the north of Guangzhou and Shenzhen and other first-tier cities, Shenzhen through the construction of a large number of creative industrial parks, Intended to create China's "creative design capital"\[3\]. Most of these famous creative industrial parks are transformed into industrial waste sites, which provides theoretical support points for many strategies and methods for the study of this paper, and enhances the feasibility of practical research.

It is of great significance for us to deeply understand the industrial heritage culture and green water Qingshan is the ecological values of Jinshan Silver Mountain, respect the spirit of the site and reasonable preservation, reuse of industrial heritage has many benefits. Firstly, this paper defines and expounds the concept, analyzes the update strategy, and finally studies the industrial heritage landscape redesign based on big data and web technology.

2. Relevant Concepts

2.1 Industrial Heritage

According to the definition of the Lower Tagal Charter, adopted by the International Commission for the Protection of Industrial Heritage in Lower Tagal, Russia, industrial heritage refers to "the various industrial remains left in the process of industrialization\[4\] of all buildings and structures constructed for industrial activities, as well as industrial and cultural monuments of historical, technical, social, architectural or scientific value, including construction and machinery, plant buildings, production workshops and factory mines and processing and refining sites, warehouses and warehouses, places of production, conversion and use, transport and its infrastructure, and areas of social activity related to dwellings, religious worship or education, etc.

2.2 Commercial Facilities

Commercial supporting facilities refer to the functional supporting facilities for developers to meet the needs of residents' various services according to the urban construction planning criteria and to cooperate with the construction of development projects. Commercial accessories include external and internal supporting, external supporting includes municipal supporting and transportation supporting, internal supporting includes commercial, cultural, entertainment, catering and other details of the service supporting. At the beginning of planning and design, according to the characteristics of the park type and the distribution of functional forms, the industrial heritage space selected in this subject is a combination of commercial and tourism industry projects. To meet the long-term sustainable development of the park, transformation to maximize the value of economic benefits\[6\].

The commercial support mainly includes all the parking facilities, entertainment facilities and various public facilities, such as education, commerce, diet and so on, which meet the long-term and effective development of the park. It adapts to the main functions and characteristics of the park and enables residents and tourists to obtain a richer and more exciting experience of recreation.
2.3 Principles for the Reuse of Industrial Heritage

As an important historical and cultural protection, industrial heritage can improve the utilization rate of industrial waste and inherit industrial memory. Choice and utilization of industrial heritage space should follow certain principle [7].

(1) Respect for the principle of protection

Although the industrial heritage can not meet the needs of the present day and hinders the construction of some cities, its cultural and historical value far exceeds the value of the land itself. If it can not be properly protected and blindly cleared, it will cause the fall of urban civilization. Therefore, we should pay attention to the protection and renewal of industrial heritage, give it a new functional definition through concise and effective measures, and balance the development of society with the protection of the original nature of industrial heritage. How a city treats its industrial heritage will mark the civilization of the city.

(2) The principle of publicity

Industrial heritage belongs to public cultural resources, most factories are abandoned, basic building structures and landscape environment space are old and old, and the objective demand for transformation and utilization is exuberant. Improve its public attributes and achieve the sharing of industrial heritage reuse resources. Based on the public demand, there are many kinds of reuse modes, such as industrial culture tourism mode, industrial park mode, industrial landscape and commerce, which can not only mobilize the value of public resources, but also obtain the promotion of economic benefits [8].

(3) Principles of functional transformation

The function of industrial heritage in the original industrial manufacturing environment is to meet the needs of production. In the new environmental space, it is necessary to transition to a new stage of development with the core of improving the living environment, replacing the functional environment and protecting the history and culture. The function conversion and retention of industrial heritage space have certain selectivity, not the whole reconstruction, but the comprehensive consideration to make a reasonable judgment. Existing domestic industrial transformation can gradually transition to theme museums, complex development, creative industry parks, tourism vacation and characteristic towns and other model [9].

(4) Principles of sustainable development

Most industrial heritage structures are intact and have not reached their service life. Parts, equipment and industrial waste in industrial heritage buildings are resources that can be recycled repeatedly. It can not only avoid unnecessary waste of resources, but also save cost and consumption. Design of reuse should pay attention to the maintenance and replacement of industrial heritage, follow the criteria of ecological protection, resource saving and development continuation, can maintain the sustainable development of society and inherit its historical value, aesthetic value and ecological environment value [10].

2.4 WEB Technology

Service-oriented access data and communication technology is Web Service technology. Another definition of this technology refers to the full use of standard Web protocols to ensure the stability and excellent operation between good service and service platforms. Web application, in other words, includes Web Service, and is included as a branch and a small application module. According to the process, after deployment, it is possible for the program application to use the interface of Web technology to call the relevant remote services. From other aspects, Web technology can be divided into the following four specific aspects.
First, UDDI: can use Web technology search and registration services through directory services.

Second, WSDL: description Web service often uses this content, generally can explain the actual communication mode of Web service, the language characteristic is the XML. It can be used to describe the return values, parameters and functions, which is helpful to reduce the difficulty of reading.

Third, SOAP: XML based extension refers to a new SOAP. of transport protocols The protocol is object access class, format encapsulation is extensible and lightweight. It can effectively solidify known structured information, which is also its fundamental role. Generally speaking, Internet protocol is often combined with this protocol, so it can support multiple format types of network data.

Fourthly, XML: markup language which can realize the ability of expansion refers to the use of XML language in XML, Web technology mainly in its formatting, which can be regarded as the basic format of data and can meet the requirements of irrelevant platform. Applicable to a wide range of transmission Web. It is also a very optimized way to exchange data from program applications.

2.5 Big Data Technology
Since the information revolution, the parallel development of Internet of things and mobile Internet, full space-time coverage, such as wireless sensors, cloud computing, wearable devices, virtual reality and artificial intelligence, has led to the surge of online data products. "In an unprecedented way, through the analysis of massive data, to obtain products and services of great value, or profound insight," benefits the cultivation of new kinetic energy, subversive scientific research cooperation and innovation, traditional industrial transformation and upgrading and social governance optimization and many other fields. Through the scalable storage resource pool, cloud computing integration and second-level data flow gathering capture, storage flow, analysis and application of raw data, provides a new scientific perspective to analyze the deep law, promote the universal process from data to knowledge to behavior," let us believe in the power of data more " . The results of mass data evaluation, including education and scientific research, medical and health care, financial insurance, transportation and logistics, judicial adjudication, social security, environmental protection and many other decision-making activities, have opened the era of social subjects gradually moving real identity, social life, business management and public power supervision into the virtual world.

2.6 Relevant Formulas
The expression of geometric height and potential height.

\[ h = \frac{Z}{(1 + Z/R)} \]  

\[ T_M = T_{M_0} + L_h(h - h_i) \]  

Solving Control Vector

\[ \Delta m = q_f \rho V(\tau) A_{cap} \]  

3. Industrial Heritage Landscape Design Based on Big Data and WEB Technology

3.1 Supporting Landscape Design Research
According to the analysis of field investigation and data inquiry, all kinds of commercial supporting service facilities can be sorted out. The required commercial supporting facilities can be divided into four types: public cultural facilities, commercial services, leisure square, and other supporting facilities, as shown in Table 1.
Table 1. Planned Commercial Supporting Service Facilities

| Types of commercial supporting facilities | Entry name                                                                 | Main functions                                                                 |
|------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Public cultural facilities               | Historical and cultural museum, exhibition center, gift shop, physical bookstore, landscape creative sketch, propaganda slogan | Meet the cultural needs of tourists, Cultural and creative atmosphere           |
| Supporting business services             | Restaurants, beverage stores, convenience stores, fast food outlets, newsstands, ATM machines, intelligent vending machines | Meet the needs of tourists for purchase, food and entertainment                 |
| Leisure square supporting                | Small square, green sketch                                                   | Outdoor open space for tourists to have recreation.                            |

3.2 Other Support
In addition to the above-mentioned related commercial support, there are some small but very important matching in the film palace, including toilet, trash can, street lamp and marking system. These supporting facilities should conform to safety, design according to human scale and activity characteristics, and ensure the durability of resisting natural environment and human loss under the premise of normal use and maintenance. In order to realize its function and serve the tourists, we should establish an orderly connection between the functions and form a perfect organization system.

4. Landscape Analysis of Industrial Heritage Based on Big Data and WEB Technology

4.1 Ecological Approaches
As shown in Table 2, the method of ecological remediation of soil is mainly to restore the soil slowly through the natural environment, mainly by relying on the plants in the site. Through the survival of the fittest plants have the function of absorbing pollutants (such as the original ferns, Xanthium, Awn, etc.), through the cumulative growth to achieve the purpose of purification. The advantage of this method is that it protects the native plants of the site at the same time, which is low cost and economical. It is an ecological and environmental purification method, but it is only suitable for the soil with slight pollution degree at the same time.
Table 2. Wild Plants With Restoration Function in the Site

| Plant name                  | Adapt to soil type | Specific description                                                                                                                                 |
|-----------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Parathelypteris glanduligera| heavy metal        | It can grow on the barren and heavily polluted land and absorb a lot of heavy metal elements from the environment.                                    |
| Paper mulberry              | Acid soil          | It can also grow on acid soil and neutral soil. It is resistant to smoke and dust, sulfur dioxide and air pollution.                                   |
| Siberian Cocklebur          | heavy metal        | It can absorb and enrich cadmium in heavy metal contaminated soil.                                                                                 |
| Green bristlegrass          | Acidity and basicity| It has strong adaptability, drought and barren tolerance. It can grow in acid or alkaline soil. It can repair the soil and beautify the environment at the same time. |
| Miscanthus                  | heavy metal        | It has a certain remediation function to heavy metal contaminated soil, has a strong ornamental, combustion can generate electricity.            |
| Moss and lichen             | Acidity and basicity| Bryophytes can be used as indicators of soil pH, and the soil where bryophytes grow is alkaline soil.                                              |

4.2 Comparison Before and after Design

Table 3. Comparison Before and After Design

|                          | Land use scale | Plot ratio | Building density | Green space rate | Parking space |
|--------------------------|---------------|------------|------------------|------------------|--------------|
| Before design            | 32000         | 1.13       | 0.36             | 0.22             | 116          |
| After design             | 32000         | 1.67       | 0.30             | 0.43             | 478          |

4.3 Satisfaction Survey

![Figure 1. Satisfaction Survey (male) |](image-url)
As shown in Figure 1 and Figure 2, the results show that with the increase of age, the lower the satisfaction with the design of industrial heritage transformation, the more dissatisfied the number of people is 12.

5. Conclusions
With the renewal of urban industrial land, the utilization of industrial heritage space makes the original waste industrial plant fresh. The promotion and transformation of industrial heritage space need to focus on the future development according to the needs of urban development by means of function replacement and space remolding. Strengthen the scientific protection of industrial heritage land, the innovative utilization of industrial architectural landscape space, so that the valuable industrial sites originally abandoned by people to participate in people's activities, it enriches the research content and research system of industrial heritage space reuse.

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