Digital Forms of Post-Industrial Landscape in the Context of All-for-One Tourism

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Abstract. In recent years, many cities and regions in China have adopted all-for-one tourism to implement the revitalization strategy of former industrial bases. As the valuable heritage of the industrial age, post-industrial landscape culture has not played its irreplaceable role of cultural transmission in the context of all-for-one tourism. Digital ecological design emerged in the context of the digital world. However, due to the rapid development of information technology focusing on computer technology, the realization of digital ecological design has become possible. The development of digital ecological design follows the trend of the age, while the application of digital ecological art and design to post-industrial landscape culture and its tourism-related fields shows great advantages in developing digital ecological design, improving tourism competitiveness, realizing the revitalization of former industrial bases in northeast China, and exploiting the geographical advantages of culture and history to the full.

All-for-one Tourism and Post-industrial Landscape

In August 2015, Li Jinzao, head of the China National Tourism Administration, formally put forward the "strategic deployment of comprehensively promoting the development of all-for-one tourism" for the first time at the national tourism work conference for the first time. At that meeting, the Notice on the Establishment of National All-for-one Tourism Demonstration Zone was issued and the concept of "All-for-one Tourism" has become a new industry demand and guidance for the tourism industry [1].

The key of "all-for-one" does not lie in "all", but focus on the integration of all aspects concerning tourism. This means that the national tourism policy guidance does not regard tourism as one separated industry, but as an integrated one. It not only cares about the development in scenic spots, resort areas, and hotels, but also takes all practical problems and ideas of tourism development as a whole. The combination of culture and tourism is also a kind of domain enlargement. The combination with culture can help to address some issues in regional tourism development such as the lack of regional characteristics. It is easy to duplicate the tourism products and their functions, while the local culture is the only one thing that cannot be copied.

As one of the oldest industrial bases of China, the three provinces in Northeast China take the development of all-for-one tourism as an important task to develop its local economy. Furthermore, most of national all-for-one tourism demonstration zones in these three provinces are based on beautiful natural scenery and unique regional culture, historical heritage and natural landscapes. In the process of implementing the revitalization strategy of old industrial bases in China, the post-industrial landscape culture, which is a precious heritage of the industrial era, has failed to exert its unique and irreplaceable cultural output in the new form of all-for-one tourism.

In recent years, China's industrial heritage protection has flourished. In 2006, the State Administration of Cultural Heritage organized the Wuxi Forum on the Conservation of China's Cultural Heritage, which proposed the protection of industrial heritage in China and worked as the milestone of industrial heritage protection [2]. After the announcement of the eighth batch of national key protected cultural relic units in October 2019, the total number of national protection units

reached 5,058 and the number of industrial heritage increased significantly [3]. The protection of industrial heritage has received comprehensive attention in China. Based on the comprehensive understanding of industrial culture, many countries and regions begin to re-examine and evaluate the value of industrial heritage resources as a record of industrial development and historical events, which is also the field of post-industrial culture. Tourism based on excellent industrial heritage is an effective way to help to realize economic upgrading and transformation and promote the protection and utilization of industrial heritage. Therefore, post-industrial landscape tourism of industrial heritage is an important way of urban economic development. The protection of industrial heritage and post-industrial culture has become a heated topic and received extensive attention from governments, experts, research institutions and civil organizations. The post-industrial landscape theories and practices have multiple meanings of renewing the appearance of the city, extending the geographical context, and revitalizing the regional economy.

Application of Digital Ecological Design in Post-industrial Landscape Tourism

Digital ecological design has emerged in the context of the nation's advocacy of digital earth. The development of information technology makes the digital ecological design become possible. Since the 1980s, with the development of information intelligence technology, many new inventions and changes in network broadband technology, GPS technology, e-commerce trading platform, large database technology, augmented reality, virtual reality technology, and computer hardware have provided the technological support of digital ecological design. Digital design will become a new field in which the demand for all parts of the tourism industry chain is rising at a great speed. It also provides an opportunity for the tourism industry, creates a new platform for the tourism industry to develop in the new era, and promotes the revitalization of the tourism industry.

The development of digital ecological design is an inevitable development of the times, and the application of digital ecological art and design to post-industrial landscape culture and its tourism-related fields shows great advantages in developing digital ecological design, improving tourism competitiveness, realizing the revitalization of former industrial bases in northeast China, and exploiting the geographical advantages of culture and history to the full.

The post-industrial landscape can be classified in both a broad and narrow sense. Post-industrial landscape in a broad sense includes industrial heritage protection and reuse, industrial building transformation, post-industrial landscape garden, post-industrial tourism, and so on. The transformation or new construction completed on an industrial site can become a post-industrial landscape. The post-industrial landscape in the narrow sense refers to the post-industrial landscape garden in the broad sense, including post-industrial landscape parks, post-industrial residential landscapes, post-industrial commercial landscapes, post-industrial cultural and creative landscapes, etc. It consists of a series of new landscapes with new functions and multiple meanings, which are built on the protection, reconstruction, conservation and utilization of former industrial buildings, industrial facilities, and wastes from industrial age. These landscape elements are used for further design and reconstruction, which can be built into new landscape with new functions and multiple meanings [4].

As for the application of digital ecological art design in tourism, digital ecological art design is a tourism information service system based on network information technology. It is a combination of regional economy, information science and technology and visual art design. It is a comprehensive integration of art and science and technology. Digital ecological art design in tourism is composed of tourism consulting, digital information, database, e-commerce, visual design display and service objects. It mainly includes tourism management, products, marketing, education, services, disaster handling and regulation of multi-dimensional information.

Digital ecological art design is one basic element of the overall framework of the digital ecological design system. In China, it will be based on the basic information construction of the country, provinces, and cities. In addition, it is independent and closely related with digitalization in other fields. Of course, its content also includes the construction of tourism information infrastructure and

the development of application information system in tourism industry. The overall framework of the tourism digital ecological art design system includes the following elements:

Key Technologies of Digital Ecological Art Design

Key technologies of digital ecological art design can guarantee the smooth development of digital ecological art design. It mainly includes network broadband and electronic technology, geographic information system, GPS global positioning system technology, e-commerce trading platform, augmented reality, virtual reality technology, decision support system, multi-database technology, data collection and integration technology, image editing and processing technology, multiple software integration technologies, etc. They all provide technical support for the overall system services, making the promotion of digital ecotourism feasible.

The Main Elements of the Digital Ecological Art Design System

The main elements of digital ecological art design system include the application of the existing electronic information database and advanced information collection models and processes to establish, update and improve the "static and dynamic resource database of cultural landscape tourism"; building the platform of "digital ecological art design informatization", integrating tourism resources across the region, providing greater motivation for the identification and promoting some post-industrial cultural landscapes in China and the development of the tourism industry on the basis of regional information technology.

Service Objects and Channels of Digital Ecological Art Design System

The service objects of the digital ecological art design system mainly include regional government departments, tourism-related enterprises, individual or group tourists, professionals and students in tourism industry. It can provide tourism information services for this industry chain, including the information concerning tourism industry for various regional government departments, guaranteeing the improvement of government work efficiency through providing guidance for decision-making, and helping the service moving from traditional affairs service to electronic government services. The effective channels of digital ecological art design system can provide plan data and real-time information to tourism companies effectively and technical support for top-down tourism-related companies' marketing, line design of products, time node control, etc. Furthermore, it can also provide the selection of travel destination, relevant travel information and reservation services for tourists of different types and scales with different travel plans. Also, the intervention of technologies such as augmented reality and virtual reality can help tourists make choices and experience the service in advance; and provide virtual practical operating environments for tourism practitioners and learners to achieve multiple effects of tourism education.

The Digital Forms of the Post-industrial Cultural Landscape with the Characteristics of All-for-one Tourism

The digital design of the post-industrial cultural landscape is involved with the research results of management, sociology, information communication, design and other related disciplines. First, this research explores the rules of the promotion of tourism in Liaoning Province in the context of all-for-one tourism. Then it takes an in-depth analysis of the construction and promotion of post-industrial landscape culture across the world. Furthermore, it analyses the existing platforms and research results of digital ecological design and information dissemination technology to transform virtual reality technology, digital panoramic vision technology, and cultural tourism of post-industrial cultural landscape in some regions of China. Finally, this research summarizes the main ideas and concepts from the analysis and comes to realize their practical application. (See Fig. 1)
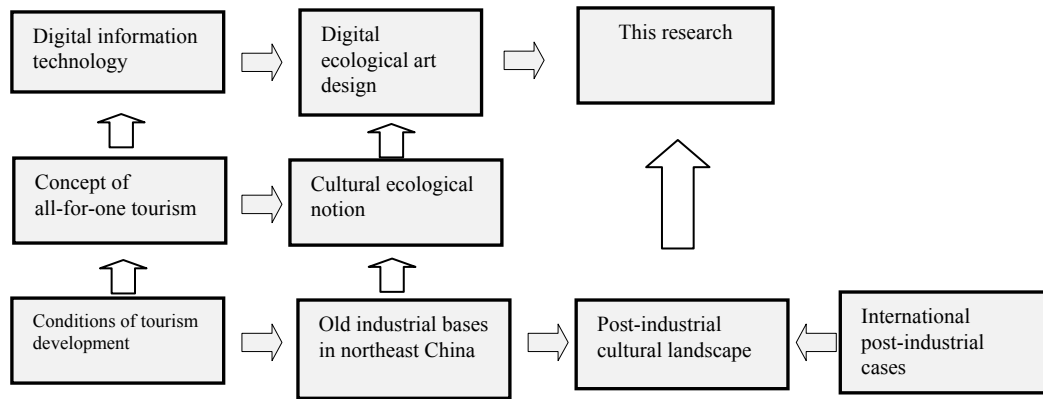
Figure 1. Research framework

The digital forms of post-industrial cultural landscape in the context of all-for-one tourism refer to the competitive products of industrial landscape tourism in a certain area. The analysis of the industrial heritage, in particularly the main resources, relevant industries, ecological environment, historical features, exhibitions and public services of post-industrial landscape can help to design and develop a comprehensive and systematic ecological digital design and development system. It can also help to build a new regional development model and form for realizing the effective integration of regional resources, integrated industrial development, and social co-construction and sharing in the context of all-for-one tourism, and promoting the coordinated economic and social development with tourism and digital technologies.

Therefore, the digital forms of the post-industrial cultural landscape in the context of all-for-one tourism include many following features such as the diversity of fields, the wide involvement of government, enterprises and tourists, the interaction based on big-data technology and customization of participants. Up to now, the digitalized post-industrial landscapes that are being developed and applied in China can be divided into the following four categories:

Digital Preservation and Display System of Tourism Cultural Heritage Based on Virtual Reality Technology

In the future, the digital preservation service terminal of industrial cultural heritage will be used as a construction platform. The contents of common websites are mainly based on pictures and text information, but the digital preservation system of industrial landscape cultural heritage based on virtual reality technology is quite different. It provides more three-dimensional dynamic scenes and vivid reproduction of remaining historical features. It can be the restoration experience of a certain area or the visual interactive interface of the landscape scene. It can also be an introduction of the online virtual reality landscape on the website.

Visual Navigation and Guide Based on Tourism Landscape Media Platform

At present, the technology of GPS is widely used, and the realization of visual interaction between visitors and travel information on the media platform is based on the development of technology to provide detailed experiences. It can be placed in the tourism service guidance system, or the media terminal of the tourism landscape platform.

Supporting Design of Streaming Media and Self-media Platforms

The display of post-industrial landscape culture contains many detailed contents including a large number of video resources, tour program plan, special information of different time periods, customer feedback and many other detailed information. The information platform of the landscape and an official account of its social media can be established through a link to the video playback server.

Customized Information Design for the User Interface

The backend database is used to present high-quality customized information according to the analysis of users' attributes and preferences such as the promotion of landscape type, suggestion of

tour styles and supporting service information.

The use of digital ecological design technology in the context of all-for-one tourism of the post-industrial landscape can enable various industries to actively participate in it, and all relevant departments should cooperate with each other and actively participate in the whole process. What's more, it can realize ecological digital art design, make full use of regional resources and turn them into products that are accessible to most tourists, provide online and offline travel experience for tourists so as to fully meet tourists' needs of high-standard experience. It can help to improve the satisfaction of tourism project brands, increase people's life quality, and improve the favorability towards new tourism experience and new technology, and increase the comfort level and matching rate of the entire process of travel. All-for-one tourism is a panoramic and comprehensive system of tourism industry, which pursues the optimization of resources, orderly space, rich products, and highly-developed industries. The digital ecological tourism industry with a new sense of science and technology provides a good opportunity for the research and development of the digital forms of tourism cultural landscape.

Acknowledgment

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