

The application of digital technology in Dali "Fengtu Yicang" scenic spot

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Abstract. With the continuous development of the digital era, it is not only a technical means of processing information, but also a demonstration of scientific and technological progress. The advent of the digital era provides a new creative idea for us to reproduce the irreparable buildings. However, as a national granary, Fengtu Charity Warehouse is mainly displayed in a single scenic spot, lacking diversified display forms, which reduces the popularity of Fengtu Charity Warehouse.

1. INTRODUCTION

Begin the Introduction two lines below the Keywords. The manuscript should not have headers, footers, or page numbers. It should be in a one-column format. References are often noted in the text¹ and cited at the end of the paper.

The State Administration of Cultural Heritage and other departments issued the Three Year Action Plan of "Internet plus Chinese Civilization", the Guiding Opinions on Promoting the Deep Integration of Culture and Technology and other documents, clearly proposing the requirements of "strengthening the digital protection and inheritance of cultural heritage, promoting the open sharing of cultural relics information resources, and carrying out the digital display and utilization of cultural relics". Fengtu Yicang is "the best in the world" in terms of the scale of its construction and the history of grain storage. With the passage of time, the appearance of the ancient buildings has also been damaged to varying degrees. The original wall houses in the ancient city have been cracked and collapsed after a long time of wind and rain due to ramming earth to build the city, surrounding slope protection rock mass, foundation collapse, building collapse, etc.

Through the digital technology to achieve the in-depth study of Fengtu Charity Warehouse landscape art, we can enrich the existing research content, so that we can understand Fengtu Charity Warehouse from a new perspective. In order to achieve the data based sustainable preservation of the granary landscape. Let history speak, let cultural relics live, enhance the regional influence of Dali culture, and contribute regional strength to the rural revitalization strategy.

2. Digital technology

2.1 Characteristics of digital technology

The primary characteristics of digitalization are reproduced and restored, spanning time, space and distance. The cultural scenic spot is one of the material carriers of traditional culture and a precious national cultural treasure. With the help of digital means, the historical and cultural landscape can be displayed across time and space, so that the traditional culture and modern culture can be exchanged and integrated across time and space, the second feature is the richness and sharing of information. Digital technology is used to compress and optimize the collected 2D and 3D information, which can realize the "one-stop" storage management of massive information. 3D lidar scanning technology is used to obtain plane data and ambient light brightness to improve the artistic beauty of virtual architecture. Take pictures of the internal and external structures of ancient buildings, including details and textures. Collect the surrounding cultural environment, development profile, historical background and other information, deepen cultural understanding, summarize and analyze the information, store the information by category, and draw the elevation and plan of physical data with Auto CAD software. Make models by using Sketch Up software and modeling methods such as surfaces and polygons. Irregular objects such as mountains and rivers are involved around the building, so the fractal set technology can be used to make models. PS is mostly used for map repair. After the light and shadow effects are processed by plug-ins, the model light and shadow are mapped to complete the digital

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protection research.

2.2 The connotation of digital technology

Digital technology is undoubtedly an interdisciplinary means of communication. It is a new form of multimedia information storage and communication media based on computer and data communication technology and Internet platform. The artistic digital scenic spot, which relies on digital media for art display and dissemination, is characterized by the fact that buildings and scenic spots are original forms, which are empowered by modern science and technology. Through the optimization of data volume and the combination with space, attribute and other data, the ancient architectural style is truly restored, while information collection and processing, building a virtual model [4], and displaying historical relics in a virtual digital form.

Fundamentally, the research on digital protection of Fengtu Yicang is the process of transforming the original static display scenic spots (buildings, landscapes, etc.), as well as the literature related to Fengtu Yicang, into digital technology through scientific and technological means. In the current social context of the vigorous development of digital technology.

2.3 Application of digital technology in scenic spots

The earliest practice of using digital technology to protect immovable cultural relics in China is more in grottoes, but there are also some outstanding applications in scenic spots, among which the Yuanmingyuan and Mogao Grottoes have the most significant digital achievements; The digital application of the Yuanmingyuan architectural heritage mainly focuses on online or offline roaming interactive experience. Specifically, it can be divided into: immersive space experience, digital interactive devices, digital interactive games, etc., showing four characteristics as a whole: The scene space has a strong sense of immersion; the participation level of interaction design is shallow; The relevance of content planning is weak; The user experience is lacking.

The core content of the digitalization of Mogao Grottoes is mainly murals. The digitalization of mural information includes three parts: digital images of murals, three-dimensional space changes of murals, and the integration of all information related to murals. It is the core of the "cultural heritage of digital Mogao Grottoes" and will also be the basis of the practice of digital Mogao Grottoes [4].

3. Overview of Fengtu Yicang

Fengtu Yicang is one of the few large granaries still in use in the Qing Dynasty in China. "Fengtu Charity Warehouse" means "make up for the harvest and seek to repay the people". The scenic spot is located in Dali County, Weinan City, Shaanxi Province, covering a total area of more than 20 mu. It is located on the dry and ventilated hillside along the Yellow River. Its natural and

superior geographical location makes it very conducive to grain storage. The slope from the southwest of the courtyard to the warehouse top, the top of the warehouse is paved with green bricks, the edge is stacked with fence walls, and drainage ditches are set to prevent the water from returning to the damp in rainy days, and the grain is transported by turning over the sun.



Figure 1 Fengtu Yicang Location Map
(Written by the author)

3.1 The political background of Fengtu Yicang

In ancient wars, grain reserve was a very important material guarantee, which was used to raise troops for war. At that time, Lian Jingming, Minister of Protection of the Qing Government, considering the fierce domestic conflicts and serious natural disasters, from his loyalty to the Qing Government, proposed the intention of building a barn with military significance and choosing the city of Chaoyi.

3.2 Farming culture

Dali has a flat terrain and no mountains in the area. The plains alluvial by the Yellow River are suitable for farming. As the representative of Dali farming culture, Fengtu Charity Warehouse stands like an "agricultural museum" on this land for people to look back [4]. "Emperor Yan is responsible for the cultivation of crops and the benefit of the people in China, and Fengtu contains historical biographies that cover the ancient and modern times to learn about spring and autumn", which highly summarizes the humanistic value of Fengtu Charity Warehouse and spreads the Chinese food culture with a long history to the world. Fengtu Yicang spreads food history and culture, promotes food culture [5], and reflects traditional farming culture by displaying storage, warehousing, warehouse administration, dozens of food specimens, grain production and use tools such as stone mill, dou [5] and liter, as well as food tickets.

3.3 Ancient architectural culture

In Fengtu Yicang City, a large number of original buildings remain, forming a large continuous and spectacular building group. The axisymmetric building in the courtyard supports the visual sense of "orderly, serious and orderly". The curved roof structure makes the facade of the building more rich and adds soft elements to the square building. On the architectural node, the poetry and painting related to grain are integrated to set off the grain cultural atmosphere of Fengtu Charity Warehouse. Fengtu Yicang is a kiln type warehouse. After the cave is built, it is M-shaped. The architectural space is used to give play to the charm of food culture in the environment, create a more humanistic, green and artistic architectural space,

and give full play to the real connotation of food culture [1].

3.4 Storage culture of Fengtu Yicang

Fengtu Yicang is located on the old cliff on the bank of the Yellow River. Its strategic location and the architectural pattern of the city in the city make it like an ancient city. It is a model project of ancient granaries in China. The perfect military defense system and the practical grain storage function make it a good architectural model integrating military and civil functions in the ancient architectural history of China. The brick kiln structure of the warehouse has a unique role in preventing fire, theft and invasion of the grain in the warehouse.

4.Integration of digitalization and Fengtu Charity Warehouse

Fengtu Yicang has a history of more than 100 years and plays an essential role in the development of food culture. Also in each period, "step forward" to shoulder its special mission. Special figure. In the digital protection of Fengtu granary, the historical and cultural connotation of the ancient granary should be explored as much as possible. In this process, we should pay attention to distinguish between historical facts and folklores, and not confuse concepts. In a word, before the digital protection of Fengtu Yicang Scenic Area, we should first explore the food culture contained in Fengtu Yicang as much as possible, so that it will not be affected by environmental loss, man-made or non-human destruction, and thus "eternal" preservation.

4.1Digital protection mode of Fengtu Charity Warehouse

The 3D digital technology is mainly used for virtual restoration of buildings in Banliang Village, and AutoCAD and Sketch up software are used to create 3D space models of main buildings, streets, roads and other structures in combination with historical data and building area information of buildings. Finally, the construction of settlement scene and the production and presentation of static frame digital animation are carried out based on Lumion software. The so-called digital technology refers to the integration of computer technology, virtual technology, image acquisition technology, remote sensing technology and other high-tech means to obtain the status quo data of traditional settlement landscape, and then use computer technology to carry out digital reconstruction, restore its original state, reproduce its scene, and achieve digital archiving, aiming at digital preservation, digital transmission, digital restoration, and digital reproduction [5].

4.2Information Collection of Fengtu Charity Warehouse

The image collection process of Fengtu Yicang digital protection generally conforms to the basic principle of digital photography collection. In view of the special Yellow River culture and food culture contained in Shaanxi Dali, it also has its unique collection characteristics. The basic work of digital protection of Fengtu Yicang with digital technology is to collect, input and sort out the overall data of the building. The traditional measurement and 3D laser are used to collect the 3D data of Fengtu Charity Warehouse. The main collection process includes deeply understanding the connotation of grain culture, selecting Fengtu Charity Warehouse as the image symbol [2], obtaining the collection method and content of high-definition data such as Fengtu Charity Warehouse landscape, pictures, audio and video, and then introducing the data optimization processing after obtaining the original data, as well as the construction of three-dimensional model, including the model establishment process and model optimization, and finally focusing on the model mapping optimization and processing, Mainly through two technical approaches: SU mapping material optimization and processing and 3D modeling processing, a complete 3D model of Fengtu Charity Store with real material mapping is finally generated [5].

4.3Establishment of three-dimensional model of Fengtu virtual warehouse

In the model construction of Fengtu Yicang, 3D modeling software such as Auto CAD and Sketch up are used. Adopt the idea of building directly according to the map, use digital surveying and mapping technology, multimedia information technology, combined with historical materials of buildings and detailed field surveying and mapping and other information, build a digital three-dimensional model, create a three-dimensional space model of main buildings and roads and other structures, and achieve a multi-directional display of the settlement.

Sketch up, named Sketch Master in Chinese, is a software tool that can express designers' design ideas, express and build 3D models quickly. Its material mapping system can well express the texture of the building facade and enhance the realism of the model.

4.4 Digital display of Fengtu Yicang

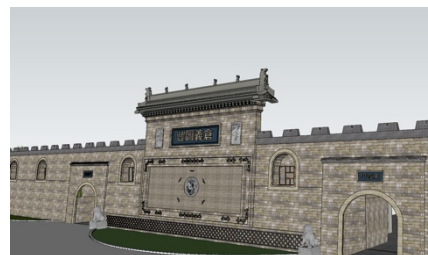


Figure 2 City gate display (Written by the author)

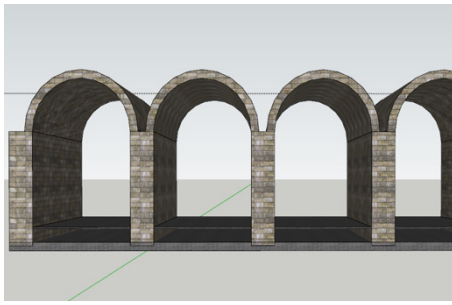


Figure 3 Warehouse cave display (Written by the author)

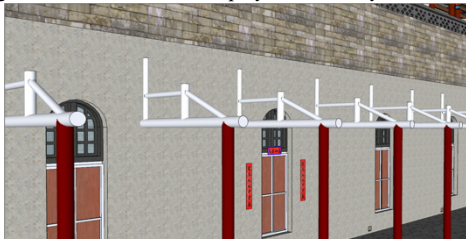


Figure 4 Rack display (Written by the author)

5.summary

This paper takes Dalifeng Tuyicang Scenic Area as the practice object to explore the application of digital technology in its display. The combination of digital technology and the exhibition of Dalifengtu Yicang Scenic Area provides a new way for the protection and inheritance of Dalifengtu Yicang Scenic Area. This design applies hand painting to the design and spreads the historical culture and architectural structure of Fengtu Charity Warehouse, which can present the traditional culture in a more entertaining and interesting way. It highlights the characteristics of Dali Fengtu Yicang Scenic Area and plays a role in promoting Dali Fengtu Yicang Scenic Area.

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