Research on Application of Virtual Reality Technology in Tourism Development--Take Dangjia Village in Hancheng as an Example

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Abstract: Virtual Reality Technology Has the Characteristics of Interactivity and Perception, Which Can Make Users Feel in the Virtual World. Virtual Reality Technology Has Attracted More and More Attention. This Paper Introduces the Application of Virtual Reality Technology in Tourism. the Advantages of Virtual Tourism Make It a New Direction of Tourism Promotion and Marketing and Even a Revolutionary Force of Tourism Concept. At Present, with the Progress of Virtual Reality Technology in Our Country, People's Yearning for Virtual Reality Technology Makes a Kind of Digital Tourism Based on Virtual Reality Technology Widely Used. This Paper Takes Dangjia Village, a Treasure of Folk Houses, as an Example to Study the Research and Design of Digital Tourism Based on Virtual Reality Technology, Which Provides Reference for Digital Tourism.

1. Introduction

Virtual tourism is based on real tourism landscape, using 3D virtual reality technology and relying on 3D virtual tourism platform to build a virtual 3D three-dimensional tourism environment by simulating or restoring real tourism scenic spots [1]. Virtual reality technology can not only intuitively display cultural relics, cultural landscape and living environment, but also enhance publicity effect, allowing tourists to realize spiritual interaction, and at the same time realize the effect of virtual and protection of existing cultural relics. It is a very important promotion technology in the future digital development of tourism in China [2]. Through the establishment of network virtual space, people can "enter" the multimedia virtual world, realize the operation of human-computer interaction and mutual communication, and become "people in the scene", that is, the integration of human and environment. Virtual reality technology provides a brand-new human-computer interaction interface for the simulation of 3-dimensional scenes with its unique performance means, and also provides new means and development direction for the informatization and simulation of these industries [3]. Therefore, this paper takes Dangjia Village in Hancheng as an example to analyze the research and design of digital tourism based on virtual reality technology.

2. Overview of Virtual Reality Technology

2.1 The Concept of Virtual Reality Technology

Virtual reality technology mainly refers to providing users with intuitive perception, such as vision, hearing, touch, etc., so that users can communicate with nature through the system, that is to say, users can feel the same feeling and experience as in the real world through virtual reality technology [4]. Virtual reality technology makes up for the deficiency of WebGIS in spatial scene expression, which enables geospatial data to be expressed in three-dimensional ways and more realistically show a certain real space. The establishment of a three-dimensional information system based on virtual reality technology can not only enable more people to understand the characteristics of scenic spots through modern scientific and technological means, but also can be

combined with the reality of tourist scenic spots. This technology has three characteristics, namely immersion, interactivity and imagination [5]. The realization of 3D virtual tourism depends largely on the development of virtual reality technology. Virtual reality technology is a technology that comprehensively utilizes computer graphics system and various interface devices such as reality and control to provide immersion feeling in interactive three-dimensional environment generated on computer. The scientific simulation and demonstration of the tourist area will provide a real 3-dimensional virtual scene for evaluating the historical and cultural landscape of the tourist area and achieve the purpose of effectively promoting the tourism and protection of the scenic area by using advanced scientific and technological means.

2.2 The Effect of Virtual Reality Technology

In the development of tourism, some precious cultural relics are often damaged by tourists. Even if it is not for tourists, nature will bring irreparable damage to some precious cultural relics. These cultural relics are of great research value and must be protected. Tourism is closely related to tourism resources and cannot be separated from the geographical elements of nature. Therefore, it has a natural connection with GIS. People can use VR equipment from thousands of miles away to enjoy the elegant demeanour of scenic spots and feel the culture of scenic spots [6]. Virtual scenic spots are more intuitive than traditional scenic spot introductions and can attract people to take a look at their elegant demeanour on the spot. For the damaged landscape cultural relics, it can be rebuilt by using virtual reality technology according to the records of historical data so that tourists can have the opportunity to enjoy the traditional art of our country. Using stereoscopic images to promote tourism resources; It is also helpful to the general survey of tourism resources and to guide the planning, development and construction of scenic spots. The establishment of the virtual three-dimensional scenic spot can enable the planners of the tourism department to fully understand the reality of the scenic spot. The use of virtual reality technology, combined with the characteristics of the city, can build a publicity effect with characteristic elements, so that tourists can more clearly understand the destination of tourism and increase the interaction of publicity [7]. Users can build a three-dimensional model through the two-dimensional pictures they have drawn up and collected, superposing the two-dimensional information with the three-dimensional model, giving people a more intuitive image and greatly enhancing immersion and interactivity.

3. Demand Analysis of Digital Tourism System

3.1 Virtual Experience of Tourism Environment

For tourists, their biggest dream is to travel around the world without leaving home. By using virtual technology, combining Internet technology and computer technology to construct a virtual scene with three-dimensional effect, tourists in different places can feel the real landscape, cultural relics and environment. In addition, using GIS's powerful spatial data processing and analysis functions can also assist tourism enterprises in making tourism marketing decisions, facilitating tourists to make tourism plans and provide related services. People can not only choose the travel destination and know the destination in advance by experiencing the virtual scenic spot online, but also provide VR equipment in the scenic spot so that tourists can know the layout of the scenic spot and taste the details of the scenic spot without interference. Three-dimensional technology provides intuitive image, specific spatial information, surface features and other information. The combination of two-dimensional and three-dimensional technology will be more conducive to the expression of virtual reality [8]. This is a brand-new tourism experience and also a very attractive tourism experience. Therefore, WebGIS can meet the different needs of tourism government departments, tourism enterprises and tourists to the greatest extent.

3.2 Design Itinerary through Network Information

In the process of tourism, the design of the itinerary is a very important thing, and the digital tourism website is to design the itinerary for tourists. After passing the destination, budget and other

tourism information provided by tourists, it will use computer technology to design a reasonable itinerary for tourists. If the tourists are not satisfied, it can also modify and adjust a single link until the tourists are satisfied. At present, the virtual tourism technology is mainly focused on the virtual reality technology based on real-life shooting. It takes continuous real-life photos through cameras, processes them to generate 360-degree panoramic real-life photos, and embeds them into websites. In the real-time roaming process, the computer can automatically draw the corresponding view according to the viewer's position, illumination and other information. Tourism resources investigation is the premise and foundation of tourism resources evaluation, and is also the necessary premise for tourism development and planning. In practical application, similar to other resources investigation, it is necessary to establish relevant thematic databases. Through scientific simulation and demonstration of tourist areas, the final decision can be assisted. If there is no time to fully view the scenic spot during the field visit, people can also relive it through the virtual scenic spot after the trip to make up for the regret during the trip.

3.3 Inquire about Travel Information

In essence, tourism is a process of going out and browsing, involving a wide range. Internet technology can help the tourism industry to carry out publicity and promotion, and to reorganize the tourism business. In the system, the user can directly control various parameters of the object, such as movement direction, speed, etc., and the system can also feed back information to the user, for example, when two cars collide in the simulated driving system, the user will feel tremor. After the car shakes after designing the travel itinerary, the tourists are most concerned about some information of the travel destination, such as the weather, snacks, accommodation and the best scenic spot, etc., which can be obtained only through the search engine, mobile phone website, etc. For ordinary tourists, scenic spots are the ultimate goal of tourists' travel among the six elements of tourism, shopping, entertainment, diet, accommodation and travel. To build a virtual three-dimensional tourism environment, netizens can view the scenery thousands of miles away in the three-dimensional virtual environment without leaving their homes, with vivid images and meticulous and vivid images.

3.4 Digital Electronic Map Inquiry

Using the digital electronic map inquiry system, tourists can find the best travel route more conveniently and quickly, and can also find the traffic, buildings, restaurants and people of the travel destination. As long as you enter what you want on the electronic map, you can accurately find the corresponding geographic location. Through a 3 d images, you will feel that you have entered a three-dimensional scene, and sometimes you will use three-dimensional modeling to make 3 d images for two-dimensional electronic map development. The remarkable feature of virtual tourism is spatiality, that is, the use of Internet technology to show all the areas where the landscape is located. The traditional map is flat and the contents of the map are fixed. Tourists can only use the map to understand the geographic information of the landscape. The reasonable application and construction of 3D virtual reality technology in large scenic spots has played a propaganda role in stimulating users' strong tourism desire, driving tourism consumption and obtaining economic benefits. Digital electronic map can construct real environmental information for tourists through virtual display technology, and comprehensively display the catering accommodation, transportation, shopping and entertainment of tourist destinations for tourists.

4. Design of Virtual Tourism System--Take Dangjia Village as an Example

Dangjia village, located in Shaanxi province, has a history of 670 years. it is called the treasure of our country's residential buildings and is a very famous tourist attraction in our country. There are memorial tablets of filial piety, Wen Xingge and some special buildings, such as tube troughs and gates. However, the traffic here is not very convenient. Only Beijing and Xi 'an have direct trains, and the accommodation conditions are not particularly good. There are houses and some ordinary hotels. The prices of hotels are relatively cheap. This paper takes this as an example to

design a virtual tourism system.

4.1 Part of a Virtual System

Using VR panoramic live video to build a virtual scenic spot can restore the real details of the scenic spot to the greatest extent, especially for historical and cultural tourism scenic spots, users can take a head-mounted VR device to experience, change the observation angle to look around, immerse themselves in the picture and feel the atmosphere of their culture and history, as if they were in a real scene. Imaging device: W645 wide-angle short-range projector, brightness of 4000 lumens, resolution of 1024×768p, 1.2m imaging of 100 inches. Reflector: a reflector. Virtual three-dimensional scenic spot is the integration of these three technologies: using virtual reality modeling language (VRML) technology to realize GIS information on PC, adding GIS spatial analysis and query functions to the virtual environment, and providing GIS users with interactive user interface and object management elements inherent in the network. Interaction and control device: 19 "4: 3 LCD, resistive touch screen. Host system: high performance CPU chip, DVI professional graphics card, 2.1 channel stereo equipment. Establishing real-time three-dimensional visual effects through computer graphics; Then the observation interface of the virtual world will be established. Virtual technology can strengthen the application of scientific computing technology. Users can really enjoy the same experience as the real environment in the virtual environment. Users have a strong sense of immersion and it is difficult to distinguish the virtual tourism environment from the real tourism environment.

4.2 3Ds Max Modeling

Taking the gate house of Dangjia village as an example, first open 3ds max interface to create a box, edit and modify the box, change the location and quantity of its points, lines and surfaces, and transform it into a gate house model. Using the acquired three-dimensional data to establish the corresponding virtual environment model. The acquisition of three-dimensional data can adopt CAD technology (regular environment), while more environments need non-contact visual modeling technology. As static landscape pictures can only show the landscape seen from a fixed place and from a fixed angle, the effect of this publicity method is very limited. After making the model of the gate house, use 3ds max sleek modifier to get the model effect. After the model is completed, use material tools to adjust the color, transparency and gloss of the gate house to make it look more realistic. You can also edit the path of the gate house through path modifier. Different from panoramic VR video, a virtual scenic spot built by computer modeling and interactive design of 3D scene can be set free in 3D virtual scene. It can not only change the line of sight, but also walk and jump freely and interact with people, objects and environment in the scene, instead of having to move along with the movement of the camera. RS provides corresponding texture mapping of satellite images to make the whole virtual scene lifelike.

4.3 Post-Special Effects Production and Editing

After creating animation through 3ds max modeling, its realistic effect is not very ideal, and it needs special effects production and editing in the later period. There will be better visual experience and immersion in the virtual scenic spot. Then set up roaming interaction. A movement script can be added to the handle controller, so that the user can control the front, back, left and right movements through the keys of the handle. By creating a three-dimensional visual, auditory and tactile environment to provide human-computer dialogue tools for users, interacting with objects in the virtual environment, users can be provided with on-site sensation and multi-sensory channels, and an optimal human-computer interaction interface form can be explored according to different application purposes. In the later period, we mainly added some virtual elements to make the real object model look more real and the virtual object model look more dreamy. Some music elements should also be added and applied to the digital tourism system to enhance the attraction of Dangjia Village.

5. Conclusion

Virtual reality technology has brought a brand-new display method to tourist attractions, providing a three-dimensional and dynamic display effect to tourist attractions (products). The function of the virtual tourism system is to show tourists all the scenic spots of the tourism destination, and its purpose is to let tourists have virtual experience of the landscape through the network. This is the development direction of tourism in the future, and it is also a sign of the development of Chinese digital technology and Internet technology. The virtual scenic spot can not only show the elegant demeanour of the existing scenic spot, but also simulate the appearance of the planned future scenic spot, which has great practical significance. With the continuous development of science and technology and the popularization of VR equipment, the relevant technologies of virtual scenic spots will become more and more mature. I believe that in the near future, virtual scenic spots will bring a brand-new experience to tourism.

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