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Research Article

Interactive Cultural Communication Effect in VR Space of Intelligent Mobile Communication Network

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Virtual reality technology can provide more display techniques to realize the interactive design of multiexhibition area of red humanities and natural resources. First of all, through the three-dimensional interactive display of cultural relics and scene reproduction of historical events, visitors can enjoy the unrestrained and immersive appreciation, make up for people's lack of understanding of history, and let tourists personally feel the difficulties and hardships in the development of Chinese revolutionary history. Second, the digital method also provides for the pavilion and the scenic spot design personnel more creative method; dynamic scene reappearance interaction design based on virtual reality technology to promote education, protection of cultural relic collection and utilization, academic research, and the industrial development and multidimensional public welfare publicity results is blended in among them, through the panoramic, immersive, and interactive display technique, such as multilevel multiway spread red brigade culture. Virtual reality constantly imitates the real-life environment, and the application of perception sensing equipment has perception. This new technology requires us to continue to explore and research it. Virtual reality technology is a very cutting-edge subject and research field, which is very challenging. The communication form of culture has also been constantly evolving. Virtual reality technology (VR) has changed the way of traditional culture appreciation through the transmission of visual information, bringing people a new aesthetic enjoyment. Mainstream media is used to mobilize the red cultural heritage protection and scholars at home and abroad, to explore the application of virtual reality in the red culture tourist attraction planning, and to explore virtual reality applications in red open spot virtual roaming: exploration of virtual reality in the application of historical and cultural sites to red tourism management and exploration of virtual reality in the brand historical and cultural sites in the application of the travel marketing, to build an intelligent mobile communication network communication platform and broaden the new path of inheritance and protection. On the basis of studying the communication effect of traditional culture, this paper studies the possible communication effect of symphony orchestra under the new technology format under the framework of communication studies. It also analyzes and explores various factors such as the practical value, difficulty, civilized prestige, adaptability, and resistance to adversity of the culture in cultural communication and compares the methods of cultural communication. By developing a virtual instrument placed in the sphere of virtual reality space, the traditional symphony orchestra can be transformed into an interactive culture communication in virtual reality space. In this communication design, users can define their own instruments to play interactive culture communication, change the position of the instrument on the sphere interactively, and even change the sound effect of the symphony interactively by rotating or adjusting the size of the sphere, so as to achieve the best communication effect of the symphony.

1. Introduction

Under the new intelligent mobile communication network, the forms of media memory have more diversified expressions. The thinking logic of mass media digitizes, imagines, and stories the way of memory, breaking through the time limit of material carrier inheritance. The media memory of red culture can strengthen the strength of

social collective memory through multiple forms of memory. We should pay attention to the preservation and repair of material carrier; on the other hand, we should also open up new media forms of red culture memory, so that the red culture can remain in the collective memory of the public. Virtual reality has three characteristics, namely, perception, VR should have all the perceptions that humans have; existence, VR should have an immersive experience for the experiencer; and interactivity, VR should have the function of interactive experience between humans and machines. What virtual reality technology emphasizes is "immersion," which makes people seem to be in the scene. The times are constantly changing, and VR plays a very important role in the research of digital space art. With the widespread popularization of computer, smart phone, and network, human beings have entered a high information age. In the past, people lacked the means of communication, interaction, dissemination, and sharing of traditional historical and cultural knowledge such as culture and painting, and the problems of abstract characters and incomprehensible semantics in traditional propaganda methods were urgently needed to be solved in the process of dissemination and promotion. Nowadays, the form of culture communication has been continuously developed and evolved. The addition of visual information has changed the traditional way of culture appreciation and brought people a new aesthetic enjoyment. Culture communication and promotion based on the interactive experience of Unity3D space can build the cultural resources of symphonic culture into an interactive three-dimensional scene to realize the visualization of symphonic culture scene. By using simple mobile devices, people can interact with objects in the virtual environment, making users feel as if they were in the real symphony environment, which can not only satisfy the perception but also have interaction, which is also more conducive to stimulating the interest of the new generation in the learning of symphony culture. Interactive experience is mainly an experience between the experiencer and the space. It expresses a kind of "immersion." The so-called "immersion" expresses the experience of the experiencer in the space. For experiencers, a good interactive experience can bring them sensory enjoyment and endless fun. The monotonous life, through the connection of virtual reality technology, adds a new understanding of space. Although the space art and the experiencer are not the same subject of expression, they are connected and integrated into a whole through the operation of virtual technology and even realize the dialogue function of human-computer interaction.

The rich connotations and historical deposits of red culture always constitute the value system and spiritual style of the Chinese nation. Therefore, in the communication environment of the new era, it is an important issue for us to think about how red culture fits into the contemporary context of intelligent media communication and how to create a communication mode integrating red gene and new media. The virtual reality technology of interactive experience is characterized by immersion, interaction, and imagination. Based on computer technology, it creates a three-dimensional and all-round environment by simulating the real world and human vision, hearing, and touch [1]. Culture communication and promotion based on the interactive experience of Unity3D space can build cultural resources into an interactive three-dimensional (3D) scene to realize the visualization of cultural transmission resource interpretation [2]. As a typical romantic country, France is one of the most successful countries in integrating aesthetic concepts with modern technology and is also the country with the earliest and most extensive research on virtual technology in the world [3]. Due to the huge benefits achieved in the application of virtual reality technology in some special fields, more developed countries have invested large research resources in this field [4]. In China, the research on virtual reality started late and there is a gap between it and foreign research results, but it has attracted great attention from relevant government departments [5]. Especially in recent years, in the field of civil use, its research results have begun to focus on various complex sensory operations of the human body [6]. On the whole, while keeping up with the international new technology, the research is paying more and more attention to the application of virtual laboratory, virtual leisure experience, virtual art appreciation, and other aspects [7].

The light field is used as the input source of the VR device. Since the light field can provide visual information of moving parallax, binocular parallax, and selective focus at the same time, the imaging result is improved from the traditional 2D plane image to the 4D light field image; eliminating the dizziness of the VR experience greatly improves the sense of immersion and fidelity and blurs the boundary between reality and vitality. It can be said that VR equipment is currently the best device for stereoscopic display of light field, and light field is also the most suitable application of VR equipment. Interactive cultural transmission equipment has its own unique properties and plays its functions in different types of works and also forms unique rules and principles [8]. In order to make the communication effect of interactive cultural transmission equipment, this study puts forward a new design idea to fully reflect its universality and interactivity. The research content is still focused on the interactive virtual cultural transmission based on VR space, which makes the communication site more authentic through basic interactive design. The research will focus on analyzing and summarizing the types and characteristics of symphonic cultural transmission, so as to fully grasp the interactive relationship between image and modern cultural transmission, which both promote and restrict each other. During the development of the system, the key technologies involved and the principles and functions of these technologies are studied and analyzed, including the selection of the platform and the integration of the implementation technology into the virtual experiment of computer assembly. The research also combines the recent survey of the audience of symphony popular concert to study the communication effect of concert in the framework of communication studies. These interactive settings of the components of the

multimedia information are used to maximize the reusability of the virtual exhibition hall.

2. Research Overview and Technical Plan

2.1. Connotation of Cultural Dissemination Communication. Break the space-time concept of narrative scene, and reconstruct the "immersive" experience scene. Due to the limited communication capacity, people's communication activities mostly take place in fixed space and time places. The emergence of intelligent media technology breaks the limitation of communication frame and makes information interaction more three-dimensional. The media connect the receivers and receivers and place them in the same virtual space. The information transmission and feedback activities in this space construct a variety of narrative scenes, which become one of the main features of intelligent media communication. The application of online virtual space constructs a broader and free space for the dissemination of red culture. Red historical stories are the most vivid carrier of red culture. Real and vivid stories are permeated with the nobleness and sacredness of red culture, which can make the people clarify the drama, reject vulgarity, and worship heroes. For example, the red memorial hall without walls and virtual simulation "immersion" experience hall are built to realize the organic combination of online virtual space and offline real experience, so as to improve the communication efficiency of red culture and enhance its identification. At the same time, efforts should be made in "interaction" and "service" to set up friendly interactive interfaces and participation links, such as cultural knowledge question-and-answer, one-click costume change and virtual scene online experience, to enhance the fun and immersion of cultural products.

The essence of culture communication is the behavioral process in which people produce culture information, disseminate culture information, and receive culture information. Cultural transmission refers to the interaction of culture from one society to another, from one area to another, and from one group to another. In this dynamic process, both parties interact and influence each other and achieve a kind of communication and resonance in the spiritual level [9–11]. The development of red tourism brings more visitors but also increases the difficulty of protecting the material resources of red culture. In addition, museums and red tours are open to the public free of charge according to the relevant policies of the state and Hainan Province. Real-time interaction means people can like the real world and the virtual world for real-time interaction and diversified simulation using each kind of sensor information interaction, and people with special equipment and all interact in virtual reality, just like in the real-world experience in virtual environment and real environment as well as the corresponding response. For example, if you grasp an object in the virtual world with your hand, you will feel as if you are grasping something. The captured virtual object will react in real time as if it is in your hand. This is the real-time interaction of virtual reality. Nowadays, the forms of cultural communication tend to be diversified and popular, and various forms of communication emerge endlessly. The medium of cultural transmission is mainly the migration and flow of people, especially the migration of people which is more important. Important means of cultural transmission are immigration, war, invasion, and occupation. In addition, tourism and the flow of other people are also important media for the dissemination of culture. In this context, to attract the public's attention, the media of red culture communication strives for innovation, so as to better spread the spirit of red culture. In addition, the rapid development of digitalization, the combination of virtual reality and cultural industry, and the performance design based on virtual reality are a communication medium for red culture to conform to the development of digital era and a new form of red culture communication. The dissemination of red culture is the cultural dissemination of red culture as the main content, which means that the communicator conveys the content of red culture consciously and purposefully through various communication carriers and media and through various communication methods. The red spirit is given to the communicator, and the behavior and value orientation of the communicator are influenced by the red culture. The dissemination of red culture is an important way to inherit red culture. Promote the spirit of red culture, show the deeds of revolutionary history, and arouse the resonance of the red spirit. In order to make red culture spread, let the red culture get better civilization inheritance [12]. Cultural dissemination communication can be divided into two forms: natural communication and technical communication. These two forms of communication are divided by the different media and channels of communication, so there are some differences in the effect of communication. The technical communication of culture is closely related to the development of science and technology, which means that the intervention of other media besides air makes the channels of communication diversified, the clarity of communication effect, and the unprecedented expansion of communication scope and speed [13]. Natural culture communication refers to the face-to-face communication of music information between receivers and receivers using air as the transmission medium, which results in the transparency of the relationship between transmission and reception and enhances the sense of reality of communication effect [14, 15]. In terms of technical communication means, for the first time, recording was used to complete the storage of sound, which broke the limitation of time and space, and the range and speed of communication were expanded unprecedentically, resulting in the unprecedented development of culture communication [16]. In the natural route of transmission, the first performer performs to stimulate the audience's emotions and to strengthen the presence of the audience, the audience watching the show of emotion, and instant feedback to the performers, thus stimulating the mood of performers and mobilize their enthusiasm; the audience can see more wonderful performances [17, 18]. The face-to-face communication of music information between

performers and viewers results in transparency of the relationship between transmission and reception, which enhances the sense of reality of communication effect [19].

2.2. Symphony Communication Integrates Virtual Reality and Audio. For the development of the platform, users can feel the speed of time and no longer have to travel far away; as long as they pick up mobile phones and other devices, they can feel the convenience of digital technology in people's lives. And for creators with dreams, young people can be actively encouraged to create and develop platform exchanges, which can drive the trend of the times and lead the development of the society's related industries of virtual reality technology, thereby driving the direction of new media technology and promoting the new media era. VR technology has played an undoubtedly key role in interactive applications in the digital space. With the arrival of the information age, electronic technology develops at a high speed, and culture communication forms are constantly developing and evolving; from natural cultural transmission, these two forms of culture communication not only inherit in time sequence but also show mutual integration at the spatial level [20, 21]. Virtual reality (VR) and other immersive technologies play an important role in the immersive experience of video games and movies [22]. Virtual reality technology includes technologies that blur the boundaries between the real world (reality) and the digital world (analog reality) [23]. According to our vision, hearing, and touch, virtual reality allows users to have immersive experiences with different contents [24]. Because of this, each category has its own special device, which users must wear or use in order to experience different types of immersive content [25]. Unlike virtual reality, "augmented reality"-based technologies can also experience environments or events that do not use a monitor, as it is often implemented in applications and projected into the real world. In other words, augmented reality (AR) can supplement the user's current visual sense with any simulator [26]. But when these simulated objects are superposed into a virtual object, people can interact with them in the real world, which becomes a hybrid reality and seamlessly merges the real-world objects with the virtual analog objects into the digital world, so that they can coexist and interact together.

The emergence of these modern communication media broadens the scope and audience area of culture communication and enriches the styles of music art. However, traditional culture communication methods will not disappear, but will be shown to us in new forms. With the intervention of modern technology, we can enjoy more mysterious scene of the live concert, romantic or popular bar music, a variety of street art, etc. Together with modern music media, they create a three-dimensional space for people to enjoy music together. More importantly, this experience is an immersive spherical video, and users can also control the position of their perspective in the video in all directions, making elegant music and folk music more widely available.

VR (virtual reality) is to completely separate reality, so that you are fully integrated into the real world. AR (augmented reality) overlays the real world with electronic content [27]. MR (mixed reality) is a mix of the real world and the virtual world; you can feel the electronic content exists in your real world.

2.3. Construction of Interaction Scheme. In the construction of interactive cultural transmission system, the system realization needs to obtain the body movement of the performer through the camera and interact with the system accordingly. The design principle of this interactive scheme is to require participants to always be in automatic browsing mode. Although participants are in a state of touring, apart from the adjustment of the picture by the system itself according to the perspective of participants, participants can control the rhythm of touring and obtain some detailed information through body movements. The avoidance of participants wearing other sensor devices not only makes the use of the system more convenient and the cost of the system lower but more importantly enables participants to interact with the system more naturally. When participants visit in the automatic tour mode, they can control the automatic tour mode to stop the tour and introduce the relevant words and sounds according to the content of the picture, so that participants can have a further understanding and understanding of the relevant browse content.

CAVE is a virtual reality system, which organically combines high-resolution stereoprojection technology, three-dimensional computer graphics technology, and sound technology to produce a completely immersive virtual environment. Interactive cultural transmission system is based on CAVE's real scene information display and interactive tour of virtual environment. In the virtual environment system, the panoramic camera and sensor devices allow to get a panoramic view of the stage in video images and other sensory information and the transmission of information to the Unity3D engine; thus, the panoramic video and other sensory information are shown in the CAVE system and access to a user action information is through it, which is transmitted to the Unity and translated into control instruction in 3D, by the Arduino, to control the movement of panoramic camera and sensor devices in the environment. The schematic diagram of interactive cultural transmission system is shown in Figure 1.

In the self-guided tour mode, participants should not only adjust the content of the picture according to the point of view but also control and select the tour route and movement state through their own body movements. Therefore, participants are required to make specific actions for interaction and control. In the CAVE system, the movement of the platform can be controlled by sending control instructions to the Arduino through the program after recognizing the body movements of participants. Video footage from the panoramic camera is also transmitted in real time to the CAVE system, where it is displayed.

2.4. Fine Optimization Modeling. About the definition of virtual reality technology, there are no unified standard, comprehensive, and multiple claims that can be summarized as follows: virtual reality technology is a kind of modern high-tech means, with computer technology as the core,

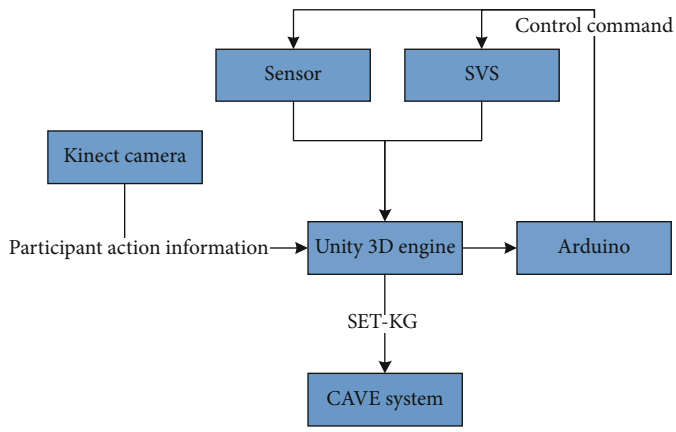

Figure 1: Schematic diagram of interactive cultural transmission system.

can build a break time and space constraints, and have a realistic vision, hearing, touch, smell, and taste, such as the integration of virtual environment; users with special helmet input/output devices, such as gloves and glasses, can interact with objects in the virtual world through gestures such as hand movement, head rotation, and body walking, so as to get real-time three-dimensional feedback and create an immersive experience.

The rapid development of virtual reality technology has been integrated into every aspect of social life, which can be called the creation with the most development potential in the 21st century. It has important application value in the protection and dissemination of red culture. Through the application of virtual reality technology, it can promote the protection and dissemination of the rural red cultural, promote the red cultural relics to "shine" and red resources to "live," and carry forward the red culture. Through the application of virtual reality technology, it can expand the radiation side and educational side of the red culture, enhance the attraction of the red culture, inspire more people to have the feelings of patriotism, love the party, love the hometown, and have far-reaching educational value. Through the application of virtual reality technology, it can inject new vitality into local red culture tourism, promote cultural exchanges, accelerate the development of local economy to a certain extent, and help rural revitalization. Red culture is the condensation and accumulation of the traditional culture and humanistic spirit of the Chinese nation. It contains profound historical and cultural connotations and is an important carrier and resource for propaganda and education in the new era. Red cultural heritage has attracted more and more attention in today's society; the use of modern means of virtual reality technology to protect the red culture and propaganda is very necessary and can firmly show cultural self-confidence, show the distinctive glamour of red cultural, and effectively play a positive education significance and practical application value.

Therefore, based on the working principle of VRML and considering the network transmission efficiency and user experience, the size of VRML files should be minimized so that the display speed can be guaranteed, display delay can be avoided, and its advantages can be realized to give users a better experience, as shown in Figure 2.

VRML to realize the virtual laboratory is a blend of network technology and can be accessed via a browser; the working principle of the VRML is by establishing a file containing description node in virtual reality, with the aid of the client browser to explain, but it must install a plugin to browse; only the corresponding plug-in installed on the client is used to establish virtual environment and the display of real-time rendering.

2.5. The Effect of Cultural Communication. The rapid development of virtual reality technology has been integrated into every aspect of social life, which can be called the creation with the most development potential in the 21st century. It has important application value in the protection and dissemination of red culture. Virtual reality technology truly restores the red historical events, providing students with an immersive learning experience that is not restricted by the venue and rich in content, so that the red curriculum can be organically combined with the base. Using high-tech means such as virtual reality improves the way of simply explaining and visiting research institutions and research bases, supports the better inheritance of red-themed research, and makes red research a spiritual inheritance that touches the soul. The application of virtual reality technology can promote the protection and dissemination of red cultural heritage, can promote the red cultural relics as "bright" and red resources "alive", and will carry forward the red culture. Through the application of virtual reality technology, the radiation and education of red culture can be expanded, the attraction of red culture can be enhanced, and more people can be inspired to love their country, the party, and their hometown, which has far-reaching educational value. Through the application of virtual reality technology, it can inject new vitality into local red culture tourism, promote cultural exchanges, and accelerate the development of local economy to a certain extent. Red culture is the condensation and accumulation of the traditional culture and humanistic spirit of the Chinese nation. It contains profound historical and cultural connotations and is

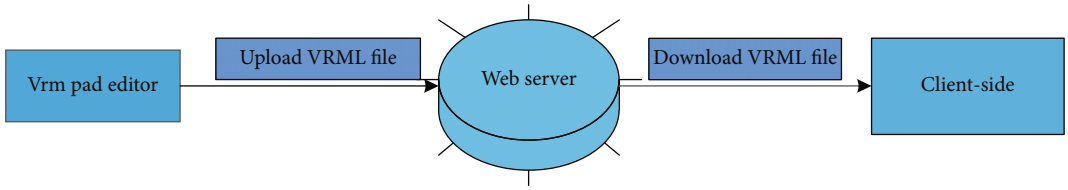

Figure 2: VRML transmission flow chart.

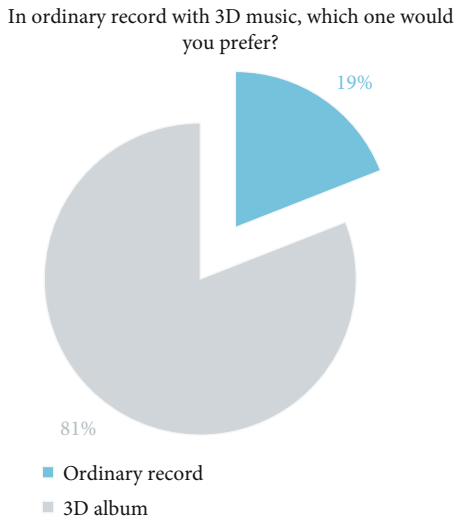

Figure 3: Which of the survey results do you prefer between CDS and 3D music.

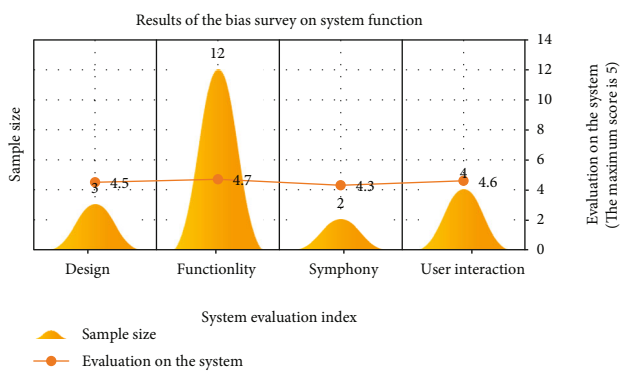

Figure 4: Survey results on system functional orientation.

Table 1: Feedback and suggestion results of users to the system.

Criteria	Number of times suggested
Improved design	2
More red culture	3
Add more features	2

an important carrier and resource for propaganda and education in the new era. In today's society where more and more attention is paid to the red cultural heritage, it is very necessary to use modern virtual reality technology to protect and publicize the red culture, which can strengthen cultural confidence, show the unique charm of red culture, and effectively play a positive educational significance and practical application value.

The intelligent communication network is based on the original communication network and provides new telecommunication services. The core of the intelligent communication network is how to efficiently provide users with various new services. The development cycle of new services is shorter than that of traditional services. This means that the development and funding services can be opened to users in advance and will be recovered early. A large amount of fund improves the utilization rate of the network and enhances the intelligence of the network; this is the source of the rapid development of the intelligent communication network. This will bring huge economic benefits and convenience to the telecommunication door and users. The basic idea of the intelligent communication network is to separate switching and intelligence in the network and implement centralized business control. This is achieved by setting up some network functional components.

Cultural exchange is also called cultural diffusion, which refers to the process of expanding human culture from the source of culture to the outside or from a social group to another social group that can be divided into direct sending and indirect sending. The former usually includes people who directly spread the culture of specific spiritual or material cultural content through convoys, military, etc., including new agricultural technologies and inventions. The latter shows more complex cultural diffusion. It mainly refers to borrowing from specific social groups. The principle of foreign cultural characteristics is to implement a kind of stimulating popularization of civilization creation activities.

The process of cultural dissemination depends on many factors such as the actual value of the culture, its difficulty, the prestige of civilization, the adaptability of the times, and the resistance to adversity. In fact, the characteristics and identity of the communication media often determine the characteristics of the communication culture. For example, in the 17th century, Italian missionaries played a role in stimulating communication to a certain extent on Chinese garden architecture and religious features, the culture of the time.

Due to the complexity of the origin of culture, the method and path of cultural transmission, and the factors that affect diffusion, investigating the origin of specific cultural characteristics is a difficult point in cultural geography.

Generally, because a certain region has a high similarity to other regions in terms of cultural characteristics, it can be inferred that the popularity of foreign culture is greater

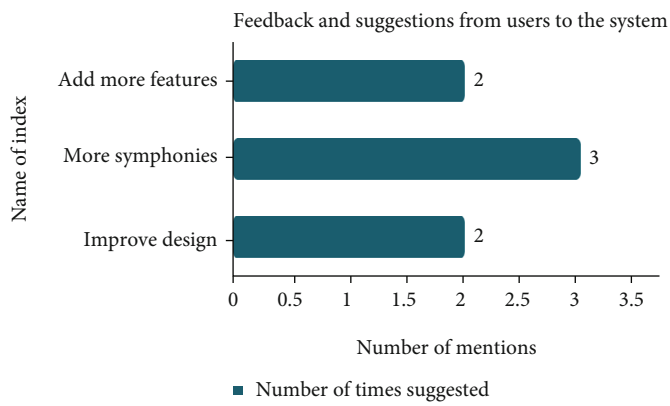

Figure 5: Feedback and suggestion result of users to the system.

than the creativity of local culture. In recent years, some cultural geographers have adopted the model of induction. The probability and law of cultural diffusion provide a new research method for in-depth understanding of cultural exchange phenomena.

There are two ways to popularize culture and media. The first is direct borrowing, directly accepting foreign cultural factors or cultural clusters. The other is indirect communication. In other words, cultural factors or cultural clusters are introduced into the region, allowing people present to think, thereby giving the people who introduce it an opportunity to create a new culture. This phenomenon is called "stimulus transmission."

The media for cultural exchange are mainly people's immigration and flow, especially people's immigration which is more important. Immigration, war, aggression, and occupation are important channels for cultural dissemination. Immigrants bring foreign cultures, and victorious countries always impose their own culture on failed countries. In addition, the movement of people such as trade and sightseeing is also an important medium for spreading culture. In modern times, with the development of transportation and communication technology, the media for cultural exchanges are increasing, and cultural communication does not necessarily depend on the movement and flow of people. The spread of culture in the world through various channels at an unprecedented scale and speed will inevitably improve the uniformity of world culture. The popularization of culture is one of the important reasons for social change. Critically borrowing and absorbing foreign culture are a necessary condition for implementing social reforms and promoting social progress.

To sum up, the application of VR technology can better play the lofty spirit and core value of red culture, create fresh historical scenes through virtual technology, and strengthen the contemporary expression of red culture in the flow and immersion scene of red spirit.

3. Interactive System Design

3.1. System Demand Analysis. According to the theme and activity planning of red tourism scenic spots, virtual reality technology is used to realize online and offline dynamic display, to create intelligent mobile communication network position of red culture and tourism, and to broaden the communication platform of intelligent mobile communication network. Mainstream media is used to mobilize the red cultural heritage protection and scholars at home and abroad, to explore the application of virtual reality in the red culture tourist attractions planning, and explore virtual reality applications in red open spots virtual roaming: exploration of virtual reality in the application of historical and cultural sites to red tourism management and exploration of virtual reality in the brand historical and cultural sites in the application of the travel marketing to build an intelligent mobile communication network communication platform and broaden the new path of inheritance and protection: first, to organize the pilot project of intelligent mobile communication network brand of red culture and tourism resources and to carry out commercial, public welfare, and educational publicity projects of sustainable development and utilization of red culture and tourism. Second, the government shall make overall planning and management, issue relevant promotion policies, coordinate functional departments at all levels, and formulate construction plans for intelligent mobile communication network platforms. Third, adhere to the policy of "protection first, rational use, strengthen management"; strengthen the red culture and tourism development, census, and registration; and expand the collection of intelligent mobile communication network. Fourth, make use of smart mobile communication network platform, in line with the trend of economic transformation; introduce capital investment through multiple channels; seize the opportunity of 5G era; and guide all kinds of enterprises and social organizations to participate in development, operation, and construction.

Interactive communication system is required to break the traditional mode of communication participation and provide participants with a virtual environment free from time, space, and place restrictions. The transmission system and interactive design technology can produce the same feeling and realistic environment, through the external devices that can operate in the scene modeling; modeling of object is based on the principle of the real scene to the participants to make corresponding feedback that enables participants to achieve immersive experience.

The design of the system should make a comprehensive and in-depth breakthrough from the following aspects: first, provide participants with a diagram of the individual modeling in the scene, promote participants' better understanding and understanding of interactive devices through three-dimensional modeling tools, provide guidance for participants to enjoy music successfully, and satisfy participants' desire for appreciation. Second, provide participants with a realistic appreciation of the environment; improve the effectiveness of participants' interest and participation, through vivid modeling and interactive design to create a sense of reality very strong appreciation of the environment; and make the participants not only observe performance animation but also participate in the scene of operations, to provide participation and promote the participant music ability enhancement. Thirdly, it provides a free communication environment for participants.

3.2. Functional Design. The system can be divided into two main parts: virtual exhibition hall configuration generation part and virtual exhibition hall operation part. With the development of the Internet of technological innovation and the different needs and feelings of public viewers, the design of online virtual exhibition halls and exhibition halls emerges from time to time [28]. For professional exhibition hall design and production companies, it is necessary to have the ability to complete the specific and virtual display work of the exhibition hall design. The specific system structure hierarchy module analysis is as follows:

(1) High-level module

Users configure the running parameters and exhibition content of the exhibition hall through the UI and generate configuration files. The actual loading data and operation process of the whole application are determined by the configuration files. The parameter violation detection includes whether the input parameter is within the valid range and whether the loaded model meets the requirements of the system.

(2) Middle-level module

The violation detection module includes the violation detection and parameter. The module and configuration file are read, and the configuration file is parsed and read to achieve the final simulation effect that meets the actual needs of consumers. Run-time violation detection includes problems such as not roaming according to the prescribed route and walking beyond the scope of the scene. The interface logic control module includes the management of UI controls such as buttons and menus and the construction of the UI control logic framework of the program.

(3) Underlying module

The underlying module includes the control of the system and the UI input control of interface interaction. The crossplatform sound API of Delta3D OpenAL free software is used for audio playback, and the video is developed by the video dynamic link library. The keyboard and mouse input control adopts the function module of Delta3D. Delta3D contains the OSG scene management engine, which is used to manage and render the state of the entire 3D model of the scene. Layer modules should not depend on low-level modules, both should depend on abstraction, abstraction should not depend on implementation, and implementation should depend on abstraction.

3.3. Interactive Interface Design. Good user interface design is the overall design of beautiful interface style, human-computer interaction, and operation logic. It can make the system more easy to use and reasonable. It is an important part of product design. In this system, in order to increase interaction and conduct behavior guidance for participants, a row of buttons is set on the upper right of the system interface. Users can click the call button. Click the music button to play the soft song. In the design features, the main color is gray; gray is a very elastic color; it represents calm, introverted, and low-key. In the upper right corner of the system interface, it conforms to the daily operation habits of most users and does not affect the viewing of users when the system is running. When playing music, the center of the system interface will scroll some live photos to increase the amount of information and guide the audience's soul resonance. Participants can break the constraints of time and space, break the constraints of hardware devices, and freely enjoy the experiment according to their own schedule. They can also exchange experimental experiences with different participants and gain experience in cultural transmission.

4. Results and Analysis

4.1. Test and Analysis of System Propagation Effect. Through the above research, we have implemented an interactive cultural transmission system in VR space, where users can interact with instruments in virtual reality. A survey of these people is performed to take the online mode; the researchers will provide questionnaires, uploaded to the cloud server system program; the participants download and install the client for audiovisual experience actively and submit the feedback form data which is passed to the experimenter; among them, the answer to question 1 results is shown in Figure 3, and the answer to question 2 results is shown in Figure 4. The first experiment had 15 participants, and the second experiment had 6 participants. So, these results are based on 21 participants.

In our survey, participants were also asked about suggestions for system improvement, and 7 effective feedbacks were obtained. The feedback results are shown in Table 1 and Figure 5. Based on the recommendations made, we have proposed three criteria relating to the number of mentions. When calculating the results, the number of times each stimulus variable caused a certain response must be obtained, and the threshold value should be determined according to the number of occurrences, and the threshold value should be obtained by linear interpolation. Of the suggestions made by the participants, "improved design" was suggested twice. It is suggested to "add red culture" 3 times and "add

features" 2 times. The results tell us that users want to see more substantial improvements.

4.2. Relevant Discussions. By digital way of virtual reality technology, the introduction of healthy and orderly development of the tourism pattern, red in these areas as historical sites, and cultural relic information detailed records is through virtual means according to the historical evolution and the nature of red cultural heritage resources, shape, size, distribution characteristics of red databases, and data repair at the same time, to lay the foundation protection, using data. Database integration to introduce public welfare, commercial and artistic development projects, and innovative means of expression increases the experience and participation of the project. Take advantage of modern aesthetic concept and tourists' consumption orientation, close to market demand; clear management of red resources in scattered and economically backward and remote areas; and overcome disadvantages such as geographical remoteness and imperfect regional supporting facilities. Optimize the configuration, standardize the management process, strengthen regional information sharing, and share the red revolution information of these regions with people from all over the country and even the world in an interactive way through the intelligent wireless communication network, so as to show the inheritance of historical and cultural development and the uniqueness of regional culture.

In this era of rapid development of information transmission technology and digital technology, virtual reality technology is gradually integrated into daily life, and people begin to pay more attention to virtual reality technology and deepen their understanding of it. Virtual reality technology through continuous development gradually tends to mature, continues to spread to all areas, and is used in all aspects of society. Moreover, in the past two years, virtual reality has ushered in a period of explosion; virtual reality headsets have been put into the commercial market and used by consumers. At this point, virtual reality began to tend to life and popularity. The development and popularization of virtual reality technology have not only enriched people's life but also produced inestimable influence in the field of design and art. Due to the continuous development and progress of science and technology, virtual and surreal performance can now be displayed, designers using virtual technology can create the world of virtualization, virtual reality draw a kind of artistic life experience, and most of these experiences are personalized, and the knowledge system and the objective reality of now have a very big gap. As the form of exhibition is gradually digitized, the application of virtual reality technology in exhibition design becomes possible. Exhibition design based on virtual reality technology has a new form in the communication of design content. Through the design and construction of virtual objects and virtual space, the audience can be immersed in the virtual world created, so that the exhibition of design content becomes more direct and more efficient. Virtual reality technology enables human beings to cross time and space to experience events that have already occurred or have not yet occurred in the world; it can enable human beings to break through physiological limitations and enter the macro or micro world for research and exploration; it can also simulate conditions due to restrictions, etc., tasks that are difficult to achieve due to reasons.

Performance of virtual reality technology of red culture is the fusion of red cultural tourism development of digital technology in an integral form; it is not only the development of tourist economy, and the important content of construction of Chinese characteristic tourism is a more political significance of the red culture education, patriotism education, and ideological and moral construction of strategic project or show times important way. The application of virtual reality technology in the digital exhibition of red culture in this paper is the development trend of the digital experience of red culture exhibition and the exploration of the form of communication in the inheritance and development of red culture, which can provide practical reference and theoretical guidance for future related research.

5. Conclusion

With the vigorous development of Internet mode, the development mode of cultural and tourism industry has been unprecedentedly impacted. In the dissemination and protection of red cultural tourism, the public's requirements for new aesthetics, new functions, and new qualities of inheritance approaches and expression forms make the protection and inheritance of red cultural tourism and virtual reality technology have more converging points. At present, the three contradictions of mobile communication network, user perception demand, and network monitoring strength exist, and they are not in a state of mutual promotion and harmonious development. In short, there are the following problems: users have higher and higher requirements for the quality of network operations, especially the higher and higher requirements for the perceived quality of using different business processes; traditional network monitoring index systems are increasingly unable to truly reflect the user's perception of the situation, and the development of monitoring technology has not caught up with the development of mobile communication networks. These scenes are all derived from the reflection of real life, and the purpose is to get closer to reality and let the experiencer experience the scenes immersively. Experiencers are no longer boring to watch two-dimensional pictures like in the past. Through the communication and interaction between humans and machines, what it shows is incomparable with the past technology. Interactive cultures have their own unique properties and play their functions in different types of culture works, as well as form unique rules and principles. However, the communication effect of VR interactive cultural communication based on the intelligent mobile communication network is different under different communication methods, and the way of communication is also quite different. Although we are still in the early stages of implementing the system, we believe these problems can be solved in the future. We hope that future researchers will consider our recommendations and put them into practice, conducting more tests and studies. In recent years, the research and

application of virtual reality technology in various industries have brought more convenience and experience mode to people's life, and the application of virtual reality technology in red literature travel has a certain era and inevitability. The immersive experience mode brought by digitization and informatization through visual, auditory, and touch perceptual behaviors brings new opportunities and challenges to the protection of red culture and tourism development. In the digital wave, we need to seize the opportunity to create red tourism pilot, realize the transformation and upgrading of red tourism, and spread the spirit of the red revolution further.

Data Availability

No data were used to support this study.

Conflicts of Interest

There are no potential competing interests in our paper.

Authors' Contributions

All authors have seen the manuscript and approved to submit to your journal.

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