Research on the Application of Virtual Reality Technology in the Transformation of Old Communities

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Abstract. On the high-speed track of urban construction and development, in addition to the large-scale expansion of the city, the renewal and coordinated development of the old urban area is also particularly important. Among them, the problem of the reconstruction of the old urban area is becoming increasingly prominent, and the reconstruction of old communities is also the focus of improving the urban environment. However, the real problems faced by old community reconstruction are complex and multi-element. In the era of new technology development, virtual reality technology has played an important role in urban architectural design and planning. This article will use the advantages of virtual reality technology to solve the old community. The problems in the transformation are explored for the purpose.

Keywords: virtual reality technology; old community transformation; the masses.

1. Introduction

Virtual reality technology is a modern high-tech computer technology. This technology is mainly used in the virtual experience of three-dimensional scenes. Through computer modeling, an interactive three-dimensional dynamic scene is created, so that the immersed experience is as personal experience. The experiencer can display a three-dimensional interface that interacts with the virtual world through the actual auxiliary sensing devices such as a helmet display and an operating handle. The experiencer can directly participate and interact with the environment, which can have effects and changes on the virtual scene. This creates a sense of immersion.

2. Overview of Virtual Reality Technology

According to the definition of virtual reality, the characteristics of virtual reality are immersive, interactive and imaginative. Immersiveness means that virtual reality technology can provide a realistic virtual environment for the experiencer. Immersiveness is the most important feature of virtual reality technology. It is to allow users to become and feel that they are part of the environment created by computer systems. Immersiveness depends on the user's perception system. When the user perceives the stimulus of the virtual world, including touch, taste, smell, and motion perception, they will resonate with the mind, cause psychological immersion, and feel like entering the real world. The experiencer can act as the protagonist in the simulated environment to make it feel like it is immersive; interactivity is the user's use of sensors such as mechanical handles. Interactivity refers to the user's degree of operability and the slave environment to objects in the simulated environment Get the natural degree of feedback, the user enters the virtual space, and the corresponding technology allows the user to interact with the environment. When the user performs certain operations, the surrounding environment will also react in a certain way; Everything is possible in the virtual space, users can interact with surrounding objects, can broaden the scope of cognition, create scenarios where the objective world does not exist or environments that cannot occur, and can inspire users' creative thinking.

3. Application of Virtual Reality Technology in Old Community Transformation

Virtual reality technology breaks the traditional thinking limit and brings great convenience to architectural design and planning. Its application in urban architecture-old community transformation is targeted to solve complex multi-element problems. The transformation of old communities involves urban space design, landscape science, ergonomics, and other related disciplines. It also involves residents' willingness to micro-renovate, sources of funding, multi-party responsible parties, and sustainable development of the community. The forward-looking requirements are high, and the demand for visualization technology is very urgent. Virtual reality technology can meet its needs, and it has a prominent positive role in the acceptance of space design, democratic consultation, project budget, and problem prevention.

3.1 Helping Continuity of Community Culture

At present, due to the severe deterioration of the external environmental functions of old urban communities, it is imminent that they cannot meet the daily needs of residents. However, old communities often represent an era, they carry historical changes and retain countless people for that. The chronological memory of local residents, its architectural style, cultural characteristics, and local customs have played a fundamental role in the continuation of historical culture. However, the history of urban communities has been covered to a certain extent, and its unique characteristic culture has been lost, resulting in monotonous urban space, mediocre appearance, and a decline in residents' sense of belonging. In the process of transformation and design, it is necessary not only to create a space design that meets modern needs, but also to fit the existing historical and cultural characteristics of the community. With the help of virtual reality technology as a quantitative tool, it explains the combination of history and modernity, and provides theoretical data support for the transformation plan. In the reconstruction design of the community, virtual reality technology can intuitively show the goal of continuing historical humanities, effectively protect the characteristic historical style of the community culture and architecture, and at the same time increase the acceptance of the community by the community. The virtual reconstruction of the architectural style of the old community is based on virtual reality technology, combining multiple aspects of the design plan, showing the new community style, with strong intuitiveness, interaction and presence. Virtual reconstruction can not only show the original cultural features of the old community, but also intuitively understand and analyze existing problems, improve public participation, and establish effective communication with local residents. After the construction of the new community is completed, the virtual reality technology community can fully display the effects before and after the transformation and the design process, opening up a new form for the subsequent cultural heritage and protection of the community history.

3.2 Assist in Completing Diverse Designs

In the reconstruction design of the old community, functionality is very important, but a single functionality cannot meet the changing needs of the old community. Virtual reality technology can show the functional design of the reconstruction through computer modeling, and give it to the people in advance. Immersive experience and interaction through its interactive settings. There are many old communities in the center of the city, and the perfect surrounding facilities have a strong historical atmosphere. The elderly has a unique feeling for this community. Most of the elderly are willing to continue to live in the original old community, and some children are in the city. Working and living for the convenience of going to work, I will also choose to buy a second-hand house to take over my parents to live and take care of, because it is located in the center, the surrounding facilities are complete, and the old people like to lively. The old mixed community is a good choice, so the diversity of community functions is It is indispensable that more elements must be added while satisfying all infrastructures, so that urban elements can be embedded in the old community and achieve the purpose of diversity and versatility. However, the external environment space of the

old community is seriously insufficient, resulting in diverse residents. Demand is difficult to fully implement in space. The interactivity and imagination of virtual reality technology can help achieve its diverse needs. Virtual reality technology has a very powerful expressive power. Through computer modeling of reconstruction design, and support of multimedia, artificial intelligence, and other equipment, it can create a new community space after the reconstruction design for the short-term experience for the masses. The functional space realizes an interactive three-dimensional experience. This is to timely understand the feedback of the masses in the functional transformation of the old community, put forward problem suggestions, improve the utilization rate of the community after the transformation, and maximize the design benefits.

3.3 Precise Cost Budget and Strengthen Preventive Measures

Compared with a large amount of investment in capital and resources for large demolition and construction, old communities can better ease the government's economic pressure on urban construction through transformation. The use of virtual reality technology for the reconstruction of the old community can not only effectively shorten the project design cycle, but also greatly save the design cost of all projects and avoid unnecessary capital investment. It is also possible to use virtual reality technology to display some historically and culturally rich old communities as a tourist function, to attract investment to increase capital investment, and the use of new technologies has become a new situation in the transformation of old urban communities. At present, the state's investment in the reconstruction of the old environment of urban old communities still has certain limitations. The use of virtual technology to optimize the transformation plan saves costs. Its operability is combined with technological optimization and appropriate measures to transform, improve accuracy while saving costs, realize the combination of technology and design, and improve the accuracy of project cost budgets, whether it is large-scale overall planning, the form of living space, or The design of the space can be made into a virtual environment, which greatly shortens the design process and gives the design more possibilities.

On the other hand, the use of virtual reality technology can prevent and intervene in advance to solve various deficiencies in operational practice. There are many unexpected situations and potential dangers in the old community transformation and design practice. If you cannot prevent and intervene in time, you will Greatly reduce the actual functional value. With the help of virtual reality technology, it is possible to simulate on-site, giving designers a near-real-life experience, allowing them to freely perform various operations and experiments in a virtual environment. In this way, various potential safety hazards can be prevented and avoided in advance, which greatly improves the safety of the real environment.

3.4 Increase Public Participation

The purpose of the old community in the early stage of construction was to quickly solve the housing problem. The acceleration of the urban modernization process has caused the external environment of the old community to fail to meet the daily use needs and aesthetic requirements of the residents. At the same time, there are certain needs of residents in different age groups and social backgrounds. The difference in degree makes it difficult to transform the old community in one step. Technical features such as virtual reality interactivity and immersion eliminate the boundary between the human environment and the computer, and have a unique advantage in the display of design schemes. Through the use of virtual reality technology to display transformation schemes, guide community residents to actively participate in the field of external transformation, we will objectively formulate reasonable transformation goals in accordance with the diverse needs of residents, and clarify the focus of the transformation of old communities. Through the virtual reality scene to comprehensively evaluate the existing problems in the old community, obtain the residents' willingness to make subjective changes, clarify the priorities in the process of reform, and formulate a scientific and reasonable reconstruction plan. The use of virtual reality technology not only clarifies the real needs of residents, but also reduces manpower investment, and eliminates the production of traditional renderings, miniature models and animations of landscape walkthroughs,

saving costs and more comprehensive display effects, thereby saving material resources and manpower. And financial resources.

4. Conclusion

During the transformation of the old community, the correct application of virtual reality technology can not only better solve the problems in the transformation process, but also promote the advancement of technology and technology used in the transformation design. Diversified needs, cost savings, and collaboration with the masses bring new breakthroughs, and can also reduce the labor intensity of designers, shorten the design cycle, improve design quality, and save investment costs. In the future, virtual reality technology has been widely used in the design field and plays an indispensable and important role. With strong design advantages and potentials, it assists the practice of renovating and designing the old community, greatly simplifies the design process while greatly improving the design effect, and ensures the quality of the planning and design schemes, and presents a satisfactory answer to the residents.

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