Application and Realistic Dilemma of VR Technology in Film and Television Production

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Abstract. VR was formally put into research in 1989. Through continuous development, it has gradually attracted attention from various fields. By now, a new viewing mode has emerged out of it. To follow up the new viewing trend, city promos also begin to adopt this technology. Under this background, this article attempts to explain the current combination of VR and film and television production, analyzes its advantages and disadvantages, and explores the practical difficulties and development prospects of this mode.

Keywords: VR Technology, City Promos, Practical Difficulties, Development Prospects

1. VR Technology and the Production of Film and Television

1.1. VR Technology

VR technology, also known as virtual reality, is the use of computer simulation to create a virtual three-dimensional environment for users. Through visual, tactile, and auditory perception capabilities, users can feel immersed in the virtual environment, and respond to the user's behavior to cause changes in the virtual environment [1]. The first virtual reality device appeared in 1957 by the cinematographer Morton Heiling, and named it ‘sensorama’. The experiencer puts his head into the box, there is an image, can feel the wind and smell, the chair can feel the vibration, the sound is three-dimensional surround, and its mobility can be regarded as the predecessor of VR virtual reality equipment. In 1968, the famous computer scientist Ivan Sutherland designed the first head-mounted display and named it after himself. In 1994, VRML was announced at the WWW conference held in Chicago, which is a virtual reality modeling language based on the Web [2]. VRML 2.0 was born in 1996. The emergence of VRML shows that virtual reality has begun to develop in the direction of the network, opening a new starting point for the development of virtual reality. In recent years, the development of VR technology can be described as rapid progress.

In CES At the 2020 exhibition, Pico displayed two new products and VR prototypes. Neo 2 and Neo 2 Eye are its latest VR headsets. The former brings the ultimate VR experience to users at home. The latter adds eye tracking technology to Neo 2. Virtual reality technology has not only become the focus of general attention at home and abroad, but China’s virtual reality industry is also developing rapidly in different directions of VR technology.
1.2. Combination of VR Technology and Film and Television Production

Facebook bought Oculus VR for $3 billion in 2014. Founder Zuckerberg said, “PC is the entrance in the Internet era; mobile phones are the entrance in the mobile Internet era; and VR is the entrance to the next era” [3]. In 2015, Google ATAP launched the first real-life VR movie “Help”. Although the movie was only five minutes long, it used a one-shot shooting method. On average, it cost $1 million per minute. Known as the most expensive VR movie in history. It took 13 months. From the 74th Venice International Film Festival in 2017, a special VR film competition unit was opened. It can be seen that VR films have developed vigorously in the past two years and have begun to occupy a place in international film festivals, and are highly recognized by the film industry.

Not only that, in the process of city image promotion, some cities have also used VR technology to promote their cities and build the city’s popularity and reputation [4]. At the beginning of 2017, the Guangzhou new city image film "Flower City in Bloom" (Guangzhou, Flower City in Bloom) was known as the country's first urban VR promotional film. The image film's magnificent and beautiful pictures, strong visual impact and artistic appeal are widely acclaimed. It has become the “standard configuration” of the 2017 Guangzhou "Fortune" Global Forum Global Roadshow, showing the world an artistic, international, and technological Guangzhou. In May of the same year, a “360-degree VR takes you to discover the most beautiful Jiangsu”H5 hit the circle of friends. The Jiangsu Development Conference used the two technologies of VR panorama + aerial photography to overlook the characteristic landscapes of 13 cities in Jiangsu from the perspective of the sky, showing Jiangsu's ecological environment and economic construction achievements. One hour after the work was launched, it received more than 1 million hits. This shows the charm of VR video and its important role in urban publicity.

Because VR technology uses panoramic imaging technology, a special optical component system is used to expand the camera's viewing angle or image stitching is used. Under the premise of such visual experience, the audiovisual language of traditional film and television will be subverted.

Firstly, this change is reflected in the lens language shooting. in VR, most of them use a one-shot shooting method, which makes the lens language monotonous, but more information is conveyed. The audience sees different plots from every angle, and they can get more three-dimensional and clear thinking to sort out the plot context.

Secondly, the auditory system has also changed a lot. In the sense of hearing, it is also necessary to make a stereo effect that perfectly matches the stereo effect of the picture. VR Audio uses headset playback or audio, combined with head tracking and other technologies, so that users can hear sounds and changes from all directions when doing movements such as turning their heads, and cooperate with head-mounted display devices to get a better immersive effect.

Thirdly, in terms of film and television space design, the traditional movie screen is a rectangular two-dimensional space. After the combination of VR and film and television, the muti-dimensional space of the movie is expressed by muti-dimensional images. The dimensions of the entire space have become larger, and the amount of information that can be stored is more [5]. The changes in the VR movie space are completely different from the picture experience of traditional movies.

2. VR Technology Promotes the Development of Modern Film and Television

The characteristics of VR can bring a new viewing experience to users. VR has the characteristics of interactivity, immersion, autonomy and multi-perception. Therefore, more and more film and television producers are using this technology for filming and urban promotional films. In the process of combining film and television production, VR technology has increasingly highlighted its own advantages and strengths.

2.1. Interactivity:
VR technology enables more interaction between the audience and the film and television works, and also increases the possibility of the audience participating in the interaction. “VR technology is a film from the original two-dimensional plane plus a three-dimensional form of time, transformed into a
four-dimensional medium composed of length, width, height and time with the concept of space. The audience can actively adjust the viewing angle and even the degree of participation through self-adjustment" [6]. Audiences can move things in the screen through VR devices to get corresponding feedback. Compared with traditional images, audiences have added more interactive channels and ways of interaction.

2.2. Immersion:
Compared with traditional film and television works, VR works have formed a brand-new relationship of communication and reception, which increases the possibility of information dissemination. In terms of narrative methods, it has changed the third perspective of audiences watching film and television works in the past, making the viewer’s perspective equal to that of the participants, that is, shifting from the “third perspective” to the “first perspective”. The existence of the first perspective makes the audience perceive the charm of images in the virtual environment, even unable to distinguish between the virtual environment and the real environment. It can be seen that in the virtual environment created by VR technology, the audience has a sensory experience similar to the real environment, which is not only conducive to the transmission of information and atmosphere of film and television works, but also helps the audience understand the ideas of film and television works.

2.3. Multi-sensory:
In addition to the visual and auditory perceptions that can be touched at ordinary times, there can also be perception activities such as touch, smell, and motion perception. The best VR perception should be the perception that all natural people have efficacy. In view of this feature, the establishment of a VR experience store is particularly important [7]. Users often can only achieve visual and auditory effects when using VR equipment themselves, and other sense organs may not be able to achieve them. The multi-sensory behavior of VR movies allows the audience to have the same sensory experience as the scenes in the movie while watching the plot, which can do as much as an immersive experience and a deeper emotional experience of the movie.

3. Obstacles to the Application of VR Technology in Film and Television Production
VR technology is still in a stage of rapid development, and there are still some unresolved problems in terms of VR equipment and technology itself. Therefore, the application of VR technology in the film and television industry also shows certain limitations.

3.1. Higher Production and Viewing Costs
In terms of film and television production, the production of VR images requires professional and shooting tools during the production process, supplemented by exquisite special effects and data display. The economic costs such as manpower and material resources have been greatly increased, so the production cost is correspondingly much higher. For example, the quotations for VR impressions within ten minutes of many studios are above one million yuan. In addition to the audience, the selling price of VR glasses in the terminal equipment market is higher. Therefore, the basic environment to support the impact of VR is not perfect. However, there are still many companies in China whose VR production technology is still immature and cannot bring users a true panoramic image experience.

3.2. Technical Bottleneck
First of all, VR glasses are easy to cause dizziness and affect vision. The color and light in the picture are simulated naturally, and there is a gap between the real natural light and color, and long-term use is prone to dizziness [8]. Because VR glasses need to be worn in front of our eyes, no matter how wide the picture we see, they are all simulated by computers, the monitor is actually just a few centimeters away from the eyes. The light and colors in the screen are too strong or long-term use can easily affect the eyesight.
Secondly, in the era of mobile Internet, the picture definition of VR glasses and mobile phones is poor. In modern times, mobile phones are a tool closely related to our lives. There are a large number of users. However, the picture quality of VR devices connected to mobile phones to watch VR videos is not satisfactory, the user experience is poor, the definition and resolution are insufficient, and the most important is Watching VR movies on mobile phones does not have the "immersive experience" that VR technology is the mainstay, nor is it unified in other senses. Such polarization can easily make VR lose users in the mobile phone market.

3.3. Lack of Content
"The development of VR equipment is not the core driving force of the industry, but the content of VR is an important factor that determines its development"[9]. Therefore, for film and television works, technology is not what the audience cares about the most, the content is the key. Technology is only a form, and ultimately serves the content. The current situation is that the amount of virtual reality content of VR technology is still relatively small, and high-quality video content is relatively lacking. It is necessary to vigorously develop the virtual reality content industry, accelerate the content development of the virtual reality industry, and accelerate virtual reality movies, documentaries, games, live broadcasts, and video education. And other content production. Enhance the innovative capacity of virtual reality content production, cultivate a virtual reality content production ecology, and provide high-quality virtual reality content [10].

4. Conclusions
From the perspective of VR producers, after more than 100 years of development, film and television have gradually formed a stable market system. Film as a huge industry for the masses, has a wide audience and penetrates into people's daily lives. As a new technology product, VR needs to quickly gain a lot of popularity and recognition in the process of promotion. Therefore, it is successful to choose to combine with film and television. VR can quickly accumulate a large number of masses through film and television, and gradually enter people’s In daily life. VR will likely change not only the way people watch movies, but also the way that movies are produced, promoted, and marketed. The charm of technology will not only allow people to rethink the social meaning of movies, but also make movies and TV enter a whole new In the process of promoting the image of the city, it can promote the development of the city and enhance the city’s own visibility and reputation. I believe that with the passage of time and continuous breakthroughs in technology, as long as the innovation capacity of virtual reality content production is enhanced, the virtual reality content production ecology is cultivated, and high-quality virtual reality content is provided. Grasping the direction that content is key, the development prospects of the VR industry are very broad.

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