ISSN 2616-7433 Vol. 5, Issue 17: 36-40, DOI: 10.25236/FSST.2023.051707

Applications Research of Virtual Reality Technology in the Production of Intangible Cultural Heritage Documentary

Sun Li*

Hainan Normal University, Haikou, China
**Corresponding author*

Abstract: *Since entering the digital era, the development of documentaries is no longer limited to traditional methods of image recording. Due to the characteristics of interaction, imagination, and immersion, virtual reality technology can be well integrated with intangible cultural heritage documentaries. In terms of audio-visual language, virtual reality technology can endow intangible cultural heritage documentaries with panoramic visual images, surround auditory sounds, and seamless light and colour connections. In terms of narrative strategy, there have been changes in narrative power, narrative space, and narrative perspective. This article takes the technological medium of virtual reality as the premise and attempts to explore the content creation of virtual reality documentaries. It studies the innovation and development of virtual reality documentary works, providing a clear theoretical basis and practical guidance for the rapid development of the virtual reality documentary industry.*

Keywords: *Virtual Reality Technology, Intangible Cultural Heritage, Documentary*

1. Introduction

Virtual reality documentaries are a new form of documentary that has emerged in the new technological environment. Compared to traditional documentaries, they emphasize more on the immersion and immersion of images. After the so-called "VR First Year" in 2016, discussions and practices on VR imaging emerged endlessly, but films, including documentaries, and many mass entertainment media did not truly enter the VR Era [1]. Within the film industry, it is gradually becoming clear which of the two film genres, feature films and documentaries, is more suitable for the aesthetic implications of virtual reality. Documentaries occupy an important position in the quantity and quality of virtual reality movies. Intangible cultural heritage documentaries are an important component of documentaries, and the application of virtual reality technology in the production of intangible cultural heritage documentaries is gradually being promoted. At present, virtual reality imaging has become a new research field, and some documentary directors have attempted to present documentaries through virtual reality. With this technology, documentaries can break through their own limitations on authenticity and bring a more realistic visual enjoyment to the audience at the sensory level. That is to say, the audience uses virtual reality means to enter the three-dimensional virtual world from the original two-dimensional visual space, obtaining a much more realistic feeling than traditional documentaries. However, there are still certain differences between virtual reality documentaries and traditional documentaries in terms of artistic expression and creative techniques. Most creators of intangible cultural heritage documentaries maintain a continuous exploration attitude towards VR technology, accept new technologies, constantly practice, trial and error, and continuously improve during this period, summarizing a set of audio-visual language belonging to virtual reality documentaries. This article briefly elaborates on the feasibility of combining virtual reality technology with intangible cultural heritage documentaries, and conducts in-depth research from aspects such as audio-visual language and narrative strategies [2]. It provides theoretical analysis and case interpretation for new forms of intangible cultural heritage documentaries in the future, promoting the diversified development of documentaries.

2. Virtual Reality Technology and Intangible Cultural Heritage Documentary

2.1. Virtual Reality Technology

Virtual reality technology is a way of interacting between humans and the virtual world with human-

ISSN 2616-7433 Vol. 5, Issue 17: 36-40, DOI: 10.25236/FSST.2023.051707

computer interaction characteristics. People can connect to the virtual reality environment constructed by computers through some auxiliary technical devices or means, such as virtual reality glasses and digital grips, so that they can receive the reality feedback brought by this technology through visual, auditory, or tactile perception. It is a technology that can truly feel the real world around them. In virtual reality, there are three main technical features, abbreviated as 3I features. Virtual reality technology has undergone an evolutionary process from simple sound, image, and dynamic simulation to the establishment of three complete features. Interaction is a means of communication that connects oneself and the virtual world. People can interact with the virtual world through computers or devices they wear, or control and manipulate the range of movement they see through the movement of their own limbs. This creates communication between people and the virtual world. Imagination is a brainstorming process that occurs during the interaction with the virtual world. By providing different situations from real life in the virtual reality system, it helps and stimulates people to constantly think about new things in the situation. Immersion is the most important feature among the three major features of virtual reality technology. It is based on people's physiological and psychological characteristics, through computer digitization processing, connecting interactive devices, and placing people in a new virtual environment, which can create an immersive illusion in three-dimensional images. Through the experience process of interactivity and imagination, one can fully immerse oneself in the so-called virtual world.

2.2. Intangible Cultural Heritage Documentary

Documentary films are films with the nature of documentary materials, based on which they are produced. Documentary film is a documentary film that directly obtains all flat or dynamic audio-visual materials from real life through documentary methods, and takes real life as the final tone to shoot the most real and vivid side of characters or things under the camera, truthfully portraying objective things and the author's understanding and evaluation of things. Documentary films emphasize the documentary nature of audio-visual images, which distinguishes them from other types of films in terms of narrative and artistic expression. Intangible cultural heritage themed documentaries refer to a form of film and television expression that uses unique creative techniques and audio-visual features to tell stories about the inheritors of intangible cultural heritage and the original ecology of intangible cultural heritage, truthfully recording and presenting historical and documentary materials of intangible cultural heritage, and balancing authenticity and artistry, with cultural value and aesthetic characteristics. With the increasing emphasis on intangible cultural heritage in China, intangible cultural heritage documentaries are increasingly presenting a spectacular scene. In the historical flood of cultural salvation, in order to achieve the prosperity of Chinese culture, intangible cultural heritage documentaries are undoubtedly an important form that cannot be underestimated in the historical task of protecting and inheriting intangible cultural heritage. It not only preserves the brilliant culture passed down from generation to generation by people of all ethnic groups through visual means and documentary aesthetics, but also creatively handles art based on respecting historical objective facts. Intangible cultural heritage documentaries perpetuate and inherit the wisdom, spirit, and life memory of the ancient genes of the Chinese nation [3].

2.3. Feasibility of Combining Virtual Reality Technology with Intangible Cultural Heritage Documentary

Virtual reality documentaries transform panoramic video devices into users' eyes, presenting no dead corners on the canvas, unlimited effects in breadth, and bringing people closer to the actual shooting environment, achieving the highest level of immersion and interactivity. Virtual reality films themselves maintain the integrity of the material world, greatly enhancing the realism and presence, allowing images to seamlessly connect with the material world. The combination of virtual reality technology and documentaries is inevitable. Many industry leaders who shoot traditional documentaries both domestically and internationally have largely forgotten their past honors, discovering new technologies, constantly exploring and learning new ones, and telling stories in a virtual reality environment, in order to showcase the greater value of documentaries themselves. The humanized physical world created by virtual reality technology can bring immersive realism and breakthrough objective experiences, bringing many new changes and reflections to the shooting of traditional documentaries; From its narrative perspective, virtual reality documentaries break through the limitations of fixed visuals and allow viewers to obtain any visual information from a visual range without dead angles. Based on the three major characteristics as the foundation and premise of creation, a unique audio-visual experience in intangible cultural heritage documentaries can be formed, imprinted with the imprint of authenticity and beauty. It breaks some of the original concepts of traditional intangible cultural heritage documentary shooting, and the in-depth exploration of virtual reality intangible cultural heritage documentary will inevitably

ISSN 2616-7433 Vol. 5, Issue 17: 36-40, DOI: 10.25236/FSST.2023.051707

give birth to a new narrative expression and audio-visual language expression.

3. Audio-visual Language of Intangible Cultural Heritage Documentary Based on Virtual Reality Technology

3.1. Panoramic Visual Image Creation

Virtual reality documentaries are shot with panoramic camera lenses, completely immersed in a environment, so they have been inadvertently overlooked to some extent. The scenery of virtual reality documentaries is fixedly set to be close to the level of a grand panoramic view. It can not only showcase the vast spatial environment, but also highlight the inner activities of individual or several characters in the grand scene. The first documentary film in China to depict the scenery of Xinjiang named *Crossing the Tianshan Mountains* presents a super large panoramic image using virtual reality technology. Through filming along one of the most beautiful highways, the Duku Highway, the characteristics of Xinjiang's vast mountains and rivers are vividly displayed. The dancer Yin Fang dances alone in the open and dark dance room. Through panoramic interpretation, the audience can immerse themselves in this somewhat lonely and empty environment, focusing on Yin Fang's solo dance and also on Yin Fang's own personal world. Montage, as a very fundamental and important part of film and television production, almost runs through the creative process of film and television works. It not only serves to connect images through various lenses and editing techniques, but also provides innovative expression methods from the perspective of creative concepts. Although documentaries recommend simple shooting techniques to restore the truth of the story, they still use montage techniques to cleverly configure the structure of time and space, thereby changing the rhythm and direction of the story and enhancing its visibility. However, the unique feature of virtual reality documentaries is that they weaken the important role of montage in the film, as it is filmed within a panoramic dimension, with almost all people, events, environments, and scenes in the audience's sight.

3.2. Surrounding Auditory Sound Recording

Virtual reality documentaries enhance the overall impact of sound language on the documentary while the lens language is relatively weakened, allowing for mutual interaction and complementarity. This type of documentary requires the use of virtual reality devices to allow the audience to enter the environment of the story. It is precisely because of this that, compared to traditional film and television works, the use of sound language in virtual reality documentaries can bring one's emotions deeper into the story of the documentary [4]. In human facial features, the ear is one of the most sensitive organs. In real life, many music phone apps specifically offer a music playlist or radio station called 3D surround sound. The songs in the software are processed through digital interactive 3D positioning sound technology, which transforms the original 2D and relatively flat sound into a 3D three-dimensional effect, creating a realistic feeling of listening to a live concert while listening to music. The sound language presented in virtual reality documentaries is similar to the listening experience demonstrated by 3D surround sound. The expressive power of sound language is no less than the impact brought to us by the screen. It is precisely because the role of virtual reality documentaries in camera language has been weakened, that the sound elements in audio-visual language have also made a contribution to the embodiment of immersion. In the sound creation of virtual reality documentaries, a very important point is to preset the starting point of the sound, allowing the audience to locate their own trajectory along the direction of the sound. Because the audience views from an extreme perspective, all things and scenes need to be completed through their own movement. The necessary sound traction is necessary to allow the audience to quickly enter the documentary scene.

3.3. Seamless Light Colour Connection

Light and color are indispensable in daily life. Objects receive light signals through the reflection law of light, and thus reflect everything. Art is also like this. Documentaries themselves also grasp the form of light and color to present art. As the youngest of the seven major arts, films are the most expressive audio-visual language elements. A documentary can determine the tone of a film based on color and light, thus presenting different types of documentary styles. In the shooting of virtual reality documentaries on outdoor scenes, the requirements for lighting are relatively low. Usually, a stable light source is selected at a fixed time period to capture the required light and shadow images. However, in indoor lens shooting, the setting and selection of light can affect the audience's line of sight. In *Instantaneous Dance*, dancer Yin Fang sits in the audience seat across the stage, and the only white light hits him. His gaze then turns, and in the same scene, Yin Fang is already dancing with the support of stage lights. The tone, saturation,

ISSN 2616-7433 Vol. 5, Issue 17: 36-40, DOI: 10.25236/FSST.2023.051707

and brightness of colors can directly affect the overall tone of a documentary. The audience can intuitively observe the original intention that the creator wants to express through colors, such as using dim tones in images to recall the past and using clear colored images to present the present. Documentaries using VR technology also use the experience of color usage in traditional documentaries. Ferryman is a documentary about dying care. The entire film has a relatively low brightness and saturation, while in the hospital and environment where the dying person is located, there are scenes with high color saturation. In the overall low-pressure tone of the film, it expresses the theme of the creator's passing and the living.

4. Narrative Strategies of Intangible Cultural Heritage Documentary Based on Virtual Reality Technology

4.1. Choice of Narrative Power

The authenticity of documentaries can easily reach the recognition of ordinary audiences, with some unique communication advantages. The existence of virtual reality documentaries makes the power of reality even stronger. In virtual reality documentaries, the characteristics of their narrative perspective are also very obvious due to the special nature of technology and sensory perception. The narrative structure of virtual reality documentaries has gradually evolved from linear narrative to interactive narrative. More interactive experiences can bring more possibilities for narrative forms. However, with current technological levels and conditions, there is still a long way to go to achieve truly meaningful interactive narrative. Taking current works as an example, we can discover some innovative narrative strategies in documentaries. The narrative mode under VR technology enables creators of intangible cultural heritage documentaries to become material carriers. Through VR, the scene at that time is presented, allowing the audience to immerse themselves in it and fully experience the true narrative scene created by the film. Being immersed in VR images is more impactful than any form of documentary genre. The audience breaks the barriers of time and space, delves into the scene, and the processing of all content information on the scene is chosen by the audience themselves. From passive to active, the audience actively immerses themselves in the story, rather than being arranged by the director into the story [5]. This autonomy allows the audience to develop the storyline based on their likes and dislikes, and even expand their emotions, affecting the theme expression of the documentary. The most important aspect of virtual reality intangible cultural heritage documentaries is the use of first-person narration. One of the purposes of the birth of virtual reality technology is to create a state of being in a strange scene for the audience. The perfect combination of technology and first person can use immersive features to enter or personally experience the real life of event characters. In virtual reality intangible cultural heritage documentaries, the first-person perspective can be completely dependent on the device, purely experiencing the unique behavior and characteristics of a person or thing.

4.2. Expansion of Narrative Space

Traditional documentaries have a clear thematic tendency, and directors can promote narrative through film rhythm, tone style, and other factors. The shots in film and television works have a clear tendency to express meaning, such as long-range imagery, panoramic freehand brushwork, close-up lyricism, close-up eye-catching, push pull, shake, and other camera movements, all of which express the director's intention. In the early stages of VR equipment shooting, due to the characteristics of panoramic photography, the camera no longer has the need to change the scene, and the focus is completely weakened, as well as a series of lens special effects functions. The frame space is completely broken, and creators not only need to shoot the main content they see in front of them, but also need to shoot full dimensional video images. VR professional camera equipment is equipped with a 3D panoramic head, and under current technology, VR all-in-one machines have also emerged. Creators must balance multi angle panoramic real-time content, which completely breaks the original narrative space. The audience is no longer limited by the frame, and the characters move from being in a few parts of the screen in traditional documentaries to being in the complete scene. In each scene, both the main and secondary characters have narrative functions. The creator breaks through the narrative space by wearing VR devices in virtual reality scenes, where the audience no longer sees the screen, but the complete character environment. This strong sense of presence allows the creator to no longer be limited to telling one person's story, and a group of people can also present the same theme from multiple angles, completing the film narrative. With the development of technology, audiences can provide a more realistic on-site experience, explore and roam in the space provided by the director, and even engage in certain interactive behaviors with characters in intangible cultural heritage documentaries, thereby enhancing emotional communication and immersion.

ISSN 2616-7433 Vol. 5, Issue 17: 36-40, DOI: 10.25236/FSST.2023.051707

4.3. Transformation of Narrative Perspective

In the process of traditional documentary creation, the narrative mode and development are controlled by the director and screenwriter. Users are only bystanders and can only participate in the development of the story from the perspective of the director or screenwriter. In traditional documentary creation, every shot is selected and arranged by the director, and users lack a sense of participation, making it difficult to evoke emotional resonance. The application of virtual reality VR technology allows users to choose the viewing perspective of film and television animations based on their own needs. From the perspective of intangible cultural heritage documentaries, there are some characteristics in the current stage of documentary creation that cannot fully reflect their artistic value due to technical and equipment issues [6]. Therefore, these three major characteristics are emphasized in this period. Among them, immersion is one of the most direct characteristics to experience in documentaries. Nowadays, virtual reality can provide immersive experience effects. As long as the relevant virtual technology devices are worn, the audience will immerse themselves in a panoramic world, and real scenes will come into sight. The immersive effect can be strongly and directly felt in intangible cultural heritage documentaries. The director introduces the characters at the beginning of the film, and the audience naturally follows their footsteps and delves deeper. The story can also be unfolded according to the movements of the characters, and the sound of the characters not only matches the function of the screen, but also compensates for the lack of montage. By using sound to advance the narrative, the director can help the audience find the source of sound to advance the narrative. The subject of the sound is the main character that the director wants to highlight, and the audience involuntarily searches for it. The director makes good use of this traditional film viewing style by aligning the sound with the screen. With a leading approach, the story is narrated in a straightforward manner, making up for the shortcomings of VR images that are always focused and unfocused.

5. Conclusions

Virtual reality technology has made certain progress in the development of various industries, especially in the application of documentary creation, which has changed the drawbacks of traditional animation production and improved the quality and level of documentary production. Under the new situation, documentary creators should carefully understand the value connotation of virtual reality VR technology, correctly recognize its application value in documentary creation, and improve the efficiency and level of documentary production from all aspects and multiple perspectives by creating three-dimensional visual experiences and innovative narrative modes, enriching user experience, and promoting the healthy and sustainable development of the documentary industry. VR technology subverts the audience's perspective and even the world of documentaries. Only through countless overthrows and reshaping can new things become more stable and popular.

Acknowledgements

This research is the result of the Subject of Philosophy and Social Sciences Research Base of Hainan named “Integrated Development Research on Film and Television Digital Technology and Inheritance and Dissemination of Intangible Cultural Heritage of Hainan under the background of Free Trade Port” (Project Number: JD22-41).

References

[1] Yang Shu. From "Restoration of Reality" to "Virtual Reality": Query on "VR Documentary" [J]. Art and Design, 2022(3): 126-129.
[2] Kritikos Y, Mania K. Interactive Historical Documentary in Virtual Reality[C]//2022 International Conference on Interactive Media, Smart Systems and Emerging Technologies (IMET). IEEE, 2022: 1-8.
[3] Ham C R, Yu J M. A Study on Virtual Reality Content of Royal Documentary Painting for Contextual Experience [J]. Journal of Digital Contents Society, 2022, 23(3): 399-411.
[4] MIAO K. The application of virtual reality in film and television production in the era of convergent media [J]. Video Engineering, 2023, 47(8): 85-87.
[5] Gruenewald T, Witteborn S. Feeling good: Humanitarian virtual reality film, emotional style and global citizenship [J]. Cultural Studies, 2022, 36(1): 141-161.
[6] WANG Yangyu. Study on Influence of Virtual Reality Technology on Film and Television Creation [J]. Electronic Technology, 2022, 51 (2): 292-293.