



Application of Olunchun “Mosukun” Intangible Elements in Visual Communication Design Under Virtual Reality Technology

Ying Luo^(✉) and Zhewei Liang

Hulunbair College, Hulunbair, Inner Mongolia, China
44908288@qq.com

Abstract. As a national intangible cultural heritage, the Olunchun “Mosukun” lacks the channel of integration with modern scientific and technological innovation, resulting in low communication efficiency, and is facing a severe problem of protection and inheritance. Therefore, this paper takes the Olunchun “Mosukun” as the research object, and with the application advantages of VR technology, 3D modeling technology and visual interaction technology, the unique characters, stories, rap forms and other intangible elements in “Mosukun” culture are transformed into design materials by software programs such as 3ds Max, Photoshop, Unity3D, etc., which are integrated into the visual communication design, and a three-dimensional visual platform is constructed by using C# language in combination with ASP.NET framework. It not only enhances the performance result of visual communication design, but also promotes the organic combination of traditional culture and modern artistic creation, enriches the cultural connotation of visual communication works, and is more beneficial to the rapid promotion of “Mosukun” culture, which has made a good demonstration for the realization of brand building and development.

Keywords: VR technology · Mosukun · Visual communication design · 3D visualization platform · Unity3D

1 Introduction

“Mosukun” is Oroqen language, which means “telling and singing stories”. It is a form of folk art storytelling performed by a single person. Now, Mosukun, as the first batch of national intangible cultural heritage, is facing unprecedented changes in history under the impact of modernization [1]. The protection of Mosukun’s intangible cultural heritage still needs to adhere to the important policy of protection first, rescue first, rational utilization, inheritance and development. On the one hand, we should do a good job in basic protection, complete a true, systematic and comprehensive record by means of digital information, and promote the digital construction of Mosukun culture [2]. On the other hand, from the perspective of rational utilization, the cultural connotation of Mosukun is highly abstracted and concentrated, and the key features are extracted, and then transformed into symbolic and symbolic cultural elements, which are integrated

into the visual communication design to greatly improve the communication efficiency [3]. In view of this, this paper holds that with the application advantages of virtual reality technology, users should be given a unique visual experience from the aspects of design space, design angle, display mode, etc. The virtual scene and simulation objects greatly stimulate the expressive ability of visual communication works of art, which not only meet the aesthetic needs of the people and enrich the cultural connotation of works of art, but also open up a unique interactive way, and promote the reform of visual communication design framework and design form.

2 Development Process

For the visual communication simulation design of Mosukun's intangible elements, first of all, it is necessary to extract the elements from the story characters, lyrics, singing patterns, the singer's body state, scenes and ceremonies in Mosukun culture through the early original data collection, and then complete the visual communication design in the traditional two-dimensional graphic design system. [4] Secondly, according to the data and materials generated by the graphic design content, the corresponding 3D digital model is built by 3ds Max software, and the processing and trimming of the mapping materials are completed by Photoshop software. In the modeling stage, the appearance, size, color, material, pattern, etc. are extracted separately to facilitate the subsequent model making. When the basic model is finished, it will be baked, that is, the basic model will be given corresponding materials and colors to make it more realistic and vivid [5]. After the design and construction of various models are completed, 3ds Max software exports all 3D models to FBX files, and introduces these files into Unity 3D software to complete the integration and assembly of models, the addition and optimization of dynamic effects, the construction of scenes, the setting and processing of various objects in the environment and the development of key interactive functions. After all the designs are completed, use Unity 3D to publish all the 3D data to the Web, that is, choose Unity3D to choose WebGL for export [6]. Finally, the overall platform development environment is .net framework 4.7.1 in ASP.NET, the development language is C#, the integrated development tool is Visual Studio Code, the database is SQL Server2019, and the Web server is IIS 10.0 under Windows 10.0. Through the introduction of the above key technical theories, the basic process of integrating Mosukun intangible elements into visual communication design by virtual reality technology is briefly described, and the overall environment of the three-dimensional visualization platform, the operation flow of related software and tools are explained, which further clarifies the technical feasibility of the overall project of Mosukun intangible elements visual communication three-dimensional visualization platform.

3 Detailed Function Implementation

3.1 Introduction to “Mosukun”

Under this function module, users can see all kinds of information about Olunchun “Mosukun” culture of. The system displays the historical background, cultural attributes, development process, artistic features and other contents behind “Mosukun” in a centralized way, and its forms are often found in words, pictures, audio and video files, etc.

3.2 3D Visual Display

Under this function module, the system supports users to enter the virtual exhibition of “Mosukun” intangible elements visual communication design works, that is, users can observe and understand comprehensively through “naked eye 3D”. The diversified display provided by virtual reality technology can integrate 3D models, text symbols, audio and video and other elements, effectively realize the virtual reproduction of visual communication design works, fully give users the space to deconstruct the intangible elements of “Mosukun”, and bring unusual experience to users with unique scenes and substantive interactions [7].

3.3 Virtual Design Experience

Under this function module, users can participate in the design process of visual communication design products through mouse or keyboard. For example, users can fill and adjust the pattern and color of the basic model of “Mosukun” intangible elements visual communication design works, and the formed sample drawings will be stored in the system simultaneously, providing more ideas and ideas for subsequent design. The realization of this function requires Unity3D to use the SliderColorHyp () class to obtain the user’s operation content in the aspect of interaction design. The key code is shown in Fig. 1 [8].

In the internal testing stage of the system, according to the actual application of users in the system, the system operation utility is set as the first-class index by AHP,

```
using UnityEngine;
using System.Collections;
using UnityEngine.UI;
public class SliderColorHyp : MonoBehaviour {
    public Slider redSlider;
    public Slider greenSlider;
    public Slider blueSlider;
    private Material hypMaterial;
    void Start () {
        hypMaterial = GetComponent().material; }
    void Update () {
        hypMaterial.color = new Color(redSlider.value, greenSlider.value, blueSlider.value); }
```

Fig. 1. Key code of user changing model color function

Table 1. The weights and scores of each index

Index name	Weight	Sort	Score	Sort
Content interactivity	0.3837	1	0.1401	1
System feedback timeliness	0.3082	3	0.1332	2
Function rationality	0.3143	2	0.1204	3

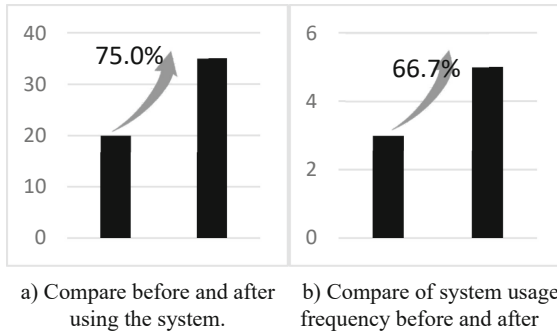


Fig. 2. Results of system effectiveness evaluation

and the characteristics of content interaction, timeliness of system feedback and rationality of functions are set as the second-class index, and the judgment matrix is constructed according to the corresponding characteristic scales, as shown in Formula 1 [9]. Then, the corresponding weights are calculated according to the hierarchical single sorting, that is, each column element of the judgment matrix is normalized. The algorithm is shown in Formula 2, and the feature vector M is added by rows. Finally, the final weight coefficient is obtained through secondary normalization. After calculation, the final system operation utility evaluation results are shown in Table 1 [10]. In addition, the system will also collect the usage frequency, usage duration and the ranking of “Mosukun” related terms in search engines before and after usage, and complete the effectiveness evaluation of the system through statistical comparison, as shown in Fig. 2.

$$M = \begin{bmatrix} 1 & 4 & 3 \\ 1/4 & 1 & 1/3 \\ 1/3 & 3 & 1 \end{bmatrix} \tag{1}$$

$$\bar{b}_{ij} = \frac{b_{ij}}{\sum_{k=1}^n b_{kj}} \quad (i, j = 1, 2, 3, \dots, n) \tag{2}$$

4 Conclusion

This paper aims at protecting and inheriting the Olunchun “Mosukun” intangible cultural heritage, and from the perspective of rational utilization, integrates the intangible elements of “Mosukun” into visual communication design, and builds a three-dimensional

visual platform of visual communication design with the help of virtual reality and the application advantages of network information technology. From the aspects of design space, design angle, display mode, interactive feedback, etc., it greatly stimulates the expressive ability of visual communication of artistic works, gives users unprecedented sensory experience, expands the transmission efficiency of “Mosukun” intangible culture.

Acknowledgements. Source of project: College Students’ Innovation and Entrepreneurship Training Program Project of Inner Mongolia Autonomous Region, 2022 “Three minority ethnic Intangible Cultural Heritage in Hulunbuir Region Based on Virtual Reality Technology – Oroqen” Mosukun “Cultural Brand Research Base” Project No.: S20221089018.

References

1. Liu Xiaoling, Cai Hongyu, et al. Protection and Inheritance of Olinchun Mosukun in Heilongjiang Province[J]. *Panorama of Chinese Nationalities*.2017.10:1–2.
2. Zhai Kun. The Study of “Mosukun” of Oroqen Nationality from the Perspective of Communication [J].*Southeast Communication*.2020.06
3. Zhang Kai. Analysis on the Innovative Application of Chinese Traditional Patterns in Visual Communication Design [J].*Art Education Research*.2021.11
4. Li Zihan, Qu Guoxian. Application of China Traditional Elements in Visual Communication Design[J]. *Appreciation*.2021.11:78–80.
5. Liu Yanrong. Research on Modeling Technology Based on 3Ds Max 2016 [J].*Computer Programming Skills & Maintenance*.2021.03
6. Geng Qiang. The Research on Key Technologies of Multi-platform Virtual Simulation Based on Unity3D [D].*Tianjin Polytechnic University*.2015.12
7. Li Yugang. Research and Design of Virtual Reality 3D Development Service Public Technology Platform [J].*Net Security Technologies and Application*.2012.01
8. Li Long. Research on Virtual Environment Simulation and Human-Computer Interaction Application Based on Unity3D[D]. *University of Electronic Science and Technology of China*.2018.09.
9. Liu Lijia, Hu Jianwang etc. The adjustment method of judgment matrix in analytic hierarchy process [J].*Journal of Ordnance Equipment Engineering*.2019.07
10. Liu Yingxin, Liu Sa etc. The weight calculation of analytic hierarchy process and its application [J].*Journal of Shenyang University(Natural Science)*.2014.10

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

