



Application of Chinese Traditional Musical Instruments

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Abstract: Traditional Musical Instruments are a part of Chinese traditional culture, forming a series of intangible cultural heritage of related music. This project focuses on various traditional Musical Instruments in the traditional Chinese concert scene, providing background knowledge and audio files of relevant Musical Instruments. The project will involve digital formats such as audio, video, 3D, other images and virtual reality. The project integrates the information of intangible cultural heritage in various forms of media, and with the help of communication and social platforms, breaks the limitation of specific time and place, and makes it the technical condition of modern communication and quality should be in a new platform, which can better protect and develop traditional Musical Instruments.

Keywords: Instruments; Traditional; Heritage

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1 Project summary

This project is about the music production system of traditional Chinese instruments, which is divided into two parts: online system and offline experience. This project focuses on various traditional Musical Instruments in the traditional Chinese concert scene, providing background knowledge and audio files of relevant Musical Instruments. At the end of the users' appreciation, they can choose their own instruments to arrange the music, complete their own music fragments, and share the music created. The project will involve digital formats such as audio, video, 3d, other images and virtual reality. The project has different audiences at different terminals, including

students, researchers, heritage organizations and general users.

The music culture formed by Chinese traditional music and Musical Instruments is an important part of China's intangible cultural heritage^[1]. Traditional Musical Instruments are a part of Chinese traditional culture, forming a series of intangible cultural heritage of related music. This project USES digital media technology to protect and develop intangible cultural heritage, providing a new platform for the communication and development of culture. The main purpose of the project is to promote the knowledge of traditional Chinese Musical Instruments, to combine the material cultural heritage with modern science and technology, so that more people can understand relevant historical knowledge, allusions and regional humanistic information, and to display the charm of traditional culture in a modern way, so as to attract more people to love traditional Chinese Musical Instruments. Secondly, traditional instruments can be displayed in different ways, such as auditory recognition of Musical Instruments, scene reproduction, etc., so as to perfectly reproduce the characteristics of traditional Musical Instruments, which can provide better viewing experience for museum visitors. In the digital technology in the protection of non-material cultural production and the important role in inheriting, on the basis of further research on the digital technology in the non-material cultural heritage protection and inheritance of the depth development and utilization, around the further digital development of the intangible cultural heritage, expand the digital application in the field of cultural heritage^[2]. Therefore, the plan will contribute to the preservation and development of cultural heritage and may also be beneficial for the administration of the heritage.

The project integrates the information of intangible cultural heritage in various forms of media, and with the help of communication and social platforms, breaks the limitation of specific time and place, and makes it the technical condition of modern communication and quality should be in a new platform, which can better protect and develop traditional Musical Instruments^[3].

2 Background

Since ancient times, China has been a country with a highly developed art of instrumental music. In traditional Chinese life, instrumental ensembles are mostly used in folk customs and religious ceremonies^[4]. The music culture formed by Chinese traditional music and Musical Instruments is an important part of China's intangible cultural heritage. Chinese traditional Musical Instruments are now used by fewer people, and the public has little knowledge of them. There were more than 70 kinds of Musical Instruments in early China, but most of them have been lost or are no longer used^[5].

At present, the use of digital multimedia and other modern scientific and technological means for the precious, endangered and of historical value of the intangible cultural heritage of the real, systematic and comprehensive record, the establishment of archives and databases has become one of the main implementation of China's intangible cultural heritage protection project^[6]. Digitalization has been applied to the protection of traditional culture. Digital applications based on the establishment of archives are mostly protected by means of text, sound recording, photography, etc., which lack the interaction with the audience and cannot increase the public's interest in intangible cultural heritage. Most of the existing music production software is based on the direction of music production mode, production function and communication form^[7]. Digital Folk's is a virtual instrument project, Digital oriented activities interacting with face-to-face "real world" and adapting the modernity of such activities in the new "traditional" concept, the influence of Digital media on Folk art participation and traditional construction in the contemporary Digital world (Keegan-Phipps 2018)^[8]. The main content of Digital Folk project studies the influence of traditional culture on the combination of traditional culture and Numbers,

which lacks interest. This project will combine traditional culture and mathematics to make music for fun and to increase public interest in traditional instruments.

3 Technical Details

The project is a music production system of a traditional instrument simulator that simulates the scene of a traditional concert, mainly based on traditional Chinese instruments. The project consists of two online systems and an experience system that is placed in the museum. The goal is to increase interest in traditional Musical Instruments and increase the number of visitors to the museum. The project is designed to be simple, so that non-professional musicians can experience it directly and use it without professional skills.

The whole system uses a variety of digital technology, has a variety of functions. The collection of audio resources in this system mainly involves two methods: directly obtaining existing audio and recording sound with a microphone. The system invites professional musicians to pre-record, and the whole system collects up to 70 kinds of traditional Chinese Musical Instruments, including the audio files of Dap, Chime, Xun, and other traditional Musical Instruments, giving the audience more choices of Musical Instruments. At the same time, the audience can learn the characteristics and skills of various traditional instruments by recording the complete cultural knowledge of traditional instruments and the use methods of traditional instruments. At the same time, the visualization model system of cultural heritage knowledge based on traditional Musical Instruments is constructed by using the visualization technology. Professional musicians also participate in the recording of traditional concerts. Virtual reality technology, knowledge visualization technology and other technologies utilize the realistic role generation technology, action binding technology, multi-agent group control technology and scene generation technology to preset up to 20 virtual concert scenes.

In addition, the system has the traditional musical instrument catalog service, the sound source server console, the audio data transmission, the audio video synchronization, the audio effect and the editing, the music synthesis, sends the sharing and so on the function. The project hopes that audiences will enjoy

the virtual reality technology more. The audience can download the system and use it in the device. The project can be used in the computer system, which supports the personal computer platform and macOS platform, as well as the mobile device, which supports the Android system and iOS system. When experiencing virtual reality, you need to wear relevant devices. The project will involve digital formats such as audio, video, 3d, other images and virtual reality. The online system of this project requires less storage space, while the offline experience system is equipped with VR system, which has high storage requirements.

This part of the online systems is aimed at visitors who do not have virtual reality equipment. The audience can choose to watch the video of the concert recorded by professional musicians in advance. When the concert is played, there will be professional introduction of relevant instruments and music. After the end of watching, the Musical Instruments in the concert will be displayed, so that the audience can directly find the traditional Musical Instruments they are interested in after the end. At the same time, the audience can click on the corresponding traditional musical instrument pictures to watch the professional solo performance video of the traditional musical instrument, And the background will appear the knowledge of related Musical Instruments and historical allusions written materials.

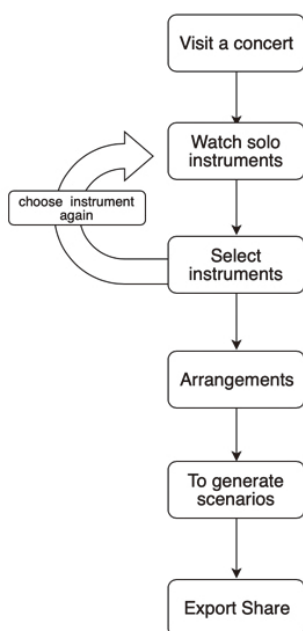


Figure 1. Online project flow chart.

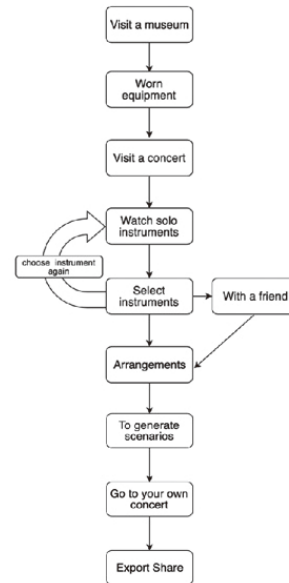


Figure 2. Experience project flow chart.

At the end of the solo performance, the audience can add the instrument to the arrangement function to prepare for the individual concert. Audiences can choose traditional instruments many times. After the audience has selected two or more instruments, they can begin their personal arrangements. The audio in the arrangement function is recorded in advance by professional musicians, users can use audio effects and editing techniques to arrange music. After the music arrangement is completed, the system will generate the concert based on the selected instrument through the preset animation effect of the system. Audio files can be exported after the final concert arrangement, and video files can be exported after the animation effect is generated and published on social platforms.

The second part is the experience systems, which are designed for museum visitors. When visitors enter the museum, they will first see the traditional musical instrument exhibits. Next to them, there will be a space where virtual reality devices will be placed. Visitors can experience the performance of relevant instruments through virtual reality, and the audience can choose to watch a solo or a traditional concert. During the audience's watching of the concert performance, the background knowledge of relevant instruments and the text materials of historical allusions will appear at the same time. After the viewing, the audience can choose the Musical Instruments appearing in the concert to complete the arrangement of the personal concert. The audio in the arrangement function is recorded in advance by

professional musicians, and the tourists can arrange the music according to the audio effect and editing technology^[9]. The system supports multiple visitors to experience together, and they can compose music together^[10].

After the music arrangement is completed, the system will generate a concert scene through the system according to the selected Musical Instruments.

Visitors can experience themselves playing the Musical Instruments through virtual reality technology and become a member of the concert. At the end of the experience, audio and video files can be exported, and visitors can see concerts they arrange and play, which are also supported send on social platforms. Due to the time problem of offline experience, the selection of Musical Instruments in offline projects is less than that in online systems, and the audience of audio clips of Musical Instruments can modify less, so tourists can use the complete music arrangement system online after offline experience.

The project is expected to be completed within 6 months, after which there will be a fixed update and maintenance system every month, and the system will be upgraded based on the user feedback collected every six months.

4 Dissemination

The communication of the project mainly focuses on social media, mainly Facebook, Weibo, and other popular social media, recording the promotional videos of the project, making promotional videos for promotion and publicity^[11]. It will also cooperate with celebrities to communicate, such as cultural heritage researchers and traditional music artists, and make use of their influence to communicate. In addition, it can also spread through users, who can post projects on social platforms when using the sharing function. In addition to the promotion on social media, offline promotion of museums will also be conducted. By taking advantage of the advantages of museums, a series of paper publicity materials such as advertising boards and brochures will be set up^[12].

5 Impact and anticipated user audiences

The relevant audiences of the project are mainly divided into two parts. The first part is academic researchers, including researchers and students of

immaterial traditional culture, and the second part is ordinary users, including visitors to the museum, who can use the system during the tour. The focus of museum policy has shifted from collections to meeting the learning needs of users, all of which are changing as we enter the digital age, ownership, participation, and the way knowledge is produced^[13]. The project tries to attract more people to pay attention to traditional culture and traditional Musical Instruments. For academic researchers, the project includes professional musicians audio, can better help researchers to cultural heritage research, at the same time, the project shows a lot of knowledge about the historical background of traditional instrument and, for students and children have a good academic knowledge, can satisfy the visitors to the museum of the present digital age learning needs. "Digital museum audience" is defined as a meaningful group part of the museum public, and presents museum trends that take place both on-site and off-site, representing the way that museums can address their online audience effectively to facilitate on-site communication^[14].

Just as the original intention of this project is to increase the number of visitors to the museum, this project builds a bridge between the visitors and the museum, so that the visitors can better participate in the museum, have more interest in the museum, and enrich the experience of the museum. It can also meet the visitors' demands for various participation and interaction in the museum.

6 Reflection

This project is designed for the protection and promotion of traditional culture. The theme of this project is Chinese traditional Musical Instruments. This project is designed for the system of different audiences and supports the use of multiple platforms. The system has the functions of knowledge visualization, audio effect and editing, music synthesis, sending and sharing, etc. The biggest feature of the offline system is the use of virtual reality technology, so that the audience can feel the charm of traditional Musical Instruments more truly. The project using the digital system, application of realistic characters generated, scenario building, binding action, such as human-computer interaction technology, quickly generate scenarios and behavior

of intangible cultural heritage, realize the virtual reappearance of the intangible cultural heritage, knowledge visualization and interactive operation, in order to make as many people as possible by watching and understanding these intangible cultural heritage, including the disappearing of the beauty of traditional instruments.

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