

# APP Design for Traditional Culture Inheritance in Mobile Internet Era –Taking Cultural Dissemination APP “Red” as an Example

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## Abstract

*Excellent traditional culture is the soft power of a nation or a country; if a country wants to be strong, its soft power in the international competition is of great importance. A country which wants to have strong soft power needs to develop its culture, and the development of culture is the mining and inheritance of traditional culture at the first place. However, in the background of digital era, with the social development trend of culture diversification, entertainment diversity, and time fragmentation, traditional culture is losing its soil of heritage and development and facing the survival crisis. In the face of a new pattern of the Internet development and being committed to traditional culture inheritance and dissemination, it is needed for people to explore the effective ways of cultural communication and interaction in which the younger generation who grow along with the mobile Internet era so as to heritage and carry forward the traditional culture digitally. Based on carrying forward the Chinese traditional South Red Culture, this paper takes the digital heritage of Chinese traditional South Red culture as the entry point, and the culture education APP "Red" as the case practice which is based on intelligent mobile terminal platform, so as to explore a way suitable for the traditional culture inheritance APP design aiming at the psychological characteristics of young audience in the current mobile Internet era.*

**Keywords:** APP; Traditional Culture Heritage; South Red; Mobile Internet; Virtual Reality.

## 1. Introduction

### 1.1 Purpose and Meaning of the Research

Excellent traditional culture is the soft power of a nation, but in the background of digital era, with the social development trend of culture diversification, entertainment diversity, and time fragmentation, traditional culture is losing its soil of heritage and development and facing the survival crisis. As a result of the fast rhythm of urbanism and increasingly great work pressure, it is becoming more and more difficult for people to set aside enough time to deeply understand a traditional opera performance, it is becoming more and more difficult for people to calmly learn and experience the traditional craftsmanship; what people are used to is to get the message and to conduct social and games by using a variety of intelligent mobile terminals. According to the data provided by Iresearch INC, by the end of 2015, the number of mobile Internet users has reached 620 million. The penetration rate of mobile Internet users in the overall Internet users has exceeded 90%, the advantages of use duration in the mobile terminal surge. Mobile Internet has become an integral part in people's life; the number of mobile Internet users is in a rapid growth in recent years. Therefore, the use of a variety of digital media means and technologies based on the mobile Internet is the real need for the digital transmission and development of traditional culture and the inheritance and development of traditional culture, which has become the important development trend for the protection of traditional culture.

Taking the digital heritage of Chinese traditional South Red culture as the entry point, the paper takes the culture inheritance APP "Red" as the case practice which is based on intelligent mobile terminal platform, so as to explore a way suitable for the traditional culture inheritance APP design aiming at the psychological characteristics of young audience in the current mobile Internet era.

### 1.2 Scope and Methods of the Research

The research methods used in this paper include literature investigation method and case analysis method, case production method.

The method of literature investigation is applied to deeply understand traditional Chinese South Red culture, and accurately understand the technical means of digital protection and inheritance of traditional culture, and the research status and development trend at home and abroad, which is used as the basis of case production. The digital protection and inheritance of traditional culture is a subject with strong practical application, so the case analysis is indispensable. The Digital Forbidden City and other mobile terminals APP are selected in this study, and the technical means adopted in Chinese classical furniture APP case based on the intelligent mobile terminal platform are analyzed so as to deeply explore the advantages and disadvantages of users' experience, and to foster strengths and circumvent weaknesses in the case production.

On the basis of above research methods, the 3D modeling, digital animation, interactive games and virtual reality panorama presentation and other methods are used to conduct the design and production of the South Red cultural heritage APP "Red", try to make the APP adapt to the operation environment of the intelligent mobile terminals, suitable for the target audience with busy rhythm of life, so that they can have a basic intuitive understanding of traditional South Red culture by using the fragment time, thus promoting appreciation ability and level of the South Red through the simple interactive games.

## **2. Theoretical Background**

### **2.1. Chinese Traditional South Red Culture**

South red agate, historically called "red jade", rich ruby red in color, moist texture, has a long history. As a rare precious jade, its bright redness fits the red tradition advocated by Chinese people, and is cherished by royal nobles, refined scholars and private collectors. South Red culture first appeared at the time of the ancient Dian Kingdom, was mainly used as monetary at the time, later, it appeared in the Silk Road, was paid as tributes to Central Plains, became the imperial tributes, and was appreciated and worn by royal family and aristocrats. South Red agate has deep root in Tibetan Buddhism. Agate is one of Buddhist seven treasures. In the Qing Dynasty in which Tibetan Buddhism has received respect, the south red agate is used to make beads and top beads worn by officials, and became the symbol of social rank and status.

South red culture originated from the traditional Chinese jade culture and the "red" culture. Jade is the material embodiment of Oriental spirit, is the material foundation of traditional Chinese culture essence. People in China compare the natural characteristics of the jade to the moral quality of people, they believe that "a gentleman is like a jade", "warm jade" is the highest criterion for the gentleman. In addition, red symbolizes festival and luck in Chinese culture, which pins the Chinese people's beautiful dream. Red represents the peace, happiness, luck, harmony, and reunion. People also often use it to get rid of disease and difficulty. South red varieties are rare in China, and particularly valuable. Because of the different geographical positions, different environments, different colors and types, the South Red is generally classified into: water material jade, mountain material jade, and fire material jade. Compared with ordinary agate, the typical feature of South Red agate is its oily gum sense except the rich natural redness. The oily gum sense of the South Red is basically the same as the texture of Hetian jade, which is a very important factor to evaluate the South Red agate. The oily gum sense of the South Red is a well-known element, moist South Red agate will give a person the sense of delicate jade and the splendor of jewels.

### **2.2 APP Audience Analysis of Mobile Internet Era**

According to CNNIC data finished by Iresearch, by the end of 2015, the number of mobile Internet users has reached 620 million. The penetration rate of mobile Internet users in the overall Internet users has exceeded 90%, it has continued growing compared with last year, and the users connected to Internet through the desktop and notebook computers are slightly down. In addition, the netizen agglutinant is increasingly improved, according to the data monitored by Iresearch, by the end of 2015, the monthly overall time duration of mobile terminals APP has reached 29.7 billion hours, which is twice more than that of the PC terminals. On the whole, mobile Internet has become the rigid demand for most users; the users have shifted to mobile terminals in access to information, shopping, and other behaviors.

In the era of mobile Internet, the Internet site on which users are using mobile devices (smart phone, Pad, etc.) is relatively abundant, including the fixed offices, the non-fixed places of entertainment, the airport/bus and the routes to the journey. Compared with the computer, tablet and other devices are not limited to the place and time; the use time presents the characteristics of the fragmentation.

Therefore, as a mainstream way for the users to get access to information in the process of mobile Internet, first of all, APP should fast and flexibly fit users' fragmentation time use habit in order to get customers' favor; secondly, in terms of content and functionality, APP is to meet the demand of users.

Thirdly, in this era of the Internet with strong interaction and all kinds of information, young people are easily attracted by entertainment things in particular. For today's young people, the spread of the channel, the source of accepting culture is more likely to be produced in the process of the entertainment. Therefore, in order to realize the dissemination and inheritance of traditional culture, it is needed to find the path of the dissemination from the interactive entertainment lifestyle of present younger generation.

### 2.3 Main Technical Means for the Digital Inheritance of Traditional Culture

At present, the means for digital protection and inheritance of traditional culture are mainly divided into the following categories: information acquisition preservation, data compilation repair, space scene display, and inheritance and flexible use. The means of information acquisition preservation are digital photography, digital cameras and digital recording, laser scanning, motion capture technology, etc. Data compilation repair uses the methods such as augmented reality technology in virtual reality, which is to have the cultural heritage virtual recovery which suffered severe damage, or to use digital animation to restore the development process, production process or working principle of the intangible cultural heritage. Space scene display fully uses 3D modeling and virtual reality technology to create a virtual digital museum or a virtual world, to realize remote virtual tour. The inheritance and flexible use makes full use of the intelligent mobile terminal platforms of new media, through MMS mobile news, wap sites, social networking platforms, mobile terminals app and others to display and interactively use cultural information. The current 3D simulation technology and virtual reality technology are popular technologies in the field of traditional material culture inheritance and protection. 3D modeling is used to simulate and reproduce the badly damaged ancient artifacts and cultural sites and interact with three-dimensional model or a virtual space environment by the sensor, so that people can stay at home and enjoy cultural ancient ruins personally on the scene, 360-degree carefully watch the ancient artifacts all-round in detail. Virtual reality technology, with its characteristics of immersion, interactivity and imagination different from other digital technologies, has won people's attention and recognition, and now it has been widely used in the field of digital protection and inheritance of traditional culture. This is also the main technical means used in the case production of this project.

## 3. Case Analysis of Traditional Culture APP

### 3.1 Case Analysis of "Night Revels of Han Xizai" APP

The Palace Museum integrated the efforts of scholars and artists of the mainland China, Hong Kong and Macao and Taiwan to carefully develop "Night Revels of Han Xizai" APP after two years' working with professional academic information, rich media content and innovative interactive aesthetics. APP has 3-layer three-dimensional appreciation models in total: overview layer, experience layer and appreciation layer, the fine degree of the screen is progressive increased from left to right. That is, a picture can be watched from far distance, can be enjoyed nearly, the view angle is completely determined by the finger of the audience.

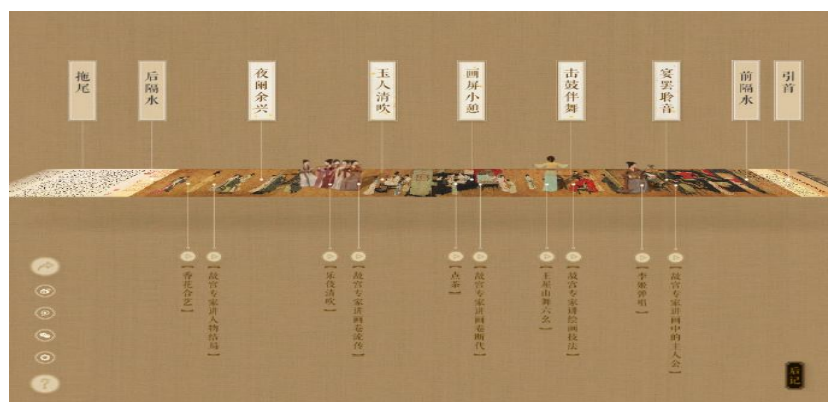


Figure 1 "Night Revels of Han Xizai" APP

The APP used the three dimensional animation, video interaction and other technologies to gently display the refined life of the literati-official class in the late Southern Tang for the users. Beginning with a far-reaching artistic conception 3D animation, it introduced the background and paintings of tone of the painting "Night Revels of Han Xizai", then the theme is introduced by opening the painting scroll. The interactive painting enjoyment mode is set on the painting scroll; when the users' finger presses the characters or props in the picture, the professional graphic annotation of corresponding characters or props will appear which makes users understand the historical story of the characters in the painting, the cultural background of the furniture items. The most fascinating is that when a user clicks on a specific character, such as Li Ji horizontally embracing pipa, Maiko wearing blue dress, these figures will "relive", and will play the traditional cultural heritage "South Sound "and conduct Opera Dance in the form of live video for the users.

The advantage of this APP lies in beautiful and full of exploring interesting UI design. In the interface of long axis design, no menus, and buttons of hint, all of the content is hidden in the painting, the users need to explore, search for related functions and annotations. This "de-UI" UI design is the fun place manifested in the cultural digital products. It is suitable for users who are interested in traditional culture and have the desire to explore it with relatively abundant time. The deficiency of the APP is that under the premise of loading with rich content, it cannot well take the efficiency problem in the mobile terminal environment into account; it often appears the problems of slow operation and flash back. In addition, its android compatibility is not enough. Under the android system, it cannot start the highlight of the live-action. It is very regrettable for the users' experience.

### 3.2 Analysis of "The Chinese Classical Furniture" APP

This is an excellent application example in 2012 iPhone's APP STORE. Its main purpose is to introduce cultural characteristic of ancient furniture during the Ming and Qing dynasties. The object manifested by the software is the five sets of furniture commonly used I ancient Chinese people's daily life, including chair, recessed-leg table with everted flanges, canopy bed, grills, and hangers. The advantage of this APP is its interaction, with 360 rotating display technology and interactive games of taking furniture apart and fixing furniture, to visually analyze furniture structure principle of the Ming and Qing dynasties. After the furniture is taken apart, the user can choose different materials of wood, tools and supplies to produce the furniture, to reassemble the furniture. In addition, you can choose woodiness material to replace it, you can also choose elegant adornment to decorate your own furniture. Finally, the users can also polish furniture through the interaction, polish, maintain, and keep the furniture bright through the different processes. Fun interactive games teach through lively activities, which stimulate people's interest in the initiative to understand the culture of traditional furniture.

The sense of frame of this APP interface design is unified, and users' usability is high. The navigation and others in APP interface all use wood texture structure, including the design of the ICON inside and the background color of the main menu, all are reflected with a wooden structure. After the furniture is taken apart, the user can see its history background of the furniture, and can also click the button of the production process; the animation introducing a furniture manufacture process will appear. Its shortcoming lies in the richness of knowledge needs to be improved.



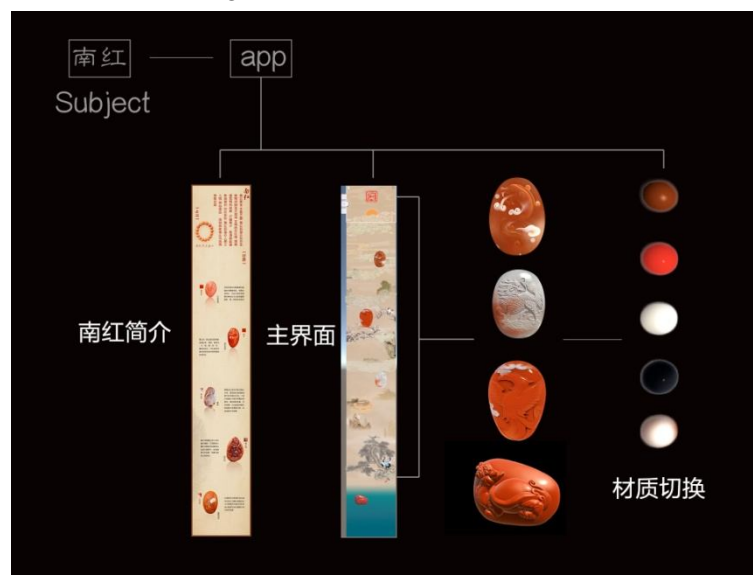
Figure 2: "Classical Furniture" APP

## 4. Case Production of Traditional South Red Culture “Red”

### 4.1 Overview and Pre-planning

This work takes traditional Chinese South Red culture as the theme, takes the four benevolent animals: dragon, phoenix, kylin, turtle as the roles of South Red sculpture. This target audience of the project is positioned on the enthusiasts of Chinese traditional culture and the lovers of South Red collection, people with busy life and great work pressure, in particular, who hope to use fragmented time to have basic understanding of the traditional South Red culture. In order to ensure the operation efficiency of mobile terminals and satisfy users' need of close observation and appreciation south red art sculpture and the material details, the app launched the IPAD terminals and the efficient version run on android terminals and HD version run on PC platforms.

This APP has three major functions. First, it used dynamic visual dissemination way with Chinese traditional aesthetic integrity so sum up and introduce the South Red culture; second, it 360 degree panoramically and interactively displayed the 3D model of the four benevolent animals for the sculpture of South Red artwork; thirdly, it is its material replacement interaction function, the user can click on the button of different materials, switch the substrates of South Red artwork so as to have an intuitive understanding of the visual differences of South Red with different kinds and different grades.



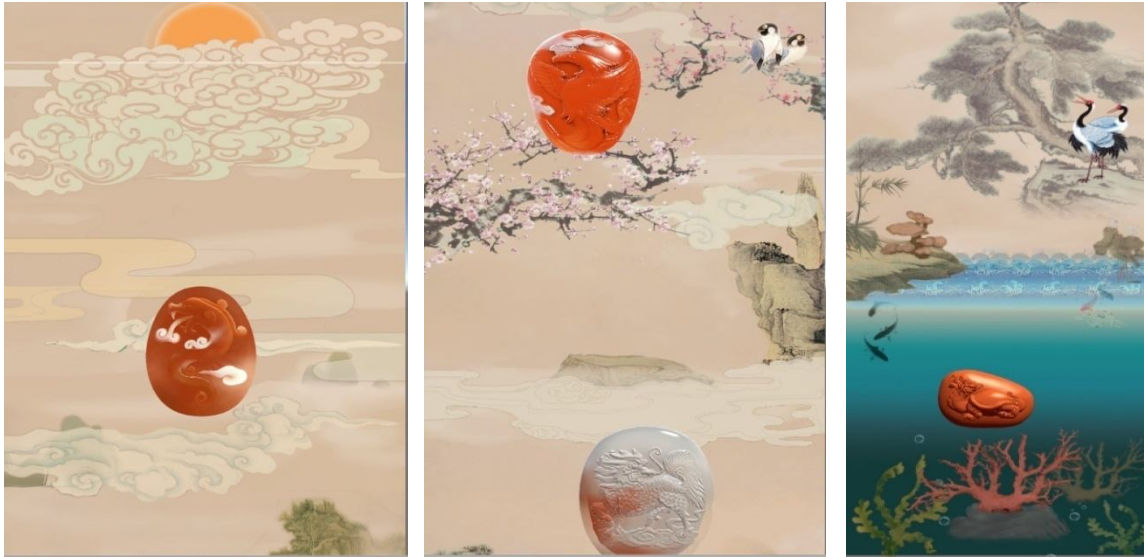
**Figure 3: Function and Structure of “Red” APP**

### 4.2 Setting of the Audio and Visual Style

Chinese traditional culture emphasizes the spirit connotation value of "unity of nature and humanity", "Slow and steady winning the race", it pays attention to integrity, which is contrast to the individual's physical culture advocated by the westerners. In addition, as the saying goes in Chinese: "the greatest and most beautiful voice is the sound of silence, and the most magnificent image is no image. Lovers of Chinese traditional culture prefer the elegant and quiet elements, they intend to have profound audio-visual elements, so the APP introduced the elegant and quiet elements and ethereal Chinese style on the vision, simulated the main APP interface design in the form of a vertical scroll ancient China landscape painting. The painting dynamically combined auspicious clouds, mountains, water, flowers, birds, and the four-season sceneries, forming a longitudinal land, sea, and air panorama painting. Long scroll painting is a unique kind of art form in China. Cooperated with light elegant classical Chinese music as the background, it built a whole audio-visual environment of classical Chinese style, making the receiver resonate and identity, inspiring the audience's interest in the APP.

At the same time, the APP introduced the shapes of four benevolent animals: dragon, phoenix, kylin, and turtle as the main body patterns of South Red model sculpture. According to the daily activities of the four benevolent animals, the main interface is divided into the sky, land and sea from top to bottom, the South Red artworks respectively engraved with "dragon", "phoenix" " kylin, " "turtle" is dangling floated in the corresponding position. Dragon and phoenix are flying in the sky, kylin is on land, and turtle is in deep water.

In order to further display the connotation of South Red culture, the sun, auspicious clouds, cliff, trees, plum trees, rocks, crane, and fish and other auspicious traditional modeling elements are added to the main interface. In order to increase the richness and fun of the interface, winter snows, spring rain, morning mist and other seasonal sceneries are added. Under the influence of different climatic conditions and lighting, it demonstrated the changes of South Red agate in color, quality, light, shape, and other details.



**Figure 4: Main interface design of “Red”**

#### **4.3 The Main Technical Means Used in “Red”**

This application mainly used the 3D modeling technology and virtual reality technology to digitize the South Red cultural heritage. The latest development version 5.0 of the Unity has the function of real-time rendering effect, South Red will lose its material after the unity is imported in 3D max lost material for the completion of the production, and the latest development 5.0 version shader can present all the features of South Red model. The APP three-dimensional displayed the texture, sculpture, material of South Red model through the establishment of three-dimensional South Red artwork and 360-degree panoramic virtual reality, enabling the users to feel immersive Southern Red charm.

#### **4.4 User Experience Design of “Red”**

Animated title is a logo animation of "Red", after the animation is played, the user can slide the screen, and South Red artwork of four animals will appear. The sculpture details and material details of four models can be watched with a 360 degree panoramic view. This study respectively provided five different materials for each of the South Red artwork, will replace the material of South Red at any time by pressing the material switch button, at the same time, there is a circular button on the left of the main interface, it is a switch which can adjust the natural scene weather climate of the main interface. According to the particle system inside the unity, all kinds of weather effects are added in the main interface, such as fog, rain, snow, etc. At this time, the user can observe and experience texture of light and shadow in different climate conditions in south red art.

The combination of South Red with four benevolent animals is likely to cause the users' misunderstanding of the subject, they mistook four benevolent animals are the subjects to transfer information. To highlight the theme of the South Red culture, at the top right-hand corner of the main interface, an introductory page of South Red culture is added, the page will present an automatic browse mode after opening the APP.

Secondly, this APP is mainly oriented at the users who want to have a basic understanding of South Red culture by making use of fragmented time, thus weakening the fun for the users to explore something in the interface. Four buttons are set up on the right side of the main interface, for users to easily find the location of the four South Red models. In addition, in the process of users' observing the South Red, in order to enable the user to see clearly the details of the South Red model, a magnified detail function is set up in the interface of South Red materials.

In addition, taking the use environment of mobile Internet and the operating efficiency of smart mobile terminal s into account, the content is simplified. If this project is to extend the content of the South Red traditional culture and deepen the details, it will be undoubtedly like the aforementioned "Forbidden City APP- "Night Revels of Han Xizai", which will produce flash back, freeze and other issues, therefore, affecting the users' experience and emotion. So the content and experience are balanced, the content is simplified, only the four models of South Red four benevolent animals are taken as the main body to illustrate the cultural connotation, for the audience of South Red culture, it is basically the popularization education instead of deepening education. However, most of the users hope to have a visual observation and taste in color and texture of the South Red art model in experiencing South Red culture and appreciating South Red art model. So, a version on PC terminal is also produced, which can be displayed in the big screen of the TV, so that the audience can more intuitively and carefully taste different material sense of the South Red under the light changes. After the users see the materials of the four benevolent animals of South Red on a big screen, if they want to know about South Red, they can find relevant knowledge of the South Red, and enjoy the South Red model by sliding the screen with the fingers with 360 degrees in the APP.



**Figure 5** User experience design for the main interface of “Red”

## 5. Conclusions

Digital inheritance and protection of traditional culture is a hot topic in today's world. In the era of mobile Internet, with the social development trend of culture diversification, entertainment diversity and time fragmentation, digital inheritance and protection of traditional culture also need to adapt to the present people acceptance characteristics of mobile internet environment. Therefore, how to achieve the balance between the richness of the content and the smoothness of operation efficiency, so as to optimize and improve the users' experience will be the core project of cultural inheritance APP based on mobile terminal platforms.

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