

Jieshou Painted Pottery Museum under Digital Interactive Experience Exhibition Design

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Abstract

With the rapid development of digital science and technology, the interactive exhibition technology has been welcomed and recognized by the public in the new era. In the exhibition design of the Jieshou Museum of Painted Pottery, digital media technology has been integrated into this place where human beings have accumulated spiritual civilization, popular science culture, and historical heritage. It has gradually integrated the collections of physical exhibitions into virtual object exhibitions, and has gradually shifted from static traditional exhibitions to dynamic interactive exhibitions. By means of technology, it has provided visitors with more diversified services. In the planning of the digital environment, it has created an interactive experience space combining ancient and modern times, centering on human needs and combining various sensory experiences. Jieshou Painted Pottery Museum is a special museum based on the protection of intangible cultural heritage. It is an important bridge between contemporary art and past art. As an important new medium, exhibition and presentation under digital interactive experience build a bridge of communication between museum and audience, provide digital exhibition and presentation environment and space for museum and audience, enable audience to selectively interact in museum, realize two-way communication of information reception and transmission, and make exhibition and presentation begin to change from "center on things" to "center on people". The change of exhibition means and mode is not only an important innovation of museum exhibition concept, but also a magic weapon to promote the close connection between museum and visitors.

1. Introduction

1.1 The research background of the exhibition design of Jieshou Painted Pottery Museum under the digital interactive experience

With the development of information technology, advanced technology has been fully applied in the protection of intangible cultural heritage. For example, museums have gradually strengthened the application of related technologies in digital interactive experience, trying to create an offline art museum with rich expressive force and attracting audiences. Through new

media and new scientific and technological means, a museum that can make the audience more intuitively understand the historical virtual scene and break the traditional sense of being limited by time and space is established. The focus of this article is to analyze the characteristics of digital interactive experience technology in the exhibition design of painted pottery museum, and to study and discuss the application mode of digital interactive experience technology. With the continuous progress of society, China's protection of intangible cultural heritage, its social and economic functions and values have been deepened, and the state has actively strengthened the protection of excellent traditional culture, such as actively applying for world intangible cultural heritage, setting up relevant museums, and devoting itself to inheriting and carrying forward excellent traditional culture, so that each place can present its own different regional culture and traditional characteristics. Therefore, the development of museums with regional characteristics has become a top priority, promoting the participation of the whole people in inheriting intangible culture, carrying forward intangible traditional culture, and integrating culture, history and skills into local museums. With the advent of the "5G" era and the rapid development of digital technology, we combine digital media technology, interactive technology and exhibition space, and constantly integrate innovative technologies into museum exhibition design, reproduce the environment, and integrate into contemporary diversified exhibition techniques such as scenes and sensors [1, 2]. Interactive technology has become an important means to display the design of museums and a "bridge" between traditional culture and modern society.

In the past, in museums, we can only understand the history of cultural relics development by observing and associating the process of cultural relics creation with words themselves, and begin to associate the background of cultural relics creation at the periphery of the exhibition hall. In the fourth industrial transfer and the general trend of museums in various countries gradually transforming into digital museums, we can place ourselves in a virtual environment with the help of interactive technology and digital multimedia applications [3]. Shuttle back to that distant era; Looking at the big screen, you can talk to your predecessors and feel the process of creating the first painted pottery. The most striking feature of the application of this digital multimedia is that it has "interactive experience". The images of interactive exhibits are no longer limited to two-dimensional and three-dimensional, and this way of viewing is no longer a one-way static arrangement, but more attention is paid to the pursuit and expression of shapes, colors, textures, light and shadow. Exhibition design should be based on the ability to arouse people's visual and spiritual shock. In the contemporary museum exhibition design, the exhibition is not only to let the audience get the information about the exhibits, but more importantly, to let the audience participate in it and have their own experience. By showing this abstract element, the audience's interest and association are aroused. What it seeks is an interaction of communication, integration and emotional resonance between the first painted pottery museum and the audience. With the transformation of museum exhibition design from "exhibits" to "people"-oriented experience, increased attention is paid to the participation and interaction of the audience, which in turn resonates with tourists and leaves a spiritual imprint, which brings new exploration needs to museum exhibition design [4, 5]. Therefore, the interactive experience technology with situational atmosphere has become an important feature to realize the exhibition design concept of Jieshou Painted Pottery Museum.

1.2 The purpose and significance of the research on the exhibition design of Jieshou Painted Pottery Museum under the digital interactive experience

The painted pottery in Jieshou is a distinctive pottery in China. The painted pottery in Jieshou

is simple and heavy. In the long years, it has formed a unique artistic feature, absorbing many local art forms such as paper-cutting, woodcut, opera, etc., and has great national characteristics. With the progress of society, the world has attracted the attention of the world [6]. It is urgent to promote the inheritance of intangible culture by combining the interactive experience technology of digital media. Jieshou painted pottery has exquisite craftsmanship, and its production process is divided into three stages: blank drawing, blank spinning and grouting. Among them, the production process of blank drawing includes: blank drawing and blank trimming, cosmetic soil application and characterization, and firing; In terms of process technology, it includes: flower picking technology, line engraving technology, die printing technology, painting technology, plastic sticking technology and sculpture technology. From the modeling point of view, Jieshou painted pottery is simple, heavy, plump and practical, showing a wealth of modeling; As far as the expression technique is concerned, it uses the "red background and white flowers" with regional characteristics. In terms of theme, it is rich in content and has the characteristics of keeping pace with the times, including traditional patterns such as flowers and birds, fish and insects, and "Knife Horse Man" with local characteristics [7]. The painted pottery of Jieshou has great development potential, but because of regional reasons, family inheritance and lack of firing team, it makes the painted pottery of Jieshou. The museum is a building facing the public, serving the society, adapting to the needs of the times, and having a certain social education mission. Based on its unique characteristics, and combining it with regional culture and innovative science and technology, the museum can stimulate its unique vitality.

1.3 Research methods of exhibition design of Jieshou Painted Pottery Museum under digital interactive experience

1.3.1 Literature research method

Collect painted pottery museums, related photos, articles, works, etc. under the original characteristics, and comprehensively consult relevant documents. Understand systematically and systematically in a planned way, and analyze, synthesize, compare and summarize the massive data collected from the survey, so that this paper can have an objective and regular understanding of it.

1.3.2 Field investigation and research method

Observe, take photos, analyze the space, collect and sort out relevant information, and visit and understand the development of local history and culture.

1.3.3 Comparative analysis method

Compare and analyze the excellent museum design cases that have been built, and improve the design scheme.

1.3.4 Comprehensive analysis method

Make a comprehensive evaluation of all the data, summarize and analyze the data, and summarize the collected cases, to complete the comprehensive data collation and summary report of the project.

2. An overview of the exhibition design of painted pottery museum under

the digital interactive experience

2.1 The concept of digital interactive experience

The so-called "digitalization" means to achieve the design goal by means of digital technology, digital images, digital programs and other technical means. Therefore, digital technology is its most important feature. Nowadays, with the rapid development of mobile Internet, the media is also changing with the development of technology. With the continuous development of science and technology, the design field is also constantly changing and progressing. From the hand-drawn era to the computer era, and now to the multi-screen era, the design methods and means are constantly updated. The optimization of mobile Internet and computer technology has promoted the development of multi-screen era. Now people can not only watch design works on computers, but also watch and communicate through different screens such as mobile phones and tablets [8]. With the continuous development of big data, artificial intelligence, virtual reality and quantum technology, the design field will also usher in more media and possibilities. The application of these technologies will bring more creativity and inspiration, so that designers can express their ideas and ideas more freely. In design, "interaction" is a very key concept. Interaction refers to mutual alternation and interaction, and it refers to the transmission of information between people and between groups in people's daily life. In design, interaction is also a very important factor. Through interaction, designers can better express their ideas and communicate with the audience, thus creating an interdependent process. In the exhibition design, "interaction" refers to a virtuous circle of mutual influence, interaction and even new links between visitors and exhibition space, exhibition theme, exhibits and even other visitors in the exhibition space. Contemporary people who regard mobile phones as a part of their bodies are not unfamiliar with this digital world, but have gradually become a mode of thinking. Because the traditional physical media can't bring more interactive experience to human beings, human beings turn to digital media. The experience brought by this experience mode is usually a psychological projection accompanied by interaction. Experience is a feeling process of the soul, which can only be realized by feeling it yourself. Therefore, experience itself has its own connotation. With the continuous development of digital technology, there will be more interactions between human beings and the digital world and more human experiences. In the real world, people can experience through five senses, such as sight, hearing, touch and taste, and digital interactive devices continue to provide this experience. In this digital world, people interact in more ways. From the beginning of mouse operation to the later touch operation, and then to the later sound operation, it is very common. For another example, in biometric analysis, there are technologies such as fingerprint and facial feature analysis, both of which bring people new experiences. The exhibition design introduced in this paper is different from the conventional exhibition design in the past. In today's era of rapid development of science and technology, digital interactive experience will bring visitors a brand-new experience. In the contemporary museum exhibition design, the digital interactive experience can not only play the role of inheriting the intangible culture, but also fully stimulate the visitors' feelings, improve the interest of the exhibition, make the psychological magnetic field between the visitors and the exhibition content resonate, enhance the visitors' visit experience, and achieve the promotion of inheriting the intangible culture and regional culture.

2.2 The concept of painted pottery museum

Painted pottery museums belong to the category of specialized museums in the classification of museums. We can compare it with a comprehensive museum to understand it. Under normal circumstances, the painted pottery museum is not as large as a comprehensive one, and it is impossible for it to have many high-quality collections. It is loved by many people because of its own professional knowledge and its unique strong flavor of life. However, its display scope ranges from a certain industry, a certain cultural and artistic category, to a certain social phenomenon.

2.3 The role of painted pottery museum

Many ancient human civilizations have developed under the nourishment of great rivers. Looking at the whole world, the two river basins in West Asia, the Nile River basin in Egypt and the Yellow River basin in China are all important components of pottery. With the origin and development of civilization, a "pottery age" was divided between the Stone Age and the Bronze Age, which laid a technical foundation for the arrival of the Bronze Age. The emergence of painted pottery not only reflects the pottery-making technology to a certain extent, but also inherits and develops the traditional ceramic patterns. Ancient typical pottery is a period with distinctive characteristics and an important symbol of the development of Chinese history, while painted pottery is its most glorious chapter, and the painting part of painted pottery is the crystallization of its historical value, artistic value and scientific value. The production technology of painted pottery, like the water of the Yellow River, has been handed down from generation to generation. It is the best proof of the continuous continuation of Chinese culture and an asset of our country. To tell the historical story of the Yellow River, it is necessary to create a representative and distinctive painted pottery museum.

3. The excellent case analysis of museum exhibition design under the digital interactive experience



The development of digital interactive experience technology affects every exhibition design, which has brought about changes repeatedly in this field, promoted the continuous development of design, and affected the way designers recognize and understand the design scheme. The rapid development of artificial intelligence and other technologies has made the application of virtual technology in exhibition design scheme begin to emerge. In the "5G" era, people are not only satisfied with material needs, but also pay more attention to spiritual pursuit [9]. With the rapid development of society, people pursue the "fast-food" way of information intake, thus ignoring the historical context and their own cultural heritage of a great country. Therefore, the participatory, interactive and dynamic virtual reality technology is introduced into the museum exhibition design, trying to guide and improve the public's awareness of the inheritance of intangible cultural technology through the interactive experience of visitors in the realistic three-dimensional virtualization scheme, and then proceed from the preliminary design of the scheme to the

optimization, aiming at improving the frontier timeliness, communication, popularity and timeliness of the museum exhibition design. In traditional exhibitions, people only see unchanging and cold things, but it is difficult to know the real situation of these things. The developing digital interactive experience technology can reproduce history by constructing digital scenes and establish contact with tourists, thus bringing visitors an immersive experience [10]. Even after this experience has passed, tourists still cherish it and form a unique and lasting feeling with it. When this experience is over, visitors still cherish it, because they have established their own connection and emotional resonance with them, which lasts for a long time.

3.1 Analysis of outstanding foreign cases

The development and construction of foreign museums using digital interactive experience technology are relatively fast, and the contents displayed are relatively comprehensive, including many attractive exhibits, which are also places for us to learn and learn from. The Cleveland Museum of Art, the Museum of Light in Paris, France, the Crystal Bridge Museum of American Art, and the National Central Museum of Korea are relatively typical (Table 1). They all have amazing virtual experiences, multi-dimensional special effects with great visual impact, and simple and clear interactive experiences, which make visitors get rid of the monotonous way of browsing pictures and texts and bring visitors a brand-new interesting and unforgettable popular science education experience.

Table 1: Digital Interactive Technology in Foreign Museums

Museum name	Exhibition picture	Exhibition and application of digital interactive experience
Cleveland museum of art	 <p><i>Figure 1: Cleveland Museum of Art.</i> Source:https://www.pinterest.com/pin/516225176042548021/</p>	The Cleveland Museum of Art (CMA) established the Art Lens Gallery with new technology, in which the most famous multi-touch Art Lens Wall displayed 4,100 pieces of collections. The gallery used various innovative interactive technologies to allow visitors to interact with the collections, and the integration of online and offline allows visitors to travel between the current travelling between real and virtual museums, promoting touring dialogue between visitors and artworks.
Museum of light	 <p><i>Figure 2: Museum of Light.</i> Source:https://ask.qcloudimg.com/http-save/developer-news/hs1j75zhbw.jpg</p>	The combination of painting and light and shadow, supplemented by classical music, makes famous paintings "move". No matter Van Gogh, Klimt and others, they don't just use their masterpieces to guide the audience. They bring visitors into a brand-new field through light and shadow, present a brand-new art exhibition for the audience with modern technology, and combine the new with the old, tradition and innovation to provide the audience with a

brand-new visual experience. Presenting a brand-new art exhibition in the same space through modern technology, blending new and old, traditional and modern art together, providing viewers with a fresh visual experience.

Crystal Bridge
Museum of
American Art



Figure 3: Crystal Bridge American Art Museum.

Source:<http://mms0.baidu.com/it/u=2706106893,2078934950&fm=253&app=138&f=JPEG?w=750&h=500>

The equipment in the "Northern Forest Light" was placed on the forest path on the ground of the museum. The whole project used digital art, projection, lighting, sound effects, interactive technology and so on, which brought people a brand-new immersive feeling, and at the same time emphasized the interrelationship between people, art and nature, and constructed a "bridge" for communication between people, buildings and the environment. Fantastic sound and lighting, interactive art and beautiful natural scenery blend to create a touching feeling that spans space and words. The forest and the 'stream' complement each other, like a 'mist', with light and shadows intertwined, obscuring the entire sky and earth.

National
Museum of
Korea



Figure 4: National Central Museum of Korea.

Source:https://p0.itc.cn/q_70/images03/20231022/d2e25d7db595463888744adcd37ae6df.png

In Korea, this art museum is the first museum to put such a brand-new digital experience space into a permanent exhibition hall. At the same time, the museum will also have three immersive digital corridors, located on the first and second floors respectively. The digital images in the museum are projected on a 360-degree panoramic screen, which brings unprecedented immersion to tourists. The panoramic monitor was made by 2,100 residents. It is a famous North Korean painting *City of Supreme Peace*, which describes a perfect city. Visitors can make the characters in the painting respond to their actions through a touch screen.

3.2 Analysis of outstanding domestic cases

Compared with foreign countries, the domestic digital interactive experience technology started much later, but its application level is not too high. This year, many representative

digital interactive experience related contents have been established (Table 2). No matter in design and technology, or in the research of related fields, they are at the forefront of the development of museum exhibition design with global interactive experience technology.

Table 2: Digital Interactive Technology in Domestic Museums		
Museum name	Exhibition picture	Exhibition and application of digital interactive experience
China Grand Canal Museum	 <p><i>Figure 5. China Grand Canal Museum</i></p> <p>Source:http://mms2.baidu.com/it/u=1029694209,587194398&fm=253&app=138&f=JPEG?w=617&h=299</p>	<p>Yangzhou China Grand Canal Museum is designed in the architectural style of new tang style. NEC projectors are used in the museum to create an immersive digital exhibition hall, which reproduces unforgettable canal cultural memories. The "Boats on the Canal" exhibition hall has a net height of nearly 11 meters and delicately reproduces the 20-meter-long luxury passenger ship "Sand Spaceship" from the Kangxi period in a 1:1.4 ratio. Modern technologies such as AR and motion sensing interaction are used to present a smoother and more realistic canal scenery.</p>
Confucius Museum	 <p><i>Figure 6. Confucius Museum.</i></p> <p>Source:http://mms0.baidu.com/it/u=1048060384,2484511813&fm=253&app=138&f=JPEG?w=520&h=390</p>	<p>The preface hall takes "Confucius is great" as the main theme, and creates a reverence for Confucius through the use of light; The second core theme: in the "dialogue map", the images of Confucius saints are presented in the form of long digital scrolls, and visitors can talk with Confucius to listen to the stories and philosophies told by Confucius himself; The third main exhibition: an interactive exhibition space, around the "gentleman's way", so that visitors can think about how to be human. Presenting the image of Confucius and Confucian classics to visitors through the theatre stage.</p>

Kaifeng museum



Figure 7. Kaifeng Museum

Source:<https://q2.itc.cn/images01/20240615/834bff0846574ffa804927d69e2e52d0.png>

After digital deduction, The *Along the River During the Qingming Festival* has become a large spherical screen that keeps flowing. In front of the screen are small touchable screens. With a light finger, the *Along the River During the Qingming Festival* can be interpreted in a deeper level with local dialects and modern characters.

4. the principles and characteristics of museum exhibition design under the digital interactive experience

4.1 The principles of museum exhibition design under the digital interactive experience

At present, the main channel of information exchange is digital tools, while regional museums are containers to publicize and display local characteristics, ideas and cultural skills. They have had many styles and forms in the process of development, but the function of transmitting information and the purpose of transmitting communication have never changed. The exhibition space with digital interactive experience design as the main content provides visitors with personalized experience with it as the core, so that visitors can use digital display equipment according to their own needs and hobbies during the tour. Visitors can have an immersive experience in the exhibition space, but also have a two-way connection with the exhibition object. Compared with the conventional static exhibition, digital interactive experience design can better attract visitors' attention, stimulate their enthusiasm for participation, and bring visitors into the exhibition theme and space.

4.1.1 The principle of unity of form and content

Exhibition design under digital interactive experience in museum exhibition design, the first thing to follow is to make the way of exhibition consistent with the content and theme of the exhibition. In the view of traditional exhibition designers, the exhibition style should serve the content of the exhibition. Among the exhibition design techniques under the contemporary digital interactive experience, no one can dominate the other in the way and content of the exhibition, and there is an inclusive and interdependent relationship between them. In the design of museum exhibition, most media show the exhibition by describing the exhibition content and explaining why relevant exhibitions should be set up, so that visitors can better understand the local culture and intangible technologies. However, in the exhibition under the digital interactive experience, visitors can not only fully explain the information of the exhibits, but also give them an answer to why they need to protect and inherit the relevant culture, and use virtual technology to experience and understand them more intuitively and profoundly. In the traditional exhibition design, the content design should be carried out first, and then the

form design can be carried out, and the specific form of the exhibition can be determined based on the content of the exhibition. In the digital interactive experience, we should not only plan the content, but also fully consider the form of the exhibition, and adjust the content scheme of the exhibition based on the characteristics of the exhibition theme. In the past, when designing the exhibition plate, the museum exhibition design could completely edit the text content first, then use pictures to supplement the explanation, and finally beautify it by artists. However, the exhibition design under the digital interactive experience must determine the content and form of the exhibition at the time of design, and arrange the programs in the device according to the designed content, to achieve the exhibition purpose. Therefore, when digital interactive experience technology is applied to design, we can't follow the traditional design method of "content determines form".

4.1.2 The principle of unifying the theme and the purpose of communication

The exhibition design under the digital interactive experience should be closely related to the theme of the exhibition and the purpose of communication, and serve it. The exhibition design under the digital interactive experience should be organically combined with other exhibition contents to form a pluralistic whole.

In China, in many museums, the exhibition design of digital interactive experience is indeed innovative and can stimulate tourists' interest. However, the correlation between it and the exhibition theme is too low, which is the core of visitors' confusion in the exhibition. Such an exhibition can not only make full use of the advantages of digital interactive experience technology, but also affect the overall effect of museum exhibition design and distract visitors' attention. When planning and designing the exhibition related to digital interactive experience technology, it must be closely combined with the theme propaganda of the exhibition, and it cannot be planned as an exhibition design showing digital interactive experience blindly. In exhibitions, digital interactive experience technology is not essential, it is just something that can play an auxiliary role. If the things displayed by digital interactive experience technology have no connection with the exhibition itself and cannot improve the effectiveness of the exhibition, then there is no need to adopt it. For a museum, the success or failure of exhibition design lies not in how many new media and technologies are used in the exhibition, but in whether it can make visitors understand the ideological core and emotional goals that the designer wants to express, to achieve the expected communication purpose [5].

4.1.2 Adhere to the principle of avoiding excessive entertainment scientifically

Museum exhibitions aim at popularizing knowledge and spreading culture, which is different from movies, theme parks and amusement parks. The relevant exhibitions of the museum need to be supported by a strict academic system, which can accurately, vividly and completely convey scientific and cultural knowledge, reflect the real humanities, and never speculate subjectively or publicize things that do not exist. The reason why museums in some countries are criticized as being too "entertaining" is that these museums pay too much attention to the stimulation of pictures and pictures, while ignoring the objectivity and realism of exhibitions. However, the design of exhibitions by digital interaction should not only meet the tastes of the public, but also be aimed at pure entertainment.

4.1.4 Adhere to the principle of people-oriented and appropriate use

When designing an exhibition, we should pay attention to the reasonable and moderate layout of digital media items. When setting the position and interval of the equipment of digital interactive experience technology on the display dynamic line, it should be adjusted with the change of the rhythm and emotion of the tourists, so that the tourists cannot watch passively for a long time, nor can they continuously set the exhibits with strong personality and good experience. Only in this way can the tourists experience better. The traditional exhibition design skills and the exhibition design under the digital interactive experience are properly combined to better mobilize the emotions of tourists. Moderation means that the number of digital interactive experience technology installed in the Chen Zhong of the museum exhibition should be properly controlled, so that visitors can reasonably allocate their visit time. When using digital interactive experience technology for exhibition design, we must follow the concept of "people-oriented", proceed from the needs of contemporary people to accept historical and cultural information, and proceed from the perspective of improving visitors' participation and interaction. Make the museum exhibition design have a stronger social education function, better enhance the visitors' experience, enhance the affinity of exhibition design, and better promote the popularization of historical and cultural information in the exhibition in contemporary society.

4.2 The characteristics of digital interactive experience in museum exhibition design

4.2.1 The concept of exhibition is more humanized

The concept of "people-oriented" has always been respected by designers. In recent years, some leading museums have changed from "exhibits as the core" to "designers as the core" exhibition planning mode [2]. The theme of the exhibition changed from the output of historical documents to the narrative of "stories". Therefore, in the exhibition under the digital interactive experience, the design of the exhibition should aim at increasing the satisfaction of visitors. A good exhibition ultimately depends on the evaluation of visitors. Only when they affirm it, can their evaluation be a good museum. The appearance of digital interactive technologies, such as online booking, online question-and-answer and intelligent tour, makes the museum "warmer", the number of visitors continues to increase, and the stay time of visitors continues to increase, which indicates that the exhibition design based on digital interaction will develop in a more humane direction.

4.2.2 The exhibition mode is interactive

With the increasing popularity of digital interactive technology, the display form is also changing. Interactive design emphasizes "people-oriented" and the communication between people and objects. In current exhibitions, visitors often participate spontaneously, and based on traditional exhibitions, static display methods are supplemented. By combining digital interactive experience technologies such as sound, light, and electricity with exhibition design, visitors' visual, auditory, and tactile senses can be fully mobilized, thereby stimulating their memories and emotions and achieving a perfect exhibition effect. The interaction of exhibition forms can be divided into three categories: first, communication, in which the exhibition content is spread by the exhibition media, and the visitors then feedback the received content to the exhibition media, which is called observation. Through perceptual experience, the resonance between people and things, people and people, and people and art

can be achieved. For example, in the first three-color depiction of pottery, we can experience its creative process, that is, experience. Visitors can gain experience and fun during the visit. Adding some interactive links can make the display effect more real and interesting, bring a pleasant experience to the audience and enhance the interactivity of the exhibition design.

4.2.3 The exhibition form is entertaining

In traditional exhibitions, people regard viewing exhibitions as an elegant activity with a specific cultural atmosphere. Therefore, photo galleries, art galleries and museums are usually quiet, which can provide visitors with a relatively immersed environment, let them better feel the cultural atmosphere of art and leave some room for thinking. However, it is undeniable that the exhibition activities under the digital interactive experience show more entertainment and interest. The way of visiting shows a trend from experience to game, which is essentially a transformation of spiritual activities. One of the reasons why entertainment has become a development direction is the pursuit of economic profits, and the other reason is that there have been some breakthroughs in the design of exhibition space, which has weakened the role of cultural communication, thus bringing a more comfortable and pleasant visit experience to the audience. Early Greek philosophers believed that art was just a kind of entertainment, and there was no sense of existence with goals. We hope that the masses will not be restricted by various reasons, but simply visit and appreciate, and pay more attention to the cultivation of body and mind.

4.2.4 Exhibition means to break through time and space

The museum under the digital interactive experience has broken the time and space restrictions, whether it is offline exhibition or online visit, and the new means of answering questions. People can choose to watch the exhibition at any place. The advantage is that with the help of modern communication tools, the time and space restrictions can be broken, which is also the development direction of museum exhibition. The exhibition method has made a breakthrough in time and place, which is embodied in the following aspects: no matter where you are, you can watch it through small programs and apps. There is no time limit, whether it is morning, night or rest day, online visits can be carried out 24 hours a day. At present, the digital interactive online exhibition mode has become a main form of museum exhibition, and its breakthrough in time and space makes the advantages of online exhibition more prominent.

5. Design Practice of Jieshou Painted Pottery Museum

5.1 Project summary

5.1.1 Location analysis

Jieshou city, located in the northwest of Anhui Province. It is adjacent to Linquan County and Yingquan District in the south, Taihe County in the east and Dancheng and Shenqiu in the northwest. Jieshou is located at the edge of northwest Anhui [11]. It is located at 115°15'-115°32' east longitude and 30°0'-33°0' north latitude (Figure 8). Jieshou city is in the northern subtropical

zone and the transition zone of warm temperature, which belongs to warm and semi-humid monsoon climate, with superior geographical location and pleasant climate. It is characterized by spring-like seasons, warm weather, moderate precipitation and long sunshine time, frost-free for a long time, rich in light, heat, water and other resources, with an average annual temperature of 14.7°C.

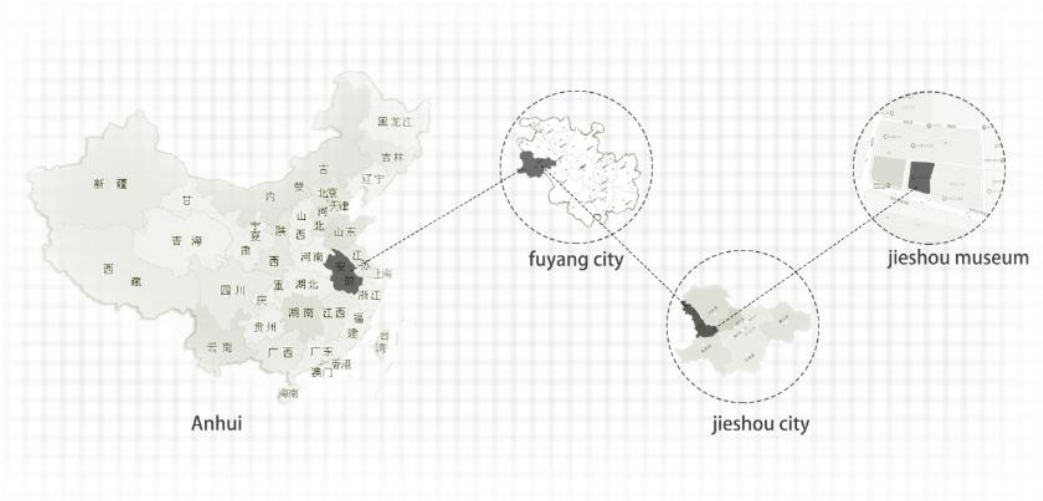


Figure 8: Location analysis map.

5.1.2 Project background

Jieshou city Museum is located about 100 meters east of the intersection of Shengli East Road and Dongxu Road (Figure 9). On the west side is the theme park for eliminating pornography and illegal publications, and on the east side is Haineng Garden. Jieshou city Museum is a museum integrating collection, exhibition, education, service and scientific research. It is in an important place of cultural education and social life in jieshou city, and it will become an important window for the world to show its culture. The museum is divided into Jieshou Cultural Relics Exhibition Hall, Jieshou Painted Pottery Exhibition Hall, jieshou city History and Cultural Center and two temporary exhibition halls. This exhibition is based on the cultural relics collected in jieshou city in the past dynasties and unearthed in various regions, absorbs the latest research results in related fields such as history, cultural relics and archaeology, and combines the successful practices of major museums in the province to create a modern exhibition museum with its own characteristics. Jieshou city, Anhui Province, is a place with rich historical background. Its overall construction area has reached 2,200 square meters, and its exhibition area has reached 1,800 square meters. It is not only a comprehensive museum, but also a central platform for social education, display and dissemination of historical civilization with regional characteristics.



Figure 9: Analysis map of surrounding roads.

5.1.3 The Purpose of Display

Jieshou painted pottery, with its unique artistic style, combines the simple and honest personality of farmers with the aesthetic interest of artlessness, and becomes a unique art form. It has become a wonderful flower among the flowers of Chinese folk art and has been included in the first batch of national intangible cultural heritage lists. As far back as the Sui Dynasty, Jieshou started the history of burning pottery in vertical kilns. In the Tang Dynasty, because it was adjacent to Luoyang, the birthplace of the Tang Dynasty tricolor, the first tricolor carved pottery came out. Although after thousands of years of development, today's first painted pottery still maintains an ancient charm. The long flowing Shaying River nurtures the industrious people on both sides of the strait, and brings silt with tenacity, elasticity and plasticity, which is the raw material for shaping the ever-changing shape of the world's first painted pottery. Painted pottery in the world is rich in themes. Apart from flowers, birds, fish and insects, it also absorbs artistic elements from traditional operas, such as *Breaking through Hongzhou*, *Battle against Qin Qiong*, *The Case of Cutting off Beauty*, and other traditional drama scenes have been put on the pottery altar [12]. In terms of expression techniques, it makes full use of such techniques as picking, engraving and scraping, making the picture more colorful and depicting the theme more vivid. In recent years, the inheritors of the first painted pottery in the world have tried to improve the painting and drawing process of painted pottery by drawing lessons from Henan Jun porcelain, Jingdezhen ceramics and Fujian Dehua ceramics, enriching the content and shape of painting and making breakthroughs. At present, there are more than 100 types of painted pottery, such as jars, altars, pots, cans, plates, dishes, bowls, vases, sculptures, hanging plates, etc., and a series of painted pottery products for tourism have been born. We should actively use the professional knowledge we have learned to inherit, carry forward and protect our culture, enhance cultural identity and arouse national self-confidence.

5.2 Design conception

The museum belongs to an open place, and the digital interactive technology provides a brand-new possibility for the exhibition mode of the museum. If it can be properly used, the effect of 1+1>2 can be achieved. We should realize that the essence of the application of digital interactive experience technology in museum exhibition design is to spread information more effectively, and to make up for the shortcomings of physical exhibits in information transmission, so that visitors can better understand the emotional core conveyed by exhibits. Find a balance between entity and illusion, and integrate the technical "virtual" with the material "real", so that visitors can have a natural and natural interactive feeling with the exhibits or their themes. This is because the biggest feature in museums is diversity. It is precisely based on this characteristic that the themes planned for exhibition design require multiple directions, perspectives, and forms to achieve diverse display effects. The museum's exterior features classic floral patterns extracted from the world's leading tri colored carved pottery (Figure 10), which have evolved through techniques such as cutting, symmetry, and simplification, forming an architectural appearance with strong regional characteristics (Figure 11).

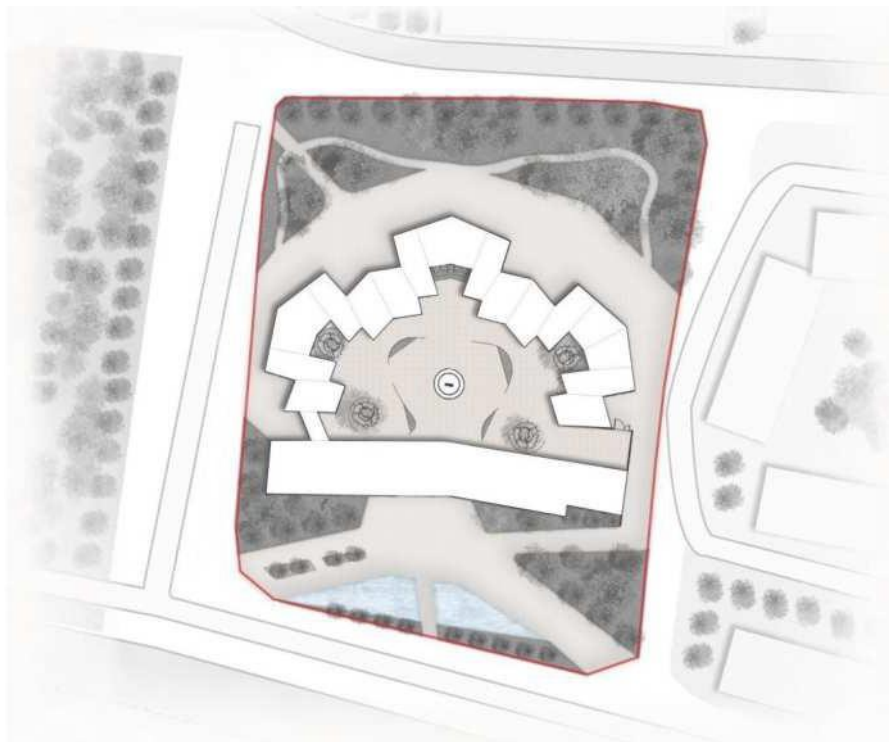


Figure 10: A plane figure.

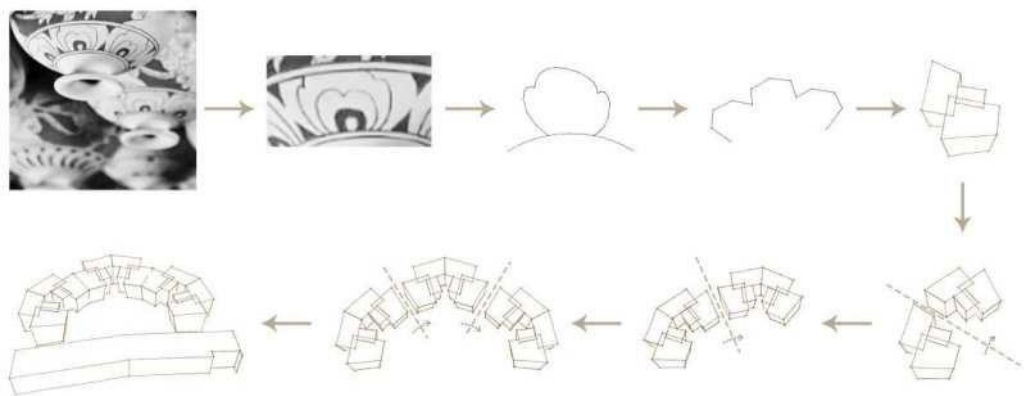


Figure 11: Evolution diagram of plane elements.

5.2.1 Layout deas

The exhibition idea of Jieshou Painted Pottery Museum is to make an exhibition outline based on the architectural layout and exhibition contents, and to show the exhibition in the context of the historical culture of Jieshou Painted Pottery and the characteristics and process formation of Jieshou Tri-colored Painted Pottery, starting from the historical origin of Jieshou Painted Pottery, and then to the changes in different development periods, from the historical context of Jieshou Painted Pottery to the formation of the characteristics and production process of Jieshou Tri-colored Painted Pottery, and then to the kiln factory full of retro flavor today, so as to let the public know the whole Jieshou in an all-round and multi-dimensional way (Figure 12). Finally, combining with the cultural and creative experience space, we will appreciate the aesthetic significance of using Jieshou colored pottery and draw a satisfactory conclusion to the entire tourism process.

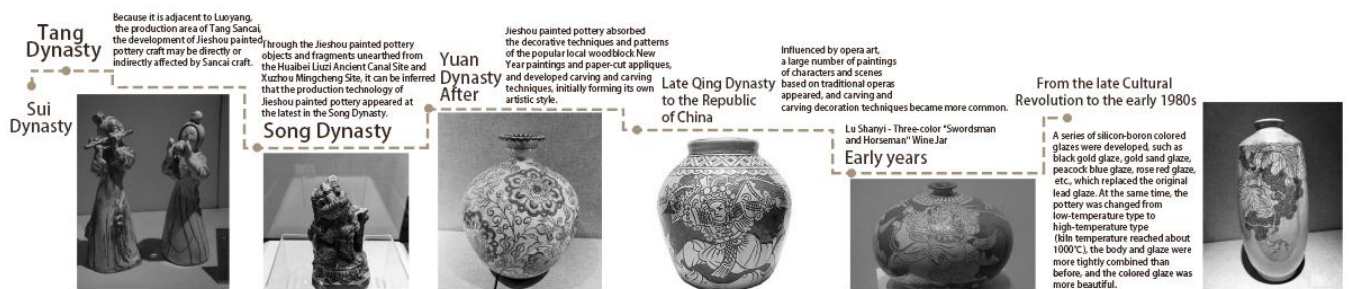


Figure 12: Historical development map.

5.2.2 Design strategy

Multi-sensory interaction to create an immersive visit experience. Sensory organs are the core link for human beings to perceive and know external things, and human beings can produce corresponding nerve stimulation through the perception of eyes, ears, nose and skin, thus leaving the initial impression on things in their hearts (Figure 13 and Figure 14).

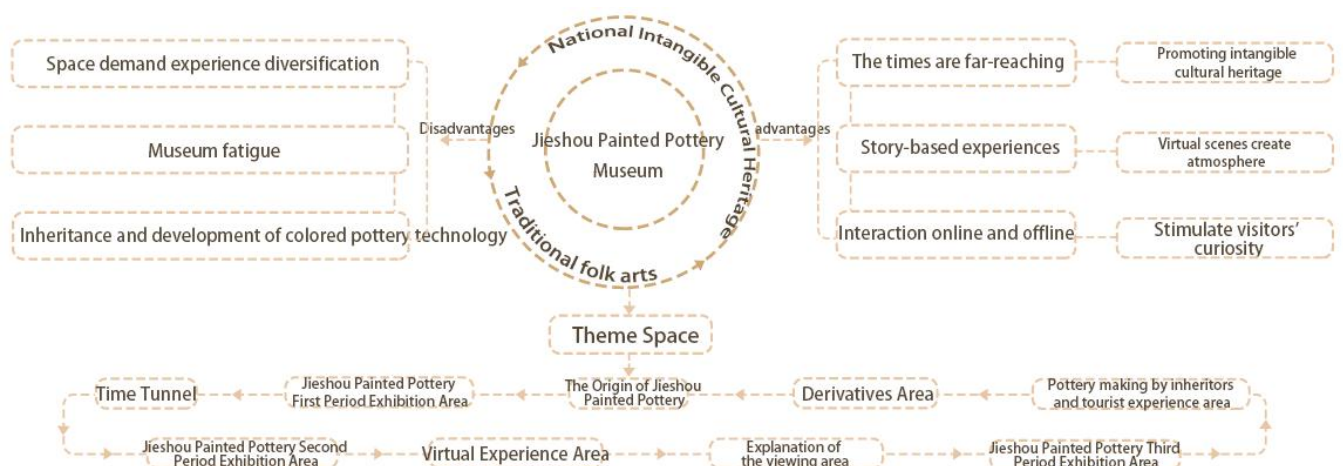


Figure 13: Schematic diagram of design strategy.

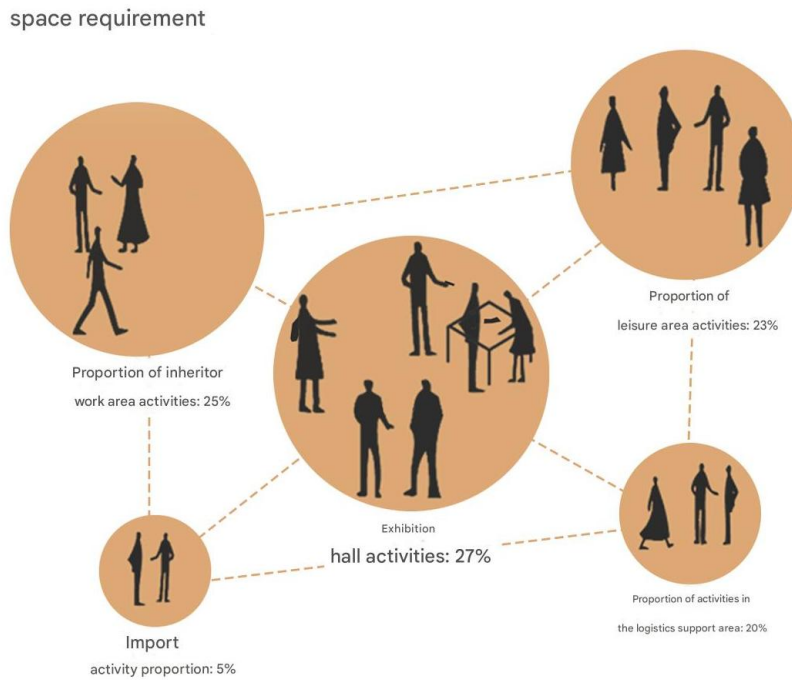


Figure 14: Demand analysis chart.

5.2.2.1 Visual experience

Vision is the most basic feeling of human body, through which people get a lot of information about the outside world. In the museum, although visual information is the main information, vision is more susceptible to many influences. Therefore, compared with other sensory experiences, the visual experience in museum exhibition design is particularly important, first, the visual experience of the exhibition itself, followed by the visual experience of the interactive multimedia that matches it. For each specific exhibition, the focus of appearance is on the shape and color. The museum uses the color, form, spatial layout and other factors of the exhibition content to have a certain influence on the theme of the exhibition, and creates various visual environments, thus making the visual effect of the exhibition space change to some extent. However, in the virtual world created by digital interactive technology, rich visual content can provide visitors with a variety of information transmission methods and extension of display forms, expand the real space in virtual form, and rich visual content can provide visitors with more experiences.

5.2.2.2 Auditory experience

From the perspective of communication, hearing is a medium for human beings to communicate with the outside world. After we hear a sound, it will be expressed in three dimensions, and the direction of the sound source will be determined by the intensity of the sound. In the interactive design of museum exhibitions, sound experience can improve the attraction of exhibition space and exhibition content, and can supplement the visual deficiency with different audio combinations, thus bringing more three-dimensional effects to the exhibition, mobilizing the enthusiasm of visitors and enhancing the atmosphere of the exhibition. The acoustic experience design of digital interactive experience technology in museums is divided into the sound explanation of the exhibition and the corresponding theme music sound effect. Voice explanation can help visitors to read less words, reduce their visual

burden, and introduce the contents related to the exhibition more clearly, while sound effects and music can play their unique role in rendering the atmosphere, prevent their visual fatigue and improve the enthusiasm of visitors.

5.2.2.3 Olfactory experience

People's sense of smell has a certain bias, and the stimulation of sense of smell will also affect people's emotions. Such a reaction will make people more impressed with the smell, and the impression of the smell will last longer than that of vision and hearing. Moreover, a special smell can remind people of a special memory. In addition, human beings can also associate the sense of smell with other actions or objects, resulting in conditioned reflex, which in turn leads to a new cognitive way. Visitors can find the hidden things in the exhibition by identifying the smell, arouse people's memory and emotion with a special smell, and then provide guidance or add a mysterious feeling to it. In the design of combining smell art with traditional audio-visual art, Jieshou Painted Pottery Museum can quickly catch the eye of tourists and play a key role in creating memories, thinking and emotional rendering.

5.2.2.4 Tactile experience

Tactile feeling is a very direct feeling, and tactile experience is a general term for feelings such as contact and pressure. It is an experience that uses the skin to perceive stimuli from external activities and make corresponding responses, which can have a certain impact on people's actions and psychology. Compared with other body parts, the tactile perception of human hands is more sensitive. Under the background of digital interactive experience technology, in the exhibition design of museums, the application of tactile sensation mainly focuses on the touch screen of multimedia equipment, using multi-touch and sliding instructions to complete the operation of items and select various forms of information of items.

5.3 The specific practice of the exhibition design of Jieshou Painted Pottery Museum

5.3.1 The spatial layout of the exhibition

5.3.1.1 Display layout

Based on the analysis of architectural conditions, project design positioning requirements and exhibition theme, Jieshou Painted Pottery Museum is divided into theme exhibition area, business area, interactive experience entertainment area and office logistics area (Figure 15).

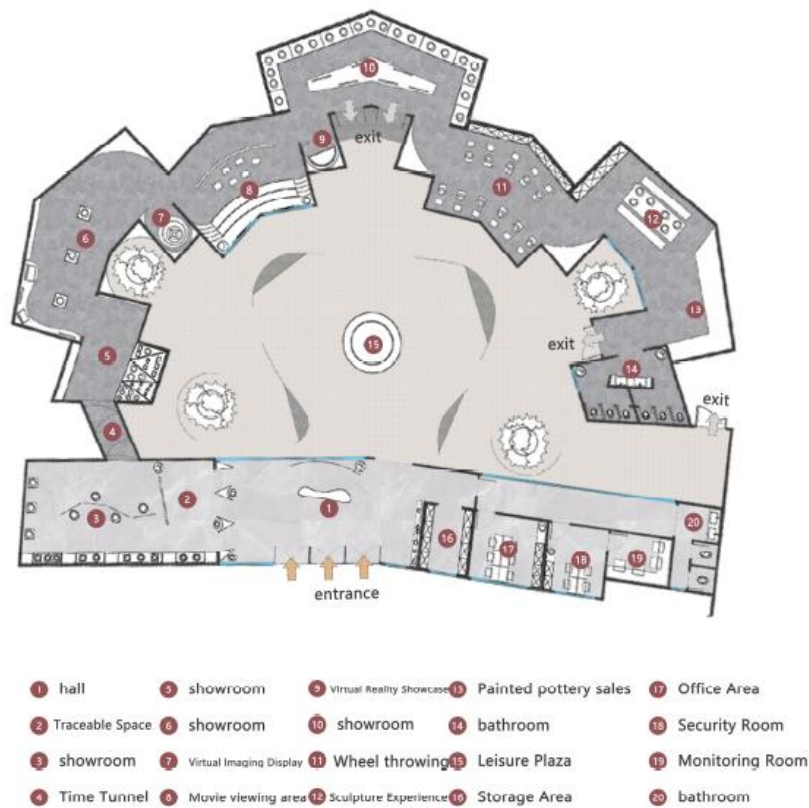


Figure 15: Floor design.

From the architectural space plane, it is mainly radial, and the main exhibition hall is naturally formed. From the analysis of the architectural space of the exhibition hall, we can find that the entrance and exit of the exhibition hall are relatively simple, so its space is greatly restricted. However, because it is a courtyard design, each part does not interfere with each other, so it has more possibilities when arranging the content. According to the layout, the main exhibition hall is divided into five blocks, the first is the lobby at the entrance, the second is the Jieshou painted pottery history exhibition hall, then the Jieshou painted pottery characteristic exhibition hall, the Jieshou painted pottery craft exhibition hall, and the final experience area and derivative sales area.

5.3.1.2 Streamline design

On the premise of ensuring the basic functions of the building, the route of tourists and staff is designed reasonably, so that tourists can visit in a certain order and time. The streamline of the exhibition space of Jieshou Painted Pottery Museum is a single streamlined moving line, which starts from the entrance and ends at the end of the visit in the order of time and space, so that visitors can read all the contents. The exhibition space and commercial space streamline are independent, interrelated and interwoven with each other, creating flexible and diverse space combinations, paying attention to details, achieving the purpose of humanization and artistry, and conveying the unique cultural charm of the first painted pottery (Figure 16).

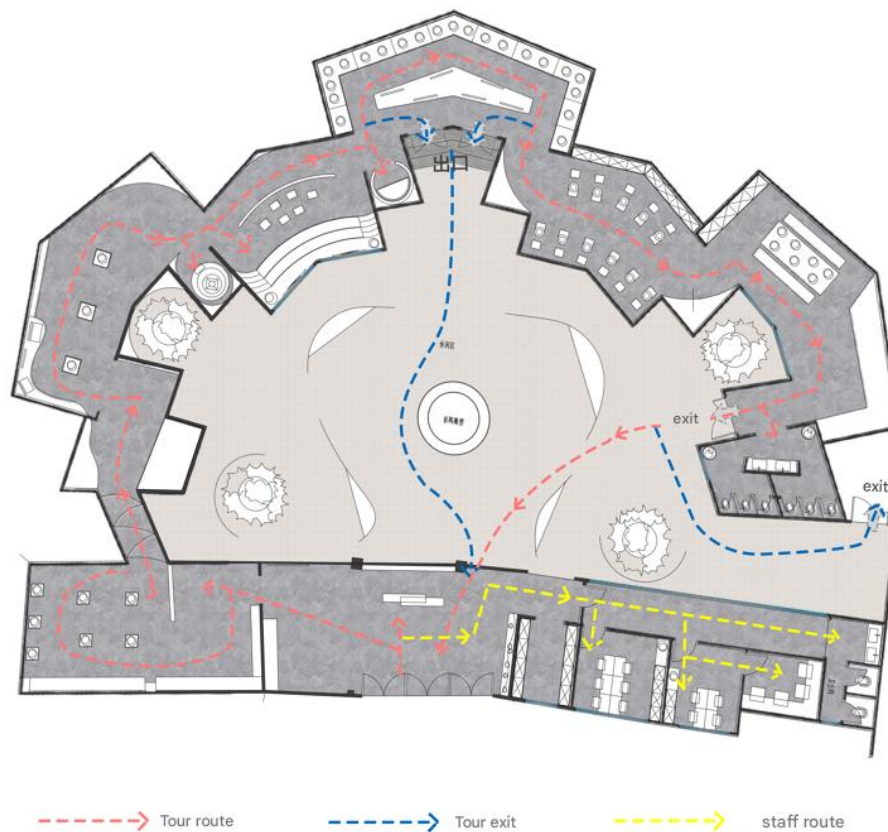


Figure 16: Line diagram of people flows.

5.3.1.3 Formal design

Exhibition wall design occupies an important position in museum exhibition design. It is a common form of exhibition, which can show the content through various media, such as wall painting, words, photos, charts, objects and modern exhibition methods. The design of the exhibition wall needs to integrate these different media units into a whole to form a unified style to attract visitors' attention. In Jieshou Painted Pottery Museum, the exhibition wall design is combined with small independent display cabinets to display important painted pottery exhibits. The painting background is consistent with the theme style of the museum, forming an exhibition area with unified overall style. This design can not only help visitors to understand the historical and artistic features of painted pottery more intuitively, but also improve the attraction and appreciation of the exhibition. The advantage of the exhibition wall design is not only that it can organically combine various media, but also that it can fully reflect the development history and artistic characteristics of the exhibition content. The design of the exhibition wall can make the audience understand the historical background and characteristics of the exhibition content more intuitively through the forms of wall painting, words and charts. The physical display can make the audience feel the charm and value of the exhibits more deeply.

5.3.1.4 Mode application

Static physical display is one of the basic ways of exhibition design of Jieshou Museum. Precious text materials, old objects, photos and honorary certificates left over before are statically hung on the wall or kept in the showcase, so that visitors can see the historical,

cultural and commercial values of Jieshou painted pottery immediately with the most convincing physical display.

"Scene reappearance" is also a display technique used in the "Jieshou Colored Pottery" exhibition. In the Tracing the Origins Hall, after entering the Kaichuang Hall of the Sui and Tang Dynasties, visitors can see the IP characters of the Jieshou Colored Pottery Museum series. Through the guidance of the IP characters, the birth and related legendary stories of Jieshou Colored Pottery are presented. Using interactive projection in a limited space to reproduce the original environment of Jieshou Colored Pottery's development, visitors can have a preliminary understanding of Jieshou Colored Pottery. Because of the limited space, complicated and time-consuming production process of Jietou painted pottery, and profound historical and cultural heritage, it is impossible to reproduce the birth and production process of Jietou painted pottery in time and space beyond the practical significance when displaying intangible crafts. Therefore, miniature models, VR virtual reality and AR augmented reality are used to show the whole production process of Jietou painted pottery in the craft exhibition hall with miniature models and modern technology, and at the same time, relevant sketches are designed to make visitors realize that it is not easy to use real time to pass down Jietou painted pottery and its skills to this day [13].

At present, the simple combination of exhibition board and showcase can't fully meet the public's demand for visiting. The design method of museum exhibition is constantly changing by constantly and reasonably integrating new exhibition means, such as VR virtual reality, AR augmented reality technology, virtual roaming, interactive projection and other technologies mentioned above. The continuous improvement and innovation of these modern exhibition means have enriched the form of museum exhibition, attracted visitors' interest, and made more people willing to understand the history, culture and intangible technology of the first painted pottery in the world through multi-dimensional methods. Exhibition Hall 3 is also a multifunctional exhibition hall and outside the youth education base.

In the interactive experience area, with the scene of wall-painted pottery as the background, visitors can not only experience the unique skills, but also truly feel the process of painted pottery making by stimulating multiple senses such as vision, hearing and touch, and gain their own spiritual and cultural journey (Figure 17).

1、Clay making

The clay is carefully selected, crushed, and soaked in water before being stirred into a uniform, soft, and delicate clay, which is then



2、Wheel throwing

Use the traditional manual technique of the rotating wheel to manually smear the entire piece of clay into an even thickness and pull out the shape of your own design.



3、dry

The formed pottery is placed in a ventilated place indoors to dry naturally.



4、Repair

When the carcass is half dry, it is smoothed and trimmed to the required thickness using the rotary method.



5、Apply makeup soil

Powdered clay: used as the base color for tri-color pots and jars
White clay: used as the surface makeup for tri-color pots and jars
Clay is an indispensable process for drawing lines.



6、Characterization

Use bamboo sticks to carve different patterns on the surface of the vessel, and then use a scraper to remove the parts other than the patterns.



7、Glaze

Lead glaze or lead-free glaze is used as the main raw material, and auxiliary materials are added and blended evenly with a ball mill.



8、Firing

① Bisque firing: After the carved pottery jars are dried in the shade, they are put into the kiln, ignited and fired at controlled temperature.
② Glaze firing: The well-mixed and evenly blended glaze is applied to the outer layer of the bisque-fired blank, and then put into the kiln, ignited and fired.



Figure 17: Flowchart of painted pottery production.

5.3.2 Show the story line

In this process, the design combines the humanistic perspective with the scientific perspective, and at the same time, it turns the story into a spatial form, so that visitors can walk into the story and participate in it. On this story line, many international leading technologies, such as interactive projection, virtual roaming, VR virtual reality, AR augmented reality, pottery-making experience, multi-functional ball screen theater, will be used to restore the once painted pottery world in an all-round way, create a multi-sensory exploration tour, and help visitors reproduce the past of the first painted pottery [13].



Figure 18: A new beginning, a renewal of all things - Traceability.

Visitors enter the preface hall from the left, and the entrance to the exhibition area is the most common shape of the first painted pottery, decorated with steel reliefs with criss-crossing textures of galaxies, pointing out the theme and laying the foundation for returning to the era of simple painted pottery (Figure 18).

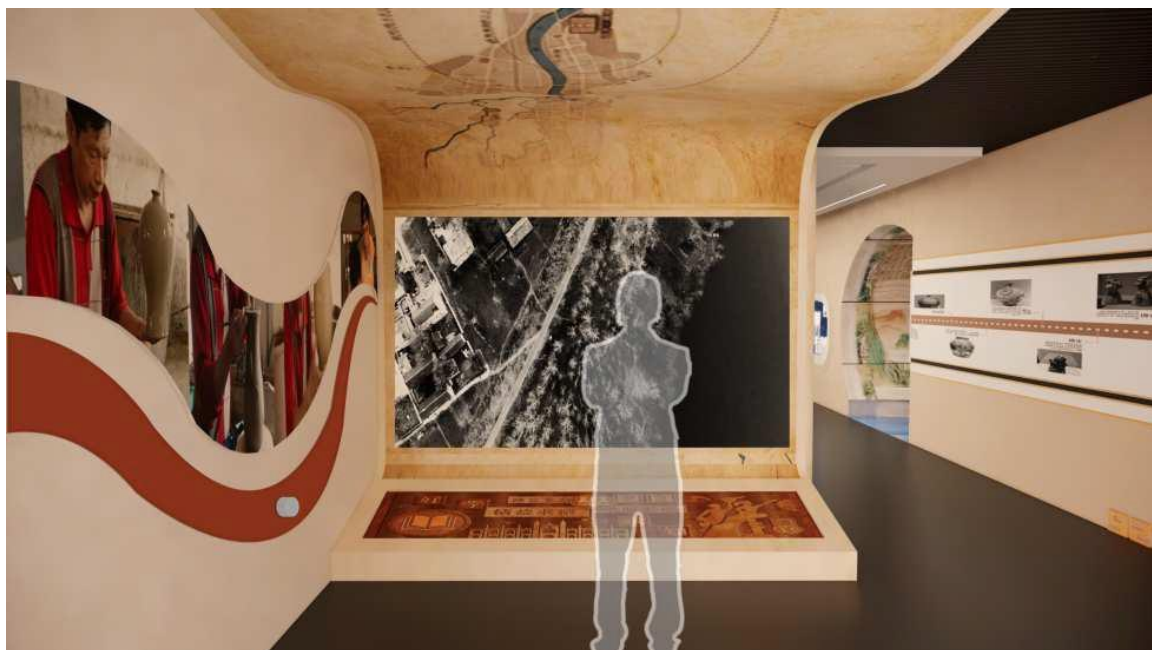


Figure 19: Digital Historical Traceability Wall.

Entering the exhibition hall, the ambient lighting changes from bright to dark, and the electronic screen hangs from the top to show the important events of important historical nodes, creating a solemn and solemn environment atmosphere in the whole space. Through a timeline, this paper introduces how to change from a piece of yellow clay to the painted pottery, which is now the first in the "Oriental Show" (Figure 19).

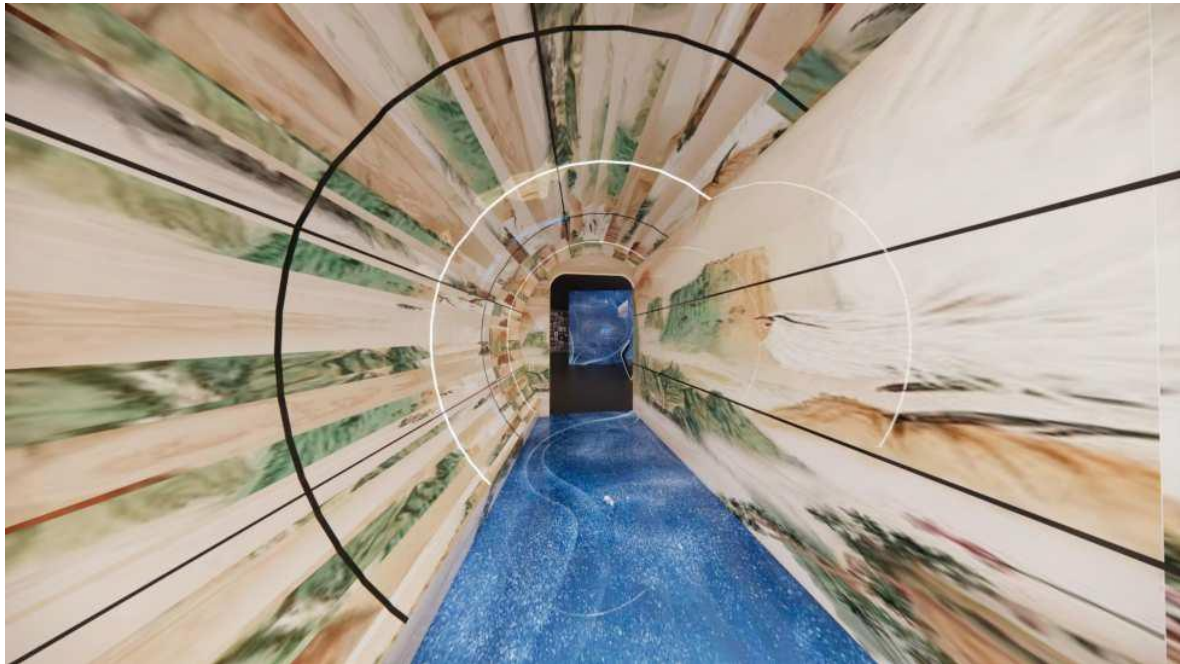


Figure 20: Time tunnel.

Into the channel, using VR virtual reality, interactive projection and other technologies to restore historical scenes, immersive understanding has long been far away from the era of slash-and-burn and knotting notes, into the depths of history, and feel the residual temperature in the hands of ancestors (Figure 20).

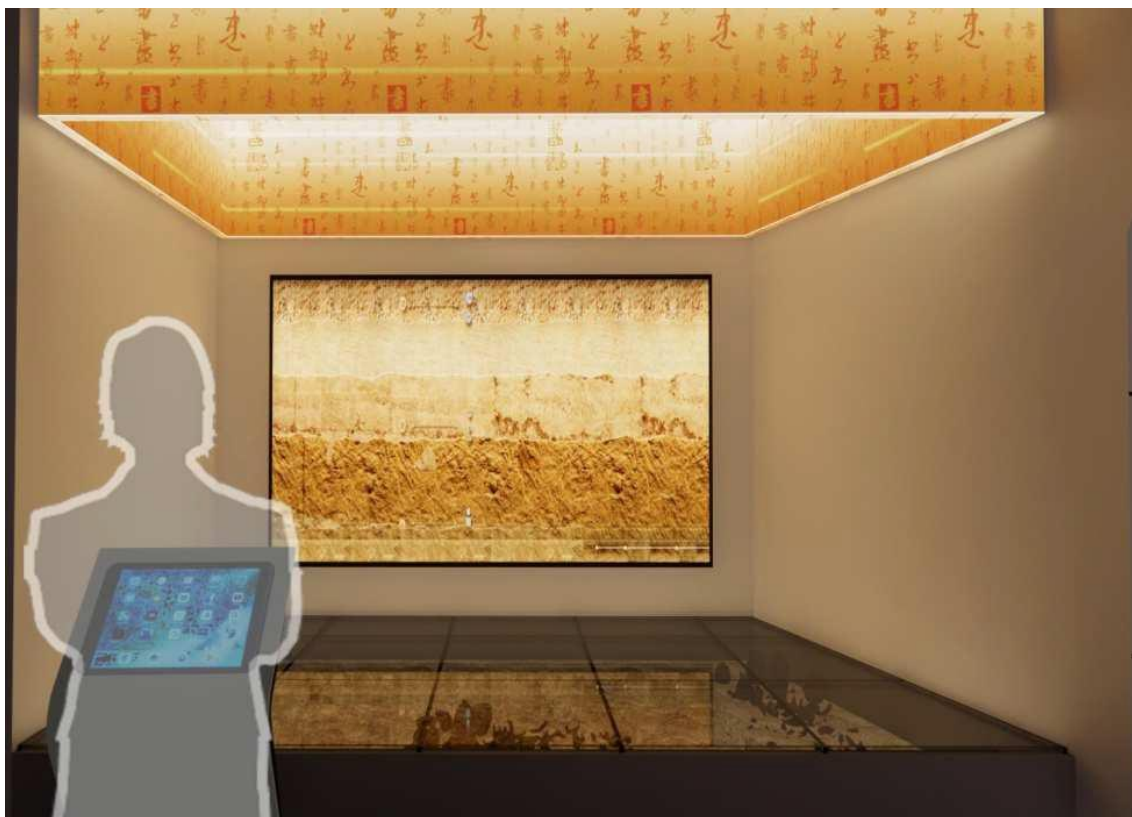


Figure 21: Huaibei Liuzi Ancient Canal Site Exhibition Area.

Through the scene model combined with objects, graphics and projection, a long picture scroll is displayed, which tells the kiln fire that has not been extinguished for thousands of

years, inherits the ancient and unique skills, and depicts the quaint oriental charm among the three colors. Under the mutual blending of Central Plains culture and Jianghuai culture, the slowly flowing Yinghe River nourishes this rich land, and breeds rich cultural heritage and colorful painted pottery (Figure 21).



Figure 22: Three-color painted pottery exhibition hall.

Tri-color depicting the characteristic exhibition area of pottery takes you to stop to understand that splendid culture and experience the visual feast with the most advanced interactive projection, virtual roaming and AR augmented reality. Using the somatosensory human skeleton capture technology, the projected picture on the wall changes and forms interaction when visitors walk by. In the form of content display, built-in LED light source highlights the key points of display. By querying the touch screen and triggering the mechanical device, you can observe and feel the skill of three-color pottery carving in the LED screen on the platform (Figure 22).



Figure 23: Viewing Area.

In this area, the space is dominated by immersive viewing experience, which crosses the dimensional space, and at the same time feels the original ecological insects and birds chirping audibly, which makes the craftsmen have a dull time for several years [14]. By watching a documentary, we can further understand the craftsmanship spirit of Jieshou colored pottery, which has been passed down for “Millennium inheritance, kiln fire never goes out” (Figure 23 and Figure 24).



Figure 24: 3D Virtual Reality Showcase.



Figure 25: Painted Pottery Craft Exhibition Area.

There are many painted pottery kilns in Jieshou. From its heyday to its decline, it has been revived and developed now. After generations of inheritance, Jieshou painted pottery is based on the simple rural folk customs and combines different regions and types of artistic styles. Although it has developed for thousands of years, it still retains the simple charm of

ancient times with its unique plastic arts and decorative arts [15]. It also formed the artistic characteristics of "simple and heavy shape, simple and vivid engraving, colorful glaze color, artistic and practical". Not only let visitors see the artistic style of the first painted pottery, but also let visitors feel the persistence and persistence of generations of painted pottery people (Figure 25).



Figure 26: Drawing Embryo Experience Zone.

The wheel of the times is rolling forward, and the first painted pottery in the world is constantly developing in innovation. The production of Jieshou painted pottery must go through the stages of mud selection, blank drawing, peeling, makeup, engraving, glazing and firing, during which it will continue to dry in the shade, and it will take about two months from the beginning to the completion. Set up the embryo drawing experience area (Figure 26) and the sculpture experience area, so that visitors can experience the difficulty of pottery-making skills from the perspectives of touch, smell and vision.

6. Design Conclusion

To sum up, if Jieshou Painted Pottery Museum is to have a broader development prospect, it is necessary to strengthen the application of digital interactive experience technology in the exhibition design of the museum, such as touch-sensitive display, virtual reality display, virtual imaging display, phantom imaging display, multimedia imaging system with browsing function, etc. This will not only make the exhibition methods more diversified and richer, but also create a new way of communication, which will integrate technology and art, to achieve such an experience effect. As a special kind of museum, the traditional non-legacy museum mainly tells the history, culture, customs, skills and other related contents of its own area, and introduces digital interactive experience technology into the museum, whose primary role is to enrich and improve the theme of the exhibition. This digital media can bring more sense of science and technology to the art form of the exhibition, make the exhibition more novel, unique, vivid and interesting, and can also effectively stimulate the interest and curiosity of visitors. For example, by playing video and music, visitors can more intuitively understand

the history of local cultural relics, the evolution of non-legacy skills and its cultural background, and leave a deep impression on visitors in the interactive environment. Unconsciously, visitors have narrowed the distance between themselves and cultural relics [16]. Using virtual reality technology, visitors can observe these cultural heritages from many different perspectives, so that they can have a clearer understanding of these cultural heritages. In the case of many exhibits and many people, people can learn about various exhibits in the exhibition hall through multimedia technology, to determine the tour route. "Integrating digital media with museum exhibitions to digitize the collection and display of cultural relics information can make the originally complex cultural relics information more concise and easier to understand, allowing audiences to more efficiently and intuitively understand the content of the exhibition, thereby deepening tourists' understanding of cultural relics." The museum exhibition under the digital interactive experience is the product of the combination of science and humanities. With the progress of the times, the museum exhibition methods will inevitably become more diverse. With the rapid development of science and technology, the application of digital media technology in Chen Zhong Museum Exhibition has become an inevitable trend, and how to practice diversified dynamic display in museum exhibition design should be given. For Jieshou Painted Pottery Museum, how to combine the cultural information of different countries in the world with digital interactive experience technology, to present its own unique historical, cultural and artistic stories, inspire everyone to pay attention to the inheritance of intangible technology and the protection of traditional culture, and finally achieve the propaganda and education function of special museums. Awaken national self-confidence with "physical objects" As exhibition designers of museums, we should always bear in mind our mission and the original intention of displaying cultural relics, properly and rationally use digital interactive experience technology, and present cultural relics information to the audience through interactive and interesting dynamic interpretation, to form more connections among museums, cultural relics and visitors.

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