

Study on the Spatial Design of Rural-Themed Exhibition Based on Digital Elements

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Abstract: *With the rapid development of informatization, people's quality of life has greatly improved. The policy of rural revitalization has become the most robust support for rural development, and digital village construction is also an essential part of rural revitalization. Exhibition halls serve as important carriers for regional cultural and spiritual heritage.[1] This design takes "peony" as its theme, focusing on a "people-oriented" approach, combining emotional design with modern technologies, and using a digital exhibition hall as a medium for a brand-new, technology-driven, and emotionally engaging exhibition space. This design aims to enhance the interactive experience between people and the space, foster coordinated urban-rural development, facilitate increased urban-rural exchanges, and enable visitors to share modern cities' political, economic, cultural, and ideological aspects with rural communities. This enables farmers to embrace new ideas and customs, thereby improving their overall quality of life. At the same time, it explores, protects, and inherits the traditional culture of Dongjiagou Village, thus promoting the development of rural culture and fostering a fresh, civilized rural social atmosphere. Through this updated design, visitors can not only experience the importance of building an ecologically sustainable and beautiful rural area in Dongjiagou Village but also immerse themselves in the slow-paced rural lifestyle and appreciate the sense of achievement and happiness brought about by rural revitalization. Ultimately, taking "rural revitalization" as the starting point, more people can gain insight into the past and present of Dongjiagou Village, along with the achievements made in rural planning and development.*

Keywords: *Digitalization, Emotional Design, Exhibition Design, Exhibition Spatial Experience*

1. Research Background

As a crucial element of rural revitalization, digital rural construction significantly strengthens the agricultural sector and promotes the revitalization of rural industries, talents, culture, ecology, and organizations. The rural exhibition area serves as a witness to the development of rural areas and the formation of folk culture. Exhibition halls represent a crucial material carrier of local culture and spiritual civilization, showcasing both the historical achievements and the inheritance of local cultural heritage.[2]

In the study of exhibitions, traditional formats have predominantly relied on static displays, resulting in a relatively limited and monotonous presentation style that hasn't fully met people's expectations. In recent years, with the continuous advancement of multimedia digital technology, there have been significant breakthroughs in the presentation format. By incorporating innovative interactive experiences, visitors' interest in the exhibition's content has been greatly enhanced. Digitization and information technology have emerged as the prevailing and future development trends in the study of exhibition halls.

Villages are vital carriers of historical, architectural, folk, and agricultural knowledge, forming the material foundation for the coordinated development of settlements and their surrounding environments. They also embody valuable insights into regional culture and ecological construction. Therefore, when designing a digital exhibition hall, it is essential to incorporate rural characteristics, ensure a visually appealing effect, enhance interactivity, and evoke emotional value that resonates with users, reflecting the countryside's unique ecological environment and humanistic charm. This research delves into the layout and structure of the digital exhibition hall, the application of technological facilities, and the representation of peony elements. The study takes the users' experience of the digital exhibition hall as the starting point, aiming to create a design consistent with national policies and public sentiments.

Additionally, it explores and investigates indoor public spaces, resulting in a refreshing and emotionally enriched themed exhibition hall.

2. Conceptual Analysis and Research Analysis

Rural Exhibition halls are distinctively characterized by their close ties to local folk customs and natural culture, as well as their strong emphasis on the inheritance of village history and cultural heritage. The design research centers around the peony theme and utilizes a digital exhibition hall as a medium to create a novel, technologically advanced, and emotionally engaging space. Currently, weak infrastructure and low living standards are prevalent issues in rural areas. Based on this analysis, the paper puts forward some policy suggestions on how to promote coordinated urban-rural development, enhance urban-rural interactions, and foster harmonious urban-rural progress. Tourists from the urban areas can spread information about the modern city's politics, economy, culture, consciousness, and more to rural areas, enabling farmers to adopt modern ideas and lifestyles, thereby enhancing their overall quality of life. At the same time, the excavation, protection, and inheritance of excellent rural traditional culture are also crucial factors in driving rural cultural construction and development.[3] During their tours and visits, people can gain a deeper understanding of the village through the exhibition hall, experiencing the importance of constructing ecologically livable and beautiful rural areas.[4] This contributes to greater achievement and happiness during the rural revitalization movement.[5] Inspired by the era of rural revitalization and evolving ideologies, the exhibition hall design showcases the village's history and characteristics, displaying the unique features that have emerged because of development and progress.

2.1. Needs Analysis

2.1.1. Subjects Analysis

As society progresses, people's spiritual life demands have been continuously increasing. Exhibition spaces, as comprehensive venues combining education, visitation, exchange, and leisure entertainment, have vast application potential. As shown in Figure 1 and Figure 2, the audience for exhibition halls is diverse, including children, teenagers, middle-aged, and seniors. Generally, it can be divided into professional groups, learners, and the general public. This includes tourists, industry experts, students pursuing specialized knowledge, and the general public.

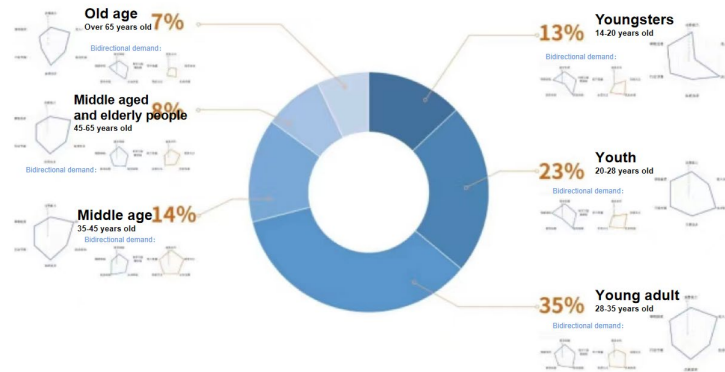


Figure 1: Research Subjects Analysis Chart.



Figure 2: Research Subjects Analysis Chart.

2.2. The Relationship between Digital Exhibition Space and Emotional Experience

2.2.1. The Concept of Digital Exhibition Space

Exhibition space refers to public spaces used to display works and convey the exhibition's theme. Based on the type of works displayed, exhibition halls can be classified into different types, such as technology, art, revolutionary history, and more. Integrating digital technology with emotional design makes the rural exhibition hall an essential public building in villages. By interpreting the characteristics and value of the exhibition hall and considering factors such as the historical and cultural aspects of the village, a unique local exhibition hall can be constructed. To a certain extent, the significance of exhibition halls goes beyond the presentation itself; it involves condensing and translating cultural expressions and historical connotations. This fosters a harmonious atmosphere by promoting the connection between visitors and the surrounding environment.

The digital exhibition hall combines modern high-tech and internet technology, utilizing digital technologies like VR (Virtual Reality) for presenting exhibits. This enables interactive experiences between the exhibition space and visitors, emphasizing the interactivity between people and the environment, thus enhancing visitors' multidimensional experiences. By employing various design methods, digital technology is integrated with exhibition themes, achieving an organic combination of people, machines, and space. A digital exhibition hall is a space that combines multiple multimedia technologies, presenting exhibits in diverse ways, including 3D virtual electronic sand tables, 360-degree circular screens, REAL TOUCH systems (3D interaction), interactive mirrors, virtual flip books, architectural renderings, interactive floor screens, interactive desktops, 3D animated promotional videos, and other formats.[6]

2.2.2. The Relationship between Exhibition Space and Emotional Experience

By incorporating emotional design into exhibition spaces, the presentation format is enhanced, emphasizing the interaction between visitors and the environment, their experiential feelings, and the emotional expression of the exhibition theme. This undoubtedly marks an improvement from traditional exhibition spaces. Designers must consider not only the exhibition's positive guidance for visitors but also how visitors' behaviour impacts the cultural dissemination within the exhibition space.

In a digital exhibition hall, the integration of emotional features is primarily aimed at balancing the harmonious relationship between people, machines, and the environment, as well as enhancing visitors' emotional experiences within the space, providing them with a positive emotional experience. The application of emotional interaction design in exhibition halls involves linking human emotions and thoughts with the exhibition display through interactive design, ingeniously blending emotional and interactive design in spatial planning.[7] Therefore, emotional interactive design in exhibition halls is based on human perception, facilitating the exchange and interaction between people, exhibits, and the exhibition space, resulting in the transmission of emotions and conveying spiritual information that satisfies emotional needs.[8] This leads to a mental connection between people and objects, evoking resonance, and effectively disseminating societal and cultural values, thereby providing a deeper understanding of the social and cultural context.

2.3. Understanding Peony as the Design Element

As China's national flower, peony holds a distinctive significance. Over the course of more than a thousand years, it has gradually developed a unique and harmonious cultural essence on both spiritual and material levels. In Dongjiagou Village, Dazhuangke Township, Yanqing District, Beijing, the "Peony Flower" also boasts a long history. It was planted during the Ming Dynasty and has been a witness to the peony cultural heritage in the Yanqing District for hundreds of years. By incorporating peonies into the exhibition hall's specific space, visitors can visually experience the allure of peony culture. This initiative plays a crucial role in unearthing, preserving, and passing on the cultural heritage of Dongjiagou Village, fostering the better development and enhancement of rural culture, ultimately transforming it into a civilized and culturally enriched countryside.[9]

2.4. Emotional Design in Digital Exhibition Spaces

2.4.1. Emotional Design Strategies

In digital exhibition spaces, using technology to present the environment often results in a cold and distant atmosphere. However, contemporary exhibition spaces place greater emphasis on human

experiential sensations and the interaction between individuals and the space. Therefore, incorporating emotional design into digital display spaces becomes highly essential.

Design of interactive scenarios. The setup of interactive design scenarios and scenes can help visitors immerse themselves in the exhibition space, enabling them to experience the intended meaning behind the exhibition. Through skillful environment rendering, the audience can enjoy the exhibit in a pleasant and enjoyable atmosphere, thus fostering a sense of comfort and appreciation.

Relevant equipment and technological products are maximally utilized in the venue. Technologies such as VR and motion sensing allow for interactive communication between visitors, exhibits, and the surrounding environment. They also encourage active engagement and enthusiasm among the audience, thereby effectively achieving scientific educational goals.

Evoking emotional response. Emphasizing the overall ambience of the environment is essential to achieve the goal of evoking emotions in visitors. In addition, during the interactive process, incorporating small surprises or games can encourage visitors to engage more actively, thereby evoking their emotions.[10]

2.4.2. The Principles of Emotional Design in Exhibition Halls

In the present day, with exhibition hall space design becoming more sophisticated, the audience's expectations for exhibition spaces are continually growing, with a greater emphasis on experiential and interactive themed displays. As a result, incorporating emotional design into exhibition hall spaces has become particularly important.

Principle of Amusement. In exhibition spaces, the principle of amusement is a crucial element. By integrating interactive installations with authentic characteristics into specific spatial designs, the aim is to create engaging tasks and activities that maintain visitors' interest at a high level. This approach enables visitors to experience a higher sense of value and achievement.

Principle of Education. Additionally, with the advancement of technology, various interactive elements have been incorporated into exhibition halls, allowing visitors to "learn while having fun" and obtain more information. These aspects are equally significant.

Principle of Emotion. In the design of exhibition halls, it is essential to integrate local cultural traditions and create distinct characteristics that resonate emotionally with visitors. By fulfilling their emotional and interactive needs, we can improve their overall satisfaction, moving beyond mere interaction experiences, and fostering a deeper, rational appreciation for the exhibition hall's design content. This, in turn, enhances the spiritual and cultural expression of the exhibition space.

3. Space Design of Rural-Themed Digital Exhibition

3.1. Overview of the Design Theme

This design centers around the peony flower theme, creating a new, high-tech, and emotionally immersive space through the form of a digital exhibition hall. As shown in Figure 3, the peony, when in bloom, exudes elegance, beauty, dignity, and nobility. Dongjiagou Village currently cultivates various peony varieties, characterized by large, vibrant, and graceful blooms. Not only do they symbolize people's well wishes, but they also represent hopes for prosperity and abundance in the future. In order to meet the demands of sustainable rural revitalization, this design fully explores the peony flower's perfect decorative appearance and its symbolization of wealth and auspiciousness. By integrating these elements with the design concept of the exhibition hall, visitors are offered a more enriching visual experience and an immersive sense of participation. Moreover, it allows them to gain a deeper understanding of the local history and culture, thus fostering the development of the rural economy.

3.2. Design Concept Analysis

3.2.1. Design Rationale

The artwork is themed around "peony," deconstructing it into three elements: "flower," "pistil," and "leaves." The flower part is evolved into pattern designs, decorating walls and small areas. The pistil part is transformed into decorative lighting patterns, which enriches the visitor's viewing experience. The leaves are artistically evolved into decorative designs, unifying the pattern style while expressing a unique artistic essence.

3.2.2. Concept Analysis

Peonies have naturally grown in China for thousands of years. During the Northern and Southern Dynasties, they were cultivated as ornamental plants and gained popularity due to their dual value in both aesthetics and economy. Peony elements serve as visual symbols in peony culture, and their unique beauty and symbolic significance represent the collective visual memory and aesthetic standards of the public. The design of this exhibition hall takes inspiration and enlightenment from the peony flower, which has a history of thousands of years in our culture. It explores the perfect decorative forms and auspicious symbols of prosperity, then incorporates them into the design, seamlessly blending them with contemporary design concepts. As shown in Figure 4, the result is a perfect fusion of the millennia-old peony culture and modern design principles in this exhibition hall.

By building upon traditional decorative elements, this design incorporates modern design concepts, simplifies, and reconstructs them, resulting in a concise, practical modern design work. It seamlessly blends with traditional decorative elements, giving it a dual characteristic of both tradition and modernity. As shown in Figure 5, by extracting and reinterpreting the peony elements, this design achieves an organic fusion of traditional cultural significance and contemporary aesthetic forms. It meets people's material needs while adding abundant cultural and spiritual value, achieving new heights in decorative and aesthetic value.[11]. In terms of design techniques, the approach involves breaking down and evolving the peony flower's form, aligning it with the design theme to create a completely new visual experience. Centering around the theme of "Peony", the design features a sensory approach that draws inspiration from the enchanting allure of peonies in the Dongjia Gou village. It aims to present the unique cultural heritage and artistic charm of the "Hometown of Peonies".

3.3. Space Design Proposal

3.3.1. Design Blueprint

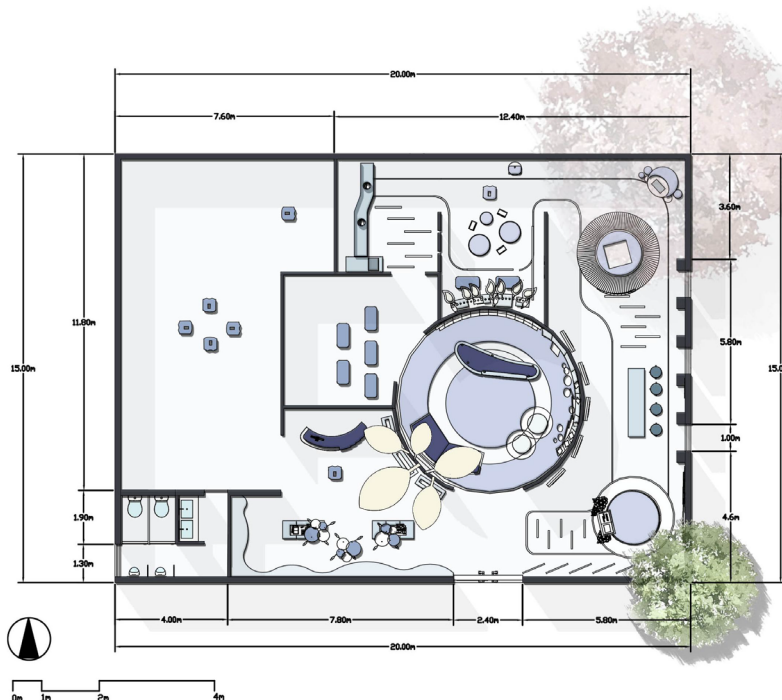


Figure 3: Design Blueprint.

3.3.2. Elevation Drawing



Figure 4: North Elevation Drawing.



Figure 5: South Elevation Drawing.

4. Conclusions

As an essential embodiment of culture and spiritual civilization, the rural exhibition hall plays a crucial role in inheriting and showcasing local culture. By adopting a human-centered design approach with digitalization and integrating emotional design principles, we conducted on-site research and analyzed the user groups to summarize the cultural characteristics and historical context of Dongjiagou Village. Modern technology and emotional design principles were incorporated into the space design of the exhibition hall. Regarding the exhibition content, we focused on presenting the historical and cultural heritage, regional customs, and beautiful rural development in the new era. The objective was to fully immerse the audience in the village's developmental journey, bringing together distinct and finely crafted cultural and creative products. Our efforts aimed to expand sales channels, increase farmers' income, and promote digital rural development, all while enhancing visitors' experiences and deepening their understanding of the rich historical and cultural heritage. This design approach also aligns with the strategy of rural revitalization and reflects the significance of digital spatial design.

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