

Research on the Integration of Interactive Experience and Spatial Narrative in Immersive Digital Display Design

Meishan Cheng^{1*}

¹ Art and Design College, Wuchang Shouyi College, Wuhan, China

Email Address

1257921667@qq.com (Meishan Cheng)

*Correspondence: 1257921667@qq.com

Received: 24 June 2025; Accepted: 12 August 2025; Published: 26 September 2025

Abstract:

Immersive interactive experience is dedicated to handling the relationships between people and space, and between people and things. Display design should focus on the practical value of the displayed objects and provide a better experience for the audience. Throughout the entire process of display design, immersive experiences for visitors and the presentation of exhibition works play an important role, and immersive interactive experiences will provide viewers with. Therefore, in the process of exhibition design, the concepts of interactive experience and spatial narrative are elaborated. In the context of immersive experience, modern technology is introduced to integrate various artistic techniques, forming a design method that combines art and technology.

Keywords:

Display Design, Immersive, Interactive Experience, Space Narrative

1. Introduction

Immersion, as the name suggests, refers to being completely immersed in water, used to represent a person or thing that is completely immersed in a certain thought activity and environment. Nowadays, it refers to a person focusing all their attention on one thing. From the perspective of exhibition design, the core is to make the audience feel like they are there when watching an exhibition. It emphasizes the core of human beings and highlights their central position. In such an environment, exploring the integration of interactive experience and spatial narrative in immersive digital display design can affect the psychological experience of visitors during their visit and achieve the goal of immersive experience. [1]

2. Overview of Interactive Experience and Spatial Narrative

2.1. Interactive Experience

Interactive experience is an important value, which refers to the emotional experience of users during interaction. Emotion, as the central element of human

reason and cognition, plays a crucial role in establishing credibility and can bring people a unique immersive experience. The interactive experience is a dynamic process generated through real-time interaction between users and the system, achieving a transition from linear to non-linear narration through digital media, and transforming from time to space through cross media means. The key lies in the interaction between users and stories. In interaction, users will subconsciously convey an actively involved emotional experience, that is to say, they will be attracted by the plot and fully integrate themselves into the development of the plot, allowing users to actively immerse themselves in the plot and obtain a deeper sense of immersion. From this, it can be seen that the principle of interactive experience plays a significant role in promoting and facilitating cultural development and inheritance in creating immersive experiences. Display design itself can be seen as a narrative object with regional characteristics. Through various narrative media, digital narrative scenarios are constructed in the device experience, thereby promoting physical activities of subject object interaction in the narrative, and better achieving the integration of human cognition and immersive experience.

2.2. Spatial Narrative

The narrator transforms the perceptual experience into a spatial story, and the receiver obtains the meaningful experience of the ‘present moment’ through physical participation. Under the interaction between these two individuals, some kind of activity occurred in this space. Therefore, “spatial narrative” is not only an “event experience” in the “action process”, but also an “experience field” for the participants’ expectations, participation, and influence on the “overall experience”. Individuals form spatial associations that are present, concrete, and interactive through their perception of ‘things’. In the process of narration, the connection between “things scene people” constitutes a spatial relationship, making the narrative parallel. Therefore, the spatial construction of spatial narrative consists of three levels: spatial interaction between “virtual” and “real”, “behavioral construction”, and “interaction of consciousness and emotion”. “Spatial narrative” is a complex process from perception to emotional connection, from memory sedimentation to semantic construction.

3. The Importance of Integrating Interactive Experience and Spatial Narrative in Digital Display Design

In recent years, due to the innovation and application of technology, more museums have used various technological methods such as holographic projection, interactive projection, virtual reality, etc. to construct digital interactive spaces. This has had a huge impact on the traditional exhibition design mode, creating an immersive atmosphere for visitors and enhancing people’s cultural experience.

3.1. Enhancing Interactivity and Participation

Modern digital technologies such as augmented reality, virtual reality, touch screen interaction, etc. can break through the limitations of traditional static displays and provide visitors with a more direct and interactive visiting experience. In addition, the design of realistic displays can give visitors a sense of immersion. Through multi-mode interactive immersion, the reasonable layout of the exhibition hall and the continuation of the plot are ensured, enhancing visitors’ grasp of the exhibition content and deepening the excavation of cultural relics. In addition, designers need to

determine the narrative subject, increase the interest of this topic, start from the age structure, cultural characteristics, and cognitive needs of the audience, improve the accuracy of the spatial position of the narrative theme, and follow the principle of gradual progress to provide appropriate guidance to the audience, in order to promote the purpose of cultural inheritance.

3.2. Enriching Display Design Forms

Due to the constraints of time and space, the current display format is mainly in a static form. In contemporary times, exhibition and display have become a separate form of art. The display design of immersive concepts is closely related to the temporal and spatial background of visitors. In the current environment, the exhibited works demonstrate a strong spirit of inclusiveness, presenting a very open and free style in both design form and material. Digital interactive design breaks through the limitations of the past, allowing viewers to immerse themselves in different situations and interact with exhibits in virtual contexts. It can not only enrich the visual experience of the audience, but also make the exhibition itself more attractive.

3.3. Promoting the dissemination of traditional culture

Digital interactive design is a new way of communication that can showcase and spread traditional culture more. By utilizing technological means, museums can create a new way of exhibition, breaking through the limitations of time and space, creating a more convenient environment for cultural exchange, enabling more people to use smart devices for online viewing, establishing communication between different cultures, and enhancing the dissemination and influence of Chinese culture worldwide. Starting from the specific scene space, using sound, light and other technologies, a virtual scene is constructed to stimulate the audience's perception through visual and auditory means, improve the interactive effect of the experience, achieve the goal of thinking resonance, and lay the foundation for the inheritance of cultural stories. In this process, it is necessary to enhance the innovation level of display methods, ensure fun, guide visitors from multiple aspects, so that visitors can perceive the design content of the creators, immerse their whole body and mind in the feeling of the exhibits, determine the cultural background and artistic connotation contained in them, and enhance their attractiveness to the public.

4. Strategies for Integrating Interactive Experience and Spatial Narrative in Immersive Digital Display Design

4.1. Adhere to design principles and clarify interaction design requirements

Digital interactive design is not simply about introducing new technological methods, but should be presented and designed in a more immersive and realistic way. Design principles centered around user experience. The ultimate goal of the exhibition is to provide visitors with a wonderful humanistic experience. So, user experience should be our starting point and destination. When conducting overall planning, it is necessary to fully understand the needs and preferences of the audience in order to create a cultural atmosphere that is closer to life. In order to enhance the user experience, museums should strengthen market research on users, classify them according to different groups of users, grasp their cultural needs, and integrate them with the characteristics of exhibits to ensure that the digital experience matches the user experience. In addition, during the exhibition, various advanced technological

methods should be used to continuously collect various information, grasp users' opinions on different exhibits and display methods, and make corresponding adjustments to the design to ensure that visitors can easily interact with the exhibits and gain a deeper cultural experience.

Process adaptability design. In digital interactive displays, in order to ensure the visual experience and display effect of visitors, it is necessary to fully consider the compatibility of technology. This adaptation includes both software and hardware compatibility, as well as the performance of the software platform. At the same time as introducing technology, it is necessary to strengthen its hardware facilities and timely apply them to different exhibition objects to ensure that visitors of different levels can smoothly participate in the exhibition; On this basis, further improvement of the system's functionality is needed to ensure efficient operation of various operating systems, provide visitors with intelligent interactive experiences, and maximize the guarantee of showcasing creativity.

The design concept aimed at creative interaction. Museums should continuously explore the potential application of contemporary technology, expand the boundaries of technology application, actively promote the integration and innovation of digital technology, combine exhibition needs, develop new digital interaction methods, and bring unique interactive experiences to visitors.

4.2. Highlighting cultural themes and strengthening spatial narrative planning

In digital exhibition halls, the spatial layout not only affects the browsing experience of visitors, but also has a significant impact on the transmission of exhibition content. In digital interactive design, designers should strengthen the layout of digital exhibition halls based on space, consciously embed interactive devices into them, provide visitors with the best visiting route, and ensure that each exhibit can be fully noticed. For example, in order to showcase the profound history and rich archaeological achievements of the local area, strengthen citizens' awareness and attention to cultural heritage, the idea of "thematic" division has been adopted. Through the planning of digital exhibition halls, reasonable spatial planning has been achieved, ensuring that visitors can closely communicate with archaeological relics along the optimal path.

In digital interactive design, the idea of storytelling should be the foundation, combining different media such as audio, video, and images, consciously integrating various factors to create a rich and engaging virtual space, deepening the emotional connection between visitors and cultural relics. The digital exhibition hall is equipped with fun interactive devices, placing various scenes freely in related "treasure boxes". Tourists can open the boxes, see prompts about ancient culture, collect every card in the "treasure box", and start an amazing discovery. It also allows the audience to feel the cultural heritage and unique charm of the ancient city. This digital interactive design, through narrative form, allows tourists to have a comprehensive and profound understanding of the development achievements in various fields such as architectural planning, canal management, economic construction, cultural development, and social livelihood of the capital of the Yuan Dynasty under the leadership of cultural celebrities. It allows tourists to immerse themselves in the grandeur and glory of big cities, learn more cultural connotations, and obtain an immersive cultural experience.

4.3. Introducing interactive devices to attract audience immersion and participation

Introduce interactive devices into the display space. (1) Folding screen cinema. By precise projection synthesis, three or more screens are perfectly connected together to form a huge and ultra wide field of view, giving viewers a strong visual impact. (2) Immersive projection technology. This technology is based on the theory of holographic stereoscopic projection, combining projectors, control consoles, fusion software, sound systems, and custom materials to create a stereoscopic projection space, allowing visitors to enter this virtual world, breaking through the limitations of time and space, and enhancing people's cultural experience. (3) Holographic projection system. The system adopts a stereoscopic projection based image processing method to create realistic 3D images in the air, allowing visitors to freely surround and watch, and have the feeling of "holographic" reproduction of the subject. While preserving cultural heritage, achieve a comprehensive visual experience; (4) Interactive demonstration. Can switch between interactive and automated modes to meet the needs of various audiences; Wall interactive projection, which captures the behavior of participants through filming devices and integrates it with the interactive system to generate dynamic feedback, allowing participants to better feel the mysteries and historical and cultural development process, and improving the auditory and visual perception of tourists.

In the design style of exhibition halls, immersive interactive experience is composed of elements related to immersive display, which greatly transforms the design style of exhibitions. Compared to traditional display methods, this display method can better reflect a better decorative effect. This immersive element draws on a lot of content related to folk customs and aesthetics, greatly catering to the aesthetic needs of the current public, and can bring the audience into a suitable atmosphere, enabling the role of the displayed design style to be realized.

5. Conclusions

Empowered by technology, digital interactive design not only brings new vitality to display spaces, but also enhances viewers' immersion and experience. In the future, we will further explore the potential of technology application, continuously optimize the content and interactive experience of display design, create more outstanding digital display design solutions, and provide high-quality public cultural services for the people.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

References

- [1] Lu, R.C.; Li, X.H. Analysis of Digital Interactive Design for Museum Display and Exhibition. *Chinese Museum*, 2023, 02.
- [2] Wang, P.P. Exploration of Digital Interactive Design for Museum Display and Exhibition Cultural Relics. *Appraisal and Appreciation*, 2024, 02.

- [3] Song, Z.J. The application of new technologies in the design concept of cultural and museum exhibitions. *Collection*, 2024, 11.
- [4] Li, Z.H.; Xu, J.Y. Research on the Application of Digital Technology in Museum Display and Exhibition. *Building Science*, 2025, 05.
- [5] Yan, X.L. The dilemma and breakthrough of museum exhibitions. *Cultural Relics Appraisal and Appreciation*, 2025, 11.
- [6] Lin, L. Analysis of design ideas of intelligent interactive experience in museum exhibition and display under the Internet background. *China National Expo*, 2024, 20, 241-243.
- [7] Fang, L. Design and Implementation of Intelligent Interactive Experience in Exhibition Display: A Case Study of Museums. *Collection*, 2024, 06, 131-133.
- [8] Chen, S.N. Exploration of Exhibition Design in Museums from the Perspective of Intelligent Interactive Experience. *China Ethnic Expo*, 2023, 18, 256-258.
- [9] Zhu, W.H. Discussion on the Design of Intelligent Interactive Experience in Museum Exhibition Display. *Cultural Relic Appraisal and Appreciation*, 2022, 18, 85-88. DOI: 10.20005/j.cnki.issn.1674-8697.2022.18.022.
- [10]Xue, C. Space Display Design Based on Interactive Experience. *Building Structure*, 2022, 52(12), 159.
- [11]Luo, Z.Y. Research on Interaction Design in New Media Display Design. *Science and Technology Information*, 2021, 19(11), 32-34. DOI: 10.16661/j.cnki. 1672-3791.2011-5042-7466.
- [12]Wang, Z.Y. Research on the Application of Interactive Design in Display. *Art and Technology*, 2016, 29(12), 86.



© 2025 by the author(s); licensee International Technology and Science Publications (ITS), this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (<http://creativecommons.org/licenses/by/4.0/>)