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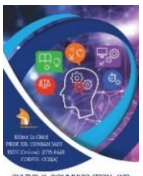

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REVIEW ARTICLE

APPLICATION ANALYSIS OF DIGITAL DISPLAY DESIGN BASED ON DESIGN PRACTICE

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ABSTRACT

In recent years, with the gradual maturity of digital technology, its application in various exhibitions and displays has become increasingly widespread. The use of digital display technology can not only compensate for the shortage of library resources, but also enhance the interaction between the audience and the exhibits, telling the story behind the exhibits more vividly. This article analyzes the transformation from the application of digital display technology to a comprehensive discipline, stepping onto a new platform of technology, interaction, and openness. Space design forms a manifestation of a social innovation system, becoming a powerful driving trend for social development. Digital experiential display design focuses more on the audience's evaluation of the display, and only by designing based on public awareness can we better elevate from experiencing basic emotions to experiencing complex emotions, until the final emotional construction and digital experiential display design grasp the balance between education and experience, so that the experience can better serve education and achieve the true purpose of the experience. The aim is to provide new ideas for the better application of digital technology in design practice in the future, lay a digital foundation for the construction of smart displays, enhance the audience's sense of cultural gain, and fully leverage the educational and guiding role of digital displays.

KEYWORDS

Design Practice; Digital Display Technology; Interaction; Application

1. INTRODUCTION

With the rapid development of modern science and technology, a large number of digital display methods have been increasingly applied in exhibition hall exhibits and related research fields. The development and promotion of digital exhibitions in exhibition halls have achieved significant results (Yang, 2019; Yan, 2020). The British Museum in London, UK is one of the earliest museums to use digital display technology in their exhibitions. They applied digital display technology to the research and display of typical classical architectural sculptures in Europe, solving and analyzing the internal structure of buildings. Viewers can gain a more intuitive understanding of the structural relationship between architecture and sculpture through exhibitions, and gain a comprehensive understanding of the manufacturing process. In the digital age, the digitization of exhibits and exhibition information in exhibition halls, as well as the digitization of exhibitions, will have a profound impact on the development of digital technology and the expansion of exhibition hall educational functions. The "Globe Digital Museum" program, co sponsored by IBM Japan College and the Museum of Ethnology, uses digital technology for online searching and browsing museum collections, provides audiences who cannot reach the museum site with an understanding of cultural relics collection, and enhances the educational function of the museum. The University of Virginia in the United States has used digital technology to reconstruct the digitized ancient Roman city by producing 6700 restored maps of ancient Roman city architecture through technological means. The Michelangelo Sculpture Digital Project at Stanford University in the United States has provided a good starting point for digital display design.

There is still a lot of room for improvement in the development of digital display design. Although digital display design started relatively late in China, the advantages of Chinese population base provide a huge market for digital display design. At present, there is a lot of academic research on the construction of digital exhibition halls, focusing on cultural relic protection, enhancing educational significance, and displaying large exhibits (such as architecture, sculpture, etc.). In terms of digital display technology, practice is the first criterion for testing truth, and design is based on practice. Theoretical research that deviates from practice leads to the lack of persuasiveness in research content, We should discuss and research specific digital display design theories and methods, pay more attention to the form and content of display design, and all designs should be based on the criteria of conveying the cultural belonging and era atmosphere of display activities (Yang, 2009).

However, as the main body of visitors, the audience visits, comprehends, and experiences the displayed content. As a result, the displayed information is transmitted from the exhibits to the audience's mind. Therefore, fundamentally, the audience is the main research object in exhibition hall design. In the design of exhibition halls, a more humanistic and emotional display space is the only way to bring a better immersive experience to the audience (Li and Zhang, 2022; Xu and Xu,2022; Kong, 2022). The support of new media technology is essentially aimed at better meeting the audience's demands for "humanities" and "emotions". Therefore, in future digital display design, the audience should be the main body of the design, and attention should be paid to the reasonable display of humanities and emotions. This article combines theoretical knowledge related to design practice to study the digital display work and related technologies of these museums, explores new ideas focused on the development of digital display design, and discusses the problems and misunderstandings of digital display technology in design practice. On this

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basis, it is hoped that it will be beneficial for the construction of digital display technology and even design practice in the future.

2. A Brief Introduction to the Design Practice of Digital Display Technology

The main purpose of display design is to convey information or experience to the audience. As the most basic medium for receiving information for humans, the five senses generally refer to the eyes, ears, mouth, nose, and touch. Their perceptual ability determines the presentation techniques of display design, as shown in Figure 1. For people with sound physiology, vision is the foundation of all cognition. Therefore, traditional display design focuses more on the visual display effect, followed by hearing, taste, and smell. Tactile perception was gradually recognized by designers in later display design, but human cognitive level is a comprehensive dimension that combines multiple levels based on human five senses. The comprehensive dimension can also be a person's sixth sense, which is the comprehensive sensory ability in cognitive psychology (Zhou, 2015). When the five senses work together on the audience, the sixth sense and deep spiritual experience are formed. Western philosophy sums up this experience as the ontological consciousness in the sober state (Kant, 1994). This dimension can be regarded as the complete boundary of experience cognition and the end point of epistemology. The development of display design can only truly meet the audience's demands for exhibitions through a deeper level of spiritual experience, which is also an inevitable trend in the future development of display design.

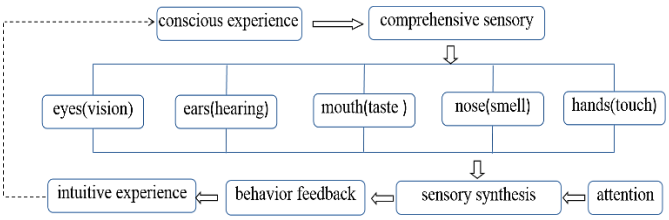

Figure 1: Shows the experience hierarchy in design

In the continuous growth of digital display technology and immersive display design. Interactivity has also become a step that cannot be ignored. With the continuous improvement of direction sensor, motion capture, gesture tracking, research tracking, gyroscope, multi-touch, gravity sensing and other technologies, the audience will have more choices in media, such as mobile phones, computers, VR glasses, Kinect and so on, so that they can make good choices. When arranging the display route, the designer can guide the audience to visit the main line while also arranging multiple auxiliary lines for the audience to choose from. The main and auxiliary exhibition lines have different display contents, both of which are the points of interest for viewing. The audience participates in a process similar to a game experience as explorers, and the designer arranges each point of interest in various parts of the exhibition for the audience to discover and explore. With the continuous increase in the functions and technologies of interactive media, the forms of interaction are constantly being explored (Guo and Gao, 2016).

3. Application Analysis of Digital Display Design in Design Practice

3.1 Transformation Towards Comprehensive Disciplines

3.1.1. Characteristics of Comprehensive Disciplines

Due to the inherent needs of the development of display design, the definition of display design is no longer solely focused on exhibition design. The ultimate purpose of display is the transmission of information, inspiring people's thinking through transmission, and meeting people's social life needs. Digitalization of display serves as a bridge between exhibition and audience, and is transforming display design from a relatively independent and single discipline to a discipline composed of display design, film and television animation, psychology The transformation of a comprehensive discipline that integrates multiple directions such as ergonomics, visual communication, computer science, literature, and intelligent control has led to a diversified team structure and a more diverse design team structure. The design activities are no longer centered around display space designers, but are jointly completed by various industry teams such as display space designers, screenwriters, game planning, digital technology implementation, and programming, In order to achieve the purpose of "experiential" display, digital display design is not just about converting physical exhibition halls into digital form, but its changes should be revolutionary.

3.1.2 The Transformation of Decentralization

With the development of new technologies and new ideas such as the Internet of Things, the Internet, artificial intelligence, big data, etc., the entire exhibition industry is also undergoing a fundamental transformation. The society is transiting from a industrial society to a network information society. The social production mode, movement mode, time-space relationship, lifestyle, etc. have changed. The role of display design is also changing Space design and other design activities centered on display and space design have been transformed into a system integrating digital design, experiential design, interaction design and other design fields. Display design is no longer a traditional form of "making cars behind closed doors", but has embarked on a new platform of technology, interaction and openness. Space design has also been separated from the traditional design space, forming the embodiment of a social innovation system, Becoming a powerful driving force in society.

3.2 Deep Emotional Experience

In the Introduction to Psychology, emotions are divided into basic emotions and composite emotions. Psychologist Robert Prachek divides basic emotions into the following eight types: expectation, happiness, trust, fear, surprise, sadness, disgust, and anger. These emotions are interconnected, and the adjacent two emotions form a new complex emotion, namely love, submission, fear, disappointment, regret, and contempt (as shown in Fig.2).

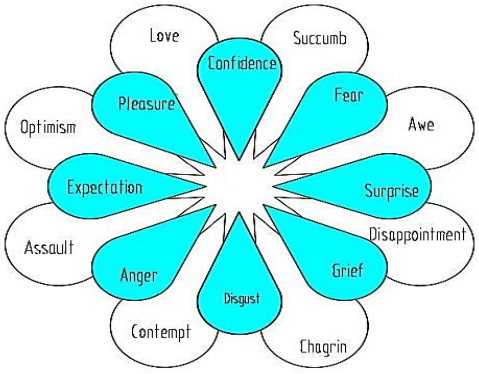

Figure 2: Robert Prachek's emotional classification (simplified)

The current digital experience display technology can already enable viewers to experience changes in basic emotions, but the ability to express complex emotions still needs to be explored. Emotions are built on basic and complex emotions, and are subjective experiences that are related to human and social needs, and are also the highest form of experience (Guo, 2022; Xia and Hunag, 2022). The evaluation emotion theory proposed by psychologists Arnold and Lazarus suggests that people's evaluation of things is related to emotions, and their cognition and evaluation can influence people's interpretation and response to emotions. When a person evaluates the perceived object as beneficial, they will experience convergence and corresponding physiological reactions. When a person evaluates the perceived object as harmful, they will experience avoidance and corresponding physiological reactions. When people evaluate their perception object as unrelated to themselves, they will experience indifference and neglect it. Digital experience display design, with the permission of technical conditions, pays more attention to the audience's evaluation of the display, and designs based on public cognition can better elevate from experiencing basic emotions to experiencing complex emotions, until the final emotional construction, which is the highest expression method of the experience.

3.3 Balance Between Education and Experience

3.3.1. Integrating Education into Experience

Digital experience exhibition design does not always attach importance to experience. Although experience, as an important factor of exhibition design, has been recognized by many designers, exhibition design still has an educational function. The exhibition hall will also become an incubator for sharing knowledge and thinking enlightenment. Through experiential learning, the habit of active exploration and active learning of the audience will be cultivated to form flat data The new learning mode created by the "interconnection" between information and behavior. The limited increase in new technologies, materials, and tools has led to the continuous upgrading of educational vehicles, helping the audience communicate with the displayed content and better understand and learn.

Therefore, the relationship between experience and education should be correctly placed, and education should be integrated into the experience. Only in this way can the experience be meaningful and the display be valuable.

3.3.2 Situational learning

Under the situational education mode, rich experiential forms can regulate the emotions of the audience, stimulate learning interest, and to some extent assist in the educational purpose of display design. Digital experiential exhibitions fully utilize the promoting effect of experience on education. Combined with practice, it has been found that environmental atmosphere and visiting methods can effectively enhance the fun of display content and attract enthusiastic participation from the audience. But if the exhibition hall only serves the audience through experience, the nature of the display will change, violating the fundamental goal of the display. Therefore, digital experiential display design needs to balance education and experience, so that experience can better serve education and achieve the true purpose of experience. The integration of education and experience brings opportunities to explore new fields while providing audiences with new knowledge; Pay attention to guiding the audience to discover problems, propose and solve problems, stimulate their creativity, and provide them with personalized and creative new opportunities, creating a more reasonable and comprehensive learning environment for the audience.

4. Conclusion

Although our school is currently in an era of explosive display technology, display technology cannot exist as the main display itself. Technology can only serve as an auxiliary tool to express display content and ideas. We should pay more attention to the presentation of display content and dissemination of culture, and not simply consider the application and expression of technology. We should pursue technology unilaterally and apply more digital technology to exhibition halls, leading to the abuse of display technology, It can only make the exhibition appear superficial and the content is scarce and weak. Only by confirming the primary and secondary relationship between display technology and display content can we better grasp the focus and main content of digital display.

The exhibition business in display design occupies the dominant position, and digital display can only be used as a means of display, not the entire display. If it is necessary to test the rationality of the use of digital display technology in exhibitions, it cannot be unilaterally considered from the perspective of design researchers. It should be found from the interests and feedback of the audience, conduct surveys among the audience, grasp their needs, and clarify the focus of communication, More detailed, specific, and targeted requirements for the application of digital display technology can even encourage audiences to choose display forms based on their personal preferences, meeting the different needs of different audiences for display design. In order to continuously improve the means of digital display and apply digital display technology to a broader field.

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