

# Analysis on the improvement direction of display cabinets and lighting in the display of art works in art museums

Guo Tingyuan<sup>1,a</sup>, Yu Bo<sup>2,b,\*</sup>

<sup>1</sup>Department of Watercolor, School of Painting Art, Lu Xun Academy of Fine Arts, Shenyang, China

<sup>2</sup>School of Painting Art, Visual Communication Art Design, Lu Xun Academy of Fine Arts, Shenyang, China

<sup>a</sup>156943756@qq.com, <sup>b</sup>811280273@qq.com

\*Corresponding author

**Abstract:** An art museum is a place for collecting and displaying works of art. Its main purposes are research, education, and appreciation. The art museum must not only meet the needs of exhibitions, but also bring a good visual experience to visitors, so it must create good visual effects, and the display cabinets and lighting environment are directly related to the visitors' viewing experience. The main function of the showcase is to ensure the safety of the exhibits, focusing on its practicality, beauty and intelligence. With the advancement of display cabinet technology, the overall operation capabilities of modern display cabinets are getting stronger and stronger, and the opening methods are becoming more and more convenient. The basic design requirements are that the showcases are detachable, reusable, and flexible, and can be designed according to different display themes and the number and characteristics of exhibits. The multifunctionality of showcases, enhancing their artistic effects and immersive interactive experience, and improving their recycling rate are the practical needs and development trends of contemporary showcase design. The expression forms of exhibition spaces are becoming more and more diverse and diversified. Lighting design must not only meet the needs of lighting and decoration, but also meet the visual comfort and emotional needs of the audience. By analyzing and summarizing the influencing factors of visual comfort of exhibition space lighting, we established exhibition space lighting design guidelines based on visual comfort. The goal is to improve the lighting quality of the display space and create an emotionally resonant visual experience in the display space. Therefore, creating a good visual atmosphere for the audience is the development trend of gallery display space lighting design in the future.

**Keywords:** art museum; display furnishing design; showcase; display showcase; exhibition lighting

## 1. Introduction

In recent years, as the cultural industry has gone abroad, art museums, as a stable and systematic organization and exhibition of art works, are a symbol of a city's development level and a symbol of social development. It is also a public space in a modern city and a place frequently used by people. The development methods of display cabinets need to be improved urgently, and they should be upgraded to detachable, movable, and sustainable display cabinets to improve the visitor experience and ensure the safety of exhibits. And carry out scientific operation of the lighting of the museum to improve the quality of lighting design to ensure the service quality of the museum. In modern art museums, visual comfort is an essential factor. This topic takes the audience's visual perception as the starting point to study the display cabinets and lighting issues in the exhibition space of the museum, with a view to providing a certain theoretical basis for the construction of the visual comfort evaluation system of the museum, and also for future art Provide reference for display design.

## 2. Art Museum Definition

### 2.1. The difference between art galleries and museums

Our country's museums and art galleries belong to different departments, art galleries are usually organized by cultural departments, and their collections are mainly modern and modern art, while

museums are usually organized by cultural relics departments, and their collections are mostly historical and archaeological museums. So there are differences between domestic museums and art galleries. However, due to name confusion, for example, the Shanghai Modern Museum is actually an art museum, so it cannot be distinguished by title. Art galleries have various names, such as "museum", "art museum", etc. The most commonly used name is "art museum". The term "art museum" originated from the West. The concept of modern Western art galleries and museums mentioned by Cao Yiqiang was introduced to China in the late Qing Dynasty.

### ***2.2. concept branch of art museum***

There are two branches under the concept of "art museum". Gallery and art museum. The former is engaged in the commercial sale and purchase of collections and is not a non-profit museum; the latter is a subtype of museum, and is similar to history museums, memorial halls, and science and technology museums. It's the same concept.

## **3. Current situation and development of art museums**

### ***3.1. Social functions***

The social function of the art museum is to display and collect works of visual art, provide public education and preserve classics. Art galleries not only provide visual enjoyment, but also guide people through aesthetic guidance. The museum's display range includes paintings, sculptures, photography, illustrations, installations and craft works.[1]

### ***3.2. Main objectives***

Art galleries protect and display artworks, and sometimes hold art activities, such as art salons and academic lectures. At the same time, it is also responsible for the education and research of publicity and popularization of culture, and is the cultural symbol of the city. Art museums can effectively activate and enrich the artistic and cultural atmosphere of the city, inject foreign culture, and inject vitality into the prosperity and development of the city's literature and art.

### ***3.3. Future evolution***

The art museum retains regional characteristics and cultural differences, enhances the cultural identity and sense of belonging of urban residents, and adjusts to the ecological and social environment brought about by globalization. Art museums are the foundation of cultural innovation and an important place for the production, dissemination and output of knowledge, enabling cross-border integration of knowledge. Exhibition design is developing towards "short, flat and fast" to meet the needs of the audience.

## **4. Ways to improve display cabinets in art museums**

### ***4.1. Improvement of museum***

Display cabinets Showcase furniture is a special appliance in museums and art galleries. It is used to display and protect the cultural relics on display. It is also a bridge for communication between art galleries and visitors. With a wide range of varieties and uses, they are an indispensable part of display design. According to different materials, they can be divided into wooden showcases and metal showcases. According to the use, it can be divided into wall display cabinets, independent display cabinets, wall cabinets, table cabinets, etc.[2] Exhibition cabinets should adopt diverse applications and diverse combination methods. They can not only accommodate fixed parts used by multiple exhibits, but also accommodate changing parts required by other exhibits. In order to save costs, it is very necessary to use the original display cabinets as much as possible, or to renovate and reuse them.

Because the glass material of the showcase is relatively independent and the base is multi-layered, the metal plate of the showcase can be replaced, or the height and shape of the showcase can be adjusted. In terms of flexibility of replacement, if the display cabinet needs to be adjusted frequently, it needs to be moved and disassembled more conveniently. Usually, there will be a caster at the bottom of

the display cabinet. The cabinet adopts standardized and modular design, supplemented by specialized design. Its structure can make assembly, disassembly, maintenance, packaging, transportation and storage easier, improve the reuse rate of parts, and reduce the recycling rate of materials, thereby achieving the purpose of reducing costs and saving costs. Large display cabinets can be combined for easy handling. Therefore, the exhibition cabinets of art museums are required to be reasonably designed, sturdy and durable, easy to process, safe and reliable, simple in appearance and simple in color.

#### ***4.1.1. Protect products***

An important function of showcases is to protect them. The first thing to solve is the problem of dust and moisture resistance. Pay attention to the sealing of the showcase to prevent contamination by harmful substances such as dust during the display process, and to reduce moisture permeability, control dryness and humidity, and protect exhibits. The opening method of the showcase has a great impact on the operational safety of the showcase and is also the key to the design of the showcase. Regardless of the opening method, the exhibits should be easy to access and place, and the seal should be ensured after closure.

#### ***4.1.2. Display materials***

Most of today's exhibitions use frames of various materials to connect glass blocks together to form display cabinets to hold exhibits. Audiences tend to take photos of their favorite exhibits, and the exhibits are placed in showcases and separated by glass, making it inconvenient to take close-up shots. It is also troublesome and unsafe to open the showcase to take out the exhibits. In order to solve this problem of inconvenience for shooting and visiting, you can use a large area of glass on the front, but you still need to pay attention to sealing and hiding. The number of glass and frame width should be reduced as much as possible to avoid affecting the viewer's visual experience.

#### ***4.1.3. Easy to move***

Although some domestic museums have installed fixed large display cabinets, most of them use single activities. This type of device is suitable for small and medium-sized museums because it can change as the content and location of the exhibition change. Large display cabinets can be combined for easy transportation. Movable showcases are also easy to clean. If it is the kicking part of the base, it is usually divided into parts to prevent the feet from getting dirty. On the surface of the display cabinet, lines that are easily contaminated by dust should be reduced as much as possible. The design of the starting line is more about covering the upper layer with vertical surfaces.

### ***4.2. Improvement of lighting in art museum display furnishings***

#### ***4.2.1. Current status of domestic art museum research***

For a long time, the lighting of art museums in my country has been following the museum lighting specifications, but there are big differences between them and the lighting design of art museums, resulting in a big difference between its specifications and practice. As the country's national strength becomes stronger and stronger, people's living standards are also constantly improving, and their demands for material and culture are also increasing. Therefore, more attention should be paid to the visual comfort and psychological effects in the lighting design of art museums. The state has regulatory requirements for lighting in museums and art galleries, including lighting intensity, color temperature, glare, color rendering, light source recommendations and anti-glare lighting fixtures. These regulations help to standardize the lighting design of art museums. In the lighting research of art museums, more attention is paid to the visual research of lighting to improve the lighting quality of domestic art museums and promote their standardized and scientific operations.[3]

#### ***4.3. Improvement of lighting in art museum display furnishings***

The art museum can be divided into three areas according to its functional composition: exhibition area, public area, and auxiliary area. From the perspective of visual comfort design, these three functional areas should have certain mobility and convenient layout methods, which can not only meet the basic flow of people, but also meet the visual appreciation needs of visitors. Exhibits, space lighting, and display space together form an organic system. [4]Therefore, lighting is a process that runs through the whole process of display and display design. It is also an important media tool and visual stimulation method. A good exhibition space is indispensable for lighting. Through different lighting selections, it can not only meet the atmosphere of different exhibition themes, but also withstand the

subtle relationship between the exhibition hall lighting and the exhibits. It can be seen that the exhibition space provides a venue for the exhibits, while the space lighting creates an atmosphere for the exhibition space, and the lighting of the exhibition space is the best way to combine the visual experience of the exhibitors with the exhibition space. And it is also the most suitable response element for the psychological cognition and emotion of the exhibitors.

#### ***4.3.1. Based on the display space lighting design concept of humanistic care***

The original intention of exhibition space lighting is to allow the audience to see the exhibition items, but inappropriate lighting design will make the audience feel fatigued. In this era of technological updates and continuous art development, people tend to put people first as the center of design. They not only want to experience convenience, but also consider psychological feelings. "Humanistic care" emerged from the European humanistic tradition. Its main content is the affirmation of human nature and human value, the demand for human personality liberation and freedom and equality, and the full development of human rational thinking. Pays attention to the human soul and life. [5] In the lighting design of the art museum display space, in the lighting design for physiological needs, the first thing to consider is how to reduce the discomfort caused by glare to visitors, and the second is the aesthetic aspect of the art museum display space lighting design, artistic light efficiency Design and delivery of emotional atmosphere. Humanized lighting design ideas require designers to pay attention to people's physical and mental needs of displayed items and respect for the soul when designing lighting. Creating comfortable ambient space lighting is a trend in modern art museum lighting design.

#### ***4.3.2. Focus on improving the lighting quality of the museum's display space***

The lighting of the exhibition space in the central area of the art museum is the most important part. In different art galleries, artistic means are used to create environmental spaces that meet functional requirements, aesthetic effects and people's psychological needs. Because the exhibition themes of art museums are different, the types of exhibits on display are also different, and exhibits of different materials require different amounts of light, which results in differences in spatial illumination for different exhibits. Therefore, changes in lighting must be taken into consideration when designing. In order to ensure that there are no excessive visual sensations and reduce visual fatigue, transition area lighting should be set up in adjacent exhibition halls or interiors with large differences in illumination levels, or in different spaces in the same exhibition hall, to adjust and balance vision.

In addition, the color of the lighting must also be determined according to the type of exhibits and the content of the exhibition. This has a great relationship with the color temperature and material of the lighting source used. Under different themes, different color temperatures must be selected to create creative Create a different light environment atmosphere. In addition, the exhibition wall lighting of the exhibition space is also a very important component. It allows visitors to obtain more information and improves the quality of the entire lighting. The factor of glare must also be considered. Generally speaking, effective lighting quality in exhibition spaces can reduce the visual discomfort of visitors when viewing, create a healthy lighting environment for visitors, and enable visitors to obtain good visual comfort.

#### ***4.3.3. Aim to create an emotionally resonant visual experience in the display space***

Human concepts change with the times and cultural changes, resulting in various spatial art forms and concepts. Gallery display spaces are places where cultural information is shared, where people resonate with themselves, space and art. The items on display reflect the artistic feelings of the writer, and the existence of the exhibits expresses the artistic feelings of the creator. Lighting design can create a lighting atmosphere that conforms to the artistic emotion of the work, use the function of light to express the artistic emotion expressed in the work, and use various techniques such as the intensity of light, color temperature contrast, lighting levels, etc., to arouse the audience's attention. Resonance creates emotional resonance, guides the logic of thinking, and continues to convey the author's artistic emotions. This is also the meaning of the exhibition. Therefore, the lighting design of the art gallery display space must be consistent with the spatial atmosphere of the exhibits.

## **5. Conclusion**

Art museums should realize the importance of display cabinets and lighting fixtures in display, and need to work together with curators, showcases, and lighting companies to achieve ideal display effects. Display cabinets and lighting are an indispensable part of museum display, and their rational use can

bring more artistic effects. In the future, the construction of art museums will still undergo great development, and this is also where we, gallery practitioners, need to learn and research. Due to the limitations of space and my ability, the author can only briefly introduce display cabinets, lamps and other equipment based on his experience in participating in the construction of the art museum, in order to serve as a reference for the newly built art museum.

## References

- [1] Ye Chengyong. 2023, *a brief analysis of the protective role and methods of public art museums in folk art* [J]. *Xinchu Culture*, (03): 75-78.
- [2] Jin Lei, Hu Jiaojiao. 2023, *Zhejiang Art Museum's calligraphy and painting temporary exhibition display design and showcase furniture design* [J]. *China Ethnic Expo*, (17): 229-231.
- [3] Zhu Ailin. 2022, *Research on lighting design of art museum display space based on visual comfort* [D]. *Shenyang University of Aeronautics and Astronautics*. DOI: 10.27324/d.cnki.gshkc.2022.000015.
- [4] Teng Siyi. 2023, *Research on curatorial design based on museum contemporary art collections* [D]. *East China Normal University*, .DOI: 10.27149/d.cnki.ghdsu.2022.003677
- [5] Chen Zhaojun. 2023, *Research on the application of humanistic care in rural landscape design* [D]. *North China University of Water Conservancy and Hydropower*. DOI: 10.27144/d.cnki.ghbsc.2023.000708.