

Investigation of the Current Situation of Museum Audio Exhibition in Beijing Area and Countermeasures

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Abstract. Audio, colorful and effective features are what the cultural inheritance pursues. However, the application status of audio exhibition in contemporary museums is very inconsistent. Through investigating the current status of audio exhibition, including the audio content uploaded by corresponding museums to the online media, in museums with different types in Beijing area, this paper analyzes and summarizes the main characteristics and problems of audio exhibitions in museums in the current stage, and further proposes countermeasures and suggestions, with the expectation of enlightening the promotion of the propagation of museum culture in Beijing area.

1. Introduction

Xi Jinping, the general secretary stated that "we should let history and cultural relics tell the wisdom of history to people." Sound is one of the most primitive carriers of cultural transmission, and its transmission can narrow the gap between people and cultural relics. Therefore, in terms of visitors who are in the museum, it is true that high-quality visual feeling is important, while the good audio effect can also play an active role in their visit experience^[1].

As a world-renowned ancient capital and a national historical and cultural city, Beijing has rich cultural resources. National political center, cultural center, international communication center, and scientific and technological innovation center are the clear city positioning of the Party Central Committee for Beijing. All work in the capital revolves around the construction of the "four centers". In this context, the construction of a "museum city" has been included in the "14th Five-Year Plan" of Beijing. The audio content is an important aspect that is related to the quality of the supply of museum public culture. Therefore, it is a new task proposed by the era and region to investigate the present situation of museum audio exhibitions in Beijing and to promote their development.

2. Research objects and method

There are already 204 museums in Beijing in total, with 16 districts having museums, 520 continuously opening museums in the whole city, more than 600 temporary museums held annually, 16.255 million collections (sets) in total, and every 100000 people share one museum,

which service more than 50 million visitors per year^[2]. Facing with such a huge sample group, it is crucial to choose appropriate research objects and research methods.

2.1 Research objects

Audio can enable people to feel, experience and understand social activities and culture. Audio exhibitions make use of the above-mentioned function of audio to use various methods, such as introduction, bionics, contrast, etc. to vividly and concretely present the object of the exhibition to audiences. At present, exhibition areas of many museums have adopted multiple kinds of audio content for exhibition, which include not only audio explanation, but also ambient sound, such as the sound of charge and gunfire in the Museum of the Communist Party of China, as well as the sound of whistle and animals in some theme museums. Certainly, audio exhibitions are not only limited to physical venues, but also exist in online digital museums and institution accounts of various media platforms.

In the aspect of museum case selection, this paper divides them into six categories of historical and cultural category, intangible cultural heritage display category, natural science category, small-scale and characteristic category and regional comprehensive category according to the nature of the collections in museums in Beijing area at first, chooses the most representative one to two museums in each category, and carries out on-site and online investigation. This paper mainly investigates 8 museums (National Museum, the Palace Museum, China Intangible Cultural Heritage Museum, Beijing Museum of Natural History, National Art Museum of China,

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Memorial Museum of Lao She, Beijing Sound Museum, Capital Museum), and 5 online platforms of the official website of museums, Microblog, WeChat official accounts, Tiktok, and Bilibili, summarizes and arranges the exhibition form and propagation effect of audio content referred by these platforms and museums.

2.2 Research method

The research method adopted in this paper is field research method, taking the 8 museums as the typical representatives, which can be divided into online and offline parts. The online part records and arranges the digital exhibition hall forms, audio-visual contents, transmission modes and page views of the above-mentioned 5 media platforms. In the offline part, the author enters museums and carries out on-site investigation, observes and records the audio application forms in corresponding exhibition halls, including explanation forms, scenario sound effects, background music, video integration, as well as the thematic features and on-site visitor numbers of exhibition halls. Subsequently, the author summarizes the information about the current situation obtained through online and offline investigation, extracts 10 main characteristic fields to facilitate the systematic comparison and analysis in the next step, which is also convenient for case accumulation and dynamic update of data.

3. Research results of audio exhibition in Beijing area museums

The investigation of audio exhibitions in Beijing area museums is conducted in the two parts of online and offline methods. After constructing a database on the basis of collected cases and analyzing it, five characteristics of the current situation can be obtained, which are shown as follows.

3.1 The audio content of museums is limited in form but attractive

It can be found from the investigation that the audio content of current audio exhibitions in Beijing area museums can be classified into three parts, which are guidance and explanation, dubbing and background music, other creative forms^[3]. Although the contents under the creative category, especially the scene restoration category, are small in amount, audible sound and visual material objects, words and videos complement each other, which are very attractive for visitors.

Guidance and explanation include two types: explanation device and explainer. At present, most museums mainly use explanation devices for guidance and explanation, which can be classified as on-site explanation and online explanation, such as using WeChat to scan the QR code to obtain explanations in Beijing Sound Museum, etc. There are also some museums that employ explainers to explain on site, such as the National Museum, the Palace Museum, etc.

However, no matter machines or staffs have limitations in form, that is, they both adopt monologues as the main explanation way.

The integration of dubbing and background music is also common in the exhibition area of museums, which can combine with some material objects or videos, having certain creativity. Corresponding audio contents are played in the National Museum, China Intangible Cultural Heritage Museum, Beijing Museum of Natural History and Beijing Sound Museum, according to the theme of the exhibition hall and the material of the exhibit. For example, in the exhibition hall of "Compiling Canon in A Flourishing Age: Exhibition of Painting Achievements in each Dynasty of China" in the National Museum, the sound effect of mountains and rivers in nature is continuously played to create the artistic conception of famous landscape paintings. Furthermore, in the exhibition area of "the Sound of the Alley" of the Beijing Sound Museum, more than 200 kinds of sound of the old Beijing keep being played, such as the peddling sound, pigeon flute sound, etc.

It can be found through on-site investigation that audio, video and other multimedia auxiliary elements can positively attract visitors. According to the correlation analysis between the number of visitors and the exhibition forms in Beijing area museums, it can be concluded that the exhibition halls with audio, video and other auxiliary elements added have more visitors than those halls merely relying on exhibit display and audio explanation. Moreover, the more abundant the audio-visual elements are, the larger the number of visitors in the exhibition area is. For example, the main exhibition hall with 15 different type display screens in the National Art Museum of China has more visitors than online the exhibition area with 8 display screens in total. In the Beijing Sound Museum, there are more visitors in the exhibition area of "the Sound of the Alley" that can play the voice of the old Beijing through touching the screen than that in the exhibition areas of "the History of the Shi Family", "Modern Education" and "Fragrance of Fragrant Thoroughwort and Angelica Dahurica", which can play the photos related to the Alley of the Shi Family through touching the screens. Besides, the investigation results show that the visitors who enjoyed the audio-visual contents are mainly the people with their children and families.

3.2 Extensive and close combination of audio elements and visual exhibits

Visual exhibits include physical museum collections and digital transmission content. Sound elements, especially dubbing and background music, closely and extensively combine with material exhibits. At first, audio explanation has corresponding relations with material exhibits in the exhibition areas. Then, audio contents and concrete exhibits or played digital materials are mutually related to each other. For example, the exhibition hall of ancient creatures of Beijing Museum of Natural History has three sensors, which can play corresponding cry of ancient creatures when visitors pass by, and there is also

a sensor, which can play the sound of bird chirp when visitors pass by, on a big tree in the plant exhibition hall. These voices narrow the gap between visitors and the displayed context.

From the perspective of the combination condition of audio elements and digital transmission contents, most museums investigated contain digital images related to the theme of the exhibition, and the carriers of the exhibition include two types of projection and screen display^[4]. The form of the contents played include videos and pictures, and the major way of playing is automatic circulation, with a small group of exhibition halls adopting the interactive form of manual on-demand playing. For example, there is a projection screen playing the episode of Chinese drama in the exhibition area of "the Legend of Opera" in the China Intangible Cultural Heritage Museum. Two exhibition areas displaying excellent photography and calligraphy works in the National Art Museum of China have not only 7 small screens that can automatically display works, but also large touch screens that allow visitors choosing what they want to see, and all of these screens are the display interfaces of audios and videos.

3.3 The difference of audio display levels exists in different types of museums

The study conducts the contrastive analysis of different types of total amount of audio-visual elements, characteristics of audio elements, main explanation forms, visitor categories, etc. according to the investigation data obtained, and finds out that the audio elements applied in small-scale characteristic museums are the most affluent, while the audio elements applied in traditional museums (historical and cultural category, as well as regional comprehensive category) are relatively monotonous.

Based on the investigation results of on-site effects, it can be found that the "Compiling Canon in A Flourishing Age" exhibition hall of the National Museum, China Intangible Cultural Heritage Museum and Beijing Sound Museum pay more attention to the creation of the immersive audio-visual environment, which provides abundant on-site audio-visual experience for visitors through projection and other new technologies, with relatively strong infectivity in the field, and the propagation of exhibits can be more vivid. In contrast, the Palace Museum, National Museum, Beijing Museum of Natural History and Capital Museum rely more on explanation devices and explainers in terms of audio transmission and audio-visual effect creation. The National Art Museum of China mainly relies on explanation devices to provide voice guidance, and it also sets online exhibition areas to build an immersive space. However, the effect of immersive experience is relatively poor, and during the period of investigation, the effect of explanation devices and explainers wasn't found.

In terms of the total amount of audio-visual elements, audio elements adopted in small-scale and characteristic museums are the richest, such as the Beijing Sound

Museum, which takes voices as main exhibits due to the characteristic theme of the museum. Voices exhibited in the museum not only are nature, but also have regional features and penetrativity, and create a good immersive experience^[5]. In contrast, since the information of connotation and background of cultural relics belonging to the historical category is abundant, and relevant exhibition areas were set up for a long time, covering more extensive ranges and following traditions, the exhibition and introduction of these exhibits mainly rely on explanation devices and explainers, with relatively monotonous audio elements. Nevertheless, at the same time, the explanation form can develop and be more diversified. For example, in the Capital Museum, many parents explain to their children about the exhibition. Moreover, citizens and students can participate in some public explanation services set up in museums.

3.4 Diversified audio contents of network media of different museums

In the "Screen Viewing Era" of online informatization, setting up channels for audio exhibitions on online platforms is more convenient than improving physical exhibition areas. From the investigation of the official contents released on five major platforms of official websites, accounts of Microblog, WeChat official, Tiktok, and Bilibili by 8 museums, the study found that the audio contents of network media of different museums are diversified.

From the perspective of expressive force and richness of the audio content, the overall performance of the Memorial Museum of Lao She is the most prominent. Firstly, as the example, the official website platform shows the three-dimensional panorama of Laoshe's former residence, and built-in audio explanation and music are played while the visitor is experiencing the interactive sightseeing. The sector of digital treasure is set up in the official website, with rich audio-visual exhibits, special area of audios and videos, intuitive and vivid presentation forms and distinctive features. Secondly, voice guidance and H5 interactive pictures are set according to the divisions of the Memorial Museum on the platform of the official account, making the explanation rich in voice and image. It is worth noting that the background music is the audio of the old Beijing, with strong regional features. The least of perfection lies in that part of audio explanations on the official account platform need to be paid for listening, which will influence the sensory experience of visitors to a certain extent. In comparison, the three museums of the Beijing Museum of Natural History, Capital Museum and National Art Museum of China perform worse in the aspects of expressive force and richness of audio contents. They upload less audio contents on their online platforms. Although the audio contents in the official website and WeChat official account of the Beijing Museum of Natural History are rich in amount, all of them are pure light music, without personalized audio contents, such as voice explanation, and exhibitions are not colorful and visual. Similarly, the Capital Museum

also has many contents of pictures and text, with little audios. The various online channels of the National Art Museum of China pay more attention to visual effects, which are rich in visual experience but weak in audio presentation.

In terms of the transmission effect of voice contents, namely the data of fans, the online transmission of the Palace Museum and National Museum performs better. As of 16:30 on December 10, 2022, the number of the Palace Museum's fans on the Microblog platform reached 10.299 million, and that on the Tiktok platform reached 1.458 million. The official website has abundant contents, including multiple panoramic digital exhibitions and the information of collections in multiple media forms. The website, through the sectors of original state display and introduction, panoramic Palace Museum, audio-visual hall, etc., deeply integrates audio-visual elements and create vivid and affluent propagation content. At the same time, the National Museum has 5.16 million fans on the Microblog platform, 982000 fans on the Tiktok platform, 549000 fans on the Bilibili platform. The WeChat official account platform has more contents about exhibitions and explanations, with abundant interactive functions, comprehensive contents, and diversified forms. However, it attaches less importance to the ambient sound effect, and the background music is relatively dull.

3.5 Audio exhibitions integrating creativity and artistic presentation deserve to be taken as reference

On the basis of the on-the-spot investigation, it is found that many cases of audio explanations, presentation forms, exhibition equipment are worth being taken as references by other parties in this industry, and many exhibition halls with strong infectivity are very impressive.

Firstly, influential explainers that can stand for the image of the exhibition hall should be cultivated, thus arousing visitors' interest in the connotation and stories concealed behind the cultural relics. For example, in the circumstance of rare visitors due to the epidemic, a Manchu explainer in the Palace Museum attracts more than ten people to stand by with his vivid explanation of the treasure exhibition hall (Figure 1).



Fig. 1 Star explainer in the Palace Museum

Secondly, the top explanation devices collecting the stories of exhibits should be researched and produced, and the content of guidance should be concise, lively and interesting. Among the investigated museums, the Capital Museum's usage rate of explanation devices is the highest. It has not only obvious QR code, but also vivid and interesting voice contents, which are welcomed by the children.

Thirdly, multi-sensory or interactive audio devices should be designed and developed. The digital exhibition hall (the Video of Chinese Painting) of the "Compiling Canon in A Flourishing Age" in the National Museum specially shows the scene of the changes of landscape paintings (Figure 2) with its interactive device that integrates visual sense, auditory sense, olfactory sense and other senses, to lead visitors to "enter" the painting in a brand-new way, with extremely strong immersive experience of arts. The exhibition hall, "the Origin of Human", in the Beijing Museum of Natural History has the projection of ancient humans, and four dinosaurs are in the Dinosaur Park of the exhibition hall of ancient creatures, which bring the situational interaction effect with vivid audios and videos with the help of sensors.



Fig. 2 Digital Art Exhibition of National Museum-Immersive Experience Zone of "Light and Shadow Danqing"

Fourthly, immersive theater exhibition areas should be set up. A piece of video in the exhibition hall of "the Legend of Opera" of the China Intangible Cultural Heritage Museum is projected on the large screen, in combination with the original version of the opera (Figure 3), which improved the appeal of the exhibition area and visitors' sense of immersion.



Fig. 3 The exhibition hall of "the Legend of Opera" of the China Intangible Cultural Heritage Museum

Fifthly, the immersive exhibition area with the audio environment should be developed. The purpose of playing the ambient sound in public in museums lies in that they want to make visitors be personally on the scene, while the people in museums are too crowded, and the immersive effect can hardly be ensured during the period with noisy environment^[6]. Therefore, visitors' experience may be influenced due to the large amount of people and noisy environment. Then the immersive audio experience can have positive effects in the process of visitors' visit. In demonstrative cases, immersive audio experience areas are set in various exhibition halls of the China Intangible Cultural Heritage Museum. In these areas, visitors can wear headphones to enjoy the voice of musical instruments. Headphones are provided in 5 places in the exhibition area of "Ancient Music" (Figure 4), as well as 10 sites in the exhibition area of "Musical Performance in all Places". These places allow visitors appreciating the exhibition and thematic music performance of the corresponding content.



Fig. 4 Headphones provided in the exhibition area of "Ancient Music"

4. Analysis of main existing problems and causes

4.1 Single audio element form, with rare vivid restoration category content

It can be found from the current results of the investigation that the form of audio elements is relatively monotonous. Although the carriers of explanation are diversified, which include full-time and part-time explainers and various auxiliary facilities, such as exclusive use explanation devices, audio QR code, etc., most of them adopt the mode of voice explanation by one person, with a lack of design of music and sound effects. The audio creative forms focusing on thematic exhibition areas and collections are scarce, and the function and charm of audio elements in the aspect of scene restoration are not given to the full play.

After analysis, it can be found that the reason lies in that museums don't have systematic planning for audio resource development and application, which leads to the circumstance in which the explanation, guidance and sound effect presentation become isolated and auxiliary tasks, and they also don't analyze and comprehensively design in depth from the perspective of scene experience.

4.2 The lack of personalized and interactive audio content

The visit process in museums refers to the dialogue between tourists and achievements of human civilization through exhibition areas and collections. It is insufficient to use stereotyped human voice explanation, spoon-feed knowledge provision and commonly used background music, which will make visitors feel tired and boring for long^[7]. The personalized design based on crucial collections and thematic exhibition areas should not be separated with audio elements, and the interactive experience on the basis of the attraction for visitors also must take auditory perception into account.

At present, compared with the rapid development of visual display in museums, audio display apparently lags behind. There is still a large room for improvement in terms of the quantity, quality and form of audio resources, which can't match the development status of digital audio technology and intelligent interaction technology^[8]. The underlying cause may be related the conventional and inherent thinking of public institutions in charge of cultural affairs, and they have insufficient understanding of the essence and potential of audio exhibitions.

4.3 The overlook of audio exhibition innovation and audio environment construction

Through investigation, it is found that although museums in Beijing area followed the trend and introduced audio exhibitions, the innovation of the diversified audio display and the overall creation of the audio environment inside museums, including noise control, still belong to weak links, with few referential cases. The Beijing Palace Museum as the representative, some top tier museums take advantage of their brand advantages and rely on Internet enterprises to give a good demonstration of integration and innovation. However, many of them don't pay enough attention to and do enough work for promoting the audio content.

The reason in a deep level is related to both the top-level design and resource investment of institutions related to museums, and the transfer of innovation awareness of practitioners in the industry of exhibition planning^[9].

5. Countermeasures and suggestions

5.1 Enrich audio element form, and give play to scene restoring force of it

The voice explanation system based on the connotation of collections is still the main focus of the optimization work at present. Yang Fan believes that "better" speak for the cultural relics ", through the sound stimulation effect, the cultural, economic and other historical background reflected in the cultural relics collection will be shaped and reproduced in the audience's mind from the perspective of hearing, so that the audience can maximize the reception of information and achieve the

museum's propaganda purpose". At first, in the aspect of audio content exploration, the quality can be improved in two aspects of the horizontal connection and vertical extension. For example, in the horizontal aspect, various cultures and aesthetics in the Ming and Qing dynasties can be integrated. In the vertical aspect, the creation concept of the imperial architecture in each dynasty and other contents can be introduced. It is necessary to pay attention to the interests of young people, such as the cooperation with some popular historical costume dramas, including *Empresses in the Palace*, *Ruyi's Royal Love in the Palace*, etc., which have many audio images that can be portrayed^[10]. The next aspect refers to the audio form exhibition. Figure dialogues, plot sound effects, scenario background music, and other elements can be fully added in current expert explanations, which can not only keep the seriousness of cultural inheritance, but also reflect the vitality of scenario restoration. Besides, both the physical space and the digital space of museums can make use of audio to create the sense of atmosphere and strengthen the immersive experience. It can be seen that the appearance of sound can not only set off the atmosphere, but also "enhance the audience's sense of experience"; or contain specific era information to help the audience recall".

5.2 Focus on the representative collection and develop a series of audio contents

In the context with limited resources, in order to improve the quality of audio exhibitions, it is available to start from a specific entry point, namely "the most representative collection of the museum", start from the creation of a popular exhibition, learn experience and skills and gradually develop a series of sound contents. For example, Hubei Provincial Museum took the "Sword of King Goujian of Yue" as the representative of the culture, science and technology of the Warring States Period, and displayed it in a multimedia and multilevel way to generate the transmission effect of leading the work in the whole aspect through one point.

5.3 Strengthen interactive design and urge visitors to take the initiative to explore

Sound is interactive and can close the distance between visitors and history. Under the guidance of sound, visitors can break through the limitation of history and closely communicate with cultural relics, and the key point behind this process refers to the interactive design highlighting the experience of participation. The interactive design requires people to change their single exhibit concept to interactive product concept, make full use of the important medium, audio, properly use sensors and intelligent voice recognition technology and promote visitors to actively participate in. For example, it is advisable to turn the stories of radio dramas and melodramas to audio products through constructing a database in the background, thus to realize the joint work between different exhibition areas, enable visitors to "communicate" with cultural relics, and even popularize

the brand of the urban culture through establishing the IP of the national treasure.

5.4 Ally through museums to communicate the innovation effect of audio exhibitions

As public institutions of the public culture, museums in the Beijing area have relatively weak innovative demand and motivation. However, this situation is contradictory to the national strategy of constructing the national cultural center. The effective methods to solve the contradiction refers to the issues of how to form favorable competitive mechanism, fully introduce high-level technical talents and encourage social forces to participate in. The alliances and organizations in the museum industry, such as the establishment of audio exhibition branches, regular communication of domestic and foreign innovative results of audio exhibitions, creative and technical team recommendation, and relevant consulting and training provision, can greatly improve the high-quality development of sound exhibitions and turn the potential of sound into charm.

6. Conclusion

Sound, with strong plasticity, can play the role of promotion for the transmission of cultural information, and it is believed that audio exhibitions in museums will attract more attention of more scholars and practitioners in the museum industry. In the process of constructing "the City of Museums", Beijing has created a series of museum publicity brands. If cultural relics can be further energized with creative voices in the process of media design, a better overall image of museums in Beijing can be shaped.

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