Research Paper

Recommendations for the Integration of Online and Offline of the Langfang Museum under Service Design Thinking

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ABSTRACT: *The purpose of this paper was to propose recommendations for online and offline integration of the Langfang Museum based on the current deficiency to enhancing the visitors' experience. The research process was based on the application of the museum service design model "Pre-During-Post visit" and the reviews of excellent cases in China and abroad. Based on three phases, the paper finally put forward recommendations for the Langfang Museum according to the aforementioned model. In conclusion, museum should pay attention to the needs of online and offline visitors at each stages of their visit, and provide a variety of platform and tools to help them achieve their expected goals.*
KEYWORDS: *Museum, Service design, online, offline*

I. INTRODUCTION

Museum is an indispensable part of modern society. In the evolution of developing urbanization, museums are considered to be a key factor in effectively expanding the cultural sharing space, strengthening the cultivation of the populace, and shaping the humanistic spirit. In the "Frontline" section of the "Art & Design" journal, experts suggest that the greatest core driving force of a country's culture is the museum, which is the top of the cultural pyramid (Zhou, 2016). However, the COVID-19 pandemic has severely affected cultural institutions around the world. Some museums have reopened under various restrictions and still face forced suspensions or closures. According to the survey of the International Council of Museums (ICOM), in the context of the current epidemic, the digital construction of museums has been stimulated to the "cusp", the public is constantly changing their views on the digital world of museums, and more museum institutions are also aware of the importance of digitalization. Yet most museums still lack the ability to deal with the new situation, especially interacting with the public remotely in different ways. In order to adapt to this transformation, governments and organizations should support the digital transformation process of museums and accelerate the research on the integration strategy of museums online and offline. In fact, as early as 2006, Maurice Davies of the British Council of Museums mentioned that a museum today is not just a building, but a building and a website (Mason & McCarthy, 2008). For this study, physical museum space is not the focus of this study's analysis. However, it is impossible not to involve it when discussing the complementary of online and offline. Because there is no online counterpart without a brick-and-mortar museum, and factors such as technology can provide a bridge between the physical and the virtual.

Based on the model "Pre-During-Post visit" of museum service design, this study discussed the online and offline integration strategy of Langfang Museum, Heibei province, China. Firstly, it analyzed the limitations of the Langfang Museum, and then reviewed the excellent museum cases in China and abroad. Finally, according to the current defects of the Langfang Museum, based on the three phases of "Pre-During-Post visit", this paper proposed recommendations for the integration of online and offline of the Langfang Museum.

II.   ONLINE MUSEUMS AND PHYSICAL MUSEUMS

Online museums, also known as virtual museums, are museums that use digital means to express the functions of physical museums and share exhibits on the Internet. Online museums often use interactivity and immersion for the purposes of education, research, enjoyment, and enhanced visitor experience (V-must, 2017). Online museums can not only take advantage of the lightweight characteristics of digitalization to facilitate the storage and access of massive content by managers and visitors, but also take advantage of the characteristics that are less affected by time, location, climate, and environmental factors to expand the use of digital content. Museum managers should be aware that online museums are not just displaying collections on website pages, but also need to simulate people's virtual visiting experience (Fan & Li, 2013). As for physical museums, their advantages in terms of creativity, interest, interactivity, and comprehensive experience are comparable to online content (Tong & Ma, 2021). Therefore, museums should fully consider the new form of the integration of online and offline.

Although new forms of museum integration between online and offline have become a trend, museum practitioners often face a common concern when planning to provide access to museum digital resources: if visitors can access digital collections via the Internet, will they come to the museum in person? To this concern, a number of investigations have provided compelling evidence that online museums actually facilitate physical visits, rather than discourage them. For example, Bowen (1999) found that when museum visitors travel, they are more likely to visit the corresponding brick-and-mortar museum if they have previously visited an online museum in the destination. The findings of Marty (2007) also show that online museums can exist independently, giving users who might never visit a physical museum in person an opportunity to get in touch with the museum. Numerous previous studies have demonstrated a complementary relationship between physical and online museums, with online content actually influencing interest in physical museum visits: well-designed online museums promote offline visits, while low-quality online museums discourage physical visits (Schweibenz, 2004; Döpker, Brockmann, & Stieglitz, 2013; Wang & Zhao, 2016; Aurindo & Machado, 2017; Liu & Idris, 2018). It can be seen that online museums have become a supplement to physical museums, and are gradually becoming the main form of museum visits even under the normalization of the epidemic.

III.   ANALYSIS OF ONLINE AND OFFLINE CONSTRUCTION OF THE LANGFANG MUSEUM

Langfang Museum covers an area of 10,000 square meters and a building area of 7,604 square meters. It has 4 fixed exhibition halls and 2 temporary exhibition halls. It is a national second-class museum. The museum has a collection of more than 40,000 pieces, which vividly reproduces the continuous history, culture and development trajectory of the Langfang area from the Neolithic Age to the end of the Qing Dynasty for more than 7,000 years. In the context of the integration of online and offline museums, this section investigates the online and offline construction of the Langfang Museum, and mainly analyzes the following deficiencies.

3.1 The Langfang Museum Portal Has Inadequate Functions and Characteristics

For the museum portal, it should be realized that its web page is not only to upload the collection of the museum, but also to simulate the virtual visiting experience of the audience. In fact, the portal of the Langfang Museum and many museum websites in China have similar problems, that is, the online museum only copies the physical museum into a web form. For a long time, the official websites of domestic museums, including the Langfang Museum, tend to introduce simple and basic facts, such as location, audience routes, and information about building facilities or exhibitions, but lack more complex functions and services, so museum portals seem to be more like High-tech notice board. As the public's demand for high-quality culture continues to grow, the demand for exhibition experience is gradually increasing. The audience wants to pursue more interesting and creativity in the website, so simple web browsing cannot meet people's needs. After a period of observation, this study found that there are still three obvious deficiencies in the Langfang Museum portal. First of all, when searching through the portal, once encountering website maintenance, there will be prompts such as "Sorry, the site has been suspended" or "Your request did not find the corresponding site in the web server". It's better not to present these unfriendly pages directly to the user; secondly, the information search function on the official website of Langfang Museum is relatively weak. This shortcoming is of great concern if we consider that the museum's portal contains hundreds of pages of information and other media documents; finally, the museum portal lacks local characteristics of Langfang.

3.2 The Service Content of WeChat Official Account Needs to be Optimized

At present, the Langfang Museum has not developed its own application (APP), WeChat applet, or video account, only the WeChat public account of "the Langfang Museum". The WeChat official account has relatively complete functions as a whole, and its main functions cover three parts, namely "Guidance", "Information" and "Services". Among them, the "Information" section mainly publishes information such as

exhibitions, lectures, theme activities and other information, which is chiefly based on web browsing, with weak interaction. The sub-sections in the "Services" are basically to meet the needs of the audience's before-visit, such as visiting instructions, traffic routes and reservation services, and are also in the form of traditional notice boards. The disadvantage of this part is that it can only make reservations but not buy tickets, and cannot complete the "one-stop" service. Besides, the traffic route part cannot be jumped to navigation APP, and there should be a hyperlink to the official website of the museum under this section. For the "Guide", the audience can select the "Online Visit" submenu under this section to visit the cloud exhibition hall of Langfang Museum online, which is the feature of the entire official account. The cloud exhibition effectively improves the interesting and aesthetic feeling of traditional page browsing, but there is still space for improvement in the vividness of the visit. The disadvantage of "online visit" also includes the slow initial loading speed of the cloud exhibition hall. The other sub-sections under the "Guidance" section basically introduce the exhibition halls and cultural relics in the form of pictures and texts with voice.

3.3 Insufficient Creativity and Weak Interaction of Exhibition Design in Museum

The exhibitions in the Langfang Museum are more focused on the exhibits, the interaction with tourists is insufficient, and the overall experience of tourists is not positive enough. In fact, not only the Langfang Museum, but the museums in Langfang City, except for very few designs that consider interaction with tourists or allow them to participate, most of the museums only stay at the static exhibition level. In this way, tourists can only passively listen to the explanations of the docents. For museum visitors, the majority of museum visitors are non-professional visitors, and they are not highly receptive to professional knowledge, and the unattractive exhibition form will inevitably decrease the visitor's visiting experience.

3.4 Museum Activities are Difficult to Attract Audiences to Actively Participate

Judging from the current activities held by the Langfang Museum, most activities are internal such as the national flag-raising ceremony, and there are also some activities open to the public such as recitation competitions. However, there are not many creative activities around specific exhibits, nor are they innovative enough. There are fewer online activities that can attract the active participation of the public, especially the younger generation. In terms of promoting public participation, the Langfang Museum still has much space for improvement.

3.5 Lack of Social Experience Will Discourage the Brand Promotion of the Langfang Museum

From the social platform of the Langfang Museum, the brand promotion is mainly carried out through the micro blog. The official micro blog account of the Langfang Museum has more than 6,000 fans. This figure still has growth potential for a city with a population of more than 5 million. The micro blog of the Langfang Museum updates a video on the theme of the museum every so often. However, from the perspective of social experience, these videos have not fully considered the interests of young people, and have not incorporated forms of interaction that young people like to see, which is not conducive to the promotion of museum brand.

IV.   RESEARCH QUESTION

In the context of the epidemic, online museums can help traditional museums to better manage the flow of people. Even if the epidemic is over in the future, online museums can continue to use their digital borderless advantages to facilitate the dissemination of museum information to remote areas of the world (Aurindo & Machado, 2017). However, there are still some deficiencies in the online and offline integration of Langfang City Museum, which makes it impossible to provide a better experience to the audience in need. Therefore, the research questions of this study is:

In order to provide users with a good visiting experience, what recommendations should be proposed for the integration of online and offline of the Langfang Museum?

V.   THE MODEL "BEFORE-VISIT-DURING VISIT" FOR MUSEUM SERVICE DESIGN

Service Design is the design of how service delivers an experience to their customers over time to improve customers' service experiences. We can consider service design as design thinking, design process, design tool, and more an interdisciplinary approach to design language and design management. Generally, the touchpoints of service design can be divided into three stages: 'Pre-service', 'During-service', and 'Post-service'. In the same vein, Liu and Liu (2017) in their article also noted that the audience experience of the museum can be divided into three service stages: 'Pre-visit', 'During-visit', and 'Post-visit'. The authors further elaborated that the Pre-visiting stage is mainly information and ticket service; the During-visiting stage is mainly based on deep excursions and knowledge services, including watching, listening and touching; the Post-visiting phase is mainly for sharing exchanges, souvenir buying, and entertainment services (Table 1). Based on the

understanding of the above research, this project divides the entire service process of the Langfang Museum into: 'Pre-visit', 'During-visit', and 'Post-visit', and the environment include "online" and "offline". Therefore, this service design model is expected to help the Langfang Museum management and designers develop and optimize online resources around "human experience", and then carry out the design of the museum's integration of online and offline.

Table 1: Service design phases for museum (Adapted from Liu & Liu, 2017)

Pre-visit	During-visit	Post-visit
Mainly information and ticketing services	In-depth tours and knowledge services in the form of watching, listening and touching	Mainly for sharing and communication, souvenir shopping and entertainment services

As mentioned above, the museum service environment includes "online" and "offline". If the museum service is confined to the offline, it is precisely a departure from the ubiquitous life of the masses based on the "Internet +" model (Liu and Liu, 2017). Because ubiquity means "everything is interconnected, intelligently controlled, and ubiquitous", it transforms the traditional service method into a method of providing services anytime, anywhere, and people can use the Internet to obtain ubiquitous information and service enjoyment at any time. Based on this advantage, museums should develop a service platform supported by information aggregation such as website groups, APPs, and big data, focusing on information services and audience social networking.

VI. REVIEWS OF CASES IN CHINA AND ABROAD

This section reviews the innovation cases of museums in China and other countries from the following six aspects: museum portals, mobile-based online museums, interactive digital creativity in museums, offline and online activities based on museum exhibits, museum social experience, and the crowdsourcing model under the concept of museum participation.

6.1 Museum Portals

The connotation of the museum portal is no longer simple web browsing, but provides more diversified interactive methods for museums and carries multi-dimensional services. With the development of digital technology, the Palace Museum in Beijing has built digital platforms such as the Palace Museum community, digital museum, and virtual reality theater, injecting fresh blood into the long-standing ancient building. As an important part of the digital Palace Museum, the main resources on its portal include Audition Hall, Forbidden City APP, Panoramic Forbidden City, VR Forbidden City, Forbidden City games, etc. From the investigation of the Audition Hall, Forbidden City APP and Panoramic Forbidden City, the basic functions of the museum portal are relatively complete, but the comprehensive utilization is not high enough. The tour of the panoramic is still based on copying offline museum, and the number of "likes" is also lower than the total number of page views. To summary, the functions of the Palace Museum's portal are relatively complete, but for today's young users, the experience still lacks interest. During the COVID-19 epidemic, live stream has become an essential skill for museums. Museums in China have successively launched their own live stream. Online channels such as micro blog, Kwai, TikTok, Baidu Live, and Taobao Live have become display platforms for museums, interacting online with the audience. The form of "Live Cloud Tour" is also very popular among netizens.

On the other hand, in order to achieve the goals of entertainment and education, the provision of corresponding applications has become a key strategy for online museums (Aurindo & Machado, 2017). For this strategy, Younan (2015) mentions the trend of online museums offering digitally "poaching" artifacts. To explain how the online format can be creatively applied to understand and experience exhibits, Younan provides a case of the creative use of digital 3D models, launched by the National Museum Cardiff and the Lincoln 3D Scans. First, digital 3D models are obtained by scanning museum collections; then, the site recruits participants to redesign 3D models online and share their results through an online gallery; finally, users can use certain editing and 3D printing techniques to transform digital 3D models into unique souvenirs (Figure 1). During this process, online users do not need to visit the museum or see the original exhibits in their original form. In this case, the platform only provides virtual exhibits in a sense, but in another sense, it can artificially expand users' experience and access to cultural heritage in a more democratic way to a certain extent.
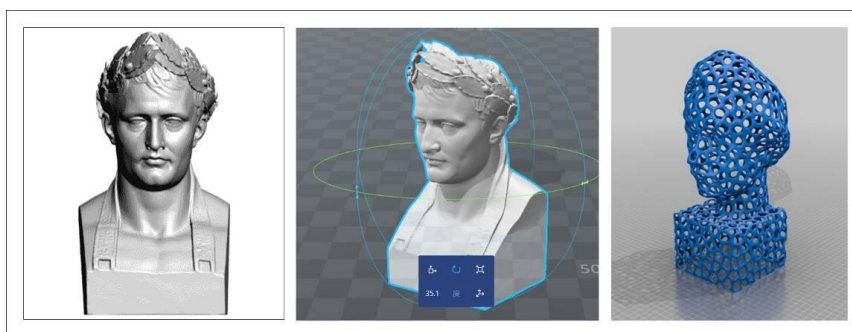
Figure 1: Users redesign the digital 3D model of Napoleon into souvenir (Source: http://lincoln3dscans.co.uk)

In addition, information search tools are considered essential by users, and without advanced retrieval mechanisms, online visitors cannot easily find the information they want. As users desire credible cultural resources and the accuracy of information in online museums, local search engines can be of great help to all categories of online users. As Lazarinis (2011) mentioned in the article that experts use resources such as search engines to discover information, and their queries are often complex.

6.2 Mobile-based Online Museums

If a museum intends to connect the online museum closely with the offline space, an APP should be designed so that the user feels "I'm not in the museum, but I'm still in the museum" (Din et al., 2012). These applications increase the purpose of education and entertainment by providing more cultural products (Aurindo & Machado, 2017). Mobile digital devices such as smart phones and PC tablets provide opportunities for user interaction and engagement (Garau & Ilardi, 2014). Another reason for application design and development is that the public is often skeptical of knowledge provided by traditional formal media such as museum portal (Wang & Zhao, 2016). In this way, opinions are made more credible by the majority commenting via mobile devices rather than by a few experts (Garau & Ilardi, 2014).

The smart phone APP "Discover NPM" released by the National Palace Museum in Taipei is Taiwan's first interactive app with the function of displaying cultural relics. The museum has selected the most representative collections to create 20 interactive programs and 80 profiles so that the public, especially those in remote areas, can easily gain access to the artifacts. Through interactive operations such as touch, tilt or light blow, the exhibition can be seen in full detail. In addition, the APP is designed to meet the needs of each phase of the visit "Before-During-Post". For example, before visiting the museum, the public uses the APP to know the exact location and transportation route of the museum, and provides a day-trip plan for reference; during the visit, the app can provide navigation of buildings and facilities, and people's feedback can be expressed; after the tour, the public can also use Facebook or micro blog to share experiences with friends and family, and provide mini-games to users. Meanwhile, as a supplement to the Discover NPM, the museum also released the mini-movie "The Shuttle Travel between Ancient and Modern" (Hong, 2012; National Palace Museum, 2017).

In addition, various forms of cloud exhibition halls are also a popular trend for online exhibitions. The cloud exhibition hall is divided into 2.5D cloud exhibition hall, 3D cloud exhibition hall, and VR (virtual reality) exhibition hall. Among them, the VR exhibition hall is also a form of 3D cloud exhibition hall, a typical case is the V Palace Museum project, which makes national treasures vivid through artificial intelligence, virtual reality and other technologies.

6.3 Interactive Digital Creativity in Museums

The combination of technological exhibits and advanced display methods will help visitors to actively integrate into the storyline by enhancing the interactivity and interest. The ArtLens Gallery at the Cleveland Museum of Art provides a comprehensive and innovative experience that allows visitors, family and friends to watch up close, explore in depth, and enjoy the use of award-winning digital technology to find the museum's collection. This project includes interactive functions such as portrait making, digital collage, and painting games (Figure 2). The public can experience the fun of creating art through interactive games. It is highly interesting and is deeply loved by the public. In the ArtLens Gallery, visitors are immersed in world art masterpieces and free touch-screen interaction during exhibitions. Visitors can also use the ArtLens APP to save artwork and photos taken during the visit, then use the APP's responsive way finding technology to annotate their visits throughout the museum.

Figure 2: Visitors are immersed in touch-screen interaction during exhibitions (Source: https://www.clevelandart.org/artlens-gallery)

Another excellent example of interactive digital creativity in the museum is the exhibition "Pure Land: Inside the Mogao Grottoes at Dunhuang" (Kenderdine, 2013). The exhibition was held at the 360 Gallery, City University of Hong Kong on March 15, 2012, allowing the public to experience the future exhibition experience. 30 experts in various fields took 6 months to use the excellent virtual reality technology to show the magnificent scene in the 220th cave. This project is in a new three-dimensional animation form, supplemented by digital audio and video effects. The exhibition hall uses a space of 10 meters in diameter and 4 meters in height to create the user experience closest to the Mogao Grottoes. In this virtual cave for 30 visitors, the installation creates an advanced visualization and interactive environment through an immersive 3D and 360-degree visualization system.

6.4 Offline and Online Activities Based on Museum Exhibits

In order to change traditional perceptions, it is necessary to open all collections to the public in order to stimulate appreciation, academic research and artistic creation (Decker, 2017), and to provide education, enjoyment and learning services for people. Mason and McCarthy (2008) proposed that before the advent of the World Wide Web, the use of cameras to record exhibits inspired the concept of a "museum without walls", where democratic visits to museums are no longer limited to physical exhibits. In fact, the concept is to establish a more humanized conceptual space belonging to the public, allowing the audience to imagine, recognize, think and judge, and create a narrative concept for the exhibits (Liu, 2017).

A representative case is the Portland Museum's 2014 tasting activity called "Art and Beer," in which the museum served beer to the public (Figure 3). The activity invited local brewers to brew beer, inspired by a painting by the famous artist called "The Drunken Cobbler" (Paul, 2014). During the activity, the museum tried many methods, such as collecting yeast from paintings or drawing inspiration from paintings. After tasted the art-inspired beer, the enthusiasm of the audience moved to the most famous painting "The Drunken Cobbler". This is a typical example integrate the community and the collection to promote the public participation.

Figure 3: Poster of the activity "Art & Beer: The Drunken Cobbler" (Paul, 2014)

As for online activities, the "Live Cloud Tour" with a strong sense of immersion has recently been popular with netizens. For example, on February 21, 2020, the Shanghai Natural History Museum cooperated with China Unicom, led by the national top ten guides in the museum, and launched an "online tour" activity. On February 23, 2020, eight museums including Gansu Provincial Museum and Suzhou Museum also launched live stream through the Taobao APP (Figure 4). Among them, the number of online viewers of Suzhou Museum exceeded 250,000, and the live stream of the Forest of Stone Steles Museum set a record of 391,000. For museums, live stream is not only an emergency activity during the epidemic, but also a new attempt to spread the digitization of museums and attract more audiences, especially young people, to visit museums and learn about museums.

Figure 4: Wang Xuelin, the docent of Gansu Provincial Museum, is live streaming on Taobao (Source: http://www.rmzxb.com.cn/c/2020-02-25/2527658.shtml)

6.5 Museum Social Experience

Many museums around the world are using social media to share their museum experiences, and other users can give feedback through comments. This expands the scope of the museum beyond the physical museum, where social media adds an additional layer (Stuedahl & Smørdal, 2015) and facilitates audience engagement. The social experience of collecting information and feedback from the public shows that the museum has developed from one-way interaction to two-way interaction, and the evolution of social media has provided the possibility of two-way interaction. Mark Check, vice president of information and interactive technology at the Boston Museum of Science (MoS), pointed out that the museum's exhibits are not the most attractive to the audience, and the main purpose of the public entering the museum is to have a social experience (LeVines, 2015). In addition, the MoS is a hands-on, participatory and dynamic museum, as the museum has launched the MuseumSelfie Day activity, audiences use Selfie to take pictures of museum exhibits and spread museum culture to the world through Twitter. It can be seen that social media has become an important way for museums to participate and experience.

6.6 Crowdsourcing Model under the Concept of Museum Participation

Crowdsourcing is an umbrella term for a variety of approaches that harness the potential of large crowds of people by issuing open calls for contribution to particular tasks (Geiger, Rosemann, Fielt, & Schader, 2012). Actually, the concept of crowdsourcing was first proposed by Jeff Howe in 2006, who stated that crowdsourcing is a mass network that voluntarily accepts employees to complete tasks (Yu, 2012). An easy-to-understand case is provided here as follows. As a new institution, a National Health Museum was struggling financially to even purchase photos priced at $100 to $150 each. The museum then found a photo site called IStockphoto and purchased 56 photos from amateurs and professionals for just $1 each through IStockphoto. In doing so, the IStockphoto site also offers contributors, including amateur photographers, students and even housewives, the opportunity to share their work. In this way, the IStockphoto site also offers contributors, including amateur photographers, students, and even housewives, to share their works.

Museums can do almost anything right with the help of public power. An important case related to crowdsourcing is the Mosul Museum in Iraq, in which two archaeology graduates and their team decided to transform destroyed ancient artifacts in a virtual museum. After the ancient Assyrian artifacts in the Mosul museum were destroyed by Islamic State militants, they appealed to the public for photos of the destroyed

artifacts and other assistance to help the Mosul museum create an online museum. Under the supervision of Dr. Marinos Ioannides of Cyprus University of Technology, since March 2015, more than 5,000 tourist photos of lost heritage have been collected through crowdsourcing, and volunteers have used digital technologies such as 3D to reproduce more than 40 artifacts. 3D printing technology has brought these objects back to life, and the artifacts are now available on the Rekrei website. Rekrei is a project that seeks to restore lost cultural heritage through crowd-sourced photogrammetric reconstructions (https://rekrei.org/).

VII. RECOMMENDATIONS FOR THE INTEGRATION OF ONLINE AND OFFLINE OF THE LANGFANG MUSEUM BASED ON THE SERVICE DESIGN MODEL "PRE-DURING-POST VISIT"

Based on the previous analysis of Langfang Museum and the reviews of excellent museum cases in China and abroad, combined with the deficiencies of Langfang Museum, this research aimed at proposing corresponding recommendations to support public participation in Langfang Museum through the interrelatedness between offline and online. As mentioned earlier, the museum visitor experience model can be divided into three service phases: before the visit, during the visit and after the visit. This section suggested a series of recommendations for the Langfang Museum under aforesaid museum service design model.

7.1 Pre-visit

Build the reputation of the Langfang Museum through micro blog and other platforms. Most visitors arrive at a museum with some level of anticipation of what they will see and do. Research shows that these expected sources mainly include information collected from the following aspects: news media, official portals, micro blog, etc., and more importantly, knowing a museum from word of mouth. Word-of-mouth usually comes from visitors with visiting experience, and people's infrequent contact with museums is often due to the lack of their own credible word of mouth in their social circles and daily life. WeChat public accounts, official micro blog, audience personal micro blog and museum portals are expected to become the main platforms for word of mouth, especially the importance of micro blog which requires the attention of museums. The rapid development of micro blog has led people to regard it as one of the most credible and objective sources of information. As a result, bloggers are emerging as new opinion leaders with powerful influence that may include the ability to shape the perception of museums. Since everyone in the world with an internet connection can read micro blogs, such information can have enormous influence. Traveling micro blog is one of the most popular types of blog, usually in the form of a diary to describe a traveler's experience. For other museum travel enthusiasts, traveling micro blog is an invaluable source of information and a social experience; for museums, traveling micro blog is an essential tool for museum brand promotion.

Additionally, the Langfang Museum needs to strengthen the regional characteristics of Langfang in the portal, add online forums, feedback, comments and other sections to interact with the audience, as well as strengthen functions such as on-site search. The portal is a major and essential tool in a museum's branding, helping to enhance the museum's geographic identity, familiarity, and ultimately, its brand image. At present, the Langfang Museum portal tends to introduce simple and basic facts, more like a high-tech notice board, and at the same time lacks the regional characteristics of the Langfang City. If more regional elements based on Langfang's brand identity items (Langfang city logo, Langfang Museum logo, city/museum slogans, city/museum IP image, flag, standard colors, etc.) can be rendered, and attach the online forums, feedback, comments, and links to "Live Cloud Tour", which can be integrated to form a unique museum brand image based on the Langfang City. In addition, during the maintenance of the portal website, it is recommended not to show prompts such as "Sorry, the site has been suspended". It is strongly recommended that the museum designer make a customized website upgrade/maintenance prompt page with the Museum's own characteristics. When the reminder is conveyed to the audience, it shows the service attitude of the museum. Finally, the information search function on the official website of the Langfang Museum needs to be greatly improved. Currently, the search engine is not visible on all pages of the museum, a shortcoming that is of concern if we consider that the portal contains hundreds of pages of information and other media files. At present, the number of pages on the portal of Langfang Museum is not large, so the importance of search engines may be underestimated, but once it develops into a large museum portal with more than 500 pages in the future, its search function will be very necessary.

Other recommendations. In view of the current shortage of the Langfang Museum's WeChat official account, it is necessary to increase the "one-stop" service for reservation and ticket purchase, as well as add a hyperlink to the portal at an appropriate position. The traffic route part needs to jump directly to the navigation APP installed on the mobile phone. As for the functions that need to be supplemented by the platform, before people visit the museum, the museum should provide solutions to the issues people are more concerned about, such as traffic routes, how to park, how to eat, where are the shops, the location of souvenir stores, etc. If these problems are solved well, it can greatly increase the visit rate of the museum. The above information needs to be provided by the Langfang Museum to the audience as much as possible through the online platform.

7.2 During-visit

Develop a museum's own APP for users inside and outside the museum, especially to effectively assist the audience in the museum to obtain a better experience. In order to increase user's viscosity and closely connect the online museum with the offline space, the Langfang Museum should develop its own APP. The museum APP can not only be used outside the museum, but also should be embedded with functions such as guide system, exhibition map, route planning, collection explanation and other functions that cooperate with the on-site tour of the museum.

With the proper use of digital technology, visitors of all ages and abilities can have fun in the experience. Digital technology can help find the joy of museum collections, using technologies (such as virtual reality, augmented displays) and interactive features such as ancient costume fitting, digital calligraphy, digital collage, and drawing games to enhance the experience. As museum media becomes increasingly rich, it becomes more difficult for visitors to choose their focal point. Accordingly, the use of technology can allow visitors to quickly find what they care about. On the other hand, however, new technologies have the potential to make the already noisy museum environment more chaotic. Therefore, the Langfang Museum can take into account that visitors of different ages and abilities can have fun in the experience in the process of incorporating multi-sensory and multi-form design into the exhibition (e.g., considering the interests and hobbies of the elderly/children, as well as the ability to manipulate new tools), which can help improve the overall museum visiting experience.

Build online and physical environments to provide a good museum social experience, and encourage in-museum photography, live stream, as well as advocate taking photos or make videos and post them on social media. For most visitors, the museum experience is first and foremost a social one. Social interactions may occur between family members, teams, peers, friends, and strangers. The touchpoints include online and cloud social networking, and also involve exhibitions, conversations, touches, dining and rest spaces, together with even a casual glance. Therefore, the Langfang Museum should not only encourage the public to communicate about the museum through online platforms, but also provide better dining, rest and entertainment space within the museum. Secondly, the museum should encourage the audience to take photos freely. Whether it is to take pictures of exhibits or to film themselves in the museum, the brand effect of the Langfang Museum can be strengthened through communication in the form of WeChat Moments, micro blog live stream, etc. In fact, many museums around the world are adopting social media to share museum experiences, expanding the scope of museums beyond physical museums. These embody the idea of making museums participatory and democratic based on social media.

Finally, the appearance and attitude of security guards, ticketing staff, and volunteers also influence how audiences, especially new audiences, perceive museums, which is a matter of touchpoint design for "people" that museum managers should pay special attention to.

7.3 Post-visit

Enhance viscosity of users by developing games, derivatives, etc. As mentioned earlier, the museum experience begins long before the visitor arrives and continues long after the visit. Accordingly, the Langfang Museum should realize the importance of follow-up to strengthen the experience and enhance user viscosity, as well as strive to create follow-up experience through emails, portals, micro blog, games developed by the museum, as well as the derivatives of the museum. In summary, these are aimed at expanding users' experience and access to cultural heritage in a more democratized manner.

Continue to encourage audiences to share visit photos, thoughts and experiences via social media. As mentioned earlier, audiences use social media to share their museum experience, and other users can provide feedback through comments. In this way, whether during or after the visit, it will help to expand the scope of the museum beyond the physical museum, thereby effectively enhancing the brand awareness of the museum.

Regularly hold offline creative activities and online stream broadcast activities based on museum exhibits, so that the model "museum + live stream + e-commerce" will become a new channel for museum reputation building and derivatives sales. The activities mentioned here are not limited to special lectures, cultural salons, professional competitions and courses, etc., but more importantly, the activities should be closely planned in conjunction with the museum collections, so that the activities are knowledge-based, interesting and experiential, then promote a wider range of public participation. For online promotion, live stream activities make "museum + live stream + e-commerce" a new channel for museums to establish word of mouth and sell derivatives; for offline activities, they should also be carried out in conjunction with museum exhibits. A good offline example is the museum's tasting activity aforementioned called "Art and Beer," which collects yeast from museum paintings to make beer.

Introduce popular practices such as crowdsourcing, crowdfunding, and crowd creation into museums as an exploration of new models for curating and donating exhibits, while expanding users' democratic access to cultural heritage. The Langfang Museum should explore crowdsourcing projects such as exhibition creativity,

content writing, exhibit creation, exhibit donation, as well as project research and development. On the other hand, as mentioned earlier, the Lincoln Scan website recruited participants to turn digital 3D models into unique souvenirs for users to download. Inspired by this case, the Langfang Museum should strengthen users' democratized experience and access to cultural heritage.

VIII.   CONCLUSION

Based on the "Pre-During-Post visit" museum service design model, this study discussed the integration strategy for the online and offline of the Langfang Museum. The model was introduced because the museum experience begins long before the visitor arrives and continues long after the visit. This research first analyzed the shortcomings of the integration for online and offline of the Langfang Museum, and then reviewed the cases of excellent museums in China and abroad, and finally put forward the strategies and suggestions for online and offline integration based on the context of the Langfang Museum.

Before the visit, the recommendations for the Langfang Museum in this study mainly include: building the reputation of the Langfang Museum through micro blog and other media platforms; strengthening the regional characteristics in the museum's portal, adding sections like online forums, feedback, comments, and hyperlinks of live streams (e.g., Live Cloud Tour") to interact with the audience. For the during visit, the suggestions given to the Langfang Museum by this research mainly include: developing an APP for users inside and outside the museum, especially to assist the audience in the museum to obtain a better experience; rational use of digital technology, considering different ages and abilities can have enjoyment in the exposure; building online and physical environments to provide a good museum social experience, and encouraging in-museum photography, selfie, live stream, and sharing; museum managers should be aware of the appearance and manner of security guards, ticket inspectors, and volunteers also influence how visitors, especially new visitors, perceive the museum. After the visit, the recommendations given in this research to the Langfang Museum mainly include: enhancing user viscosity by developing games, derivatives, etc.; continuing to encourage audiences to share visiting photos, feelings, and experiences through social media; regularly holding offline creative activities based on museum exhibits and online live stream activities to make "museum + live stream + e-commerce" a new approach for museum reputation building and derivatives sales; exploring introducing the crowdsourcing, crowdfunding, crowd creation and other popular practices into museums, while expanding user democracy access to cultural heritage. In summary, museums should pay attention to the different needs of online and offline tourists at various stages of their visit, and provide a variety of platform and tools to help them achieve their expected visit goals. If these goals are achieved, it ensures that they have a pleasant and satisfying experience both online and offline.

IX.   FOUNDATION

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