



Possibilities and Recommendations for Digitally Empowering the Development of Tourism Resources in Beijing's Local Guild Halls

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Abstract. Beijing's local guild halls possess rich historical and cultural resources as well as tourism resources. However, traditional methods of development face many practical limitations and are no longer sufficient to meet the new demands of tourists in the digital age. By using digital information technology, it is possible to effectively address the problems of traditional development methods, improve the reception capacity of guild halls as tourist destinations, and satisfy the sensory experience of tourists. The digital protection and development of Beijing's local guild halls are also replicable and can provide new ideas for the development of traditional cultural tourism resources to other tourism resources with similar historical and cultural features.

Keywords: Beijing Local Guild Hall · Digital technology · cultural and tourism resources

1 Introduction

The Beijing Local Guild Hall is a unique cultural and tourism resource in Beijing. It embodies local characteristics and serves as an important hub connecting ancient local culture, politics, economy, and Beijing [1]. It is also a witness to the relationship between local and central governments during the Ming and Qing dynasties. In terms of architectural form, the local guild halls mostly reflect the architectural characteristics of different regions at that time and are historical archives of architectural styles. In addition, when political, economic, and cultural celebrities from various regions visited Beijing, they often chose local guild halls as their residence. This has also created a close relationship between the guild halls and important historical figures and events, making the guild halls an important cultural tourism resource in Beijing with great development potential [2] (Fig. 1).

Compared with other tourism resources, there are problems with the selection of development methods, the authenticity of development content identification, and different demands from residents for the empowerment of local guild halls. Therefore, in the

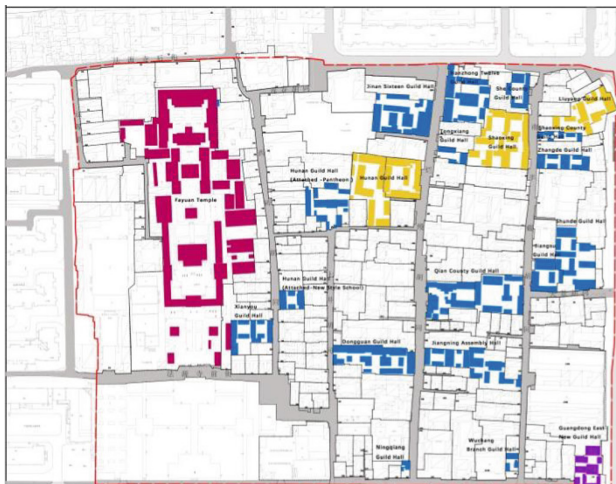


Fig. 1. Distribution map of local hall in Bewon Temple Historical and cultural District

development process, it is necessary to include urban construction planning and development, government policy guidance for correct development, and innovative empowerment development by developers [3, 4]. However, there are no mature digital empowerment cases for guild halls based on the research situation of scholars from all walks of life and the protection status of this type of building. This article will analyze the use of digital technology and propose an empowerment plan suitable for local guild halls, providing different protection and development ideas, and becoming a promotion example of the organic combination of “digitalization + tourism” [5] (Table 1).

2 Local Guild Halls in Beijing

2.1 Conservation Status

The first local guild hall in Beijing was born in the Yongle period of the Ming Dynasty, and since then, the establishment of guild halls has been like bamboo shoots after a spring rain, spreading throughout the city. These guild halls can be classified into three categories: official guild halls, imperial examination guild halls, and commercial guild halls. A total of 31 provinces have set up local guild halls in Beijing. According to statistics in November 1949, there were a total of 391 guild halls in the city, with a large number in quantity. Due to political activities and urban transformation, many guild halls gradually became ordinary residences, and only a few guild halls were preserved due to their important cultural promotion work or for accommodating famous scholars and poets, thus retaining a relatively intact courtyard layout. The rest of the guild halls even became ruins. As the second batch of historical and cultural protection zones in Xicheng District of Beijing, the Fayuan Temple block is characterized by the development and empowerment of the Xuan Nan culture and the local guild hall culture. There are 15 guild hall relics in the Fayuan Temple historical and cultural block, as shown in the figure below [6].

Table 1. Classification table of preservation condition of Fayuan Temple Local Guild Hall

Type of guild	Guild Name
The first type	Anhui Guild Hall Shaoxing Guild Hall Huguang Guild Hall Liuyang Guild Hall
The second type	Tongxiang Guild Hall Hanzhong twelve Guild Hall Jinan Sixteen Guild Hall Zhangde Guild Hall Wuchang Branch Guild Hall Jiangning Assembly Hall Dongguan Guild Hall
The third type	Qian County Guild Hall She County Guild Hall Ningqiang Guild Hall Xianyou Guild Hall Jiangsu Guild Hall Shunde Guild Hall

Based on the preservation status of their courtyards, vacancy situation, operation situation, and building properties, these guildhalls have been classified for more targeted and differentiated digital empowerment. The first type of guildhalls, such as the Anhui Guildhall and Shaoxing Guildhall, serve as venues for the dissemination of Huizhou Opera culture and the former residence of Lu Xun. The original courtyard preservation status is good, and they have development potential. Their vacancy and operation progress are smooth. The second type of guildhalls, such as the Dongguan Guildhall and the Wuchang Branch Guildhall, also serve as historical and cultural propaganda bases and commercial hubs. The preservation status of their original courtyards is relatively good, but their rankings are lower, and there is no urgency to vacate and operate them. The vacancy work continues, but the progress is slow. The third type of guildhalls, such as the Shexian Guildhall and the Xianyou Guildhall, have turned into residential buildings, some of which are in a state of disrepair. The difficulty and cost of vacating these guildhalls is high, so they are not currently a priority for digital empowerment.

2.2 Existing Problems

According to the “13th Five-Year Plan for the Protection of Immovable Cultural Relics in Xicheng District, Beijing”, the development direction of the Fayuan Temple block in the future will be to replace demolition and reconstruction with protection and repair. Currently, the protection and development of local guildhalls still follow traditional methods, which require deployment of the evacuation work according to the government’s planning protection and development list. Guildhalls confirmed on the list must start the evacuation work, first to confirm ownership, then to evacuate the space, to ensure

the original layout of the courtyard [7]. This step requires multiple consultations and is the most time-consuming and uncertain part of the entire protection and development project. After the evacuation is completed, renovation and construction of the courtyard will begin, followed by designing and decorating according to the needs, and finally waiting for completion and operation.

There are still various risks in the renovation and design of the courtyards, including environmental impact and traffic impact risks that may affect the daily lives of residents in the neighborhood, leading to acceptance risks for residents. These risks can cause delays in construction progress and implementation risks due to conflicting opinions. In addition, excessively focusing on the personalized development of individual local guildhalls while neglecting the coordinated development of the entire neighborhood and other guildhalls can also lead to risks in overall monitoring [8].

This traditional method of protection is costly and time-consuming, and may result in a restoration vacuum period, which leads to closed protection and development of local guildhalls. Tourists cannot know the expected development status, so innovative technologies need to be developed to assist in their protection and development. Currently, local guildhalls have not yet used cloud backup, smart facilities have not entered into development, and the frequency and quality of digital technology usage are poor, resulting in the inability to meet the needs of residents for digital empowerment in the neighborhood. Using digital means can achieve unified management of the guildhalls, complete data monitoring and analysis, optimize visitor experience with external devices, and even virtually restore local guildhalls that cannot be physically restored, greatly improving the utilization of historical and cultural resources of local guildhalls (Figs. 2, 3, 4, and 5).



Fig. 2. Liuyang Guild Hall (Inside)



Fig. 3. Anhui Guild Hall(Exterior)



Fig. 4. Shexian Guild Hall (Courtyard interior)

3 Application and Suggestions of Digital Technology in the Development of Local Guild Halls as Cultural and Tourism Resources

This study takes the local guild halls in the historical and cultural district of Fayuan Temple as an example, and identifies existing problems based on the actual use of the guild halls. It then provides solutions using digital technology, focusing on three areas of empowerment: resource information preservation and sharing, audio-visual effects and experiential expansion, and tourism management.



Fig. 5. Ningqiang Guild Hall(Exterior)

3.1 Digitalization of Resource Information Preservation and Sharing

The first step in protecting and developing local guildhalls is to determine their development content. Due to the different nature of the protection of different guildhalls, the government's published list has a certain order, so the time and progress of protection and development are passive, which leads to the lag in the content development process [9]. After the development plan is determined, it needs to be deeply involved around a certain theme, and all relevant information about local guildhalls needs to be collected and verified, and it must be approved by the National Cultural Heritage Administration, which has a significant time cost. However, by using digital technology to perform cloud backup of historical and cultural resources related to local guildhalls in advance, the cost of third-party information verification can be reduced, and information and data can be updated and shared.

The use of cultural computing technology and audio-visual digitalization can solve the problems of resource information preservation and sharing. Cultural computing technology mainly uses methods such as metadata quantification and feature relationship similarity measurement to quantify feature relationships. For example, the preservation status of a scenic area and the degree of aging of street equipment, which are difficult to measure with data, can be quantified by metadata and analyzed visually through imaging or digital means. The use of cultural computing technology can effectively quantify some unquantifiable information and indicators, and combined with audio-visual technology, save and backup related image and video resources. Such digital technologies can well classify and verify resources, ensuring the authenticity and usability of the development content, and building a related cultural resource information database is also beneficial for the preservation of the cultural heritage of the local meeting hall [10].

3.2 Digitization of Data Measurement Recording

To protect and develop each guild hall, precise data is needed. However, the original measuring tools are limited to manual tools such as rulers, tape measures, spirit levels,

and scaffolding. These tools not only have measurement limitations, but also cause secondary damage to the courtyard ecology when used in areas that are too high or too narrow for manual measurements.

Using surveying and mapping equipment such as laser rangefinders, electronic total stations, and theodolites can better and more conveniently achieve data measurement and recording for the original courtyards and buildings. These devices have no spatial usage restrictions and can be used indoors and outdoors. In addition to using advanced equipment for measurement, BIM modeling technology can also be used to achieve a 1:1 restoration of the collected data. BIM modeling technology has collaborative design functions, information collection functions, auxiliary plugin functions, and program simulation functions that can make data three-dimensional and stereoscopic.

3.3 Digitization of Audio-Visual Effects and Experience Expansion

The digitalized museum that this study aims to create hopes to fill the gap left by the closure of local museums and consolidate cultural tourism resources related to local museum culture, enhancing the tourism experience. Therefore, a user-oriented digital heritage interpretation concept model is introduced for development, which focuses on interpretation and includes interactivity, learning, and display. This model provides positive feedback for building virtual museums and revitalizing historical and cultural heritage, increasing interaction between users and cultural resources. In contrast, the current operational models of local museums that have already been put into operation all revolve around promoting museums and former residences, with a single operating model and poor visitor experience. By utilizing digital technology, the operational model of local museums can be innovated, increasing the visual and experiential effects, making museum tourism no longer monotonous.

Using virtual reality (VR), augmented reality (AR), and Internet of Things (IoT) technology can address the issues of expanding audio-visual effects and experiences. First, VR and AR technology can be promoted both online and offline. This project classified the venues based on research and visits. For venues that are in good condition and could support installations, offline promotion can be conducted. Tourists can use head-mounted VR devices, handheld MAR systems, body recognition technology, or projection devices to virtually tour a specific scene or event in a venue, increasing immersion and improving the experience. A virtual venue block can also be constructed by introducing 3D modeling technology to virtually restore venues that have not been vacated or cannot be vacated. This satisfies tourists' expectations of previewing the content of venues that can be restored in advance and gives a second life to venues that cannot be restored on-site. Secondly, by introducing IoT technology, QR code and NFC technology can be combined with other digital technologies, allowing users to scan or stick a code on their phone and access the digital sensory experience section, which cannot be supported by digital devices (Fig. 6).

Furthermore, by integrating IoT technology with QR codes and NFC technology, and combining them with other digital technologies, visitors can simply scan or tap their phones to access digital interactive experiences. For areas where it's not feasible to install digital devices, visitors can still access audio and video playback, thereby moving away from traditional monotonous text and image browsing.



Fig. 6. Building Information Modeling sketch map

To meet the needs of tourists for information about local guild halls and to attract more tourists, the introduction of intelligent guidance signs is also essential. This kind of signage was first used in large shopping malls, and by adding a voice interaction system and a facial recognition system, as well as incorporating the AI-powered “Xiaoman” as a guide, which was specifically developed for the historical and cultural district of Fayuansi, the electronic guidance signs can provide detailed answers to the needs of residents or tourists. Compared to other traditional building materials used for signs and directional signs, intelligent guidance signs can display the panoramic view of the district, capture information about the road direction, and usage of public facilities from a third-person perspective, breaking the barriers for the elderly residents to use mobile devices, as well as overcoming communication barriers. This enhances the tourist experience by combining online and offline tourism resources.

3.4 Digitalization of Tourism Management

As a link that runs through the pre, during, and post-tourism stages, tourism management can obtain tourist intentions in advance, monitor real-time data of tourist attractions, and collect and analyze data through visualization [11]. Currently, the management of local cultural and tourism resources in the place of meeting lacks technological support and integrated systems, and there is also a lack of attention to organizing and analyzing these data, resulting in unsatisfactory utilization and promotion of cultural and tourism resources related to local meeting culture, and the reception situation of scenic spots is not optimistic. Therefore, it is urgent to obtain data for analysis.

Using tourism big data technology and positioning technology can solve the problems existing in tourism management. Big data technology is mainly manifested in the forms of data reports, data centers, cloud services, and solutions, mainly involving management, service, and marketing dimensions. Tourism big data can systematically record

tourists' ticket purchase demands and quantities, and is compatible with IoT technology, recording tourists' scanning or use of digital functions' frequency and browsing time. Positioning technology mainly uses GPS system and needs to use this digital technology for accurate people flow analysis. It is compatible with tourism big data technology and can draw space heat maps to assist in tourist attraction analysis based on time periods, locations, and other indicators, thus aiding the development of local cultural and tourism resources.

4 The Problem and Suggestions for the Development of Local Cultural and Tourism Resources in the Conference Center

4.1 Issues in Development

The issue and suggestions for the development of local cultural and tourism resources related to the local guild halls involve sustainability in terms of development methods, environmental impact, and innovation. These resources are unique and cannot be replicated, and therefore sustainable development is crucial. Traditional development methods can lead to inappropriate land use and environmental degradation, while over-reliance on digital technologies can result in excessive use of water and electricity, leading to infrastructure breakdown. In addition, the authenticity of the development content needs to be verified, as historical and cultural resources require certification from cultural authorities. Some developers may skip steps or engage in false advertising due to policy and practical pressures, leading to the deviation of the development from the original intention of digital empowerment, and a departure from the cultural heritage of the guild halls.

The upcoming digital development of local meeting halls will add overall intelligence and cultural appeal to these buildings while preserving their historical features and increasing their visibility and digitalization of cultural resources. However, there are still some issues to consider. Digital development often involves large-scale construction projects, which may damage the existing environment and affect residents' daily lives. Furthermore, there are challenges such as long development cycles, high costs, high maintenance difficulty, and lack of talent. Not all local meeting halls are suitable for offline digital experiences, and excessive reliance on immersive experience equipment may only exacerbate the loss of value in meeting hall development.

The development of local meeting halls should focus on both their cultural and commercial aspects, and the impact of meeting hall economics should be positive. The impact of commercialization on meeting halls lies in the collision between history and modern culture and industry. The decoration and content of shops may be incongruent with the meeting halls, and a focus on selling local specialties may neglect the cultural significance of the meeting halls themselves, which is contrary to the overall digital empowerment plan. In addition, the entrance of shops into the neighborhood may cause competition from different channels, and synchronizing online and offline information is also a challenge for commercialization in the neighborhood [12].

4.2 Suggestions on Development

Starting from the issues of developing sustainability and selecting means, when determining the use of digital means, the actual bearing capacity of the building should be fully considered. Based on the actual preservation status of the block facilities and the guild halls, exclusive restoration plans should be formulated, highlighting the different roles of digitalization in relocation and operation. For example, a virtual storytelling event can be created for the Liuyang Guild Hall that has not completed relocation, utilizing live broadcasting platforms for preheating and attracting audiences. For the Anhui Guild Hall that has completed relocation, online cloud performances can be arranged, breaking through geographical restrictions. To empower local guild halls, there needs to be reliable historical evidence, not only to verify historical facts but also to ensure the development of the guild hall's individuality. For example, the Liuyang Guild Hall witnessed the beginning and end of the Hundred Days' Reform and left the immortal spirit of famous figures such as Tan Sitong. In the process of its development, it is necessary to pay attention to the authenticity of the development content and to focus on displaying the experiences of the figures and the characteristics of the guild hall around the main theme. Starting from commercialization issues, the introduction of cultural and creative shops can showcase different guild hall cultures and break through single sales channels, driving the development of the guild hall's brand economy. Additionally, drama performances, themed restaurants, and cafes can be added to meet the different consumption needs of visitors.

In addition, the Xicheng District government, the development company led by Xuanfang Dade, and the neighborhood committee should also play a leading role. The government should clarify the project progress and participating units, and work with developers to determine the best restoration plan. The development company, such as Xuanfang Dade, should conduct safety inspections for facilities that require external digital equipment in advance and control costs. The overall planning should focus on driving the overall development, coordinating the overall progress, and providing logistical support to deal with any financial disputes that may arise during the project. As residents of the Fayuan Temple area, we have a responsibility and obligation to support the development of digital-enabled features in the neighborhood, actively cooperate with the government's work, and provide suggestions for the development of digitalized halls.

5 Conclusion

Local guild halls, as carriers of excellent historical and cultural resources, are the trend and inevitable choice for digital empowerment. This study explores the real problems of protection and development of local guild halls in the historical and cultural block of Fayuan Temple through a large amount of field research and communication with various parties involved in the protection projects of guild halls. Many practical difficulties cannot be properly solved through traditional protection and development programs. This study proposes the use of digital means to empower local guild halls in Fayuan Temple block, and proposes possibilities for digital empowerment from four aspects: resource information preservation, digital measurement and recording, audio-visual experience

expansion, and tourism management. Problems and suggestions for digital empowerment programs are also proposed, with the aim of providing reference for the protection and development of similar historical and cultural resources.

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