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# *Research on Spatial Organic Regeneration of Mega-events under the Guidance of Social Integration*

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***Keywords:*** Social integration, social isolation, China Pavilion of the Shanghai World Expo, China Art Museum, organic regeneration

***Abstract:*** To promote city marketing, some cities have hosted Mega-events and left behind several large cultural facilities. However, some of facilities are underutilised in subsequent stages, leading to isolate from the daily lives of the surrounding communities. In this context, this research takes the China Pavilion of the Shanghai World Expo as a case study to evaluate the subsequent use of Mega-event spaces. It proposes strategies for spatial organic regeneration guided by social integration. Data were collected through questionnaires and interviews and analysed using mean statistics and multiple linear regression methods. The findings revealed several issues regarding the subsequent use of the China pavilion. The conclusion highlights that, to achieve the goal of sustainable social development, targeted strategies for the organic regeneration of Mega-event spaces should be proposed under the guidance of social integration based on qualitative and quantitative analysis.

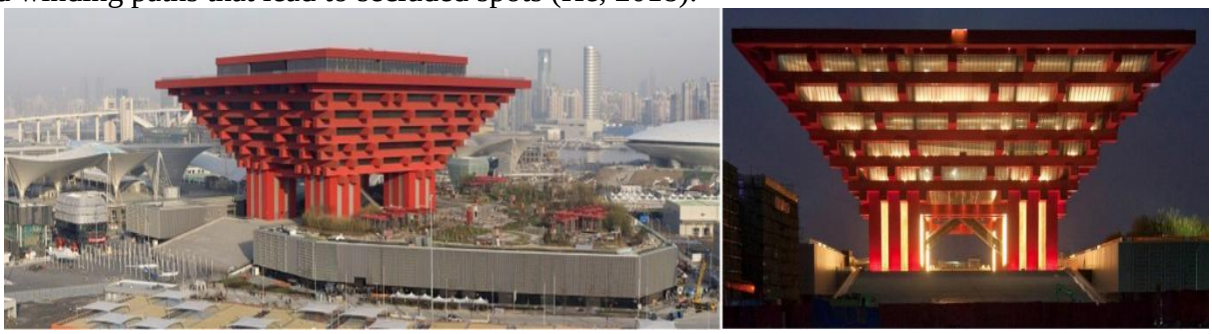
## 1. Introduction

Mega-events include leisure-oriented events such as the Garden Expos, sports events such as the Olympics, cultural events such as art festivals, and comprehensive events such as the World Expos. Mega-event spaces attract significant attention during an event, they often fade from public view and struggle to integrate with social life in subsequent stages. Wu introduced the theory of spatial organic regeneration (Wu, 1998), which core concepts are using appropriate scale based of spatial texture, adopting high quality regeneration strategies from humanism, making each space relatively complete, accumulating to achieve the goal of spatial system regeneration (Fang, 2000). The concept of social integration critiques the alienation phenomenon of technicism and pragmatism in daily life, aiming to achieve humanism by improving social relations (Heller, 2010). This necessitates spatial organic regeneration that focuses not only on the physical form of space but also on its multilayered social meaning (Madanipour, 2014). Multilayered social meaning is based on the psychological needs of communities, including physiological, safety, love and belonging, esteem, cognitive, aesthetic, self-actualisation, and transcendence needs (Maslow, 1970). The multilayered psychological needs of communities interact with spatial design. For instance, space meets the community's basic needs by offering various spatial functions, providing healthy, safe, and comfortable internal and external environments for the community, and promoting interaction among individuals and communities

(Whyte, 2020). Cultural public spaces serve as platforms to meet the higher-level spiritual needs of the community, and space offers opportunities for communities to explore their potential and realise their social value. This research aims to explore how multilayered social integration can be achieved through the organic regeneration of Mega-event spaces. This research uses the China Art Museum as a specific case study to provide a valuable reference for research on the organic regeneration of Mega-event spaces.[1]

The China Pavilion, the Expo Center, the Performing Arts Center, the Theme Pavilion, and the Axis constituted the permanently preserved core architectural complex during the Expo 2010 in Shanghai. The China Pavilion is the core building of this complex. The architect drew inspiration from the national treasure “Fangding” (bronze vessel), integrating cultural essences such as the “nine verticals and nine horizontals” traditional urban layout, the “Dougong” traditional architectural form, and the “Jiuzhou Qingyan” classical garden feature. The architect developed the "Crown of the East" building image through the combination of spatial composition and modern construction materials (Figure 1). In the post-Expo period, the China Pavilion was renamed the China Art Museum and served as a versatile cultural platform for exhibitions and events in Shanghai.[2]

The China Art Museum spans approximately 160,000 square meters. This Mega-structural building primarily comprises three sections: the main exhibition space, podium space, and rooftop garden. The main exhibition space, originally the National Pavilion, spans approximately 53,000 square meters and has a height of approximately 59.6 meters. The podium space, originally the Regional Pavilion, spans approximately 27,000 square meters and is approximately 14 m high. The rooftop garden, originally the performance area of the “Jiuzhou Qingyan” scene, spans approximately 27,000 square meters. It embodies the characteristics of northern classical gardens, featuring green and winding paths that lead to secluded spots (He, 2018).



(Source: Architectural Design & Research Institute of SCUT Co., Ltd.)

Figure 1: Spatial Composition of China Art Museum

## 2. Methodology

This research's methodology encompassed both data collection and analysis. Data collection methods included structured questionnaires, semi-structured interviews, and field observations.

### 2.1. Structured questionnaires

Structured questionnaires were employed to collect basic information about different types of communities and their satisfaction with spatial functions, spatial environment, social interactions, and other aspects. The participants were selected based on a spatial clustering sampling method. Approximately 100 visitors from the China Art Museum participated in the survey, yielding 100 valid samples. Approximately 200 individuals from four typical communities surrounding the China Art Museum participated in the survey, with each community contributing approximately 50 participants, resulting in 200 valid samples.[3]

### 2.2. Semi-structured interviews

Extracting 20% from each of the five communities mentioned above and conducting interviews with approximately 60 persons, the respondents consented to participate and remained anonymous. The average interview duration was approximately 20 minutes. The content of the interviews relating to the opinions and suggestions of spatial function, spatial environment, social interactions was recorded in notes.

### 2.3. Field observation methods

Photography and recording were used to collect information on venue use. In terms of data analysis methods, Jamovi (version 0.9.5.12), an emerging statistical analysis software, was employed to descriptive statistical analyses. These included calculating the mean, standard deviation, and weighted average of several classification dimensions of spatial quality and community social interaction satisfaction. These analyses provide an overview of venue use. The questionnaire data were further analysed through multiple linear regression using Jamovi. Several categorical dimensions of spatial quality were selected as independent variables with community social interaction satisfaction as the sole dependent variable. Normal distribution, collinearity diagnostics, model fitting evaluation and the calculation of model coefficients were used to identify the spatial dimension factors that significantly affected community social interaction satisfaction at the venue.[4]

## 3. Composition Of Visiting Communities At China Art Museum

A percentage-based descriptive statistical analysis was conducted using questionnaires completed by approximately 100 visitors to the China Art Museum. The composition of the visitors reflects four main characteristics. First, most visitors come from other provinces and cities, accounting for 81%. Secondly, the visitors were younger, with 42% visitors aged 18 to 24, 38% visitors aged 25 to 34, 15% visitors aged 35 to 44, 3% visitors aged 45 to 54, and 2% visitors aged 55 to 64. Third, visitors had different occupations. Since the survey was conducted during summer vacation, students and teachers made up the majority of visitors, accounting for 43% and 13% respectively. The rest of the visitors had a variety of occupations accounting for 40%, and had a relatively low proportion of art professionals accounting for only 4%. Fourth, the visitors mainly consisted of tour groups. Groups with more than 100 visitors accounted for 21%. Groups with 10 to 100 visitors accounted for 23%. Groups with less than 10 visitors and more than 1 visitor accounted for 48%, and single visitor accounted for 8%. 91% of the participants were visiting for the first time.[5]

## 4. Isolation of Social Relationships Within Communities At China Art Museum

### 4.1. Isolation of Daily Management at China Art Museum

The Shanghai Art Museum oversees the daily operations of the China Art Museum. The Shanghai Art Museum, founded in 1956, was one of the first art museums established after the founding of New China. Its functions include collecting fine art, organising exhibitions, promoting aesthetic education, conducting academic research, and facilitating international exchange. Since its relocation to the China Art Museum, the main exhibition space of the Shanghai Art Museum has primarily showcased artwork, reflecting its professional characteristics. The podium space is occasionally rented by other municipal departments to host forums. According to the observations, a significant portion of the podium space is vacant, and unique public spaces such as the rooftop garden and top floors of the main building are inaccessible to the public, suggesting that the spatial value of the venue

has not been fully explored. Introducing diversified management units and adopting a diversified management model will result in more diverse spatial functions, in order to reduce the amount of wasted spatial resources.[6]

*"The Shanghai Art Museum, which is operated directly under the Propaganda Department of the Shanghai Municipal Committee, relocated to the China Pavilion in 2012. The exhibitions of the Shanghai Art Museum encompass a wide range of artistic disciplines, including painting, calligraphy, traditional Chinese painting, and sculpture, with less involvement in other art forms. It is a professional art institution. When naming the venue, it was deemed inappropriate to retain the name "Shanghai Art Museum" due to its significant symbolic role during the World Expo. Therefore, it was renamed the China Art Museum. Compared to its original location at the Race Club on People's Square, the demographic structure of visitors has undergone a significant shift. Initially dominated by art professionals, the museum now primarily attracts tourist groups organised by schools, institutions, companies, and travel agencies. The China Art Museum is one of the most popular tourist attractions promoted by travel agencies in Shanghai. Nearly 90% of its visitors come from other provinces. The exhibitions primarily focus on fine arts, showcasing modern and contemporary art pieces (1840-1949) from the Shanghai Art Museum's collection. Compared to other tourist attractions in Shanghai, the venue has experienced consistently low visitor traffic since its opening. On weekdays, the number of visitors is around 500 and does not exceed 1,000, while the peak number of visitors during holidays is around 2,000 and does not exceed 5,000." (Interview with a museum staff member, male, 45 years old)*

### 4.2. Isolation between the China Art Museum and Surrounding Communities

There are four primary categories of typical communities located within a 2-kilometre radius around the China Art Museum: employees of enterprises and institutions, residents of old residential neighbourhoods, residents of public rental housing, and residents of mid-to-high-end commercial housing. Descriptive statistical analysis was conducted using questionnaires from approximately 200 respondents in the vicinity of the China Art Museum. These four communities have low visiting frequency and weak recognition to the museum. More than half of the respondents stated that they had never visited the China Art Museum in their daily lives. Some respondents occasionally visited the venue accompanying with relatives and friends or were casually observed outside the venue's fence.

Enterprise employees focus more on self-improvement. Some respondents noted that the China Art Museum was open from 10 a.m. to 5 p.m., with a relatively short opening period. The venue's interior is brightly lit at night, primarily to showcase lighting effects, but it lacks functional accessibility for the public. They suggested that operators use the podium space to provide a place for reading and educational activities after work.

Residents of older neighbourhoods prioritise social interaction. They often walk along the fences of the Museum in their daily lives. They recommend that the operator open up external plazas, which are isolated from the city, to enhance their shared use and provide a public platform for daily social interaction among residents.[7]

The residents of public rental housing prioritise their spiritual needs. Although they often visit the city's cultural venues such as museums, art galleries, and libraries during their leisure time, they do not usually choose the nearby China Art Museum. They suggest that the operator regularly update exhibition themes at the China Art Museum to enhance the appeal of both its physical facilities and exhibition content.

Mid-to-high-end commercial housing residents are more focused on developing interests and realising self-worth. Some respondents mentioned that exhibitions at the Museum are highly

specialised and not closely related to their daily lives. They recommend that the operator incorporate interest activities and volunteer opportunities tailored to communities, such as children, young people, and retirees, to enhance the diversity and vitality of the communities and provide a public platform for civic engagement and self-acturalisation.

### 4.3. Isolation of Social Interaction among Visiting Communities to the China Art Museum

Visitors to the China Art Museum often come into groups, providing ample opportunities for social interaction. However, aside from the solitary act of moving around the exhibition hall, there are few instances of interactive behaviour within the venue. The interior space of the China Art Museum is large and sparse but lacks areas conducive to social interactions among visitors. Some respondents recommended that the operator include various types of interactive spaces tailored to different age groups, such as children, young people, and seniors, to enhance visitors' enjoyment and reduce their physical and psychological fatigue.

Table 1: Descriptive statistical analysis of satisfaction with social interactions and spatial elements of the venue (5-Point Scale)

| Dimensions | Factors | Mean | Standard Deviation | Weighted Mean |
|---|---|---|---|---|
| Social interaction elements | Personal action experience | 2.32 | 0.84 | 2.21 |
| | Interactions among communities | 2.16 | 0.79 | |
| | Interactions among companions | 2.14 | 0.76 | |
| | (n=3) | 6.62 | 1.99 | |
| Exhibition functionality | Exhibition method | 2.56 | 0.91 | 2.63 |
| | Exhibition content | 2.70 | 0.97 | |
| | (n=2) | 5.26 | 1.54 | |
| Supporting facilities | Space utilisation rate | 2.02 | 0.68 | 2.40 |
| | Diversity of functions | 2.46 | 0.89 | |
| | Catering facilities | 2.68 | 0.98 | |
| | Cultural innovation facilities | 2.44 | 1.61 | |
| | (n=4) | 9.60 | 2.42 | |
| Exhibition environment | Exhibition flow | 2.36 | 0.98 | 2.12 |
| | Exhibition experience | 1.88 | 0.80 | |
| | (n=2) | 4.24 | 1.62 | |
| Public space environment | Space openness | 3.10 | 0.74 | 2.80 |
| | Space natural lighting | 2.52 | 0.86 | |
| | Leisure seats | 3.12 | 1.00 | |
| | Indoor greenery | 2.30 | 0.99 | |
| | Guidance signs | 2.96 | 0.90 | |
| | (n=5) | 14.00 | 2.67 | |
| Outdoor space environment | Connection of indoor and outdoor space | 2.54 | 0.99 | 2.58 |
| | | 2.08 | 0.99 | |
| | Vitality of outdoor plaza | 3.12 | 1.27 | |
| | Attractiveness to the surrounding | 7.74 | 2.58 | |
| | (n=3) | | | |
| Spatial accessibility | Accessibility via public transport | 4.14 | 0.83 | 4.14 |
| Social interaction satisfaction | - | 2.24 | 0.82 | 2.24 |

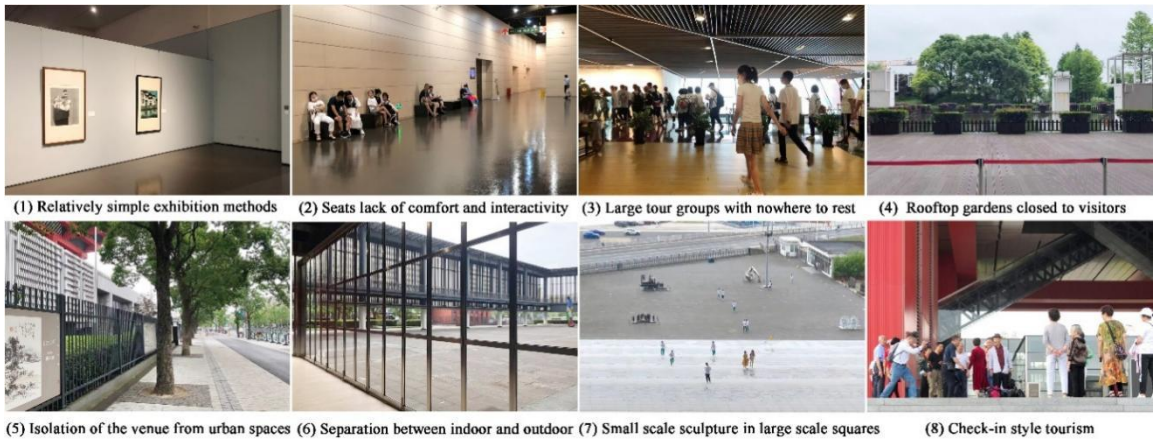
## 5. Isolation Between Visiting Communities And Spatial Elements At The China Art Museum

### 5.1. Isolation between Visiting Communities and Spatial Functions at the China Art Museum

As shown in Table 1, visitor satisfaction with the spatial function was low. First, regarding the exhibition function module, some respondents mentioned that the venue primarily showcases modern and contemporary art that lacks diversity, making it somewhat monotonous. They recommended that the operator introduce dynamic, abstract, and avant-garde cultural exhibitions for art borrowing, possibly in collaboration with sister institutions. In terms of exhibition methods, some respondents noted that the China Art Museum primarily employs traditional static display methods without incorporating diverse approaches such as audio guides, guided tours, and interactive media installations. Second, regarding the supporting functional modules, the majority of respondents indicated that the catering and cultural innovation functions integrated with the podium space were limited and lacked distinctive features.

### 5.2. Isolation between Visiting Communities and Spatial Environment at the China Art Museum

As Table 1 shows, visitor satisfaction with the spatial environment was low. First, regarding the public space environment module, the venue does not fully embody its public character. For example, the public does not have access to appealing locations, such as the podium's rooftop garden or top-level exhibition spaces. In terms of space natural lighting, the public spaces inside the venue are somewhat dim and lack adequate natural light. In terms of public facilities, there is a lack of amenities essential for enhancing the overall visitor experience, including vending machines, water dispensers, snacks and coffee points, speciality shops, plants, shelves, comfortable seating, and background music. Regarding the maintenance of public facilities, the venue’s inverted cone-shaped architecture with sloping glass curtain walls makes external visibility challenging. Regarding signage, the internal directional signs are unclear and the layout is somewhat confusing, which makes navigating the venue difficult. The operator needs to provide guidance for both general orientation and specific floors, ifacilities. Second, within the outdoor space environment module, there was a disconnect between the podium spaces and the outdoor plaza, as well as a lack of vibrancy in the outdoor plaza (see Figure 2).




(Source: photographed by the author)

Figure 2: Isolation of visiting community and spatial elements in the Chinese Art Palace

### 5.3. Quantitative Analysis of Isolation between Visiting Communities and Spatial Elements at the China Art Museum

To further validate the hypothesis that external spatial elements significantly impact visitors' social interaction satisfaction, Jamovi software was employed to conduct a multivariate linear regression analysis of the independent variables against the dependent variable of social interaction satisfaction. The independent variables encompass six dimensions: exhibition functionality, supporting facilities, exhibition environment, public space environment, outdoor space environment, and spatial accessibility. According to the formula "Y^ = a + bx", where "Y^" represents the dependent variable (outcome variable), "a" denotes the intercept, "b" denotes the slope, and "x" represents the independent variables (predictor variables), the following results were obtained:

Table 2: Model fitting assessment

| | | | Overall model test | | | |
|---|---|---|---|---|---|---|
| **Model** | **Coefficient of determination $R^2$** | **Adjusted $R^2$** | **F value** | **Degrees of freedom 1** | **Degrees of freedom 2** | **P value** |
| 1 | 0.64 | 0.59 | 12.79 | 6 | 43 | <.001 |

Table 3: Collinearity diagnostics

| | **Variance Inflation Factor (VIF)** | **Tolerance** |
|---|---|---|
| Exhibition functionality | 1.94 | 0.51 |
| Supporting facilities | 1.66 | 0.60 |
| Exhibition environment | 1.39 | 0.72 |
| Public space environment | 1.54 | 0.65 |
| Outdoor space environment | 2.50 | 0.40 |
| Spatial accessibility | 1.29 | 0.77 |

Table 4: Model coefficients calculation (with social interaction satisfaction of the visitors as the dependent variable)

| **Predictor variables** | **Coefficient** | **Standard error** | **t value** | **P value** | **Standardised coefficient** |
|---|---|---|---|---|---|
| Intercept | -0.54 | 0.45 | -1.18 | 0.245 | |
| Exhibition functionality | 0.07 | 0.07 | 1.05 | 0.298 | 0.13 |
| Supporting facilities | 0.16 | 0.05 | 2.98 | 0.005 | 0.32 |
| Exhibition environment | -0.05 | 0.04 | -1.36 | 0.181 | -0.16 |
| Public space environment | 0.35 | 0.11 | 3.11 | 0.003 | 0.32 |
| Outdoor space environment | 0.09 | 0.05 | 2.04 | 0.047 | 0.3 |
| Spatial accessibility | 0.05 | 0.03 | 1.54 | 0.131 | 0.17 |

First, using the Shapiro-Wilk's test to test the data distribution, P=0.273( > 0.05), linear regression satisfied the basic assumption of normal distribution. Second, as indicated in Table 3, in the collinearity diagnostics, the variance inflation factors were < 10 and tolerances > 0.1, suggesting no severe collinearity issues and supporting the use of linear regression analysis. Third, as shown in Table 2, in the model fitting assessment, the $R^2$value was in the higher range (0-1) with a p-value of < 0.05, indicating overall model significance. Fourth, as presented in Table 4, among the model coefficients, the dimensions of the public space environment, supporting facilities, and outdoor space

environment significantly and positively influenced visitors' social interaction satisfaction. Among them, the dimension of the public space environment had the highest degree of influence. the dimensions of exhibition functionality, exhibition environment, and spatial accessibility exhibited non-significant effects on visitors' social interaction satisfaction.

## 6. Results and Discussions

In summary, under the guidance of social integration, China Art Museum's organic regeneration strategies can be proposed in four ways: integration of daily management, integration of space with surrounding communities, integration of social interactions within visitors, and integration of visitors with spatial elements. First, regarding daily management, given the abundant space resources, various management units can be introduced and a multifaceted integration management model can be applied to enhance the efficiency of venue utilisation. Second, regarding social relationships among communities, the China Art Museum should meet the needs of the four typical surrounding communities by providing cultural facilities, opening up outdoor spaces, organising cultural events, and providing opportunities for public participation so that museums can be better integrated into their daily lives. Third, regarding social interactions within visitors, the venue should meet the diverse needs of visitors of different ages and sizes while also mitigating the physical and psychological fatigue caused by its large scale. Fourth, regarding visitors and spatial elements, it is essential to improve venue functionality and enhance environmental quality. Visitors' satisfaction with social interactions at the China Art Museum was particularly influenced by three specific spatial elements: the public space environment, supporting facilities, and outdoor space environment. In the organic regeneration of venues, special attention should be directed towards enhancing the public space environment by improving natural lighting conditions and signage systems. In addition, upgrading supporting facilities, including catering and cultural innovation facilities, is essential. Finally, improving the outdoor space environment, such as enhancing indoor-outdoor connectivity and fostering the vibrancy of public spaces, will contribute to improving visitors' satisfaction with social interaction.

## 7. Conclusion

Considering the social isolation that often arises after permanently designating spaces for Mega-events, it is crucial to explore the organic regeneration of such spaces through social integration. This exploration should focus on integrating daily management, aligning spaces with the surrounding communities, fostering social interaction and communication among visiting communities, and integrating visiting community needs with spatial elements. Qualitative and quantitative analyses of survey results were conducted to propose targeted and focused organic regeneration strategies. These strategies aim to achieve the sustainable goal of cultural development with social equity and coordination of hardware and software updates.

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