

ORIGINAL ARTICLE

World Heritage Cities in the context of urban renewal: The reuse pathway of heritage buildings in Suzhou, China

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Abstract

Suzhou in China, as a participant in UNESCO's World Heritage Cities Program, stands as one of China's pilot cities for urban renewal. Within its historic urban areas, the city has implemented innovative practices and strategies to revitalize its tangible and intangible heritage. This paper delves into the crucial issue of heritage building reuse, aiming to strike a balance between their "specimen" and "living" values. To define the success of reuse projects, this study compares evaluation criteria and parameters from both domestic and international contexts. The paper then focuses on examining the exemplary reuse practices in Suzhou, leading to the identification and summarization of the "Suzhou reuse pathway." Specifically, value construction serves as a case study to assess the impact of heritage reuse through the analysis of public feedback. This examination underscores the effectiveness of Suzhou's pathway, positioning it as a positive reference in the global discourse on architectural heritage conservation and sustainable development in World Heritage Cities.

Keywords: Suzhou; Reuse; Heritage buildings; World Heritage Cities; Pathways***Corresponding author:**Yiting Pan
(panyt@suda.edu.cn)**Citation:** Chen, X., Shi, Q., & Pan, Y. (2024). World Heritage Cities in the context of urban renewal: The reuse pathway of heritage buildings in Suzhou, China. *Journal of Chinese Architecture and Urbanism*, 6(4), 2158.<https://doi.org/10.36922/jcau.2158>**Received:** November 1, 2023**Accepted:** January 29, 2024**Published Online:** September 3, 2024**Copyright:** © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 International (CC BY-NC 4.0), which permits all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.**Publisher's Note:** AccScience Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

1. Introduction

1.1. World Heritage Cities in the context of urban renewal

Urban renewal has become a crucial approach for creating a better living environment in World Heritage Cities. It is often used to improve the physical environment and meet the material and spiritual needs of the residents through the conservation and reuse of heritage buildings. These efforts optimize the quality of architecture, the environment, and services in the area (Chen *et al.*, 2022). However, with the rapid development of urban renewal in World Heritage Cities, the conservation and reuse of heritage buildings have encountered practical challenges: balancing the special requirements of conservation with the economics of reuse (Engelhardt, 2010; Zhou, 2012). To address this problem, it is essential to analyze the core contradiction in the reuse of heritage buildings.

Over the past decade, the contemporary use of architectural heritage has been extensively discussed. Adaptive reuse is a facet of sustainable urban renewal, encompassing

the repurposing and alteration of the function and space of heritage buildings. This process extends the life of these historical structures to meet contemporary needs while preserving both their physical and immaterial significance (Abdulameer & Abbas, 2020; Fiorani *et al.*, 2017; Yung & Chan, 2012). The term “regeneration” is akin to “adaptive reuse,” but according to Orbasli & Vellinga (2020) in their recent book *Architectural Regeneration*, it is defined as the collective activities of reusing, adapting, and evolving existing buildings, guided by the principles of environmental, social, and cultural sustainability. While “reuse,” as a broad term, highlights awareness of ongoing changes in the community, the more technical term “rehabilitation” is commonly employed in conservation standards and guidelines. It describes a choice of conservation treatment — distinguished from “preservation” and “restoration” — that makes contemporary use of historic places through repairing and, sometimes, replacing historical features (Canada’s Historic Places, 2010).

The term “reuse” holds distinctive context and connotations in the administration of architectural heritage resources in China. Historically, the conventional approach of Chinese cultural heritage authorities was relatively cautious when dealing with designated heritage buildings. New functions were strictly restricted, and public access was limited, emphasizing the protection of architectural structures. However, the absence of adaptive reuse could lead to the rapid deterioration of these historical buildings in the absence of inhabitants. Moreover, proper involvement of private sector entities, such as heritage planning enterprises or developers, with access to alternative sources of financing and revenue for covering repairs, operation, and maintenance costs, brings new opportunities. This involvement can contribute to the conservation of more heritage buildings and provide public benefits. Furthermore, a growing understanding of community engagement, social justice, and sustainability has prompted the architectural heritage field and the government to reassess architectural conservation practices.

One notable document reflecting this change is the issuance of the *Opinions on Strengthening Historical and Cultural Protection and Inheritance in Urban and Rural Construction* by the State Council of China in September 2021. This document underscores the importance of “promoting the use of heritage buildings to enhance preservation efforts, encouraging increased accessibility to cultural relics, and facilitating the perpetual inheritance of historical and cultural heritage through effective utilization.” In this context, “reuse” emphasizes the delicate balance between preserving these structures effectively and deriving benefits from their utilization.

It is important to note that publications such as “The Guidance on Heritage Impact Assessments for Cultural World Heritage Properties” (ICOMOS, 2011) and “The Ename Charter” (ICOMOS, 2008) have contributed to a deeper and broader understanding and knowledge of interpreting, presenting, and utilizing architectural heritage. Despite these advancements, the fundamental concept of architectural heritage reuse can still be traced back to the Recommendation of The Madrid Conference (Sixth International Congress of Architects, 1904), which categorized monuments into two classes. The first class consists of “dead monuments,” referring to those belonging to a past civilization or serving obsolete purposes, which should be preserved to prevent their falling into ruin. This type of monument can be called the “specimen type.” The second class encompasses “living monuments,” referring to those still in function and should be repaired to a state that can be used sustainably; this can be called “living type” (Liu, 2012).

Corresponding to the heritage building, comprehensive protection should be applied to ensure the authenticity and integrity of these structures, portraying them as “specimens” that showcase their historical, cultural, scientific, and social values. However, when it comes to demonstrating these values, ensuring the continuation of their functions, and considering the utilization of the buildings and their surroundings, a more dynamic approach is required, treating the heritage buildings as “living entities.”

This paper argues that a successful case of heritage building reuse effectively addresses the complex and diverse value system that combines both the “specimen” and “living” aspects. It involves operating, intervening, and managing heritage buildings from various perspectives related to value, culture, society, economy, and technology. In the reuse process, the “specimen” aspect of the heritage building necessitates a comprehensive interpretation of its value, emphasizing its historical and cultural significance. Conversely, the reuse of the building as a “living” entity relies on operational management and technological considerations. Essentially, the process of reusing heritage buildings entails transforming the characteristics of both the “specimen” and the “living” elements into a harmonious operation. Identifying the priorities to address during this process is crucial for the successful reuse of heritage buildings.

1.2. Literature Review

In recent years, China has been actively exploring ways to protect and utilize architectural heritage resources. Heritage buildings refer to officially designated historic buildings that fall under China’s heritage protection system at the national, provincial, municipal, and county

levels, as well as undesignated buildings of historical value within the core historic district of the World Heritage City. In 2019, the National Cultural Heritage Administration published the Guidelines for the Open Use of Heritage Buildings (The National Cultural Heritage Administration, 2019). Subsequently, in 2020, the first six National Demonstration Zones for the Protection and Use of Cultural Heritage were set up, including Suzhou, China (The National Cultural Heritage Administration, 2020). These initiatives aim to analyze exemplary practices and expand their implementation across a broader region (Suzhou Government, 2021). The current study will explore model practices for the reuse of heritage buildings in line with the promotion of the National Demonstration Zones.

With the increasing emphasis on heritage reuse alongside conservation, related research has gradually emerged in China. Emerging studies show that various perspectives, dimensions, and factors are considered when assessing the results of reuse projects in China. For example, Liang (2011) evaluated the adaptive reuse of old buildings using five elements: sustainable development, preservation of historical and cultural values, the possibility of renewing the building life cycle, economic feasibility, and social benefits. Zheng & Zhang (2015) summarized eight project evaluation criteria based on the criteria of the UNESCO Asia-Pacific Cultural Heritage Conservation Award, including sound conservation administration, adaptation to regional conditions, project completion enhancement, building performance improvement, humanistic environment enhancement, public participation encouragement, information platform utility, and emergency response strategy development. Tian *et al.* (2016) conducted a study on industrial heritage, evaluating the effectiveness of reuse from six perspectives: social impact, resource and environment, economic benefits, management system, operational conditions, and historical culture. Jiang (2017) focused on modern heritage, employing eight criteria for assessment, including historical cultural continuity, public image improvement, functional usage improvement, spatial form optimization, artistic esthetics elevation, indoor and outdoor environment enhancement, green and sustainable transformation, and economic benefits improvement. Wang (2022) used five major perspectives — history, society, culture, art, and economy — to evaluate and study the reuse of modern industrial heritage.

Extensive international research has been conducted on the evaluation of the effectiveness of reuse projects. Elsorady (2014) assessed the compatibility of heritage for new uses in eight aspects: architectural integrity, public perception, formal and physical characteristics, architectural function,

sustainable adaptation, cultural identity, environmental benefits, and economic contribution. Approaching from a circular economy perspective and considering four sustainability dimensions — social, cultural, economic, and environmental — Bosone *et al.* (2021) developed a 40-criteria evaluation framework for circular cultural heritage adaptive reuse. Arfa *et al.* (2022), based on an analysis of jury reports from prestigious award in the Netherlands and Europe, proposed using six umbrella criteria — social value creation, cultural enhancement, architectural enhancement, environmental sustainability, economic value creation, and innovation — to assess the effectiveness of adaptive reuse projects, aiming to guide and enhance the reuse process. Most recently, Vafaie *et al.* (2023), following the PRISMA guidelines, conducted a systematic review of a vast body of literature to gain a thorough understanding of the factors contributing to the success or failure of heritage reuse. The results were categorized into 10 success factors: architectural, structural, socio-cultural, economic, environmental, energy-related, authenticity, legal, management, and functional considerations. A list of assessment criteria and a summary of keywords are listed in Table 1.

In summary, the increasing focus on reuse projects at national and international levels underscores the importance attributed to the interpretation of historical, cultural, and artistic values. Notably, there is growing attention toward social benefits and technical design, followed by economic benefits, management and operation aspects, and finally, sustainability and environmental considerations. It is important to recognize the inherent connection between management and economic benefits, as well as the overlapping emphasis between management and social benefits.

1.3. Methodology

This article proposes the utilization of a combination of research methods across different stages, including literature survey, fieldwork research, case study analysis, quantitative and qualitative analysis, and inductive reasoning. By synthesizing various literature, the study offers in-depth insights into the current research status of heritage reuse evaluation criteria, providing a theoretical foundation for the subsequent summarization and generalization of the heritage reuse pathways in Suzhou, China. At the same time, the article reports an in-depth examination of implemented heritage reuse cases through case study analysis, aiming to distill practical experiences and offer specific guidance.

Regarding data collection, primary documentary sources were obtained from the Suzhou Cultural Heritage

Table 1. List of assessment criteria and summary of keywords

Study	Evaluation dimensions/factors	Keywords
Liang (2011)	Sustainable development	Sustainability
	Preservation of historical and cultural values	Value interpretation
	Possibilities for building life cycle renewal	Sustainability
	Economic feasibility	Economic benefits
	Social benefits	Social benefits
Elsorady (2014)	Architectural integrity	Value interpretation
	Public perception	Social benefits
	Form and physical characteristics	Technology and design
	Building functions	Management and operation
	Sustainable adaptation	Sustainability
	Cultural recognition	Social benefits
	Environmental benefits	Environmental benefits
	Economic contributions	Economic benefits
Zheng & Zhang (2015)	Sound conservation administration	Institutions and policies
	Adaptation to regional conditions	Environmental benefits
	Enhancing project completion	Technology and design
	Improving building performance	Management and operation
	Enhancing humanistic environment	Value interpretation
	Encouraging public participation	Social benefits
	Using information platform	Information platform
	Developing emergency response strategy	Institutions and policies
Tian <i>et al.</i> (2016)	Social impact	Social benefits
	Resource and environment	Environmental benefits
	Economic benefits	Economic benefits
	Management system	Management and operation
	Operational status	Management and operation
	Historical culture	Value interpretation
Jiang (2017)	Historical cultural continuity	Value interpretation
	Public image improvement	Social benefits
	Functional usage improvement	Management and operation
	Spatial form optimization	Technology and design
	Artistic esthetics elevation	Value interpretation
	Indoor and outdoor environment enhancement	Environmental benefits
	Green and sustainable transformation	Sustainability
	Economic benefits improvement	Economic benefits
Wang (2022)	History	Value interpretation
	Society	Social benefits
	Culture	Value interpretation
	Art	Value interpretation
	Economy	Economic benefits

(Contd...)

Table 1. (Continued)

Study	Evaluation dimensions/factors	Keywords
Bosone <i>et al.</i> (2021)	Society	Social benefits
	Culture	Value interpretation
	Economy	Economic benefits
	Environment	Environmental benefits
Arfa <i>et al.</i> (2022)	Social value creation	Social benefits
	Cultural enhancement	Value interpretation
	Architectural enhancement	Technology and design
	Environmental sustainability	Environmental benefits
	Economic value creation	Economic benefits
	Innovation	Technology and design
Vafaie <i>et al.</i> (2023)	Architectural	Value interpretation
	Structural	Technology and design
	Socio-cultural	Social benefits
	Economic	Economic benefits
	Environmental	Environmental benefits
	Energy-related	Environmental benefits
	Authenticity	Value interpretation
	Legal	Institutions and policies
	Management	Management and operation
	Functional considerations	Value interpretation

Administration and design documents from key firms such as Suzhou Historic and Cultural City Development Group Co., Ltd. and Suzhou Jicheng Cultural Artifacts Construction Engineering Co., Ltd. In terms of data analysis, this study adopted both quantitative and qualitative approaches. The quantitative analysis draws data extracted from government systems, design documents, and community reports, quantifying factors influencing reused heritage buildings, such as the scale of activities and passenger flow. Qualitative analysis derives insights from text analyses of on-site research interviews and online evaluations, revealing cultural, social, and environmental factors underlying the changes brought about by architectural heritage reuse.

Moreover, this article seeks to integrate perspectives from various disciplines, including architecture, anthropology, historical building conservation engineering, and urban planning. By adopting a multidimensional and multidirectional approach, this article aims to explore both the theoretical and practical aspects of reusing heritage buildings.

2. The practices of reusing heritage buildings in Suzhou

This study focuses on Suzhou, located in the Yangtze River Delta in East China, which is part of UNESCO's World

Heritage Cities Program (OWHC, 2006) and is home to two World Heritage properties: Classical Gardens of Suzhou and The Grand Canal (UNESCO, 2014). With a history of more than 2500 years, Suzhou boasts a wealth of built heritage resources, including classical gardens, historical water towns, historic districts, and intricate canal systems. Throughout its enduring commitment to heritage conservation, Suzhou has consistently been at the forefront of safeguarding and preserving architectural heritage, setting an exemplary standard not only within China but also on a global scale.

Regarding the reuse of heritage buildings, Suzhou has been actively exploring this aspect since the 1990s and has made various useful attempts, including opening museums, memorials, cultural management offices, and sightseeing places in heritage buildings (Shen, 2021). Suzhou has also encouraged the establishment of cultural activities in heritage buildings and allowed some heritage buildings to carry out business activities with restrictions. Through a progression from pilot projects to full-scale implementation, beginning with the archaeological survey and gradually encompassing high-level heritage buildings, Suzhou has accumulated substantial experience in this field (Ying, 2021). At the same time, Suzhou has established a state-owned enterprise to strengthen the protection of heritage

buildings, aiming to elevate the level of conservation efforts (Xu & Ying, 2022). The city has also actively promoted public-private partnerships to facilitate the preservation and reuse of heritage buildings (Liu, 2008).

Suzhou government's commitment to conserving and innovatively reusing heritage buildings is evident in its trajectory of municipal heritage policy-making. From 2002 to 2021, Suzhou implemented 11 policies specifically aimed at protecting and utilizing its architectural heritage. These policies have evolved, starting with the establishment of a new conservation and utilization model, subsequently integrating it into the planning framework, and progressively introducing targeted policies (Table 2). A retrospective examination of Suzhou's heritage conservation history reveals a clear evolution, with strengthened efforts and the development of a more robust administration system.

Suzhou's pioneering practice demonstrates that integrating architectural heritage into urban planning is a key to promoting sustainable urban development while preserving the authenticity and integrity of architectural heritage. The present article argues that the reuse of heritage buildings is an effective strategy for promoting cultural heritage conservation and driving economic development. In essence, Suzhou's accomplishments underscore the crucial balance between conservation and sustainable development. These achievements offer

valuable insights for other World Heritage Cities grappling with the challenge of harmonizing architectural heritage conservation with urban development.

3. The reuse pathway of heritage buildings in Suzhou, China

Drawing from extensive case studies, as illustrated later in the present article, Suzhou's strategy for the reuse of heritage buildings is grounded in several key aspects: a comprehensive understanding of their values, efficient resource utilization, suitable operational models, effective management processes, and progressive technical support. To strike a balance between the traditional "specimen" approach to conservation and the "living" approach required for urban regeneration, Suzhou renovates heritage buildings that are deemed unsuitable for their original purposes, allowing them to be repurposed. This reuse process necessitates a profound respect for the values of the heritage building (Cong, 2014), which calls for a thorough assessment of its worth as a resource and the development of a comprehensive understanding of its content and significance before initiating the reuse project. Once heritage is transformed into a resource, the subsequent step is to convert these heritage resources into assets through meticulous planning and construction.

On being transformed into assets, the built heritage resources should be selected according to the different

Table 2. Eleven specific policies for heritage conservation and utilization implemented in Suzhou, China

Period	Time	Policies	Policy names in Chinese
Create new models	2002	Regulations on the protection of ancient buildings in Suzhou	苏州市古建筑保护条例
	2003	Methods of protecting historical and cultural cities and towns in Suzhou	苏州市历史文化名城名镇保护办法
	2003	Suzhou city calendar ancient architecture repair and protection implementation rules	苏州市古建筑抢修保护实施细则
	2004	Suzhou relies on social forces to repair the ancient dwellings of the implementation of opinions	苏州市市区依靠社会力量抢修保护直管公房古民居实施意见
	2005	Measures for the implementation of the law of China on the protection of cultural relics in Suzhou	苏州市实施《中华人民共和国文物保护法》办法
Integrate into urban planning	2013	Suzhou historical and cultural city protection plan (2013-2030)	苏州历史文化名城保护规划（2013-2030）
	2016	Suzhou cultural relics protection undertaking "13 th Five-Year" development plan	苏州市文物保护事业“十三五”发展规划
	2018	Regulations on the Protection of Suzhou National Famous Historic and Cultural Cities	苏州国家历史文化名城保护条例
Formulate targeted policies	2018	Pilot Program for the Conservation and Utilization of Historic Buildings in Suzhou	苏州市历史建筑保护利用试点工作方案
	2021	Management Measures for the Protection and Utilization of Historic Buildings in Suzhou	苏州市历史建筑保护利用管理办法
	2021	National Cultural Relics Protection and Utilization Demonstration Zone Creation Implementation Plan	江苏苏州文物建筑国家文物保护利用示范区创建实施办法

Source: Table by Qinyi Shi

conditions of the heritage building, with the appropriate mode of operation and feedback to the heritage building itself using adaptive design. This feedback process, which includes management and technical support, is crucial. Consequently, Suzhou's pathway for the reuse of heritage buildings can be divided into three key steps: value construction (heritage converted into resources), benefits operation (resources converted into assets), and technology adaptation (assets feedback to heritage).

3.1. Value construction: Heritage converted into resources

The initial step in the reuse of heritage buildings involves constructing values and transforming heritage into resources. This conversion process entails assessing the potential of each heritage building, developing a comprehensive understanding of its value, and formulating strategies to optimize its value and align it with urban regeneration objectives. Suzhou has conducted extensive research and studies to identify the significance and value of each heritage building. Once the diverse values of the heritage buildings have been determined, conservation and utilization strategies are devised to maximize these values and align them with the requirements of urban regeneration (Wu, 2006). This process involves positioning and planning the heritage buildings, as well as identifying the most suitable reuse options and utilization approaches for each building, considering their historical and cultural values, location within the city, and economic development potential.

3.2. Benefits operation: Resources converted into assets

Building on the initial step, the subsequent phase focuses on converting heritage resources into heritage assets through the operation of heritage buildings. This second conversion process necessitates the development of appropriate operational models and management processes that maximize the benefits of heritage buildings while meeting the demands of urban regeneration (Wang, 2018). Suzhou has implemented suitable operating models for different types of heritage buildings, considering their unique characteristics and historical context. Examples include leasing, sale, and cooperative development. In addition, a comprehensive management system and process are established to ensure the daily operation and maintenance of heritage buildings, guaranteeing their long-term use and value. Furthermore, this approach takes into account potential risks and challenges that heritage buildings may encounter during operation, leading to the development of appropriate risk control measures to ensure effective and sustainable reuse.

3.3. Technology adaptation: Assets feedback to heritage

On completing the aforementioned two transformations of heritage, the final component of technology support becomes indispensable (Ru, 2007). Leveraging modern technology and techniques, heritage buildings can be more effectively conserved and utilized, leading to improved operational efficiency and management. These efforts positively impact the heritage buildings themselves (ICOMOS, 2011). Suzhou has established a regulatory framework to ensure that the adaptive reuse of historic buildings adheres to relevant laws and regulations. It has also created a platform for dialogue and collaboration among stakeholders, fostering consensus formation. Throughout the process of reusing heritage buildings, Suzhou has actively embraced advanced technical and technological tools. Examples include the utilization of digital technology and intelligent systems for the conservation and management of heritage buildings, enabling digital display and intelligent operations within these structures. In addition, Suzhou has increased its investment in environmental protection and energy conservation, aiming to achieve sustainable and environmental-friendly operations within heritage buildings.

By following this reuse pathway, Suzhou's heritage buildings can be successfully adapted to contemporary development while retaining their historical integrity, thereby contributing to the revitalization of the city. On the whole, the reuse of heritage buildings in Suzhou exemplifies a harmonious balance between the "specimen" and "living" values of heritage. It effectively combines three key dimensions: value construction, benefits operation, and technical adaptation, fostering positive interaction between the conservation and use of heritage buildings and urban regeneration. In future development, it is necessary to maintain focus on balancing the contradictions between the "specimen" and "living" values of heritage buildings, as well as managing the relationship between different stakeholders' interests. This approach ensures the protection of heritage buildings while fostering sustainable urban development (Figure 1).

4. Effectiveness of reuse pathways of heritage buildings in Suzhou: Value construction as case study

4.1. Sampling matrix based on value construction

To verify the effectiveness of the reuse pathway of Suzhou's heritage buildings, this study examined a substantial number of reuse projects spanning the past decade. Given the extensive pool of potential cases, specific criteria such

as occupancy, scale, complexity, location, project year, representativeness, and social visibility were considered to ensure a balanced selection (Genovese & Varriale, 2023). The recommendations of governmental heritage organizations and private architectural conservation enterprises were also taken into account. Ultimately, 16 cases were chosen for this study, collectively exemplifying Suzhou's value-building characteristics from four distinct perspectives (Figure 2):

- (i) Heritage that celebrated the highest forms of humanity: Two types of heritage were selected for this category. One is the Classical Gardens of Suzhou, including the Humble Administrator's Garden and Chang Garden; the other is educational heritage, including the Temple of Literature and Tieqin Tongjian Building.
- (ii) Heritage that witnessed the construction of the country: Two types of heritage were selected for this category. One is the revolutionary legacy, including Wusa Road and Jiangkang East Road; the other is the residence heritage of celebrities whose owners made significant contributions to serving the country, including Wang Ganchang's Residence and Pan Zuyin's Residence.
- (iii) Heritage that incubated the regional industry: This category comprises industrial heritage, including Wansheng Rice Company, Caocangzhou Ci, Pingwang-Sihe Jinghang Daji, and Sulun Fang.
- (iv) Heritage that shaped the appearance of the city: This category comprises waterfront residential heritage, including Pan's Residence in front of Weidao Guan, Pan Yifen's Residence, Aiqing Tang, and Zhiren Li.



Figure 1. The reuse pathway of heritage buildings in Suzhou. Source: Drawings by Qinyi Shi

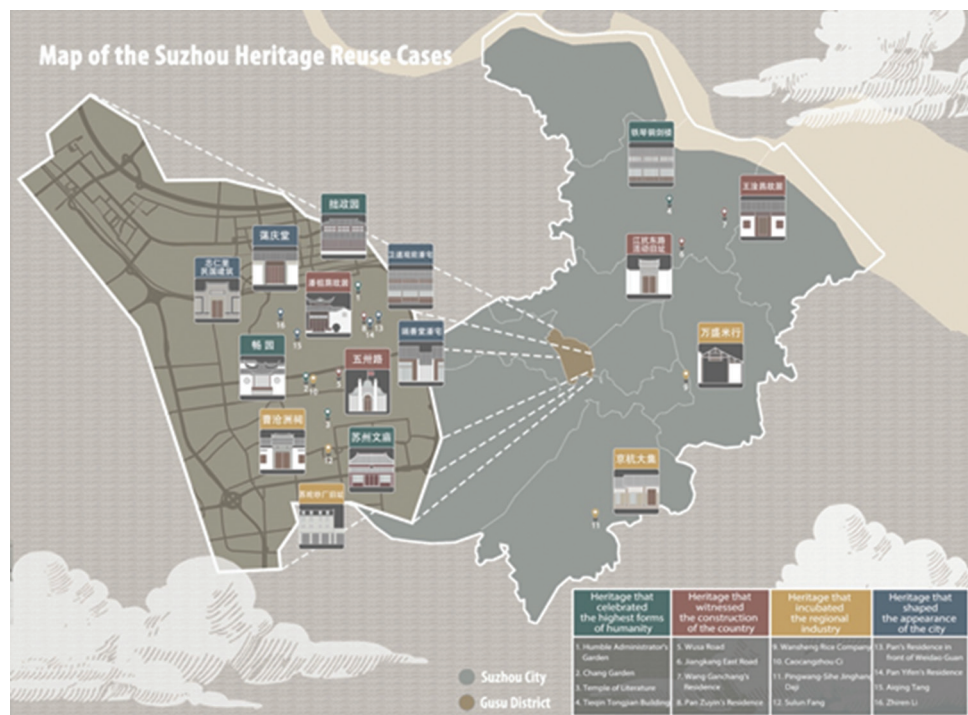


Figure 2. Map of the Suzhou heritage reuse cases. Source: Drawings by Qinyi Shi

4.2. Four categories of value advocacy of heritage reuse in Suzhou

Following a thorough examination of the abovementioned cases with a specific focus on value construction, this study highlights the four main categories of value advocacy in Suzhou, aligned with the inherent values of the heritage and evident in Suzhou's heritage reuse practice (Table 3).

The first is “*Yi wen hua ren*” (以文化人; heritage as mentors to nurture the humanity). As a World Heritage City, Suzhou possesses a wealth of cultural resources. The reuse of Suzhou's garden heritage, educational heritage, and other heritage buildings serves as a platform to promote art and esthetics. These buildings play a vital role in guiding the community toward spiritual and esthetic enrichment, fostering a culture of appreciation, and cultivating healthy pursuits through diverse community cultural activities.

The second is “*Yi wen bao guo*” (以文报国; heritage as warriors to serve the country). Suzhou boasts a rich revolutionary history and notable residences of influential figures, embodying the spirit of family and country. Through their reuse, these heritage buildings can effectively convey and narrate local humanistic stories, inspiring present-day youth and perpetuating cultural values.

The third is “*Yi wen xing ye*” (以文兴业; heritage as fuels to revitalize the industry). The historical development and economic prosperity of Suzhou are intricately tied to its industrial and commercial growth, with a particular emphasis on the grain trade, traditional Chinese medicine and herbs, silk production, and water-town markets. Suzhou still preserves a rich array of industrial heritage in these sectors, including granaries, traditional pharmacies, silk factories, and markets. By retaining their original functions and reusing these industrial heritage sites through adopting suitable new business models or introducing novel industries, Suzhou fosters rejuvenation. This approach preserves the historical memory of Suzhou's commerce and sustains the city's economic model, providing fresh impetus for its economic development.

The fourth is “*Yi wen zhu cheng*” (以文筑城; heritage as resources to enhance the city). Among the heritage buildings in Suzhou, there are many waterfront dwellings with historical value and cultural characteristics. The protection and reuse of these heritage buildings promote the overall protection and enhancement of the city. This preservation effort augments the city's cultural soft power, improves the quality of its ecological environment, and reinforces its overall appeal.

Table 3. Sampling matrix based on value construction

Representative image	Value construction	Type	Name
	<i>Yi wen hua ren</i> (以文化人)	Suzhou garden	1 Humble Administrator's Garden 拙政园
			2 Chang Garden 畅园
		Educational heritage	3 Temple of Literature 苏州文庙
			4 Tieqin Tongjian Building 铁琴铜剑楼
	<i>Yi wen bao guo</i> (以文报国)	Revolutionary legacy	5 Wusa Road 五卅路
			6 Jiangkang East Road 江抗东路旧址
		Residence heritage of celebrity	7 Wang Ganchang's Residence 王淦昌故居
			8 Pan Zuyin's Residence 潘祖荫故居
	<i>Yi wen xing ye</i> (以文兴业)	Industrial heritage	9 Wansheng Rice Company 万盛米行
			10 Caocangzhou Ci 曹沧州祠
			11 Pingwang-Sihe Jinghang Daji 平望·四河京杭大集
			12 Sulun Fang 苏纶坊
	<i>Yi wen zhu cheng</i> (以文筑城)	Waterfront residential heritage	13 Pan's Residence in front of Weidao Guan 卫道观前潘宅
			14 Pan Yifen's Residence 潘缙芬故居
			15 Aiqing Tang 蔼庆堂
			16 Zhiren Li 志仁里

Source: Drawings by Qinyi Shi

4.3. Effectiveness of value construction based on review analysis

Suzhou's rich heritage is thoughtfully conserved and repurposed to benefit its people. In this context, the evaluation of public feedback holds paramount importance as it serves as a vital gauge of the effectiveness of heritage reuse, which has emerged as a growing international trend (Jiang, 2017; Rogers, 2017). A pertinent example of this approach can be seen in the recent publication by the Getty Conservation Institute, where they conducted a reuse assessment of George Town, placing significant emphasis on soliciting and analyzing public opinion (Throsby & Petetskaya, 2022).

Following this paradigm, this study employed a diverse array of survey methods to ensure a comprehensive representation of perspectives from various stakeholders. The survey targeted residents, developers, designers, tourists, and government officials, with residents constituting 70% of the surveyed population. During on-site investigations, questionnaires were distributed to residents and tourists to solicit their opinions on the project. In addition, in-depth interviews were conducted, focusing on engaging developers, designers, and government officials to gain their experiences within the project. To encompass a broader audience, existing public feedback on the cases was collected and compiled from online platforms, including user review websites such as Dianping (<https://www.dianping.com/>) and Ctrip (<https://www.ctrip.com>). MAXQDA software was then used to code and analyze the feedback and interview content (Lin, 2007), disassemble the content, and refine the keywords related to reuse utility (Chauhan, 2022). These keywords were also analyzed for word frequency to generate word clouds to visually present the effects of the reuse of heritage buildings in Suzhou. In the analysis of feedback content from the 16 cases, the theme

of “Leading Social Spirit” emerged prominently, appearing 11 times, closely followed by “Inspiring the Youth” with 10 mentions. In addition, “Activating Consumption” and “Building Cultural IP” both appeared frequently, each being mentioned nine times. These findings highlight the efficacy of the reuse of Suzhou's heritage buildings after value construction in fostering social spirit and stimulating economic activities (Figure 3).

The analysis of public feedback reveals positive content, reflecting the effectiveness of Suzhou's value construction in the reuse of heritage buildings. This approach not only ensures the preservation and utilization of heritage buildings but also generates a positive and progressive impact on the public's lives and social development (Figure 4).

In the case of “heritage as mentors to nurture humanity,” the intangible cultural heritage is emphasized. For example, the Temple of Literature stands as a testament to the preservation of Confucian culture and the history of Chinese education. It serves as a hub for cultural education, learning, and indoctrination (Wu, 2006). The historic Temple of Literature was revitalized by value construction, seamlessly intertwining traditional cultural practices with modern life through the meticulous restoration of the “*Jikong dianli*” (祭孔典礼; a ceremonial activity commemorating Confucius) and the “*Xiangsheli*” (乡射礼; a ritual activity combining archery and the significance of indoctrination), thus propagating the essence of Confucian ideology (Ji, 2022). The Temple of Literature has been revitalized to concurrently facilitate traditional cultural events and host contemporary educational activities. Through interactive exhibition methods, knowledge and appreciation of heritage can be dynamically disseminated, encouraging all citizens to actively participate in the exploration, protection, and interpretation of heritage.



Figure 3. Public feedback content: distribution range, frequency of occurrence, and keyword cloud. Source: Drawings by Qinyi Shi

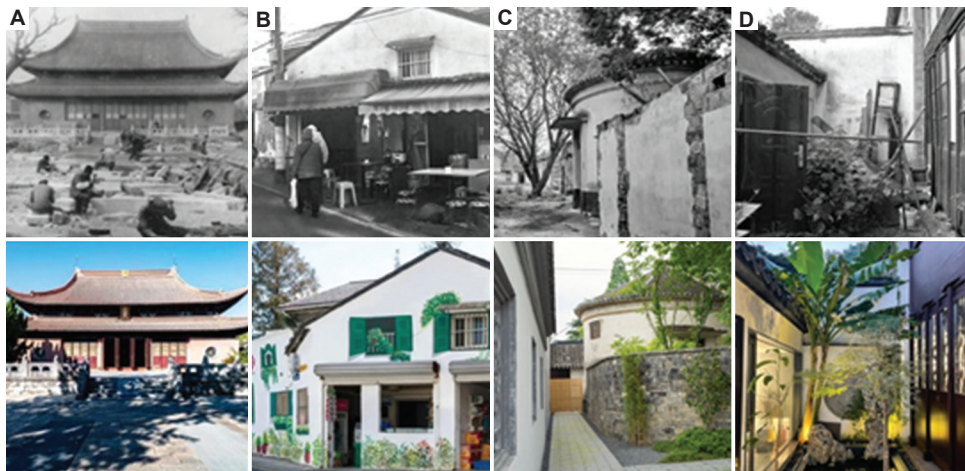


Figure 4. Comparison of before (upper panels) and after reuse (lower panels): (A) Temple of Literature. Source: Photos by Suzhou Jicheng Cultural Heritage Construction Engineering Co., Ltd. (historical) and from the Internet (https://www.hellorf.com/image/show/hi2240829368?utm_source=bdimg&utm_content=local&utm_term=hi2240829368) (contemporary). (B) Wusa Road. Source: the Internet (historical: https://mp.weixin.qq.com/s/-z_7nZrlojiXT1LIUsbltA; contemporary: <https://mp.weixin.qq.com/s/qIYZyIIBzPM6KfMg-YO4iQ>). (C) Wansheng Rice Company. Source: from the Internet (https://www.xiaohongshu.com/explore/62cab3840000000010029e3d?xsec_token=ABQZnob1O_TJh3I7vCcCScYcmUuuhNQMDMCAubomIq99M=&xsec_source=pc_search) (historical) and photo by Jiangsu Blue Garden Co., Ltd (contemporary). (D) Zhirenli. Source: the Internet (https://mp.weixin.qq.com/s/FiNnI3Fd2pM7bK96NbUfSg?poc_token=HC16v2ajJ5UCRish6Yhl9TaUyVra6P-dwVHT-Fp8).

In the case of “heritage as warriors to serve the country,” heritage not only commemorates the history of a nation’s establishment but also reflects how the spirit of democracy contributes to its progress, which is vital in guiding the new generation to better serve the country. For instance, the Wusa Road, a historic district built in the 1920s with a significant revolutionary history (Guo *et al.*, 2021), has witnessed several residents’ self-management initiatives since 2014. In the absence of government intervention, residents of the community, organized under the resident committee, have autonomously established various projects and formed working teams to address needs such as environmental enhancement, cultural activities, and elderly care. Residents have truly become the protagonists of the community. These initiatives include daily maintenance of heritage buildings (the establishment of the volunteer service team), mapping of historical houses (“My Neighborhood,” a project documenting historical and old house culture), and more (Gusu Government, 2021). Wusa Road seamlessly integrates conservation principles into the daily life of the community, fostering self-management and resulting in a vibrant and cohesive neighborhood. In addition to resident self-governance, the Suzhou government has undertaken comprehensive planning for the Wusa Road community. On the one hand, catering to the younger demographic, the infusion of interactive media and artistic installations has swiftly transformed the community into a tourist hotspot, thereby revitalizing the community. On the other hand, diverse businesses, including retail outlets and markets, have been

introduced to enhance the daily convenience of residents. The renewal process adheres to a progressive methodology, elevating environmental quality and addressing the varied needs of the community residents.

In the case of “heritage as fuels to revitalize the industry,” heritage that once incubated the earliest regional industry today has become the base for traditional industries revitalized with modern technologies and sustainability practices. For example, the reuse project of the Wansheng Rice Company, originally built in the early 20th century for the sale and storage of grain (Guo, 2014), carries the historical memory of Suzhou’s prosperous rice trade. This project reconfigured the old buildings into a museum and cultural innovation hub, introducing the new economic model of “stalls.” This transformation utilized open spaces to establish market stalls and exhibitions, serving as a platform to support local cultural brands and enterprises, infusing fresh economic vitality into the community. Simultaneously, it offered more cultural and leisure activities for local residents. During the renovation process, historical structures were preserved to create new spaces, and materials from some old buildings were recycled for new use (e.g., floor coverings), which minimized construction waste, honored the traditional industry with new revenue, and promoted sustainable operations.

In the case of “heritage as resources to enhance the city,” historical residential buildings that used to shape the appearance of the city today symbolize a progressive concept of “social justice” through contemporary efforts in

conservation and reuse. For instance, in Zhirenli, Suzhou, where homeowners with incomes below certain thresholds cannot afford to conserve their own homes, the Suzhou government has stepped in with dedicated funding for their rehabilitation (Chen, 2008). A prime example is Zhirenli 7, where the local government invested a total of 700,000 RMB, which accounts for 87% of the overall construction cost. This exemplary form of government support for the protection of socially disadvantaged community members demonstrates a commitment to upholding equal rights for urban residents. Beyond targeting individual buildings, the project has renovated the overall essential living infrastructure for the entire community, including water supply, electricity, heating, drainage, and disaster prevention facilities. This initiative aimed to enhance living conditions for the community, achieving the integration of heritage conservation and reuse as a catalyst for the improvement of residents' livelihoods. This aligns with the growing international interest in the field of heritage conservation concerning human rights and social equity.

5. Conclusion

The sustainable development of World Heritage Cities has emerged as a significant global concern. In the pursuit of reshaping urban vitality and achieving sustainable development, many World Heritage Cities have embraced heritage reuse as part of their urban renewal strategies. Nevertheless, a critical challenge arises in the development process: how to effectively manage the inherent contradiction between the unique nature of heritage preservation and the economic imperative of reuse while striking a harmonious balance in their development. Addressing this challenge has become an urgent priority for World Heritage Cities.

This retrospective study examined a significant number of reuse projects in Suzhou, narrowing down to a sampling matrix of exemplary projects that received recognition and positive feedback from both the government and the public. Various building types were considered, including single buildings, larger complexes, and historic districts with concentrated heritage buildings, to represent the diversity of the sampled projects. The article demonstrates that in Suzhou, a participant in UNESCO's World Heritage Cities Program, the challenge of sustainable development has been addressed by balancing conflicting aspects during the heritage reuse process. The authors summarized this process into "reuse pathways" as a paradigm within the specific context of Suzhou, encompassing three essential steps: value construction, benefit operation, and technology adaptation. In particular, the article examines the rationale behind various value constructions, correlating them with four types of prevalent value advocacy that resonate

with Suzhou's urban cultural identity and the intrinsic characteristics of heritage buildings. It then explores the impact of appropriate value construction on the results of reuse projects and public feedback.

Throughout this research process, the authors extensively communicated with frontline architectural conservation enterprises and practicing conservation architects, comprehensively reviewed China's national and Suzhou-specific heritage policies, and examined conservation regulations related to the reuse of heritage buildings. The article addresses the challenges and needs of preservation practices and management. In this context, conservation enterprises and local governments may find this research particularly valuable. By refining and clustering common factors in successful reuse projects, the study provides a model pathway, guiding enterprises to prioritize value interpretation and construction, focus on community interests, consider public participation, and avoid unilateral government dominance and commercial exploitation.

Given the retrospective nature of this study and the researchers' academic background in architectural history, conservation theory, policy, and design, the research may not extensively explore certain aspects, such as community engagement in heritage practice throughout the reuse projects. This limitation underscores the importance of future research adopting a more holistic approach to examining architectural heritage reuse, with a greater focus on the perspectives of the community. Although this study primarily focused on the first step of the pathway — value construction — as an illustrative example to evaluate Suzhou's reuse pathway, subsequent research will comprehensively assess the effectiveness of the reuse pathway, aiming to establish a universal quantitative evaluation system. By presenting the Suzhou pathway and analyzing specific cases, this study aims to offer valuable insights, innovative concepts, creative local solutions, exploratory assessment methods, and critical discussions on revitalizing heritage buildings for other World Heritage Cities engaged in the conservation and reuse of heritage buildings. Ultimately, this study contributes to the global discourse on architectural heritage conservation in World Heritage Cities. It underscores the significance of striking a balance between conservation and sustainable urban development, while also fostering a platform for international communication and collaboration in the field of architectural heritage conservation.

Acknowledgments

We sincerely thank Suzhou Jicheng Cultural Heritage Construction Engineering Co., Ltd. for their collaboration

and support throughout the entire research process. Special appreciation goes to the 2023 OWHC-AP World Heritage Cities Youth Forum.

Funding

This research is funded by the National Key R&D Program of China (2021YFE0200100), the 2021 Policy Directed Program of Jiangsu Province (BZ2021015), and the Suzhou Social Development and Technological Innovation Program (2022SS52). We also extend our gratitude to the International Cooperative Joint Laboratory of Cultural Heritage Conservation Science, supported by the Belt and Road Initiative, for their research funding and support.

Conflict of interest

All authors declare that they have no competing interests.

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Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data

The data can be obtained by sending request e-mails to the corresponding author.

Further disclosure

The early draft of this article was presented at the 2023 OWHC-AP World Heritage Cities Youth Forum (Korea, 2023).

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