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# TECHNOLOGY, RISK, AND HERITAGE PRESERVATION

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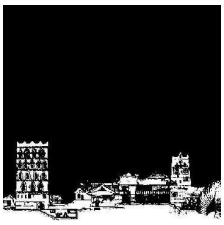

**TRADITIONAL DWELLINGS AND SETTLEMENTS WORKING PAPER SERIES**

Volume 352
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# TECHNOLOGY, RISK, AND HERITAGE PRESERVATION

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**Traditional Dwellings and Settlements**
Working Paper Series

# VIRTUAL REBIRTH OF AN URBAN HERITAGE: THE CASE OF THE WUKANG MANSION LBVR PROJECT IN SHANGHAI

*Jiahao Yan, Huaqing Huang*

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*The development of cutting-edge technology is redefining the distance between history and the present, endowing historical contents with more intriguing forms of expression. In the "virtual reality" constructed by technologies such as spatial computing, LBE (location-based entertainment), real-time cloud rendering, and AIGC, audiences can break through the limitations of time and space and "walk" into a cultural heritage of any place and era. This paper explores the possibility of the "digital rebirth" of an urban heritage in Shanghai—Wukang Mansion, a notable urban icon built in 1924. The research outcomes are showcased via an LBVR (location-based virtual reality), allowing the physical heritage to "tell" its own story. This interactive experience invites viewers to revisit the past and continue its legacy.*

*This study takes the relationship between the Wukang Mansion and the modern urban legends of Shanghai as the entry point. Urban life is the source of modernity. In the late 19th and early 20th centuries, the rise of modern Shanghai attracted large populations, breaking free from tight-knit community ties and becoming psychologically free "individuals." In 1924, Wukang Mansion was born against this backdrop. As a significant milestone in China's residential culture, The invention of modern apartments marked a shift from ritualized living spaces to consumer commodities. As people began to value the privacy and efficient living, ideas of independence and freedom gained popularity, establishing Shanghai as a "modern metropolis." Thus, living in an apartment became integral to the "experience of modernity" in early 20th-century Shanghai.*

*The Wukang Mansion LBVR Exhibition, led by the authors, showcases a research-practice path combining academic achievements with commercialized technology. It first analyzes historical images, architectural drawings, and literature about Wukang Mansion, synthesizing findings from urban architectural and socio-cultural history. By incorporating architecture, furniture, graphic, and fashion design, it aims to reconstruct the modern lifestyle in Shanghai. Using the Unreal Engine (UE) platform, which offers advanced real-time rendering and global illumination, along with VR headsets and SLAM (Simultaneous Localization and Mapping) for cohesive perception and visual experience, the project transforms research into an immersive LBVR exhibition..This urban heritage elaboration goes beyond physical restoration to include a drama script, 3D characters, and interactive plots, bridging reality and imagination, the past and the future.*

*The exhibition exemplifies how "digitalization + industrialization" can empower cultural heritage. The value of heritage is transformed into a replicable and propagable cultural product. In this scenario, the virtual Wukang Mansion becomes a digital museum, an immersive drama, an interactive game, and a boundless journey, paving the way for the "digital rebirth" of urban heritage. Opened to the public in June 2024 in Shanghai, the exhibition sparked broad discussion and gained popularity across age groups and organizations. Unlike overly commercialized projects, it is grounded in rigorous academic research, offering a methodological path for digital technology to balance globalization and localization challenges, as well as academic and public perspectives in the realm of urban heritage.*

## 1. INTRODUCTION

Digital technologies are increasingly breathing new life into cultural heritage, blurring the lines between past and present. Around the world, museums and researchers are leveraging virtual reality (VR), augmented reality (AR), and other immersive media to allow audiences to experience historical environments and narratives as if they were there. In this context, "virtual rebirth" refers to the revival of heritage sites or experiences through digital means, enabling historic buildings and cultural narratives to be experienced anew

by contemporary audiences. This paper introduces a replicable methodological framework for virtual heritage practice and demonstrates its application through a Shanghai-based project called "Once upon a time in Shanghai: The Immersive Exhibition of Centennial Wukang Mansion", a location-based VR exhibition. The project showcases how rigorous historical research, cutting-edge VR technology, and immersive storytelling can be combined to achieve a compelling heritage experience that bridges academic and public interests.

Fig. 1: Historical photograph of Wukang Mansion (Normandie Apartments) circa 1934. (Source: Cronobook, 2021, https://cronobook.com/pic/ntjc1ecxhm)

The Wukang Mansion, a protected historic apartment building in Shanghai built in 1924, serves as the core of the exhibition. The choice of this site is significant: known as the Normandie Apartments in the colonial era, Wukang Mansion stands as an icon of early 20th-century Shanghai's urban modernity. The building's history encapsulates the city's transformation into a cosmopolitan "modern metropolis" during the early 1920s, when traditional lifestyles gave way to new forms of living (such as apartment dwelling) that emphasized privacy, efficiency, and individual freedom. By virtually reconstructing the Wukang Mansion and its surroundings as they were a century ago, the project invites viewers to *"walk into"* the past and experience the texture of everyday life in 1920s Shanghai. In doing so, it addresses key questions in the field of digital and virtual heritage: How can we ensure historical authenticity and educational value while also delivering an engaging,

even entertaining, experience? How can local heritage projects harness global technological advances without losing the nuances of local context?

Fig. 2: "Once upon a time in shanghai" exhibition site (Source: Photography by the Production Team)

To situate this project in the broader discourse, we begin with the review of relevant literature and concepts in virtual heritage. This includes clarifying the terminology – distinguishing digital heritage, the digitization of heritage, virtual reconstruction, and virtual heritage – and surveying international principles and exemplars that have shaped this emerging field. We then outline the methodological framework developed by the authors, which spans from archival research to VR content creation to public exhibition. The Wukang Mansion VR exhibition is presented in detail as a case study, highlighting both the process and the outcomes of this approach. Finally, we discuss the implications of this work for the future of virtual heritage, arguing that localized projects like *"Once upon a time in Shanghai"* can provide a model for balancing globalization and localization, as well as scholarly and popular demands, in the digital preservation and presentation of urban heritage.

## 2. CONCEPTS, PRINCIPLES, AND APPLICATIONS IN VIRTUAL HERITAGE

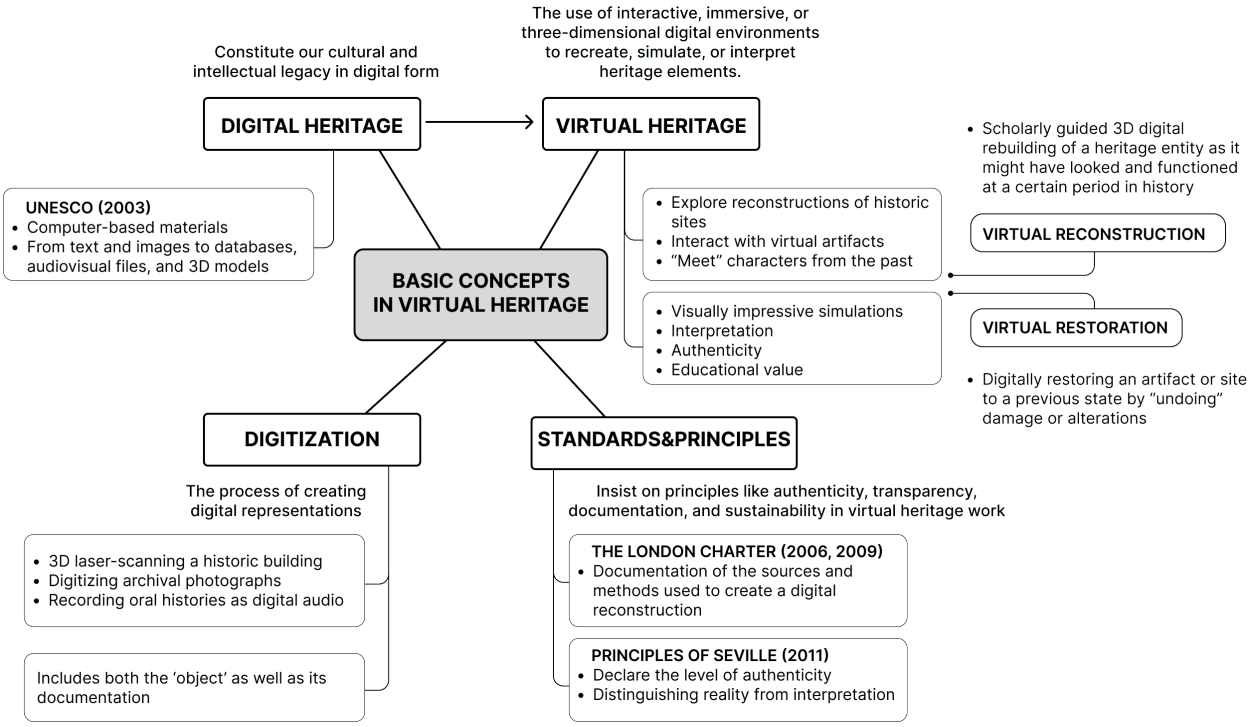


Fig. 3: Related Concepts in Virtual Heritage Area (Source: Drawn by auther)

### 2.1. Digital Heritage and Digitization of Heritage

According to UNESCO[1], "digital heritage is made up of computer-based materials of enduring value that should be kept for future generations.". This definition, articulated in the UNESCO Charter on the Preservation of Digital Heritage (2003), highlights that digital heritage encompasses a broad range of content – from text and images to databases, audiovisual files, and 3D models – that constitute our cultural and intellectual legacy in digital form.

The digitization of heritage refers specifically to the process of creating digital representations of existing cultural heritage items. This could mean 3D laser-scanning a historic building, digitizing archival photographs, or recording oral histories as digital audio. In a strict sense, digitization is "making content digital" – translating information from an analog medium into binary code. In the heritage domain, digitization typically involves capturing not only the primary object or site, but also its associated documentation and context. As Trilce Navarrete (2013)[2] puts it, digitizing cultural heritage "includes both the 'object' as well as its documentation," ensuring that metadata (descriptions, provenance, etc.) accompanies the digital copy. The result of digitization efforts is often a digital archive or repository that preserves valuable cultural content and makes it accessible beyond the constraints of location or the original's fragility.

It is useful to distinguish digital heritage in general from the more specific notion of virtual heritage. While digital heritage can refer to any cultural content in digital form (including static records or simple digitization), virtual heritage usually implies the use of interactive, immersive, or three-dimensional digital environments to recreate, simulate, or interpret heritage elements. Champion (2021)[3] succinctly explains virtual heritage as "virtual reality applied to cultural heritage," but also notes that this definition only scratches the surface of a diverse field. Virtual heritage projects go beyond digitizing objects for preservation; they aim to create engaging experiences where users can explore reconstructions of historic sites, interact with virtual artifacts, or even "meet" characters from the past. In virtual heritage, the emphasis is often on immersion and interaction – allowing people to step into a simulated historical space or scenario, thereby gaining insight through experiential learning.

Crucially, virtual heritage is not just about producing visually impressive simulations; it also involves questions of interpretation, authenticity, and educational value. Pietroni and Ferdani (2021)[4] argue that the goal of virtual heritage is not only to produce realistic digital replicas, but to create a "dynamic space of relations and interactions" that generate meaning and understanding. In other words, the power of virtual heritage lies in the way users engage with the digital environment – exploring it, manipulating it, and connecting it to historical knowledge. A virtual reconstruction of an ancient temple, for example, becomes truly valuable when it allows users to appreciate not just the temple's appearance, but its cultural context and the human activities associated with it.

### 2.2. Virtual Reconstruction and Virtual Heritage Principles

A core activity within many virtual heritage projects is the virtual reconstruction of lost or altered heritage assets. The ICOMOS-recommended Principles of Seville (2011)[5] provide a formal definition of virtual reconstruction: it is a digital process using a virtual model "to visually recover a building or object made by humans at a given moment in the past from available physical evidence, scientifically reasonable comparative inferences, and all studies carried out by archaeologists and other experts.". In simpler terms, a virtual reconstruction is a scholarly guided 3D digital rebuilding of a heritage entity (be it an artifact, building, or landscape) as it might have looked and functioned at a certain period in history. This process relies on whatever physical evidence exists (ruins, photographs, plans, etc.), augmented by historical research and comparative analysis, and clearly distinguishes between known information and hypothetical additions.

It is important to differentiate virtual reconstruction from virtual restoration, terms which are sometimes used interchangeably but have nuanced differences. Virtual restoration usually refers to digitally restoring an artifact or site to a previous state by "undoing" damage or alterations – for instance, virtually reassembling a

broken statue or digitally recoloring a faded painting. It aligns closely with principles of physical restoration, aiming for fidelity to an earlier authentic state. Virtual reconstruction, on the other hand, often involves rebuilding something that is largely missing or only partially present, which inherently requires more conjecture. In archaeology, where much of a structure might be lost, "reconstruction" emphasizes the hypothetical nature of the result and the need for inference. In practice, many projects involve both: for example, a heritage building might be partly intact (and thus virtually restored in those parts) and partly ruined (requiring virtual reconstruction for the missing parts). Both virtual restoration and reconstruction should adhere to rigorous scholarly standards and be transparent about the level of certainty or guesswork behind each element.

The London Charter[6] (initially formulated in 2006 and revised in 2009) and the Seville Principles (2011, ratified by ICOMOS in 2017) are two key documents that articulate the ethical and methodological guidelines for computer-based visualization in cultural heritage. Together, these charters insist on principles like authenticity, transparency, documentation, and sustainability in virtual heritage work. For example, the London Charter calls for documentation of the sources and methods used to create a digital reconstruction, so that others can understand and evaluate the interpretations made[6]. The Seville Principles build on this, addressing concerns of authenticity by requiring that users be informed about what in a virtual scene is based on factual evidence and what is hypothetical. In other words, virtual reconstructions should "declare the level of authenticity"[7] of each part, distinguishing reality from interpretation. If a medieval castle's VR model includes a conjectural timber roof where none survives, this should be indicated to the viewer (for instance, through on-screen notes, color-coding, or accompanying materials).

Despite these guidelines, researchers have noted that not all projects meet the ideal standards. Clark[8] observed that many virtual reconstructions lack proper transparency measures to document their uncertainty. Especially in the early days of virtual archaeology (1990s and early 2000s), projects often prioritized visual impressiveness and public appeal over scholarly verification. The first wave of VR heritage models sometimes presented a single, authoritative version of the past – potentially misleading audiences into taking the virtual images as "the truth". This overconfidence in digital models was critiqued for creating a "false sense of knowledge" by depicting speculative reconstructions with unwarranted certainty.

Alongside concerns about accuracy and authenticity, scholars have highlighted the positive potential of virtual heritage methodologies. As early as 2007, David Sanders[9] posed the question "Why do virtual heritage?" and answered that interactive 3D models can go beyond static visualization to "produce new insight into the past" . Unlike traditional research outputs, digital simulations allow researchers to test scenarios (for instance, how certain architectural features might have influenced lighting or acoustics), visualize changes over time, and

fuse large datasets into a coherent representation. This makes virtual reconstructions not just presentational tools but also research tools. Forte (2014)[10] and others argued that virtual archaeology integrates theoretical aspects and should be seen as part of the archaeological investigative process, not just a post-excavation display technique. In sum, when done in accordance with established principles, virtual heritage work can maintain scholarly integrity while significantly enhancing both expert understanding and public appreciation of cultural heritage.

### 2.3. Major Applications of Virtual Heritage: From Digital Museums to Immersive Exhibitions

Over the past decade, the convergence of improved 3D modeling, game engines, and affordable VR hardware has led to an explosion of virtual heritage projects worldwide. Early efforts in the 1990s and 2000s often took the form of standalone computer applications or screen-based exhibits, but today we are seeing increasingly immersive and interactive implementations. These range from virtual museums and online heritage visualizations to large-scale Location-Based Entertainment VR installations that operate more like theme-park attractions.

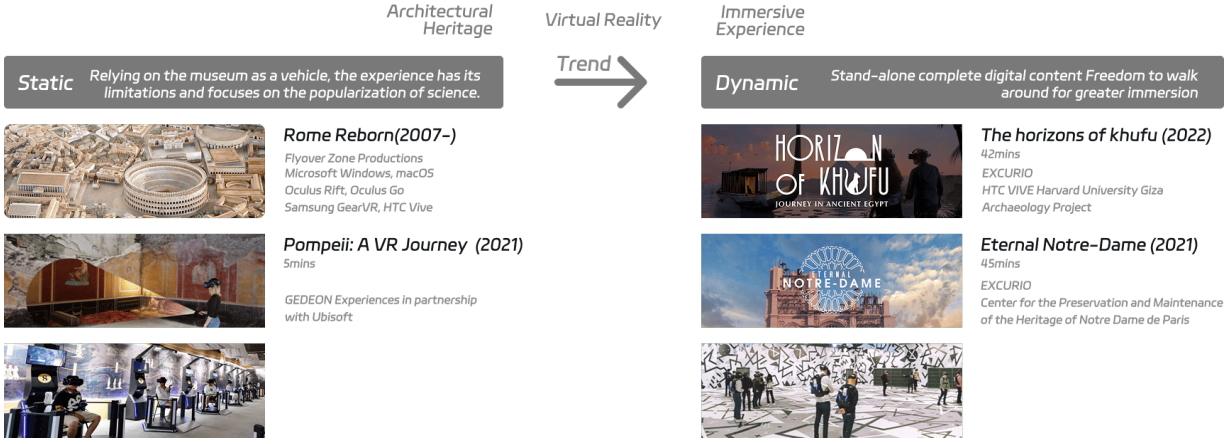


Fig. 4: Application of virtual heritage and the "LBVR" trend (Source: Drawn by auther)

One prominent category is the immersive virtual tour of historic sites. As early as late 2007, Italy had a digital reconstruction and tour plan for Rome called "Rome Reborn", and in 2021, Pompeii also launched a related VR immersive experience. However, the cutting-edge technology that has attracted more attention in recent years is the LBVR exhibition, represented by a series of projects developed by the French company Emissive. LBE (Location-Based Entertainment) attractions is a brand-new technology applied in the field of VR exhibitions. Through positioning systems, real-time rendering and unlimited streaming, it allows the experiencer to break away from the constraints of traditional "seats" and freely explore and walk in the space, truly achieving the unity of physical perception and vision. This technology transforms the traditional static

VR experience into a diverse and dynamic experience, thereby comprehensively enhancing the sense of immersion.

For example, the VR experience "Eternal Notre-Dame" (also known as "Éternelle Notre-Dame") in Paris allows visitors to don VR headsets and virtually step inside Notre-Dame Cathedral as it was before the 2019 fire, witnessing its architecture and treasures up close. Thousands of high-resolution scans and photographs were used to construct a detailed 3D model of the cathedral, ensuring a visually authentic experience. Located in a building adjacent to the real cathedral, this installation effectively acts as a virtual time machine and museum, letting the public safely explore the landmark during its restoration period. Another example, "Horizon of Khufu" (also marketed as "Khufu: A Journey in Ancient Egypt"), provides a free-roaming VR exploration of the Great Pyramid of Giza. Equipped with a backpack PC and VR goggles, participants can physically walk through a large tracking area as they virtually navigate the pyramid's corridors and even ascend to its summit. This experience blends entertainment with education – visitors not only marvel at the monument's scale, but also learn about ancient Egyptian engineering and burial practices through interactive storytelling.

Underpinning many of these projects is a drive to engage the public in new ways. Bekele, Pierdicca, and Frontoni (2022)[11] reviewed immersive VR games, highlighting best practices that increase visitor engagement within heritage exhibitions. Virtual heritage exhibitions often draw on concepts from immersive theater, interactive games, and virtual tourism. They transform heritage content into a form of experiential media that can compete for attention in an entertainment-saturated environment. Emissive, the French studio behind Horizon of Khufu and Eternal Notre-Dam refers to these productions as "Immersive Expeditions" and has demonstrated that they can be both culturally enriching and commercially successful. According to their CEO[12], these VR exhibitions have achieved throughputs of over 100 people per hour and totaled over 100,000 visitors in multi-month runs, validating a profitable model for heritage-themed LB attractions. Such success stories are encouraging other museums and content creators to consider VR for outreach and revenue generation, suggesting that virtual heritage has matured from experimental demos into a viable medium for large audiences.

At the same time, academic research continues to explore how these immersive experiences impact learning and perception of heritage. Studies have examined, for instance, the effectiveness of VR in helping users distinguish original historical elements from reconstructed additions. One 2024 study[13] integrating VR into the reconstruction of an archaeological site in Jordan found that immersing both experts and laypeople in a virtual model (with embedded annotations about authenticity) improved their ability to understand what was real versus conjectural and facilitated a sort of peer review of the reconstruction hypotheses. Other research

has looked at the incorporation of virtual humans[14] or avatars to populate historical simulations, evaluating how character-driven narratives can enhance engagement in museum settings. Overall, the literature suggests that when thoughtfully designed, virtual heritage applications can significantly enhance education and interest in cultural heritage, provided that they maintain clarity about historical fidelity and do not sacrifice accuracy for spectacle. In summary, the state of the art in virtual heritage is characterized by a dynamic interplay between rigorous scholarship and creative technology-driven presentation. Foundational principles (London Charter, Seville Principles) guide the scholarly responsibilities, while successful real-world projects point to best practices in audience engagement and technical implementation. Building on this foundation, we explored the methodology developed for the "Once upon a time in Shanghai" project, which seeks to harness these global insights within a local heritage context.

## 3. ONCE UPON A TIME IN SHANGHAI: A VIRTUAL HERITAGE PRACTICE

### 3.1. Transmission of the Value Behind: Bring the Heritage to the Public

#### 3.1.1. Historical Background and Significance of Wukang Mansion

Wukang Mansion, formerly known as the Normandie Apartments, is one of Shanghai's most famous historic buildings. Located at the intersection of Wukang Road and Huaihai Road in the former French Concession, the building is celebrated for its French Renaissance-style architecture and its striking flatiron shape that resembles the prow of a ship. It was designed by Hungarian-Slovak architect László Hudec and completed in 1924 for the International Savings Society (ISS) as a modern apartment residence. At seven stories tall, it was among the earliest high-rise residential buildings in the city and a symbol of the burgeoning cosmopolitan lifestyle of Shanghai's elite in the early 20th century.

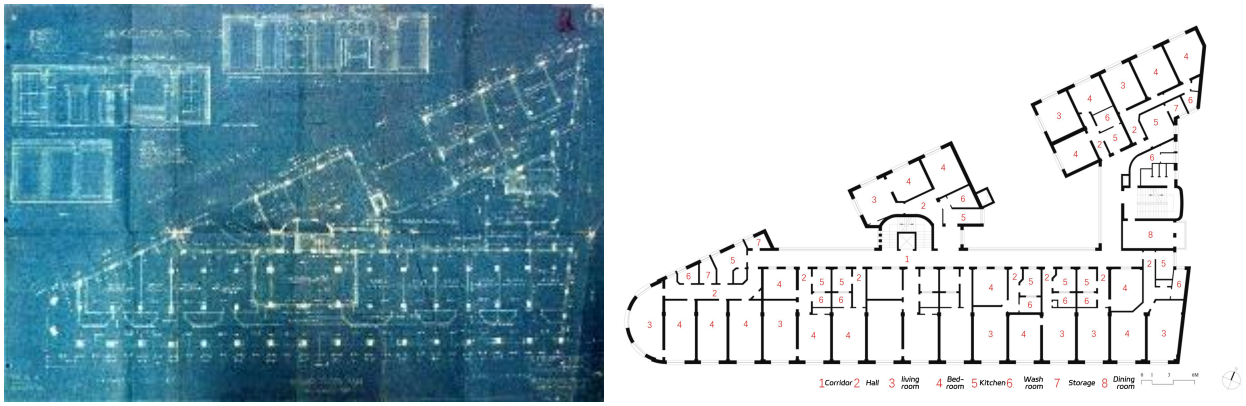


Fig. 5: Textual Research and Surveying of the Design Plan of Wukang Building (Source: Shanghai Urban Construction Archives, drawn by the author)

Beyond its architectural value, Wukang Mansion is imbued with social and cultural significance. During the 1920s and 1930s – an era when Shanghai was known as the "Paris of the East" – the building was home to many notable figures, including foreign expatriates, Chinese film stars, and writers. Its apartments represented a new mode of urban living distinct from traditional Chinese lilong housing or courtyard homes. The introduction of modern apartments like Wukang Mansion marked a shift from ritualized living spaces to consumer commodities, reflecting how Shanghai's residents were embracing privacy, efficiency, and modern comforts. Living in such an apartment became part of the "experience of modernity" – it allowed residents to lead independent lives, freed from some of the extended-family and community constraints of old, and to partake in a metropolitan identity. For the female community in Shanghai, the emergence of this type of apartment coincided with the discussion of feminism and the issue of "Nora's escape" in the Shanghai cultural circle at the time, and together inspired the germination and development of women's thought in the new era.

By the late 20th century, Wukang Mansion had aged but survived largely intact through wars and political changes. It was officially listed as a municipal heritage building. In the 21st century, it gained renewed popularity, becoming an "internet-famous" check-in spot for tourists and photographers due to its photogenic appearance. The local government's Hengshan-Fuxing Road Historic Area preservation initiative further enhanced its status as a cultural icon of Old Shanghai. However, like many heritage sites, the public's engagement was often limited to admiring the exterior – few could access its interior or appreciate its historical stories. The centennial of Wukang Mansion's completion (1924–2024) presented an ideal occasion to celebrate its legacy and educate people about its past. The "Once upon a time in Shanghai" immersive exhibition was conceived against this backdrop, to allow visitors not just to see the building, but to enter its history.

One unique aspect of this project is its localized focus. Many high-profile virtual heritage endeavors globally center on universally famous monuments (e.g., Egyptian pyramids, European cathedrals). In contrast, Wukang Mansion is a more locally resonant landmark – beloved in Shanghai, known among architectural historians, but not globally iconic. By choosing this site, the project aimed to demonstrate that immersive VR can be just as powerful for "everyday heritage" or vernacular urban history as for ancient wonders. It positions Shanghai's local heritage in dialogue with global heritage practice, suggesting that the methodologies of virtual reconstruction can be scaled down to city landmarks and yield insights relevant to urban cultural history.

Fig. 6: Eileen Chang's Aunt Zhang Maoyuan's Living Room in Eddington House (Source: m.thepaper.cn)

### 3.1.2. The "Once Upon a Time in Shanghai" VR Experience

Visitors at the "Once upon a time in Shanghai" exhibition wearing VR headsets and hand controllers. Inside the headsets, they are immersed in the virtual world of 1920s Wukang Mansion.

The exhibition opened to the public in June 2024 at the Shanghai Old Villa Art Center, just a block away from the actual Wukang Mansion. Upon arrival, visitors are introduced to the historical context through wall displays and a short video, after which they enter an open room to don the VR equipment. The experience that unfolds can be described as a blend of virtual tour, interactive story, and educational simulation.

**Immersive Journey Through Time**

Once the VR session begins, participants find themselves standing on Wukang Road as it appeared in the late 1920s. The bustling noises of old Shanghai – tram bells, rickshaw pullers, vendors – fill their ears. In front, the Wukang Mansion rises, newly built and red-bricked, with period cars (early automobiles of the 1920s) occasionally driving by. A virtual guide in the form of the architect László Hudec (represented as a realistic avatar based on historical photos) greets the visitors. Speaking in either Chinese or English (audio selectable), "Hudec" briefly explains the significance of the building and invites the visitors to step inside with him.

**Exploring the Building Interior**

Inside the mansion's lobby and corridors, the detailing – from the Art Deco iron elevator grille to the marble flooring – has been meticulously reconstructed. The Hudec character highlights architectural features, effectively turning the tour into an architectural appreciation lesson. Visitors can look closely at, for example,

the cornerstone plaque or the design of the wooden bannisters, while Hudec provides commentary. This part of the experience emphasizes heritage interpretation: it connects design elements to the era's social context (such as how the existence of an elevator signified luxury living, or how the building's concrete structure was innovative for local construction at the time).

Fig. 7: Screenshot of VR experience scene (indoor apartment and outdoor street scene) (Source: drawn by the author)

**Dramatized Vignettes of 1930s Life**

As the tour continues, the visitors are led into one of the apartments. Here, the perspective shifts from architectural to social history. The group finds themselves in the year 1932, in the elegantly furnished home of a fictional resident – a composite character based on real figures (specifically, a Chinese actress who actually lived in Wukang Mansion during the 1930s). The "movie star" character appears as a young woman in cheongsam attire, getting ready for an evening gala. Through interactive dialogue, she shares anecdotes about life in Shanghai's "Jazz Age": attending dances at the Cathay Hotel, shopping for Parisian fashions on Avenue Joffre, and reading about world events in the newspapers. The apartment space is richly interactive: visitors can gaze at the actress's vanity table to see vintage makeup items, or pick up a magazine on the coffee table which triggers a brief augmented overlay of historical images of 1930s Shanghai socialites. This narrative

interlude personalizes the history – it allows visitors to emotionally connect with the lifestyle of the era, not just the brick and mortar of the building.

**Interactive Exploration and Gameplay**

After the intimate scene with the resident, the experience opens up into a more exploratory phase. Visitors are given a degree of freedom to wander through a portion of the virtual building on their own (within the bounds of the physical tracked space). They can choose to visit the rooftop garden or peek into other rooms. Hidden easter eggs are placed throughout – for instance, discovering a phonograph in one room allows the user to play a snippet of a popular 1930s Shanghainese song, while finding a stack of architectural blueprints in another room triggers a mini-game of assembling a puzzle (reconstructing a simple 3D model of the building). Such elements add a playful layer to the experience, catering to younger visitors and encouraging active participation. Importantly, these interactive moments are not arbitrary; each is tied to conveying some information (the song is an actual period recording, the blueprints teach about the building's structure, etc.), aligning with the educational goals.

Fig. 8: The interaction between the experiencer and the scene and characters (Source: drawn by the author)

**Aerial Panorama and City Context**

The climax of the VR journey involves the much-publicized virtual hot-air balloon ride. At a certain point, Hudec reappears to "invite" the visitors to see the city from above. The group is guided onto a wicker basket of a tethered balloon on the mansion's roof. As the balloon "lifts off", visitors are treated to a panoramic view of 1930s Shanghai surrounding the French Concession. They can look out and identify landmarks: the tree-lined avenues, the distant skyline where a few other early high-rises stand (like the Gascogne Apartments or Picardie Apartments). Hudec provides narration about how at that time this area was the edge of the urban center, whereas today it is in the heart of the city. This segment powerfully contextualizes Wukang Mansion

within the broader urban development of Shanghai – viewers viscerally grasp how the city has expanded and changed.

**Cultural inheritance and feminist perspective**

In addition to interpreting the knowledge level of architectural heritage, the exhibition also incorporates the thinking of cultural identity inheritance and female perspective. The experience ends with the audience returning to the present time period and accidentally discovering a letter left by a historical figure. This letter connects several key figures that appear in the experience. They are Shanghai women from different eras. Their images of female stars, maids and independent women in the new era have a dialogue under the discourse of class and history, allowing the experiencer to touch another level of contemporary value presented by the architectural heritage of Wukang Mansion.

### 3.2. Methodological Framework: a muiltidisplinary collaboration

Developing a comprehensive LBVR heritage experience such as the "Once upon a time in Shanghai" requires an interdisciplinary methodology. The framework is designed to balance academic rigor (ensuring historical accuracy and meaningful interpretation) with experiential design (ensuring an engaging and immersive experience for visitors). The major components of this methodological process are as follows:

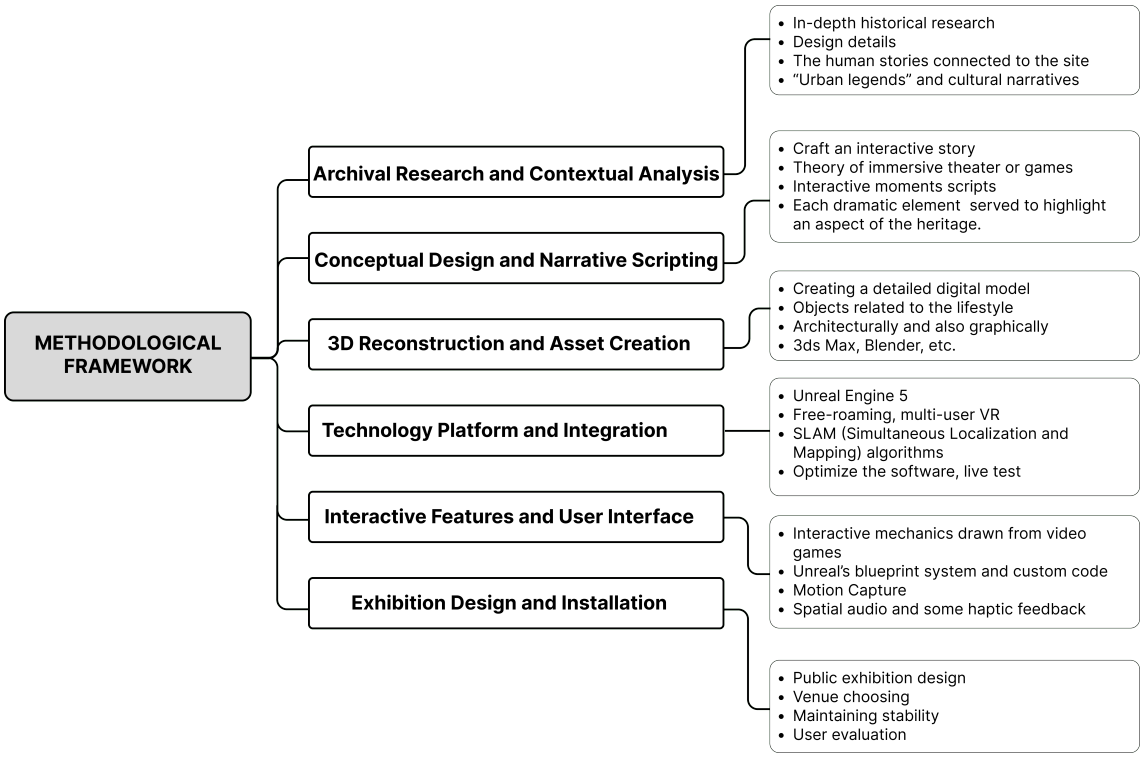


Fig. 9: Methodological Framework of Wukang immersive project (Source: drawn by the author)

### 3.2.1. Archival Research and Contextual Analysis

The project begins with in-depth historical research on the chosen heritage site. For Wukang Mansion, this meant studying a wide array of sources: historical photographs, architectural drawings, maps, newspapers, and scholarly works on Shanghai's urban and social history. The research team, which included architectural historians, scoured archives for details about the building's original design (by architect László Hudec), its construction in 1924, and its role in the city's development. Equally important was understanding the human stories connected to the site – for instance, identifying famous residents (such as the movie star Wang Renmei who lived there in the 1930s) and the "urban legends" and cultural narratives surrounding the building over the past century. This phase establishes the factual and interpretive basis for the virtual content. Key concepts and themes (e.g. "experience of modernity" in Shanghai, or the symbolism of apartment living) were distilled to guide the narrative experience.

### 3.2.2. Conceptual Design and Narrative Scripting

With a foundation of research, we developed a creative concept for the VR experience. Rather than a simple tour of the building, the decision was made to craft an interactive story – a script that would let visitors follow a sequence of events or characters tied to Wukang Mansion's history. This involved elements of storytelling similar to immersive theater or games. For example, in this case, we wrote a storyline in which the visitor might visit the home of a 1930s film actress living in the mansion, then encounter the architect Hudec and a maid working in the apartment who give an architectural tour, revealing the structure of the building through some fantastic views such as the exploded version of the building which visitors can't see in the reality, and later take a dramatic air-ballon flight over 1930s Shanghai to witness the development of the whole district. Multiple plot branches and interactive moments were scripted – visitors could open virtual doors, discover hidden details, and make choices that affect the sequence of scenes. This narrative design was carefully interwoven with factual history, ensuring that each dramatic element (even the fictionalized ones) served to highlight an aspect of Shanghai's heritage.

### 3.2.3. 3D Reconstruction and Asset Creation

In parallel with writing the narrative, the team began the digital reconstruction of the physical environment and artifacts. Using the collected archival data, architects and 3D modelers created a detailed digital model of Wukang Mansion as it would have appeared circa 1924–1930. This included exterior facades and the surrounding street, as well as interior layouts, period-appropriate furnishings, decor, and even minutiae like signage and everyday objects to populate the apartments. Historical maps and photographs guided the recreation of the broader neighborhood (the French Concession's Hengfu area), so that views from the building – such as the aerial balloon perspective – would reveal an accurate skyline of old Shanghai. The

modern lifestyle of 1920s Shanghai was reconstructed not just architecturally but also graphically: period fashion designs were studied to dress the virtual characters, vintage posters and newspapers were reproduced to add realism, etc. All assets were modeled using software compatible with real-time rendering (3ds Max, Blender, etc.), and textures were created to evoke authentic materials of the era, such as the old Shanghai-styled timbers and wall papers.


Fig. 10: Architecture, objects and characters reconstruction (Source: drawn by the author)

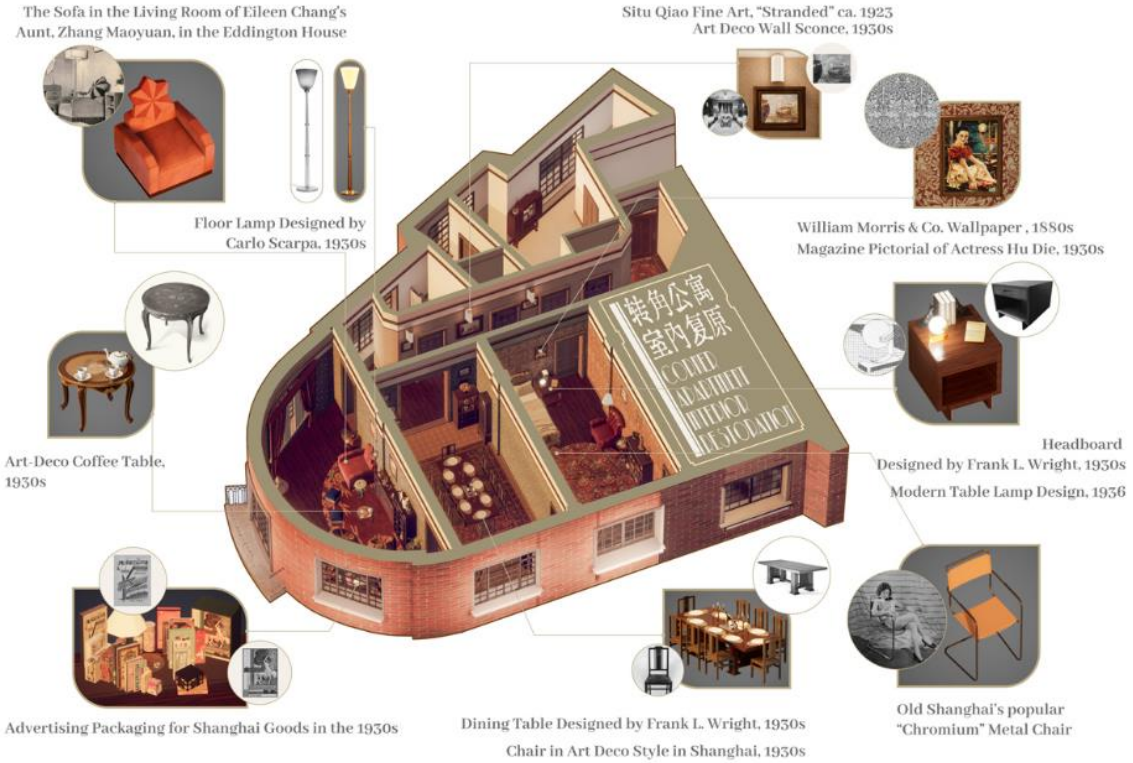


Fig. 11: Virtual reconstruction of the apartment interior (Source: drawn by the author)

### 3.2.4. Technology Platform and Integration

The Unreal Engine 5 (UE5) was chosen as the real-time platform for this project due to its advanced rendering capabilities, including global illumination, realistic lighting, and high-fidelity real-time visuals, as well as its robust support for VR development. Detailed architectural and historical assets created through 3D modeling software such as Rhino, 3ds Max and Blender were seamlessly imported and integrated into UE5, where textures, lighting setups, and interactions were meticulously fine-tuned to achieve a historically accurate and immersive virtual environment.

The team collaborated closely with a professional VR development company to implement this virtual environment into a comprehensive LBE setup. A critical technical challenge addressed by the project was enabling a free-roaming, multi-user VR experience within a physical exhibition space measuring approximately 200 square meters, without relying on external tracking infrastructure. The solution involved the deployment of high-end standalone VR headsets—specifically, the Pico 4E—which utilize inside-out tracking enabled by integrated cameras and sensors combined with Simultaneous Localization and Mapping (SLAM) algorithms. This configuration allows users to move freely within the designated area while accurately synchronizing their movements in the virtual world, thereby enhancing the sense of presence and immersion.

To further optimize visitor comfort and accessibility, the exhibition employed wireless streaming technology, eliminating the need for visitors to carry cumbersome backpacks or tethered hardware. This approach significantly streamlined the user experience, enabling up to 16 simultaneous participants to explore the virtual Wukang Mansion together in real-time, each visible to one another as personalized avatars. Developers carefully optimized the software performance, achieving a balance between graphical fidelity and the demands of real-time rendering across multiple VR headsets, ensuring smooth and immersive interactions for all participants.

### 3.2.5. Interactive Features and User Interface

To enhance engagement, the project integrated interactive mechanics drawn from video games. As visitors explore the virtual mansion, they can perform simple interactions: picking up letters or photographs to examine, opening drawers and doors, triggering dialogue with characters, etc.. Certain choices lead to branching storylines – for example, choosing different letter for the NPC might lead to a different subsequent scene. These interactions were implemented through Unreal's blueprint system and custom code, and considerable testing was done to ensure they are intuitive for users who may not be gamers. The interface was largely diegetic (built into the story world) so that users could interact naturally by moving and gazing or using hand controllers, rather than through abstract menus. In order to enhance the realism of the characters' dynamics in dialogue and interaction, all characters were rigged with skeletons, and their expressions and

dynamics were presented using real-life motion capture. Additionally, the experience incorporated spatial audio and some haptic feedback (vibrations in the controller for emphasis) to enrich immersion. In terms of sound design, the team also invited a professional music team to restore the melodies and sounds of Shanghai in the last century, and to adapt and remake classic melodies, so as to make the Wukang Mansion and its social environment "Rebirth" in more dimensions.

#### 3.2.6. Exhibition Design and Installation

Finally, the project was deployed as a public exhibition in a historical villa-turned-art center on Wukang Road, near the real mansion. The physical exhibition space was designed to complement the VR content – with introductory panels about Wukang Mansion's history, displays of research materials, and themed decor to set the mood. Visitors were admitted in small groups, given a short briefing, and then outfitted with VR headsets and simple wearable computers. The experience lasts on the order of 30 minutes, after which visitors can provide feedback or discuss with guides (who are often the creators themselves). This setup in a fixed location with controlled conditions ensured that the VR experience ran smoothly and that the academic goals (surveys, observations on visitor learning outcomes) could be pursued and evaluated.

### 3.3. Public Reflections

After the exhibition was officially opened to the public in June 2024, it received widespread acclaim and support, and received attention from many media reports and relevant government departments, which made the popularity of the Wukang Mansion IP continue to grow, and allowed more people to begin to understand the story behind this urban heritage.

A common reaction from older visitors is astonishment at how "real" the old Shanghai felt, with some commenting that it triggered personal memories or stories from parents and grandparents. Younger visitors frequently express excitement that they "played a game inside a museum" and often report learning new things about their city in the process. The Wukang Mansion VR exhibition ran for about six weeks, attracting thousands of visitors. It was widely praised for its innovative fusion of scholarship and technology. Local newspapers noted that unlike some commercial VR attractions that are heavy on spectacle but light on substance, this exhibition delivered authentic content in an entertaining wrapper.

This framework proved effective in the Wukang project, yielding an experience that is historically rich and technically robust. Notably, the framework emphasizes collaboration between academia, industry, and government, which was key to its success. The university team brought research depth; the VR company provided development expertise; and the cultural authorities facilitated venue and outreach. This cross-sector

collaboration opened up a path from research to market, from academy to society, enabling scholarly work to directly inform a public-facing product.

Fig. 12: Group visits organized by schools (Source: Photography by the Production Team)

## 4. DISCUSSION

One striking aspect of the "Virtual Rebirth" project is how it demonstrates the globalization of heritage techniques while advocating for localization of content. The tools and techniques – game engines, VR storytelling, digital scanning – are globally available and were pioneered largely in Western contexts. By applying them to a Chinese urban heritage case, the project suggests that any culture can partake in this digital heritage revolution, not as passive consumers of another's history, but as active narrators of their own. This democratization of virtual heritage is significant. It means that immersive reconstruction is not just for world-famous UNESCO sites; it can be used for neighborhood museums, for indigenous heritage, for recent past histories, and so on. The Shanghai team's success may encourage other cities in Asia, Africa, and South

America to consider VR exhibitions for their heritage, thereby widening the diversity of stories told through this medium.

Digital heritage projects, especially ones using VR, often find themselves at a crossroads: veer too much towards entertainment and risk trivializing or distorting history; focus solely on accuracy and depth and risk failing to engage lay audiences. The Wukang Mansion project offers a model for achieving equilibrium. By design, the project was "grounded in rigorous academic research" and yet conceived from the start as a product for the general public. The involvement of university scholars ensured that at every step – from choosing which stories to tell, to deciding how to depict a scene – there was a guiding concern for truthfulness and insight. Meanwhile, the involvement of VR designers and consideration of audience experience ensured the final output was far from a dry simulation; it was lively, surprising, and emotionally resonant.

This balance is echoed in the Seville Principles' call for both scientific transparency and effective communication to the public. The Wukang project could be seen as a case where those principles were successfully implemented. For instance, when creating the VR scenes, the team documented their sources for each element (photographs for furniture, census records for who lived in the building, etc.), thereby producing an internal archive that backs the reconstruction. They also, as noted, embedded some of that documentation into the experience (e.g., the user clicking on a newspaper in VR to see a snippet of a real 1920s newspaper). This approach fulfills documentation goals while making it part of the user's learning. At the same time, the outcome was entertaining enough to spark "broad discussion and popularity across age groups" in Shanghai. It suggests that with careful design, it is possible to avoid the binary of "serious" vs. "fun" – a virtual heritage experience can be seriously fun and funnily serious.

Fig. 13: Screenshots of VR experience scenes, interpretation of imagination and restoration of details (Source: Photography by the Production Team)

The concept of "Virtual rebirth" for urban heritage, as applied to Wukang Mansion, opens up philosophical considerations about preservation. Traditional conservation focuses on protecting the physical fabric of

heritage – the bricks, the stone, the structure. But many aspects of heritage (like the lived experience, the atmosphere of a bygone era) cannot be preserved in situ once time passes. Virtual heritage offers a complementary form of preservation: a digital conservation of experience and context. In creating the Wukang VR, the team essentially preserved on digital record a representation of 1920s Shanghai life around that building. This does not replace the physical building (which fortunately still stands), but it adds value to it by preserving intangible dimensions (social history, ambience).

While the overall outcome was positive, it's worth discussing challenges faced and areas for improvement. One challenge is accessibility – VR can be physically and cognitively demanding for some. Not everyone can or wants to wear a headset and walk around. Some older or mobility-impaired visitors to Wukang Mansion exhibition might have opted out. Providing alternate ways to experience the content (like a 2D screen version or guided mode) could expand accessibility. Another challenge is keeping content up-to-date with research. Just as physical reconstructions can become outdated with new findings, so too can virtual ones. It will be important for digital heritage projects to have maintenance plans – updating the VR content if new evidence about the past comes to light (for example, if a new photo of Wukang Mansion interior surfaces, the virtual model should ideally be updated to reflect it). This raises the issue of sustainability: once created, who maintains the project? In the case of Wukang, it was a temporary exhibition. A long-term goal could be integrating it into a permanent museum installation or an educational program so that it continues to be used and updated rather than shelved after the event.

Finally, looking forward, the integration of emerging technologies like AI and cloud computing could further enhance replicable frameworks. AI could help automate parts of reconstruction or simulate crowds and behaviors in historical scenes. Cloud rendering could allow people to experience high-fidelity VR from anywhere without needing local high-end hardware, which could make such experiences more broadly accessible online. The Wukang project lightly touched these (e.g., using AI upscaling on old photos, using cloud services for multi-user sync), but future projects might leverage them more heavily.

Overall, the discussion around the Wukang Mansion virtual rebirth project illustrates that we are at a promising juncture where technology and heritage studies intersect fruitfully. The project balanced global inspirations with local cultural storytelling, academic depth with user-friendly design, and preservation goals with innovation. It stands as a microcosm of how cities can approach preserving not just their buildings, but the life of those buildings, through immersive media. The success in Shanghai reinforces that virtual heritage practices, guided by international principles and tailored to local context, can significantly enrich the way we safeguard and disseminate cultural heritage in the 21st century.

## 5. CONCLUSION

"Once upon a time in Shanghai" exemplifies a new paradigm for heritage conservation and education in the digital age. In reconstructing the physical spaces and social narratives of 1920s Shanghai through an immersive VR exhibition, the project has demonstrated how technology can bridge the gap between past and present, scholarship and popular engagement, global techniques and local stories. Historical evidence was digitized and meticulously modeled, virtual environments were created with attention to authenticity and transparency, and an interactive narrative was crafted to convey both the facts and the spirit of an era. Adhering to international guidelines like the London Charter and the Seville Principles ensured intellectual integrity, while embracing creative storytelling ensured the result was compelling to a broad audience. Moreover, it adds to the global discourse a valuable example of how to localize such experiences to reflect a city's unique heritage and cultural identity. The exhibition not only celebrated a Shanghai landmark's 100th birthday in style, but also provided insights into how digital methods can help balance the demands of globalization and localization – using a globally cutting-edge medium (VR) to tell a story that is distinctly and authentically Shanghainese. In doing so, it offers a methodological framework that is replicable: other heritage practitioners can adopt its multi-phase approach of research, design, development, and collaboration to create their own virtual heritage projects. The success of the Wukang Mansion VR exhibition carries several implications. For heritage professionals and institutions, it underscores the importance of investing in digital literacy and partnerships – bringing historians, designers, and technologists together – to explore new avenues of heritage interpretation. For academia, it provides a case study in effectively translating scholarly research for public consumption without dilution of quality, suggesting that similar models could be used in university-led public history projects. For policymakers and cultural authorities (in China and beyond), it sends a message that supporting such innovative projects can yield significant cultural value, engaging younger generations with heritage and potentially boosting cultural tourism in novel ways.

Virtual heritage experiences, when done well, are not gimmicks but powerful tools for what UNESCO calls the transmission of heritage "in spirit and letter" to future generations. They allow us to not only see history but to walk into it, listen to it, and interact with it—an engagement that fosters deeper understanding and appreciation. The Wukang Mansion VR exhibition exemplifies how rigorous historical scholarship, paired with immersive digital innovation, can produce richly educational and emotionally resonant experiences. This approach embodies the essence of "Virtual Rebirth," demonstrating how urban heritage can be revitalized in the 21st century—not merely conserved as static relics but continuously reanimated through dynamic virtual narratives, making historical legacies vividly accessible and meaningfully relevant to contemporary and future generations.

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**Traditional Dwellings and Settlements**
Working Paper Series

# RISK MANAGEMENT STRATEGIES FOR CULTURAL HERITAGE IN LIBYA: INSIGHTS FROM GHADAMES CITY

*Fatma Seila, Gehan Selim, May Newisar*

# RISK MANAGEMENT STRATEGIES FOR CULTURAL HERITAGE IN LIBYA: INSIGHTS FROM GHADAMES CITY

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*In today's globalized era, the increasing international challenges of heritage and the exacerbation of illegal human activities such as wars, urbanization, economic growth, and tourism pose risks to cultural heritage safety. Hence, global efforts have increased to manage and conserve cultural heritage and ensure its continuity of introducing societies' identities and consolidating the feeling of belonging.*

*Libya has a wealth of diverse cultural heritage. As a state in the post-conflict period, its cultural heritage is exposed to the exacerbation of the human threats it is exposed to. This requires appropriate management to avoid its adverse effects and maintain the safety and value of this rich heritage.*

*This paper aims to study the management strategies used in Libya to manage human risks. This is done by determining these risks and assessing their seriousness. Moreover, the effectiveness of the performance of cultural heritage institutions in addressing human risks is evaluated, in addition to the planning methods used and the approved strategies.*

*To obtain a more comprehensive understanding of risk management in Libya, this research uses a qualitative approach and a case study as a research design. The selected case study, Ghadames City, includes a World Heritage Site and four local sites. In addition, two institutions are responsible for overseeing and managing these sites. This makes it a suitable model for verifying the performance of various state institutions, as well as the possibility of generalizing results.*

*The initial results specified that the heritage management system in Libya lacks planning strategies and works with short-term plans. The institutions also work without the support of the main stakeholders. Furthermore, the results show a substantial difference in the performance of administrative institutions in the case study, attributed to the administrative independence granted to each of them. The research outcome will help to understand the adequacy of risk management strategies employed to conserve cultural heritage and propose a framework to enhance its performance.*

## 1. INTRODUCTION

Shenzhen was a series of small villages, on China's border with Hong Kong, totaling around thirty thousand Cultural heritage is a fundamental element of a society's national identity, reflecting their historical development, enhancing their social cohesion, and serving as an essential source of economic growth through tourism and cultural diplomacy. In Libya, cultural heritage holds significant importance due to the country's rich historical legacy, which extends from the ancient civilizations of the Phoenicians, Greeks, and Romans to the Islamic and Ottoman periods. The country boasts five World Heritage Sites, including Leptis Magna, Cyrene, Sabratha, the Old City of Ghadames, and the rock art sites of Tadrart Acacus. Each of these sites is a living testimony to the country's cultural and historical diversity.

Despite their great importance, Libya's cultural heritage sites face increasing threats, especially in light of armed conflict and political instability. Many global experiences have shown that wars and conflicts pose a

fundamental threat to heritage sites. Example can be seen in Syria, where sites such as Palmyra and the Citadel of Aleppo were severely damaged as a result of fighting, Iraq, which witnessed the systematic destruction of Assyrian and Islamic sites amidst the instability of armed conflict, and the bombing of the ancient city of Dubrovnik in Yugoslavia[1,2]. Ideological extremism has also had a devastating impact on heritage, as was the case in Afghanistan when the Buddha statues in Bamiyan were destroyed, or when armed groups targeted the archaeological monuments in Timbuktu in Mali[3,4]

Libya was no exception to these challenges. Although its archaeological sites were not directly bombed during the Libyan Civil War of 2011, the political unrest, security vacuum and conflixt that followed exacerbated the human risks threatening heritage. For instance, some sites were damaged due to armed clashes, such as the Qarmali Mosque in Tripoli, the Italian Theatre in Benghazi, and the ancient citadel in Sabha[5,6]. Furthermore, Libya experienced deliberate demolitions of shrines and ancient tombs, as occurred with the Murad Agha Shrine and the tombs in the city of Zuwayla, amidst the rise ideological trends that reject Sufi and historical heritage[7,8].

In addition to the damage inflicted by armed conflict, Libyan heritage faces enduring challenges regarding its management and protection. Political and legislative instability following the revolution has weakened the institutions responsible for heritage, rendering heritage sites more vulnerable to theft, smuggling, uncoordinated urban expansion, and encroachment upon archaeological areas. A prominent example of this was the theft of the assets from a bank in Benghazi, which included invaluable archaeological treasures[9,11]. Certain World Heritage Sites, such as Sabratha, Leptis Magna, and Cyrene, have also experienced an uptick in urban encroachments, in addition to overgrazing and agricultural activities near archaeological sites, highlighting the absence of effective control over these cultural properties[7,8,12.]

Human activities that damage heritage sites in Libya were not solely a consequence of the revolution but also stem from a lack of adequate preservation and care for heritage sites before the 2011 revolution. Libya is a country whose economy relies on oil, and heritage has not been a priority in any of the country's political eras[5,13.] However, when examining the period of the 2011 revolution and prior to it, one finds that heritage sites suffered from mismanagement, insufficient conservation strategies, and a scarcity of funding. After the revolution, this issue was exacerbated by the weak enforcement of heritage laws and the absence of adequate protection for heritage sites[5,14,15,16,17,18].

Administrative issues in the management of heritage sites constitute a global challenge. Countries experiencing political instability due to wars, such as Syria, Iraq, Yemen, and Ukraine, face mismanagement, insufficient funding, and a lack of expertise due to death or migration[2]. In this context, international organizations like the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the

International Council on Monuments and Sites (ICOMOS) have endeavored to develop frameworks to address these challenges, highlighting the necessity of effective management strategies to ensure the long-term preservation of heritage sites[9].

Many countries have adopted and tailored these practices to their specific contexts, resulting in progress in managing threats to their cultural heritage. Notable examples are referred to as best practices in heritage management, as seen in relation to the 32 sites listed on the UNESCO website as exemplary cases[20]. These cases (among others) have successfully identified deficiencies in their heritage management, arriving at solutions to address these gaps. Improvements were achieved by assessing the current situation and striving to enhance existing strategies.

This is what this study aims to achieve; to provide a comprehensive analysis of the strategies for managing human risks that threaten cultural heritage in Libya by examining the case of Ghadames city as an applied model for this issue. This study will identify the human risks facing heritage sites, whether caused by conflict, urban expansion, institutional neglect, or illegal human activities such as theft. Additionally, it will analyze the efficiency of the institutions responsible for heritage protection in addressing these risks.

The importance of this research lies in its ability to illuminate the actual challenges facing cultural heritage in Libya, particularly given the unstable political and security conditions in the country. By analyzing the case of Ghadames, broader insights can be gained regarding the issues experienced by institutions involved in heritage management, which aids in offering realistic recommendations for enhancing policies and procedures related to heritage protection. Furthermore, the results of this research can hold practical value for governmental bodies and NGOs operating in the field of heritage, as it may assist in developing a more effective framework for safeguarding archaeological sites from human threats. This study also contributes to raising public awareness about the significance of cultural heritage and its role in bolstering national identity, along with underscoring the connection between heritage management, political stability, and sustainable development. Furthermore, the applicability of this study's findings are not confined to Libya alone but offer a model that can be applied to other nations facing similar challenges. In this manner, the research enriches the academic dialogue on cultural heritage management in unstable regions and formulates more sustainable strategies for its long-term protection.

This paper begins by discussing the relevant literature, which establishes a proposed framework for evaluating risk management practices. Subsequently, it presents a detailed case study analysis of Ghadames city and outlines the methodology employed to gather data. This entails the collection of policy documents, and semi-structured interviews based on the framework suggested by the literature. It is followed by a discussion of

findings and proposed recommendations to enhance the management of human risk of cultural heritage in the case study, which can be generalized to the broader Libyan context.

## 2. LITERATURE REVIEW

### 2.1. Libya's Heritage Governance System

Libya's state institutions are structured hierarchically, with decision-making authority concentrated at the top, restricting flexibility at lower levels[21,22]. Such centralization promoted uniformity but presents challenges when rapid adaptability is necessary. More decentralized institutions approaches could be more effective in responding swiftly to changing circumstances. The success of decentralized institutional power model relies on the communication and feedback mechanisms within the system, as well as the competence of senior officials[23].

The persistence of centralized institutions is rooted in Libya's political and historical context, including the centralized governance under the previous regime, which was characterized by a one-man rule[22]. Post-revolution attempts at decentralization have struggled to change entrenched structures. During the prior regime, strategic planning and resource allocation were often erratic due to fluctuating powers within ministries. These issues persist today, manifesting as inadequate planning, ineffective management, and low productivity within public institutions[22]. Additionally, Libya's tribal structure complicates decision-making, with the Shura Council of tribal elders playing a significant role in local governance, reinforcing the hierarchical nature of decision-making[22].

In the realm of heritage management, the same centralized structure applies. The Antiquities Department, which oversees the protection and management of Libya's cultural heritage, operates under laws based on legal frameworks introduced during the Italian occupation of Libya, including the Antiquities Law of 1968 and the 1994 Law No. 3 concerning archaeological sites and museums. Despite the efforts of this institution to safeguard heritage, it faces persistent challenges due to the state's centralization of decision-making, leading to frequent changes in their administrative affiliations[5,13].

Globally, hierarchical decision-making models are common in cultural heritage management. For instance, in Saudi Arabia, national authorities lead decision-making, ensuring strong coordination but limiting local community involvement in conservation efforts[24]. In China, a fragmented governance structure hinders coordination, making it difficult to implement cohesive conservation strategies[25].

Similarly, while Libya's centralized approach to heritage management aims to ensure uniformity and control, its poor execution has led to weak management and damage to heritage sites. A more flexible, participatory management model may be required to improve the preservation and sustainability of Libya's cultural heritage.

### 2.2. Learning from Global Best Practices in Heritage Risk Management

While Libya's centralized governance presents distinct challenges, many other countries confronting similar constraints have implemented adaptive strategies to enhance heritage management. Analyzing these global best practices provides valuable insights for addressing Libya's shortcomings.

Heritage management systems are guided by international standards developed by organizations like UNESCO and ICOMOS. UNESCO's operational guidelines emphasize the value of adaptive management systems that integrate legal, institutional, and resource elements in a flexible manner, ensuring adaptability to evolving challenges. These systems operate across various levels, from national frameworks to local adaptations, enhancing flexibility in heritage management[26].

Many countries have adopted UNESCO's heritage management systems, such as the Burra Charter, to tackle local challenges and improve practices. For instance, Jordan's management of Petra, a complex site with both cultural and natural features, uses a participatory planning process that involves all stakeholders - local communities, government agencies, and international organizations - in decision-making. This collaborative approach ensures that local issues are addressed, and management plans can adapt to future needs[27,28].

Similarly, Uganda's successful restoration of the Kasubi Tombs, with support from UNESCO and other international organizations, led to the site removed the site from the UNESCO in Danger List in 2023. This success emphasizes the importance of community participation and traditional knowledge in heritage management, ensuring that local communities have the skills and knowledge to protect their heritage[29]. New Zealand's risk management framework also offers valuable lessons, highlighting the need for flexible legislation and community engagement, particularly in response to disasters, and adapting regulations to emerging risks[30].

These practices provide key insights for Libya, highlighting the importance of engaging diverse stakeholders at every stage of heritage management. They underscore the need for legislation to evolve with the threats faced by heritage sites, ensuring that all actions taken are transparent and understood by all parties involved. Key themes from the literature (Figure 1) include participatory governance, community participation, legislative adaptation, and transparency.

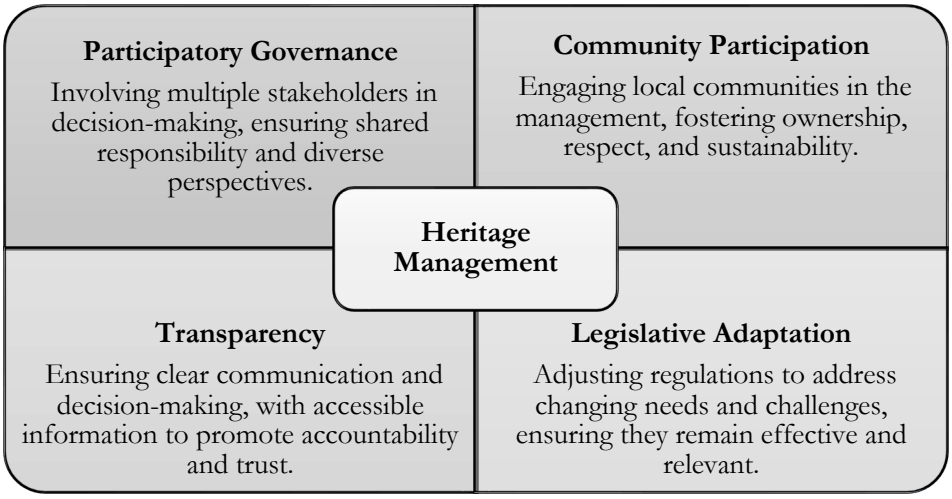


Figure 1. Factors for Enhancing Heritage Management (Source: Researcher).

The management of Petra exemplifies the role of participatory governance, where diverse stakeholders, including local communities, governmental bodies, and international organizations, engage in decision-making. This shift from top-down models to more inclusive and democratic approaches challenges traditional authority in heritage management, ensuring that community values are incorporated. By empowering local communities through direct involvement in decision-making, a sense of ownership is fostered, which is vital for sustainable conservation[31,33].

Likewise, the success of the Kasubi Tombs in Uganda highlights the importance of community participation, which preserves traditional skills, fosters a sense of ownership, and promotes social cohesion. This approach integrates economic, social, cultural, and environmental values, essential for sustainable development[34,35].

In the Libyan case, adopting similar stakeholder models would promote collaborative management and decision-making, shifting from centralized to more inclusive heritage conservation. Rooting conservation in local knowledge and traditions can enhance conservation outcomes.

New Zealand's experience also underscores the need for flexible heritage laws, particularly after disasters, to address emerging risks. Libya should review its outdated heritage management laws, incorporating improved risk management provisions to ensure the legal framework remains relevant and capable of protecting cultural heritage in the face of new challenges.

Finally, the importance of transparency in heritage management is evident in these case studies. Effective communication and open decision-making processes build trust and accountability among stakeholders, ensuring full commitment to conservation plans. Libya would benefit from adopting transparency in its heritage management system, ensuring efficient and informed conservation efforts.

Incorporating the principles that have contributed to the success of heritage management plans for other sites, this study integrates them into the risk management framework and assesses their applicability to heritage sites. The adoption of participatory governance, community engagement, and flexible legal frameworks forms a strong foundation for heritage management, fostering collaboration and transparency while addressing emerging challenges. This approach highlights the importance of risk management in safeguarding both the physical and cultural significance of heritage sites, ensuring their protection in the face of evolving threats.

### 2.3. Integrating Theory and Best Practices in Heritage Risk Management

Building on these global lessons, this section explores heritage risk management frameworks, particularly in managing human-induced threats. It culminates in a conceptual model integrating theoretical insights with the practical strategies observed in successful international cases.

Heritage risk management is vital for protecting cultural heritage from threats like natural disasters, climate change, human activities, and neglect. It involves identifying, assessing, prioritizing, and mitigating risks to reduce their impact on heritage sites. Recently, there has been a shift toward proactive risk management in heritage conservation, focusing not just on physical structures but also on preserving their cultural and symbolic value. This requires ongoing monitoring, collaboration, and strategic planning to protect heritage for future generations[36,37].

A typical risk management process includes defining the context, identifying risks, analyzing impacts, evaluating severity, implementing strategies, and monitoring changes (Figure 2). The ISO 31000 framework and ICCROM's guidelines stress the importance of stakeholder engagement and public awareness. Human-induced risks, such as vandalism, neglect, and inappropriate development, often arise from a lack of awareness about heritage value. This highlights the need for human risk management that incorporates heritage significance outreach, engaging communities and decision-makers to prevent threats.

The planning phase of heritage management is essential in linking theoretical frameworks to implementation. The value-based approach, which considers both the tangible and intangible aspects of heritage, has become key. Value-based conservation recognizes that heritage is more than its physical manifestations; it embodies

meaning to society. The Bora Charter defines heritage significance as embodied in a site's fabric, use, associations, meanings, and related objects[38]. Thus, heritage should be managed not only for its physical attributes but also based on its societal values.

For example, Japanese heritage management prioritizes spiritual significance, as seen in the Ise Grand Shrine, which is rebuilt every 20 years while retaining its spiritual value. This illustrates that a site's significance can go beyond physicality and reside in its social and historical meaning[39]. The value-based approach helps make informed conservation decisions, especially when resources are limited, ensuring the preservation of the most significant heritage[40] [40].

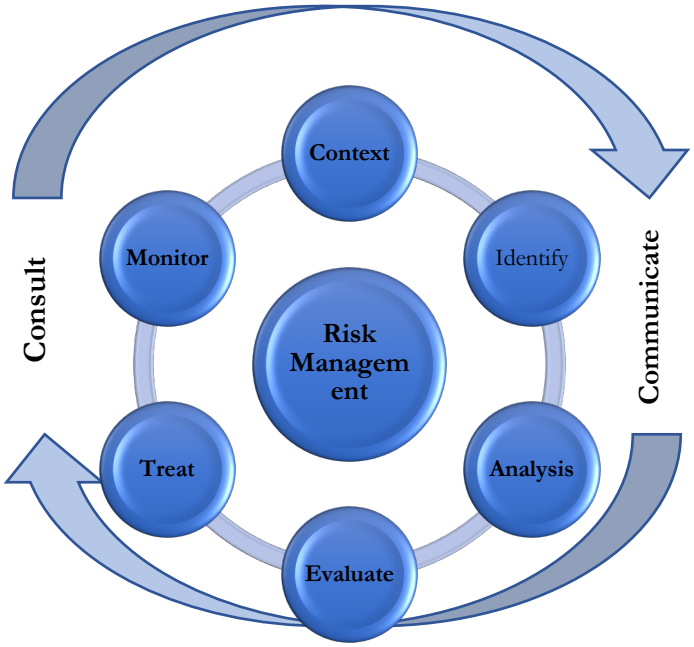


Figure 2. The ISO 31000 heritage risk management process (Source: Pedersoli Jr et al., 2016)

Despite its advantages, value-based management faces criticism. Assessments may not fully consider a site's historical significance or could reflect biased views of experts. However, inclusive stakeholder engagement and long-term historical analysis can mitigate these issues.

Incorporating value-based planning into Libya's heritage risk management framework can enhance sustainable conservation efforts, safeguarding sites in a manner that aligns with community values. Effective heritage risk management necessitates the comprehensive involvement of all stakeholders in management and decision-making, legislative adaptation, and transparency. By integrating value-based planning, heritage

conservation decisions can better reflect the cultural and historical significance of sites, thereby raising awareness and mitigating threats.

Based on those approaches, this study will assess the current state of cultural heritage management in Ghadames in term of human risk, considering all the aforementioned aspects as presented in Figure (3). Identifying issues in heritage management at Ghadames is essential for developing sustainable and adaptive management systems that align with local and global conservation objectives.

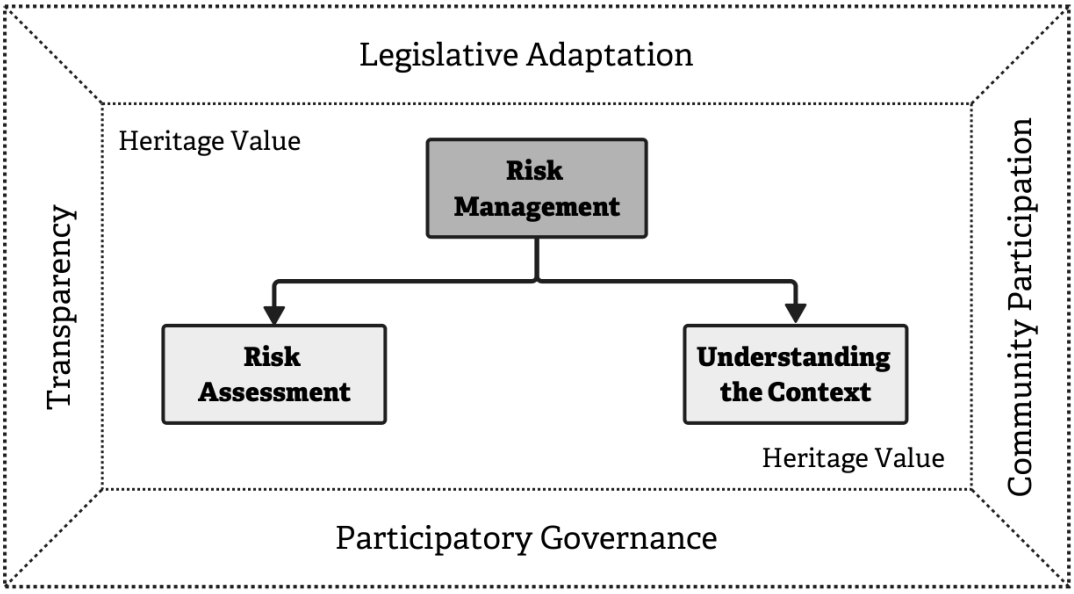


Figure 3. A theoretical framework for evaluating heritage management best in the literature (Source: Researcher).

## 3. CASE STUDY: GHADAMES CITY

Ghadames is a desert city in western Libya, situated in the border triangle between Libya, Tunisia, and Algeria (Figure 4). The city comprises two parts: The Old City (OCG) and the new district. The old part, characterized by its multi-level mud-brick houses and intricate alleyways, has represented Saharan life for centuries. In contrast, a modern district has developed outside the OCG walls, showcasing contemporary housing, infrastructure, and services.

Ghadames, a city with deep historical, cultural, and architectural significance, owes its importance to its carefully chosen geographical location. The founders selected the site due to the presence of the Ain Al-Faras Spring (Figure 4), which ensures the availability of water and for the natural protection provided by dunes to the south that shield the city from harsh desert winds. Additionally, the region was rich in essential building

materials such as clay, limestone, and gypsum, which allowed the city to be constructed and sustained over centuries. Ghadames' strategic location also made it a vital transit center for commercial caravans. Travelling between North and sub-Saharan Africa, these caravans transported goods and played an essential role in spreading knowledge, culture, and Islam to the city[41,42].

The historical significance of Ghadames is rooted in its role as a site of various successive civilizations, including the Romans, Phoenicians, and Arabs, and many sites in the city are evidence of those ears. These civilizations contributed to the city's rich cultural heritage, making it an important historical center. The city's exceptional architectural design is another key aspect of its significance. Using available building materials, the city's layout achieved practical and aesthetic value. Its design reflected the social structures of its inhabitants, promoting social cohesion through interconnected dwellings and meeting religious needs with separate spaces for men and women. This innovative urban planning contributed to the city's comfort and the functionality of daily life[41,43].

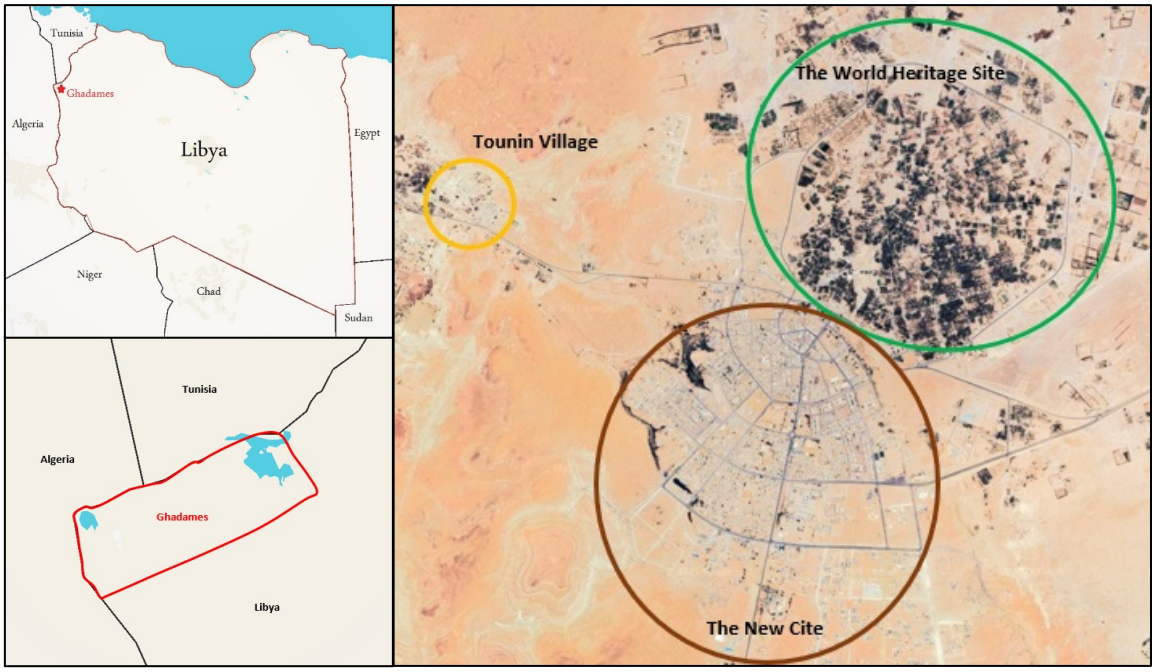


Figure 4. Location of the case study (Ghadames Cite), (Source: Google Map, 2025)

Ghadames' cultural and architectural uniqueness and its historical richness led to its recognition as a World Heritage site. In 1986, it was included in UNESCO's World Heritage List for meeting the criteria of being an outstanding example of a traditional human settlement that reflects the interaction between humans and the environment, especially as it faces the threat of irreversible change. Ghadames' global significance is further reflected in its recognition by the Arab Cities Organization in 1980 and the World Heritage Cities Organization in 1999.

### 3.1. Ghadames Heritage Sites

Ghadames city has many heritage sites, ranging from historical sites to archaeological sites and historical buildings. The most famous of these sites is the (OCG), with its distinctive architecture and sustainable urban planning that is adapted to the harsh desert conditions. Ghadames extends over an area of 8 hectares within 215 hectares of orchards and includes approximately 1,600 traditional buildings, including houses, mosques, schools, and shops, surrounded by a protective wall with seven gates[42] (Figure 5).

The buildings within the OCG are a fine example of desert architecture, carefully designed to carefully designed to mitigate the effects of the harsh climate, resource constraints and social needs. The city's houses typically stand four floors high, reaching up to 12 meters, with floors staggered in layers. This staggered architecture often interlocks with neighboring structures, creating a unique load-bearing system that does not rely on structural beams but instead on support from surrounding buildings. While this design is highly effective in withstanding the desert environment, it requires regular maintenance to prevent cracks. If one building collapses, it can damage or even induce collapse in connected buildings due to the interconnected nature of the structure[44,45].

The building techniques used in Ghadames are traditional and simple, passed down through generations, and have stood the test of time and contributed to the preservation of the city. The buildings were built using local materials, primarily mud, palm trunks, natural roofing materials, and other materials such as gypsum, light stones, and hard limestone. The choice of materials is influenced by both their availability in the surrounding desert environment and the season, with careful attention paid to the preparation and treatment of materials to ensure their durability. This preservation of traditional methods has allowed Ghadames to maintain its unique architectural style and function, which is in perfect harmony with its environment[44,47].

The city contains some distinct buildings that were built later in different eras. One such building is the Tilwan School, which was originally built as a palace for the Ottoman governor before being reused as the first girls' school in Ghadames in 1940[48]. While the Tilwan School does not follow the traditional architectural design of Ghadames, it does incorporate local materials and building techniques. Another notable building is the Ain Al-Faras Hotel, built by the Italians in 1926[41]. In contrast to the traditional architecture of Ghadames, the hotel was built with modern materials and design, which contrasts sharply with the city's unique character. Furthermore, there are modern buildings in the city's surroundings, such as the first modern school in Ghadames, which is still in use today as a center for memorizing the Holy Quran, and a government building that now serves as the headquarters of the Ghadames administration. These modern structures highlight the ongoing balance between preserving the integrity of Ghadames' historical architecture and adapting to the needs of the present.

Additionally, the city is home to several local attractions (Figure 6). The first is Tounin village, a miniature world heritage site located 3 km away from (OCG), featuring the same design and structure. Furthermore, Ghadames city houses archaeological remnants of palaces and castles from various eras, including the Temsammudin site which is Roman funerary monuments, the Maqdoul Palace also dates back to the Roman era. In addition, the Al-Ghoul Palace, locally known as Ras Al-Goual, shares similarities with other castles in Libya. Majazm Castle, built during the Ottoman era in 1845, is located about 40 km from the city. Furthermore, the city boasts an extant castle constructed during the Ottoman era and later expanded during the Italian occupation, now the site of Ghadames Museum. Unfortunately, all the local sites are in a state of neglect and abandonment, exposed to violations[49,50].


Figure 5. Aerial map of the old city of Ghadames (Source: Researcher, 2024).

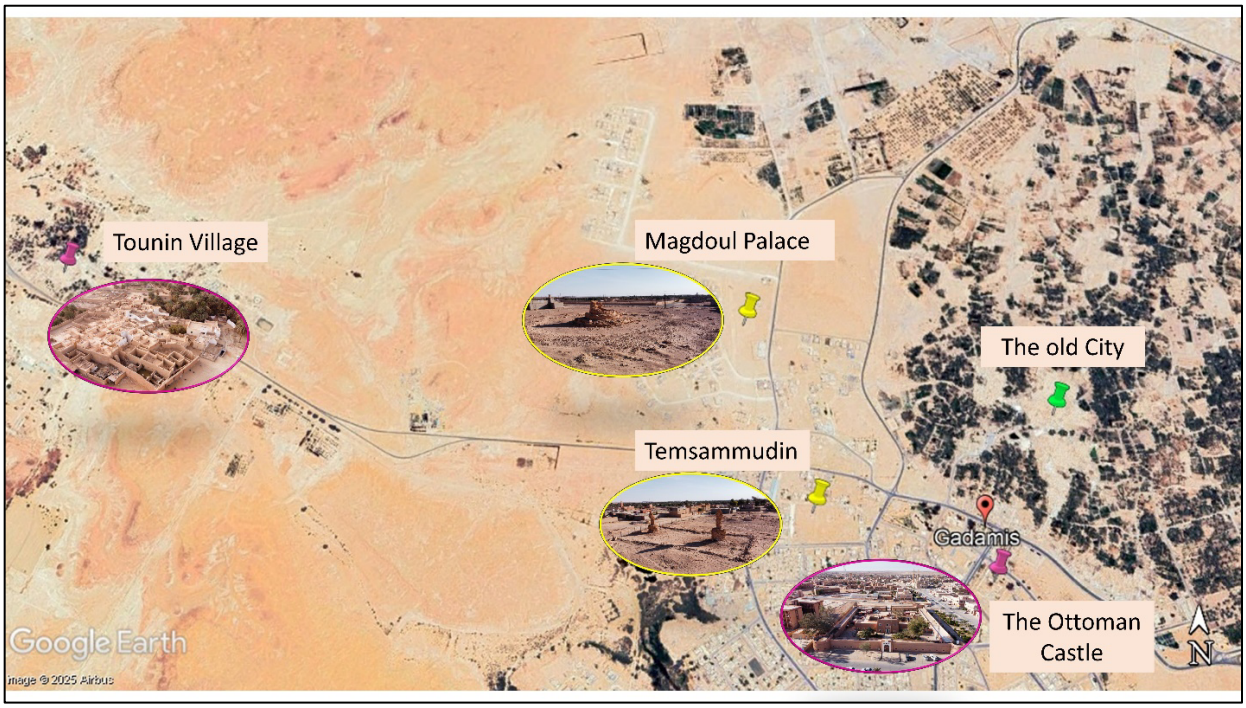


Figure 6. Location of some of Ghadames' local heritage sites (Source: Google Map, 2025).

### 3.2. Ghadames Heritage Institutions

Local heritage management institutions cannot be understood without first understanding Libya's higher institutions. Libyan heritage sites are managed by two central entities: The Antiquities Department and The Historical Cities Management Authority. Each has several branches spread across various cities. Some cities house branches of one or both national institutions, depending on the classification of the heritage sites they host and their legal affiliation with either. Furthermore, there are a few local institutions dedicated to specific heritage sites.

Ghadames has two institutions responsible for managing its heritage sites; the first is a branch of the Antiquities Department known as the Ghadames Antiquities Monitoring Branch (GAMB), established in 1985. This department however is regarded as an executive body rather than a decision-maker, particularly in significant tasks, as most of its responsibilities are directed by the central department. This body is responsible for all archaeological sites, such as Temsammudin, the Maqdoul Palace, the Al-Ghoul Palace, and Majazm Castle, in addition to the Ottoman Castle, which serves as its headquarters.

According GAMB's Resolution No. 2 of 2011, some of its duties include supervising the conduct of daily operations at heritage sites, implementing decisions of the central department, following up on monitoring plans and programmes, preparing periodic reports about them, inspecting immovable and movable antiquities

to ensure their safety and proposing methods for their preservation, and providing security and monitoring for buildings and sites[51].

The second entity managing heritage at Ghadames is the Ghadames City Promoting Development Authority (GCPDA), one of two local institutions of this type established in Libya. One is located in the capital city and pertains to the old city of Tripoli, while the other is the GCPDA, which focuses on Ghadames. According to Resolution 401 of 2007, the GCPDA was established as an institution with legal personality and independent financial accountability. This institution is solely concerned with the Ghadames World Heritage Site.

The main tasks of the GCPDA are [52]:

- Carrying out restoration and maintenance work within the OCG.
- Paying attention to the farms surrounding the OCG and working to revitalize them.
- Implementing the provisions of Law No. (3) of 1993, which protects antiquities, museums, ancient cities, and historical buildings related to the UNESCO site.
- Providing traditional building materials that meet precise technical specifications.

The heritage sites of Ghadames, primarily managed by those two entities, are responsible for preserving the city's rich cultural and historical significance. However, despite their mandates, these institutions face challenges such as mismanagement and neglect, leading to risks ranging from structural deterioration to inadequate maintenance practices. This situation highlights the urgent need for improved governance, enhanced preservation efforts, and increased community engagement to protect Ghadames' invaluable heritage for future generations.

## 4. METHODOLOGY AND METHOD

This study employs a qualitative approach to evaluate heritage management strategies in Libya, concentrating on human risk management. Given the necessity of an in-depth examination of heritage management's current and historical status, it is beneficial to focus on a singular case study to identify all its aspects and the potential for effective management[53,54]. Case studies allow for an in-depth study of a phenomenon's natural context and enable a comprehensive inquiry[53]. The selected case study is that of Ghadames city, which encompasses two heritage institutions, thus making it an embedded case study (Figure 7). This is demonstrated by selecting one case with multiple units of analysis[53].

Moreover, one of the advantages of the case study as a research method is the potential to utilize multiple strategies for data collection, which this study necessitates. Initially, it relied on analyzing documents and policies related to administrative institutions and their operations, as well as the regulations governing their

activities. Semi-structured interviews were also conducted with staff of heritage institutions at both the national and local levels. This provided insights into the mechanisms of cooperation between them, alongside identifying the stakeholders relevant to the case study, who are a vital element that must not be overlooked when evaluating the effectiveness of the strategies adopted to manage heritage risks. This data collection approach offers a comprehensive understanding of the social context of the selected case, and the past and present challenges faced by management institutions in conserving heritage sites.

The study aims to evaluate the effectiveness of human risk management for Ghadames sites; therefore, the theoretical framework proposed in the literature was relied upon during the data collection phase.

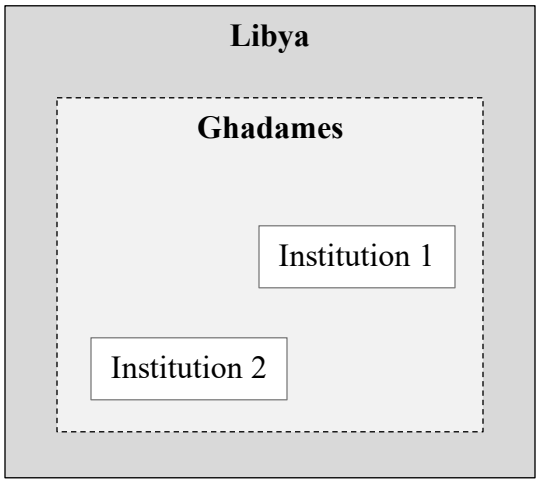


Figure 7. Single case study with multiple unities of analysis (Source: Yin, 2018).

### 4.1. Documents and Policy Analysis

The analysis of documents related to the two heritage institutions in Ghadames included a comprehensive review of political documents, laws, and correspondence. This process was crucial for understanding the operational mechanisms of these institutions and the scope of their authority to issue decisions. Furthermore, the analysis illuminates the nature of cooperation between these institutions and the parties concerned with heritage preservation.

Despite the challenges posed by the scarcity of available documentation due to the poor state of archiving practices in some institutions, and the significant loss and damage of many records during the 2011 revolution, the available documentation still provides valuable insights. These materials provided a detailed and clear view of the heritage institutions' administrative framework and status over time. In particular, they helped clarify the evolution of these institutions, highlighting the strategies employed in risk management.

This analysis also aided in recognizing the references upon which decisions were based, typically included in these documents.

Furthermore, the documents allowed the researcher to trace the historical trajectory of these institutions, providing a long-term perspective on their activities, achievements and challenges. This retrospective examination was invaluable because it provided a stable and objective account of the evolution of the institutions without being distorted by the biases or perspectives of the individuals involved[55]. This approach facilitated the formation of a nuanced understanding of how these heritage institutions functioned and their interactions with other relevant actors over time.

The analysis of these documents offered a rich narrative about heritage institutions in Ghadames. The insights were also vital for understanding their historical context and contributions to heritage risk management.

### 4.2. Semi-Structured Interviews

This study conducted semi-structured interviews with 24 key stakeholders involved in managing heritage sites in Libya. These stakeholders included directors of heritage institutions, legal affairs officers, planners, and staff from implementation departments at both the national and local levels. Additionally, interviews were held with 10 local stakeholders directly connected to the management of heritage sites. The interviews continued until data saturation was achieved, ensuring sufficient responses were gathered to address the research inquiries thoroughly and that the interviews no longer provided new information[56,57].

The interview process began with probing questions designed to clarify participants' perspectives on the issue at hand, often uncovering aspects not immediately apparent to the researcher[58]. In the second phase of the interviews, the focus shifted to a deeper exploration of the core subject of the study. Drawing on a theoretical framework established in the literature, this phase aimed to evaluate the performance of the heritage institutions. By doing so, the researcher could identify weaknesses within the institutions and ensure that the recommendations based on the interview findings would be both practical and effective. The questions varied according to the interviewee's role and area of expertise, enabling a more tailored approach for each participant.

To analyze the data collected from the interviews, thematic analysis and coding were employed, concentrating on identifying recurring patterns linked to key themes such as the effectiveness of legislation, risk assessment strategies, stakeholder participation, decision-making transparency, and the level of cooperation and coordination between institutions. This analytical approach aimed to evaluate how effectively existing

legislation responded to the challenges faced by administrative institutions in managing heritage sites. It also sought to understand the strategies employed for risk management, the process of developing administrative plans, and the relationship between central heritage administration and its local branches. Furthermore, it examines how relevant stakeholders were selected for participation in heritage management and evaluates the extent and quality of their involvement.

The study's findings helped identify the strengths and weaknesses of the administrative structures and offered insights into the mechanisms that either facilitated or hindered effective heritage site management. This comprehensive evaluation contributed to a deeper understanding of the operational strategies within Ghadames's heritage institutions and provided a solid foundation for formulating recommendations to enhance management practices.

## 5. FINDINGS AND DISCUSSION

### 5.1. Human Risk Facing Ghadames Cultural Heritage Sites

The interviews conducted in Ghadames revealed a clear difference in the level of attention given to various heritage sites within the city. While locals view the OCG site as a source of pride, other heritage sites have not received the same attention or care. The OCG is cherished by residents as the city's heart, representing its cultural identity. However, other sites do not attract much interest despite their historical and archaeological significance.

One such site is Tounin village, which bears similarities to OCG; however, its distance from the main area and its resemblance to the UNESCO World Heritage Site have resulted in reduced interest. Similarly, most locals have largely overlooked the archaeological remains throughout the city. These architectural remnants and archaeological sites, regarded by many as mere ruins, do not possess significant value in the eyes of the community. In fact, some sites, such as Qasr Maqdoul and Tamsammudine, are even resented by certain locals, as they occupy strategically important land within the modern city that could be utilized for more practical purposes.

The Ottoman castle (Ghadames Museum), another significant historical site, has similarly lost its prestige and appeal. The museum itself has been closed since 2011. The central part of the castle is now used as the headquarters of the local branch of the Antiquities Department, while the Public Safety Authority occupies the other section. Consequently, the castle is no longer regarded by locals as a historical monument but rather as just another government building.

The variation in the perceived value of different heritage sites among the residents of Ghadames has influenced the focus of the interview results. Most attention was directed towards identifying human risks to the OCG site, while some risks related to other sites were also acknowledged. The differing levels of importance attributed to these sites by the local community played a crucial role in shaping the nature of the identified risks. A summary of these risks and their assessment is presented in Table (1).

| NO. | RISK | FREQUENCIES OF OCCURRENCE | RATE | IMPACT | RATE | RISK SEVERITY | RATE |
|---|---|---|---|---|---|---|---|
| 1 | Neglect of the museum maintenance | Almost certain | 5 | Catastrophic | 5 | Extreme | 25 |
| 2 | The neglect of OCG houses by residents | Almost certain | 5 | Major | 4 | Extreme | 20 |
| 3 | The government system | Almost certain | 5 | Major | 4 | Extreme | 20 |
| 4 | Vandalism and scribbles | Almost certain | 5 | Moderate | 3 | Very high | 15 |
| 5 | Urban sprawl | Probable | 4 | Moderate | 3 | High | 12 |
| 6 | Renting houses to expatriate workers | Probable | 4 | Moderate | 3 | High | 12 |
| 7 | Poor maintenance and non-original material | Possible | 3 | Major | 4 | High | 12 |
| 8 | Uncontrolled irrigation water in farms adjacent to the buildings | Improbable | 3 | Major | 4 | High | 12 |
| 9 | Unqualified workers | Improbable | 2 | Moderate | 3 | Medium | 6 |
| 10 | Allocating quarries to citizens | Probable | 4 | Minor | 2 | Medium | 8 |
| 11 | Uncontrolled domestic tourism | Possible | 3 | Moderate | 3 | Medium | 9 |
| 12 | Waste on farms, houses and the city outskirts | possible | 3 | Moderate | 3 | Medium | 9 |
| 13 | Theft | Possible | 3 | Minor | 2 | Medium | 6 |
| 14 | Use of heavy machinery inside the city | Rare | 1 | Insignificant | 1 | Very low | 1 |

Table 1. The human risk of Ghadames Heritage sites and their level of severity

The human risks facing Ghadames' cultural heritage sites arise from multiple interconnected factors, many of which are rooted in local social, economic, and cultural conditions. The neglect of the museum and the houses of the OCG primarily results from a lack of awareness and institutional shortcomings. Residents and institutions frequently overlook the necessity of regular maintenance. Local indifference, particularly as new generations become increasingly disconnected from their cultural heritage, significantly contributes to this neglect. The governmental system is another major factor. Ineffective governance and political instability lead to weak enforcement of heritage protection laws and a lack of funding for conservation efforts. Institutional inefficiencies further inhibit the coordination of necessary conservation and protection activities, leading to further deterioration of heritage sites. To address these challenges, a values-based conservation approach is recommended, focusing on both tangible and intangible cultural values. This strategy has been successfully implemented in other regions, such as Uganda, where local communities have been actively involved in preserving their cultural heritage. In Ghadames, this approach would enhance community engagement in heritage conservation. Educational campaigns to raise awareness of the importance of Ghadames' cultural heritage could help residents and institutions recognize the significance of its preservation. Moreover, integrating local knowledge into conservation practices ensures that the community comprehends the cultural value of heritage sites and their protection.

Vandalism and graffiti, largely resulting from a lack of awareness and indifference among residents and visitors, pose significant risks to Ghadames' heritage. The "I was here" mentality, particularly prevalent among tourists, adds to this risk, as individuals overlook the long-term damage inflicted by such acts. This issue is further exacerbated by insufficient education and engagement with the cultural significance of heritage sites. To mitigate this phenomenon, public awareness campaigns could be implemented, educating residents and visitors about the importance of heritage conservation and the devastating impact of vandalism. The participatory management model successfully implemented in Petra, Jordan, can be applied to Ghadames to engage local communities in protecting their heritage, potentially reducing vandalism and enhancing residents' sense of ownership.

Urban sprawl, driven by economic pressures and inadequate urban planning that fails to prioritize heritage protection, poses another major threat. Renting homes to migrant workers and a lack of maintenance due to financial stresses on residents worsen the issue. One approach to address this challenge is to enforce zoning regulations to prevent urban expansion into heritage areas and ensure that future developments do not impact the authenticity of Ghadames' cultural sites. Furthermore, establishing sustainable urban planning frameworks that balance heritage conservation with economic development is vital for effectively addressing this encroachment.

Poor maintenance, resulting from unsuitable restoration materials and unskilled workers, poses a significant risk. Financial constraints and a lack of awareness regarding traditional construction methods has led to the use of materials and techniques incompatible with the original structures, further deteriorating heritage buildings. To address this situation, providing specialized training for local craftsmen and heritage experts on traditional construction methods and using local materials will help ensure that restorations are conducted using appropriate materials and techniques that preserve the integrity of heritage sites. Collaboration with heritage experts and relevant organizations can deliver the necessary training and guarantee the quality of restoration work. Another risk is water damage caused by uncontrolled irrigation practices. A lack of awareness about the damage caused by water misuse leads to moisture problems that affect the integrity of buildings. To mitigate this, local farmers must be educated on the importance of managing irrigation in a way that does not harm heritage sites.

Finally, tourism-related risks, such as uncontrolled domestic tourism and waste accumulation, arise from inadequate tourism regulation and mismanagement. The absence of systematic planning and oversight of tourism activities exacerbates unintentional damage, including littering, fires, and graffiti. To mitigate this, tourism management plans must be implemented to regulate tourism activities. This could involve establishing visitor limits, creating dedicated tourist routes, and imposing penalties for damage to heritage sites. Furthermore, encouraging community-based tourism investment can enable residents to benefit economically from tourism while fostering a sense of responsibility for preserving their cultural heritage.

Addressing the human-induced risks facing Ghadames' cultural heritage sites requires a multifaceted approach that combines value-based conservation, public awareness, sustainable urban planning, and skilled labour development. By leveraging international best practices and adapting them to the specific Libyan context, these strategies can help mitigate risks and ensure the long-term preservation of Ghadames' invaluable cultural heritage.

### 5.2. Performance of Heritage Institutions

The heritage in Ghadames is overseen by two institutions: one is a branch of a national institution (GAMB), and the other is a local institution (GCPDA). Their management approaches differ significantly, leading to varied outcomes in their work. Table 2 shows the results of the evaluation of these two institutions.

| ASPECT | GAMB | GCPDA |
|---|---|---|
| Administrative affiliation | Affiliated with the Central Antiquities Authority | Administratively independent |
| Financing | Receives allocations from the Central Authority | Financially independent |
| Legal Structure | Operates under Libyan Antiquities Law No. 3 | Operates under Libyan Antiquities Law No. 3 |
| Human Resources | Facing significant staff shortage | Fully staffed |
| Administrative Strategies | Lacks formal strategies | Initiatives to adopt global strategies |
| Human Risk Management | No risk management | Manages human risks with inaccurate assessments |
| Collaboration with heritage partners | Limited cooperation | Initiatives to involve stakeholders in meetings and decision-making |
| Local Community Participation | Limited involvement | Strong initiatives to engage the local community |

Table 2. Comparing the Ghadames heritage management institutions

As shown in Table 2, a comparison of (GAMB) and (GCPDA) reveals significant differences in their administrative structures, resource management, and effectiveness in managing Ghadames' heritage sites.

This disparity is due to their administrative independence; GAMB adheres to the Libyan administrative system, which is marked by centralization and lacks decision-making authority. Instead, it serves as an executive body responsible for relaying reports concerning issues and threats to the sites it oversees. This structure imposes a hierarchy that necessitates higher-level approval and financial support to act against threats or resolve specific problems. As a result, its operations are governed by routine procedures, which impede the execution of emergency projects and the ability to respond swiftly to threats. In contrast, GCPDA operates independently, both administratively and financially, with full authority to make decisions, implement plans, and finance them directly. Its administrative link to state ministries is merely supervisory and does not constrain its actual operations. However, the interview results indicate that this institution's internal structure is hierarchical; decision-making powers are restricted to a specific management level within the institution, which manages planning due to the lack of experience among many staff in such tasks.

Regarding legal affiliation, all heritage institutions in Libya are subject to Heritage Law No. 3 of 1994. However, this present shortcomings as this law has become significantly outdated in light of recent events and developments in Libya, leading to an increase in heritage violations. While the law acknowledges most human threats identified in protecting heritage sites, the penalties imposed for these violations are

disproportionate and fail to sufficiently represent the extent of the potential damage to heritage sites. Consequently, the weak penalties in place do not adequately reflect heritage value, resulting in ongoing violations and undermining efforts to protect these sites. Therefore, it is of utmost urgency to update this law and adapt it to the current circumstances of the country.

The administrative performance of the two institutions was evaluated through interviews based on the framework that encompasses factors contributing to the success of other cases. It emerged in the interviews that neither institution had clear strategies for its work. Furthermore, when identifying and assessing human risks, it became evident that insufficient attention has been given to human threats to heritage sites in Ghadames, with interviewees largely considering that they do not pose a significant risk to the sites. Nonetheless, the reality is that risks do exist but are incorrectly assessed. Current risk assessments are grounded in experience across all sites and levels without following any systematic strategies.

In the case of the UNESCO site, it was found that most human risks are cumulative, and their effects increase over time, such as the risk of residents neglecting heritage buildings and their maintenance. Visually attractive, heritage buildings appear sound but are not inspected or maintained until deep cracks and collapses became evident, which may occur over time. There is also the threat of graffiti and carvings on the walls, which is not apparent because the institution responsible for the site periodically paints the walls, which is expensive and exhausting, in addition to concealing these violations and making it difficult to assess their actual severity accurately. As for other local sites in Ghadames, human threats have been ignored because the archaeological sites are not of interest to the local community or the responsible institution, which poses a significant threat to their sustainability.

Regarding stakeholder involvement in decision-making, GCPDA is earnestly seeking to adopt this practice, but it has not yet reached a level that allows all parties interested in heritage to truly participate in the decision-making process. Several factors contribute to this situation, including stakeholders' confusion regarding the significance of their involvement in the session-making process. The initial steps of work are often unclear to stakeholders, and their participation is limited to the final stages, making them feel that this process is only formal.

Regarding community engagement, the work of GAMB is almost at a standstill, and stakeholders are not involved. In contrast, GCPDA is endeavoring to introduce initiatives to engage stakeholders. For instance, three individuals from each of the seven tribes of Ghadames were chosen to serve as links between the local community and the institution. These committees undertake several tasks, such as connecting citizens to the organization, facilitating communication among them, consulting citizens on projects proposed by the institution, and attending meetings on behalf of the citizens. However, these initiatives did not receive a

strong response from the Ghadames community, as enthusiasm was limited to a small group of citizens who remain connected to the OCG and appreciate its value. The vast majority of the population did not show much interest, either due to a lack of awareness regarding the significance of the heritage site or because factors like economic conditions which prevent them from prioritizing the site, contributing to a negative attitude towards it. Therefore, the greatest shortcoming in engaging the local community stems from the citizens and their lack of interest, despite all the efforts made by the GCPDA to involve them.

Despite the efforts of GCPDA, its work remains ambiguous to stakeholders and the local community. It suffers from a lack of transparency in its procedures, which reduces its effectiveness and adversely impacts interactions between the local community, stakeholders, and the institution concerning heritage protection.

There is no doubt that heritage management in Ghadames requires improvement. GAMB needs greater autonomy, by decentralizing decision-making, the institution can establish a more robust administrative structure and respond effectively to emerging risks without needing approval from a central authority. In addition, GAMB should secure funding to support essential conservation efforts and develop a structured risk management framework. For the GCPDA, enhancing transparency and fostering better stakeholder communication is crucial. A more inclusive decision-making approach would ensure effective participation from relevant partners. The GCPDA should also decentralize its internal decision-making, allowing more staff to engage in heritage planning and management.

To improve community engagement, it is crucial to implement awareness-raising campaigns about the cultural and historical value of Ghadames' heritage. This can be achieved by drawing from global examples like that of Petra in Jordan and the Kasubi Tombs in Uganda, where community participation played a key role in heritage management. In these models, local communities and government bodies worked together in decision-making, ensuring a more inclusive and adaptive approach. Ghadames can adopt a similar participatory governance model. Stakeholders, such as the seven tribes committee of Ghadames, municipal representatives, and local NGOs, could be more actively involved in preserving their heritage. This would foster a sense of ownership and responsibility for conserving Ghadames' cultural heritage.

On a broader scale, concerning legal reforms, Libya's Heritage Law No. 3 of 1994 needs updating to address contemporary risks and improve enforcement. Proposing heritage impact assessments for new developments and imposing stricter penalties for violations would align Libya's legal framework with international best practices, such as those in New Zealand. This would ensure that the Heritage Law remains relevant and effective in the face of threats, providing stronger deterrents for those who violate cultural heritage protections.

Furthermore, both institutions would benefit from investing in staff training in areas such as modern conservation techniques, risk assessment, and community outreach. These investments would build the capacity of both GAMB and GCPDA, ensuring they are better equipped to manage Ghadames' heritage sites. Developing local expertise through training will improve the institutions' ability to make informed decisions, encourage community involvement, and implement effective preservation strategies that are both sustainable and culturally sensitive.

## 6. CONCLUSION AND RECOMMENDATIONS

Ghadames' cultural heritage faces many threats posed by human activities, which differ in severity. Some of these risks, including neglect, lack of a functional government system, vandalism and graffiti, urban encroachment, misuse of heritage buildings, inadequate maintenance, and unregulated irrigation, have been identified as being of high severity. However, the seriousness of these threats has often been underestimated due to insufficient experience in risk assessment, resulting in a failure to accurately evaluate the true scope of the risks. Other threats, such as unskilled labor, uncontrolled domestic tourism, waste accumulation, theft, and the use of heavy machinery within the OCG, have been deemed to be of medium to low severity. These sites are not only crucial to national identity but also contribute to the shared heritage of humanity. Nevertheless, their preservation is severely obstructed by ineffective governance, institutional mismanagement, and a lack of cooperation from key stakeholders. Without urgent action, Ghadames' invaluable cultural heritage sites are at risk of further deterioration.

The management strategies currently in place for Ghadames' cultural heritage are fragmented and inadequate, primarily due to the shortcomings of the institutions overseeing them. Key institutions like GAMB and the GCPDA face significant challenges. GAMB suffers from complete administrative inefficiency due to its centralized dependency, which stifles decision-making and delays responses to emerging threats. Meanwhile, the GCPDA grapples with weak staff expertise, resulting in decision-making being confined to a specific group with in organization. At the same time, a lack of transparency in planning strategies undermines the effectiveness of stakeholder engagement.

Furthermore, both institutions experience limited community participation and lack interest in heritage sites. These issues are exacerbated by outdated laws and weak enforcement mechanisms, which fail to adequately protect heritage sites from risks arising from human activities. Consequently, Ghadames' cultural heritage is increasingly vulnerable to deterioration, and the protections and management strategies remain insufficient to safeguard these invaluable sites.

Given these challenges, several recommendations can be made at both the local and national levels to improve heritage management in Ghadames:

At the Local Level:

- Institutional Cooperation: Foster collaboration between local institutions, create a unified heritage management approach and engage all stakeholders.
- Community Participation: Encourage active participation in conservation initiatives to foster a greater sense of community engagement in heritage management.
- Heritage Management Transparency: Ensure transparency at all stages of heritage management to build trust, improve collaboration, and address issues early.
- Staff Training: Invest in staff training to enhance risk assessment, conservation, and stakeholder communication abilities.

At the National Level:

- Legislative Reform: Revise heritage protection laws to safeguard cultural heritage by enforcing stricter penalties and more precise guidelines.
- Decentralized Governance: Transition to a more flexible, decentralized management system that allows local authorities to respond effectively to threats promptly and independently.
- Education and Awareness Programs: Enforce nationwide initiatives to foster a sense of responsibility for conservation and increase young people's awareness of cultural heritage.

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**Traditional Dwellings and Settlements**
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# MAKING IN-BETWEEN: RECONSTRUCTING CULTURE THROUGH RESIDUAL URBAN SPACES

*Peter W. Ferretto, Sze Wai Veera Fung*

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*Making has long been integral to Hong Kong's identity but is now on the verge of disappearing. One contributing factor is the city's economic shift from manufacturing to commerce since the 20th century, which has relegated its once-thriving craft culture to scattered remnants in in-between urban spaces. This spatial displacement has also widened the gap between younger generations and craftspeople, further endangering its survival.*

*In Sham Shui Po, known as Hong Kong's living warehouse, making persists within a network of in-between spaces where daily life, social connections, economic exchanges, and undefined spatial conditions intersect. While these spaces offer flexibility for informal craft and trade, they remain subject to strict bureaucratic regulations. As a result, engaging in craft production is not only a cultural or economic act but also a continuous negotiation with urban policies.*

*Building on the premise of in-between spaces as sites of creative negotiation, this paper examines how these spaces can support the survival of Hong Kong's craft culture. As part of an action-research project aimed at revitalizing local craftsmanship and fostering community connections through a temporary architectural prototype, this study employs an ethnographic approach to analyze two case studies of craft production in informal urban spaces. It explores how craft and trading activities operate within these spaces and the spatial tactics used to navigate Hong Kong's rigid urban and regulatory landscape. The paper concludes by emphasizing that temporality and adaptability are essential strategies for sustaining craft culture within the urban residual spaces of Hong Kong. These insights not only inform the initial prototype development but also contribute to broader urban, architecture, and cultural preservation discourse, highlighting the role of the built environment in revitalizing local craftsmanship and strengthening community ties.*

## 1. INTRODUCTION

As Ackbar Abbas famously observed, Hong Kong is "not so much a place as a space of transience[1]." This sense of impermanence is directly reflected in the city's making culture, which was once integral to its urban fabric and identity but is now on the verge of disappearing[2,3]. Since the late 20th century, when the manufacturing industry migrated to Mainland China, craftsmanship, which was central to the local economy and daily life, has been reduced to vestiges scattered across in-between spaces within the city[4]. These spaces, characterized by spontaneity and improvised temporary activities, exist at the center of two urban polarities: on one end, the highly engineered cityscape, and on the other, unplanned natural spaces. As craft culture gradually phases out in a city that prioritizes technological advancement, in-between spaces have become a refuge for the remaining craft practices. However, beyond spatial displacement, an equally pressing issue is the growing disengagement between younger generations and traditional craftsmen, leading to a further decline in the inheritance of artisanal skills and knowledge[5].

Sham Shui Po has long been a hub for Hong Kong's manufacturing industry and grassroots economies, where a network of in-between spaces fosters a range of making and trading activities[6]. These spaces, often

overlooked by formal urban planning, accommodate fluid, adaptive, and mobile forms of production and exchange, allowing craftsmen, traders, and small-scale entrepreneurs to operate outside conventional commercial settings[7,8,9].

Throughout the day, Sham Shui Po's in-between spaces transform to support a diverse array of craft practices[10]. In the mornings, fabric merchants and leather artisans set up temporary stalls outside storefronts, displaying their materials for local designers and independent manufacturers. By noon, alleyways and pedestrians become sites for small-scale workshops, where craftsmen repair watches, tailor garments, and assemble electronics using compact, mobile workstations. In the afternoons, second-hand traders and independent makers activate spaces along Tai Nam Street, repurposing vans as retail spaces. As daylight fades, the district's midnight markets come to life, where recyclers and traders establish pop-up stalls offering affordable goods to grassroots communities.

These activities reveal how in-between spaces enable a dynamic form of production and trade, distinct from the regulated, static nature of formal commercial districts. Instead of functioning as designated workspaces, these spaces are constantly redefined by those who occupy them, responding to shifting spatial opportunities, economic needs, and social interactions[11].

However, despite their apparent informality, in-between spaces in Hong Kong are not entirely unregulated. These spaces exist within a bureaucratic framework where multiple governmental authorities oversee their usage, accessibility, and safety through complex licensing processes[12]. Depending on the type and location of the space, various regulations dictate what activities can legally take place, imposing constraints on making and trading practices. Thus, engaging in craft production within these urban voids is not merely an economic or cultural act but also a continuous negotiation with urban policies and enforcement mechanisms[13].

**Residual Space as Creative Negotiation**

The concept of in-between space aligns with broader discussions on residual space—urban areas that lack predefined functions within formal planning structures[14]. Such spaces, including car parks, privatized plazas, and public housing estates[15,16], often suffer from neglect and poor governance[17]. However, rather than viewing these spaces as passive byproducts of an overdetermined urban structure, this paper argues that they serve as active, flexible conditions that enable alternative forms of inhabitation[18].

Sola-Morales Rubio describes such spaces as "vague, undefined, and blurred", allowing cities to accommodate spontaneous activities and unexpected social interactions[19]. Similarly, Sendra & Sennett critique overdetermined urban forms, advocating for improvisational, adaptive environments[20]. DeWolf reinforces this perspective by describing Hong Kong's informal spaces as "borrowed spaces," shaped by intuitive,

unspoken logics[21]. For Cupers & Miessen, it is these very logics that operate in these spaces that generate the city's identity[22]. These perspectives collectively frame in-between spaces as potential arenas of creative negotiation, where urban resilience and cultural sustainability intersect.

**Research Objective**

Building on the idea that in-between spaces offer untapped potential, this paper explores how these spaces can support the survival of craft culture. Employing the ethnographic approach, it examines two case studies to analyze how craft and trading activities operate within in-between spaces and how they navigate Hong Kong's spatial and regulatory frameworks. This research is part of an action-research project initiated in 2024—Making Conditions: A New Typology of Temporary Making Places for Hong Kong's Urban Residual Spaces—funded by the Research Grants Council through the General Research Fund. It seeks to activate underutilized spaces through temporary architectural prototypes that foster connections between local craftspeople and younger generations. By establishing spatial and educational opportunities through the construction of a making space, the project aims to revitalize hands-on learning, reconnect youths with making practices, and contribute to the revival of Hong Kong's craft culture. This paper serves as a pilot analysis conducted prior to the prototype's design, focusing on the remaining making and trading practices within Sham Shui Po's in-between spaces. The findings will directly inform the development of the prototype.

The key research questions in this paper are as follows:

1. Where and how do making and trading practices take place within in-between spaces?
   This research examines the spatial, physical, social, and political conditions that shape these practices. Through on-site fieldwork and interviews with the research participants, it analyzes how specific crafts are performed while coexisting with regulatory constraints.
2. What spatial tactics do craftspeople and traders employ to negotiate Hong Kong's rigid urban and regulatory conditions? This paper draws on Michel de Certeau's concept of tactics, understood as modes of living that operate outside institutionalized systems[23]. Tactics are conceived as the "art of the weak"—creative, everyday practices that emerge in response to the constraints imposed by formal urban frameworks. These practices are inherently transitory and opportunistic, often seizing fleeting moments to assert presence within regulated environments. By examining the lived experiences and tactical activities of research participants, this study explores the adaptive and spatial maneuvers that enable making and trading activities to persist within the city's highly controlled environment. Ultimately, this paper aims to identify the key spatial operations used to navigate Hong Kong's strict urban and regulatory conditions in Sham Shui Po, providing critical insights for the architectural design of a making space that facilitates shared cultural practices and fosters intergenerational exchange.

This research is particularly significant as it sheds light on the contemporary making landscape, offering timely insights into a diminishing culture that was once a defining element of Hong Kong's identity. As economic shifts continue to displace crafts, this study brings attention to the potential of urban residual spaces as sites for cultural preservation and innovation. Furthermore, it contributes to urban and architectural discourse, particularly at the intersection of spatial design and cultural heritage, emphasizing the role of the built environment in revitalizing local craftsmanship and bridging communities

## 2. THE TRANSFORMATION OF MAKING CULTURE IN SHAM SHUI PO

### From Industrial Hub to Craft-Based Economy

Hong Kong's rapid economic transformation has seen it evolve from a major industrial hub into a service-oriented financial center. While early manufacturing in the city was dominated by multi-scale industries such as textiles, garments, and hardware, the rise of offshore production in mainland China during the 1980s led to a significant decline in local factories[24,25]. As industries relocated, many former manufacturing spaces in Hong Kong were repurposed, leaving behind a fragmented but resilient network of small-scale workshops, artisans, and informal craft economies[26,27].

Sham Shui Po, historically one of Hong Kong's primary manufacturing districts, has played a crucial role in this transition. Initially home to garment factories, leather workshops, and electronics repair shops, the district has retained its maker culture despite industrial decline. Today, it remains a vibrant hub for fabric markets, hardware stores, and artisanal crafts, where independent makers and small businesses continue to operate in in-between spaces—from street-side stalls to converted industrial buildings (Fig. 1). However, these craft-based economies now face increasing spatial and economic pressures due to urban redevelopment and gentrification[28].

### Sham Shui Po Today: Gentrification and Spatial Pressures

While Sham Shui Po has long been associated with grassroots economies and low-income communities, recent urban renewal initiatives have begun reshaping its landscape. The Urban Renewal Authority's (URA) redevelopment plans, including the "Fashionable Vitality Innovation Belt", aim to transform areas like Tung Chow Street into commercialized creative districts[29]. However, these projects risk displacing local artisans and informal traders who rely on affordable rents and flexible spatial arrangements to sustain their work.

At the same time, an influx of art studios, independent design shops, and creative businesses has contributed to gentrification, altering the district's socio-economic fabric[30]. While these changes bring new opportunities, they also pose challenges for traditional craftsmen and informal traders, who struggle to find affordable, flexible spaces within an increasingly commercialized environment. As gentrification and redevelopment

pressures intensify, identifying alternative spatial opportunities for sustaining craft traditions becomes increasingly urgent. To explore how craftspeople navigate these challenges, the following section examines two case studies, analyzing their craft practices and spatial appropriation strategies for survival in today's urban landscape.


Fig. 1: Sham Shui Po district and the different trade and craft practices. (Source: Authors, 2025).

## 3. METHODOLOGY

This paper employs an ethnographic approach—more specifically, what Momoyo Kaijima describes as "Architectural Ethnography"—to examine how craft practices and their spatial adaptations persist within Hong Kong's urban fabric through fieldwork[31]. The study focuses on two cases: Ms. Wong and Mr. Mok, a craftsman couple, and Mr. Au, a mahjong tile carver. Their accounts are drawn from fieldwork conducted in Sham Shui Po over one year (2024–2025). By narrating the lived experiences of these craftsmen, this paper contextualizes the challenges they face within specific urban conditions shaped by broader political and developmental forces. More importantly, these stories reveal how craftspeople negotiate spatial constraints to sustain their practices, not only offering insights into the wider phenomenon of marginalized crafts and trading activities in the city but also informing the design of the architectural prototype to be developed in the later phase of the research.

Prior to on-site investigations, a preliminary survey was conducted through an online virtual walkthrough. This online exploration helped identify key locations and typologies of craft and trading activities in the Sham Shui Po district, providing an initial understanding of how products, materials, and skills are distributed within the district's making ecology. Building on these insights, the ethnographic fieldwork focused on the southeastern area of Sham Shui Po, where crafts and trading activities are most concentrated.

The research participants, ranging in age from their 30s to 80s, included both men and women engaged in various forms of craft and trade. In addition to interviews, fieldwork involved direct observations to analyze the spatial conditions in which making and trading activities unfold. Data collection methods primarily included photographic and audio recordings, with a particular focus on materiality, construction methods, spatial configurations, and in-situ making processes.

The interviews with craftsmen were conducted in two main formats: informal, free-flowing conversations and semi-structured interviews. Before initiating formal discussions, unstructured conversations were held during fieldwork to establish rapport and gain preliminary insights into their practices. These informal exchanges helped build trust and provided context for the subsequent semi-structured interviews. The semi-structured interviews aimed to explore the craftsmen's daily routines, career trajectories, business conditions, and perspectives on the future of Hong Kong's craft culture. Beyond gathering qualitative data, these follow-up discussions also played a crucial role in establishing long-term relationships, potentially encouraging further engagement in the research.

## 4. MAKING IN THE GAPS OF TIME

Ms. Wong and Mr. Mok are vendors at the Sham Shui Po Fabric Market. Among the many traders—most of whom have decades of experience in the garment industry—they are the youngest couple engaged in textile trading and garment production. In addition to running the business, both are full-time nurses working in hospitals. Whenever their schedules allow, they return to the Fabric Market to help manage the stall. Their business is a joint family operation, run alongside Ms. Wong's parents, who have been in the textile industry for over 50 years. Since their marriage, the couple has actively contributed to sustaining the family trade while balancing their professional careers.

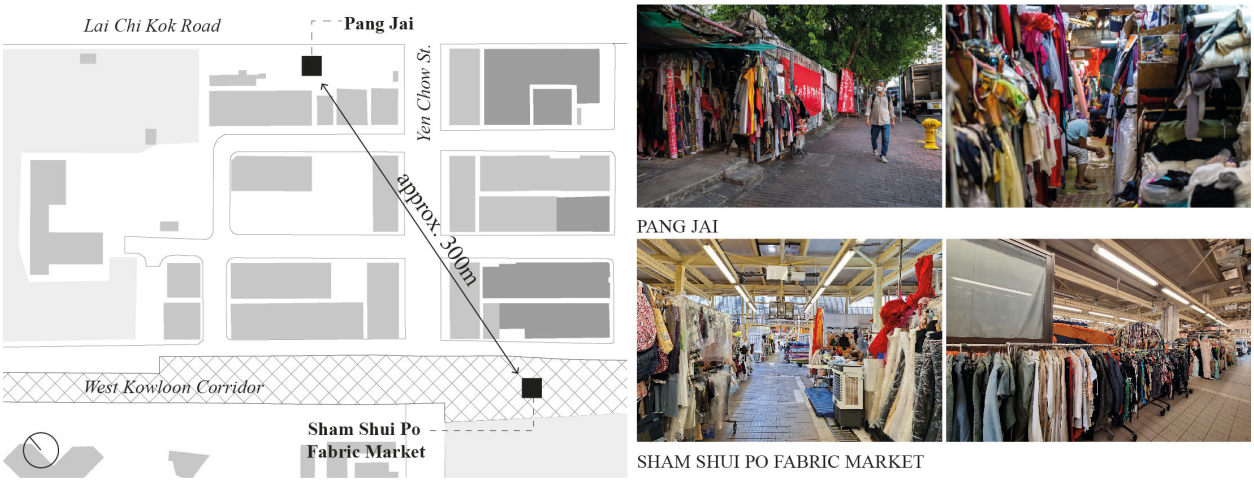


Fig. 2: "Pang Jai" was relocated to the Sham Shui Po Fabric Market, located approximately 300 meters away. (Source: Mingpao News, 2022; Authors, 2025).

The Sham Shui Po Fabric Market, located under the West Kowloon Corridor, opened in early 2023 as a replacement for the iconic "Pang Jai" textile bazaar, which was demolished as part of a housing redevelopment project[32] (Fig. 2). Despite improved amenities, the new market failed to retain most original vendors due to its less accessible location and significantly reduced foot traffic[33]. Only 16 of the original 49 stall owners, including Ms. Wong's parents, chose to continue their businesses in the new location[34].

However, government efforts to revitalize the area, such as the "Night Vibes Hong Kong" campaign, have largely missed the mark[35]. While intended to stimulate local nightlife and economic activity, the campaign overlooked the actual rhythms of small vendors, many of whom open after noon and close by early evening. As a result, vendors like Ms. Wong and Mr. Mok have had to devise their own strategies to sustain business.

One such strategy has been diversifying their business model by offering craft workshops aimed at attracting a broader customer base. Over the past two years, they have actively collaborated with organizations and

institutions, hosting more than ten workshops. These sessions, which cover a variety of textile-related skills such as accessory-making and tie-dyeing, are designed to engage a wide spectrum of participants, ranging from primary school students to the elderly.

To accommodate the growth of their workshop business, the couple decided to expand their presence by utilizing additional spaces in the market area, effectively creating a cluster of business sites with diverse functions (Fig. 3). One of the key locations remains the parent's shop, which serves as the main business hub. This space occupies four stalls, providing ample room for textile storage and workshop activities. However, its location at the far end of the market poses challenges in attracting walk-in customers. To enhance visibility and accessibility, another business site is established near the market entrance. Unlike the main shop, which primarily serves as a textile display area with minimal decoration, this new location features glass panels and a brightly lit interior, creating a modern and inviting atmosphere. From the outside, various garment products are prominently displayed, helping to attract potential customers.


Fig. 3: Diagrammatic plan and section showing the locations of the outdoor workshop area and the stalls rented by Ms. Wong, Mr. Mok and their family. (Source: Authors, 2025).

Beyond their formal business locations, what stands out most is the couple's innovative use of the empty space outside the fabric market. This area, part of the Tung Chow Street Temporary Market, is situated at the center of the entire market district. Covering nearly 400 square meters, it is a semi-open space, sheltered by a flyover overhead. Despite its ideal conditions for hosting various activities, this space remains largely underutilized. Other than a handful of community events held occasionally, it sits vacant for most of the year. Recognizing its untapped potential, the couple has taken the initiative to occasionally host community workshops in this space. By doing so, they not only expand their workshop business but also activate an otherwise neglected public area, creating a space where artisans, shoppers, and the local community can connect and engage.

A contributing reason why this public space—along with many others across Hong Kong—remains underutilized despite its cultural and business potential is the strict regulatory framework governing the use of public spaces. The Food and Environmental Hygiene Department (FEHD), for example, is the government body responsible for enforcing regulations related to public space usage, including licensing requirements for hosting events. One such requirement is the Temporary Places of Public Entertainment Licence, which imposes strict regulations covering a wide range of concerns, including the construction and maintenance of physical structures, furniture and fixture arrangements, fire protection measures, and mechanical installations. In addition to navigating these complex regulatory requirements, applicants must endure a lengthy approval process that takes approximately one and a half months to complete. While these regulatory measures are essential for ensuring public safety, the bureaucratic complexity and extended processing time often discourage many potential users from activating these underutilized urban spaces. Although Hong Kong is frequently viewed as a city constrained by limited land, the more pressing challenge lies in the restricted usability of existing spaces—a consequence of regulatory barriers rather than physical scarcity.

"As long as we don't occupy the space for too long, the FEHD won't kick us out," Mr. Mok remarked when discussing the informal use of space outside the market. His response highlights a pragmatic strategy that he and Ms. Wong have adopted—leveraging the short duration of their workshops as a way to circumvent strict enforcement. Time, in this case, becomes the crucial factor – the in-between condition – that allows them to repeatedly conduct workshops in a space they do not officially own or lease. From their experience, a 2-to-3-hour timeframe appears to be tolerated by FEHD officers, who may turn a blind eye as long as the event remains temporary and does not obstruct public access for an extended period. This unspoken threshold creates a grey area that the couple carefully navigates—long enough for meaningful engagement with participants, yet short enough to avoid attracting regulatory intervention.

Consequently, their spatial strategy is deeply intertwined with this temporality. Because they do not have permanent control over the space, they must adapt their setup to be quick, flexible, and unobtrusive. To achieve this, they rely on foldable furniture and lightweight materials, which enable them to assemble and dismantle their workshop area efficiently (Fig. 4). Tables, chairs, and workspaces are designed to be portable and collapsible, ensuring they can be set up within minutes and removed just as quickly. This adaptability not only maximizes efficiency and convenience but also allows them to navigate the constraints of temporary occupation, ensuring their presence remains both functional and seamless.

Fig. 4: The use of foldable furniture and lightweight materials to create an outdoor workshop area under the flyover. (Source: Ms. Wong and Mr. Mok, 2025).

This use of temporary spatial occupation not only allows them to bypass bureaucratic restrictions but also exemplifies a broader tactical urbanism—a grassroots approach to reclaiming underutilized public spaces in cities like Hong Kong. By operating within a short-lived timeframe, they transform an otherwise neglected space into a vibrant hub of activity, if only for a few hours.

In Sham Shui Po, such temporal spatial tactics take various forms, reflecting the adaptability and resilience of small-scale entrepreneurs and crafts practices navigating strict urban regulations (Fig. 5). One common example is the suitcase market, where vendors without formal business locations use suitcases as mobile storefronts. Once they identify a potential selling spot, often along a pedestrian walkway or street corner, they unpack their suitcases and display their products. Many vendors even expand their selling space by arranging goods on the ground or stairways of multi-story apartments. However, when FEHD officers intervene, they quickly pack their belongings and relocate to another temporary marketplace. Another prevalent form of temporal trading is the use of vans as mobile shops, a tactic particularly common among ethnic minority communities. Vendors open their vans to create a makeshift storefront, displaying products inside the vehicle.

When authorities attempt to disperse them, they simply drive to another location, often returning to the same spot once enforcement eases. This cyclical movement allows them to maintain a continuous presence in the urban fabric, despite the constant challenge of eviction.

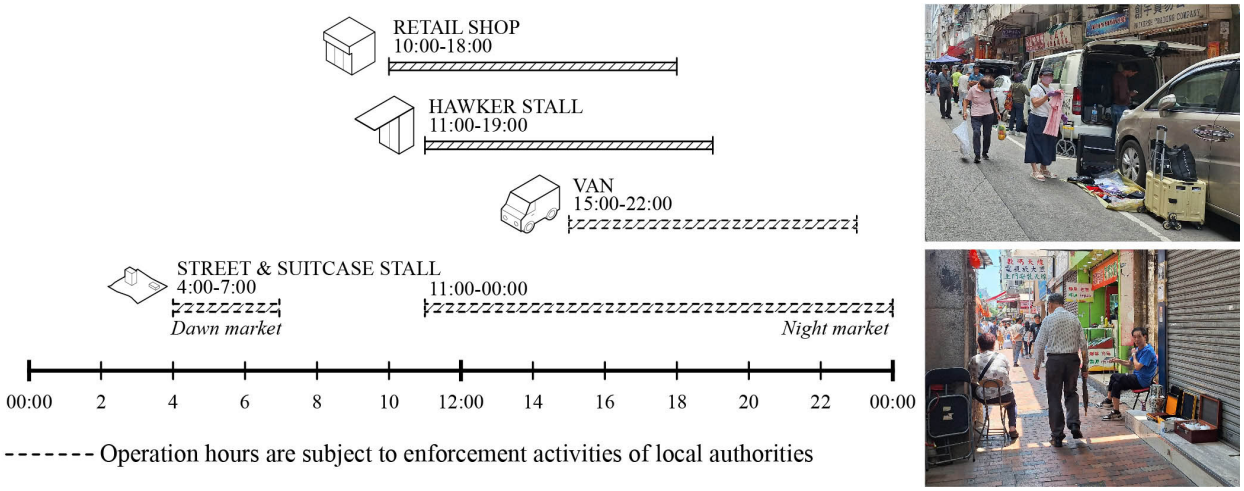


Fig. 5: The operation time and duration of different trading practices. (Source: Authors, 2025).

Whether it's mobile vendors or Ms. Wong and Mr. Mok's short-term workshop, these ephemeral urban practices highlight how temporality has become a crucial survival tactic in a city where public space is heavily regulated and contested. Faced with uncertain access to space and shifting enforcement patterns, these vendors and craftspeople must continuously adapt their operations, developing strategies that allow them to navigate restrictions while maintaining their livelihoods. Their ability to remain agile—through flexible setups, mobile structures, and responsive spatial tactics—demonstrates a form of resilience that extends beyond mere survival. Rather than being passive subjects of urban policies, they are active agents reshaping the spatial dynamics of the city.

## 5. MAKING IN MOTION

The previous discussion examined how time as an in-between condition shapes the way craft practices operate within the city. In this second case study, we turn to how space itself, in a literal sense, functions as an in-between condition when craft practices take place within the gaps of the formal urban grid.

Mr. Au, an 80-year-old master craftsman specializing in mahjong tile carving, has been operating his stall along Un Chau Street for more than 40 years. His shop occupies a narrow gap between two buildings, covering an area of approximately 3 by 1 meters. With one side affixed to an adjacent building, the shop

appears almost like a parasitic structure, growing out of the urban fabric in an organic yet precarious manner (Fig. 6).

Mahjong tile making is recognized as one of Hong Kong's intangible cultural heritage, requiring processes of cutting, polishing, carving, and coloring each tile by hand. Traditionally, mahjong tiles were crafted from wood, ivory, or bamboo plates, leading to the craft being historically referred to as bamboo carving[36]. Today, following the industry's shift toward modernized materials and production methods, most mahjong tiles are made from plastic (Fig. 7).


Fig. 6: The stall appears as a parasitic structure growing out of the building wall. (Source: Authors, 2025).

Before the 1980s, mahjong tiles were entirely hand-carved, with a single master craftsman taking approximately three days to complete a full set. However, with the rise of mechanized production, handcrafted mahjong tiles became unable to compete with cheaper, mass-produced alternatives, leading to a gradual decline in the traditional craft. The industry faced further transformation with the introduction of electronic mahjong tables, which require specialized tiles that are difficult to carve by hand. As a result, the role of mahjong craftsmen has shifted from tile production to tile repair, with additional adaptations such as customized tile engraving and carving workshops to sustain the craft. This evolution of the mahjong industry is also reflected in its spatial form—the craft's physical presence in the city has often confined to small, marginal spaces.

This type of stall which Mr. Au operates is known as a wall stall, a legally recognized structure defined as a stall attached to or positioned against the exterior of a building or a similar structure[37]. Vendors operating

such stalls are required to obtain a hawker license, which comes with strict regulations not only on usage but also on succession and transfer. However, when asked whether anyone would be inheriting his craft and shop, Mr. Au revealed that his son has no intention of taking over the business. This means that once Mr. Au retires, his license will be revoked, effectively marking the end of his longstanding presence at this location and further contributing to the disappearance of mahjong craftsmanship in the city.

For decades, hawkers have played a crucial role in Hong Kong's crafts culture, operating in the margins of formal commerce. Beyond those who practice their craft in brick-and-mortar shops, various artisans—such as locksmiths and watchmakers—have historically operated businesses as hawkers under different types of licenses, including the Tradesman license or, in Mr. Au's case, the Wall Stall Hawker license. However, since the 1970s, the government has largely stopped issuing new hawker licenses, citing concerns over hygiene and urban congestion, as well as changing consumer behaviour, leading to the decline of the diversified crafts activities in Hong Kong urban landscape[38].

Fig. 7: Mahjong is a traditional Chinese table game that is popular among the elderly and consists of 144 tiles adorned with different patterns and Chinese characters. (Source: Authors, 2025; SCMP, 2018).

In 2015, a Legislative Council Hawker Policy Subcommittee report acknowledged the importance of street craftsmen with local cultural characteristics and suggested that the government was considering licensing measures to support them[39,40]. However, opinions remain divided. Some believe that formalizing licenses could help preserve traditional crafts, while others argue that the non-inheritable nature of these licenses fails to ensure the continuity of craftsmanship. This debate underscores a larger tension between heritage preservation and regulatory control, raising questions about whether Hong Kong's remaining street craftspeople can continue to pass down their skills in a highly regulated urban environment.

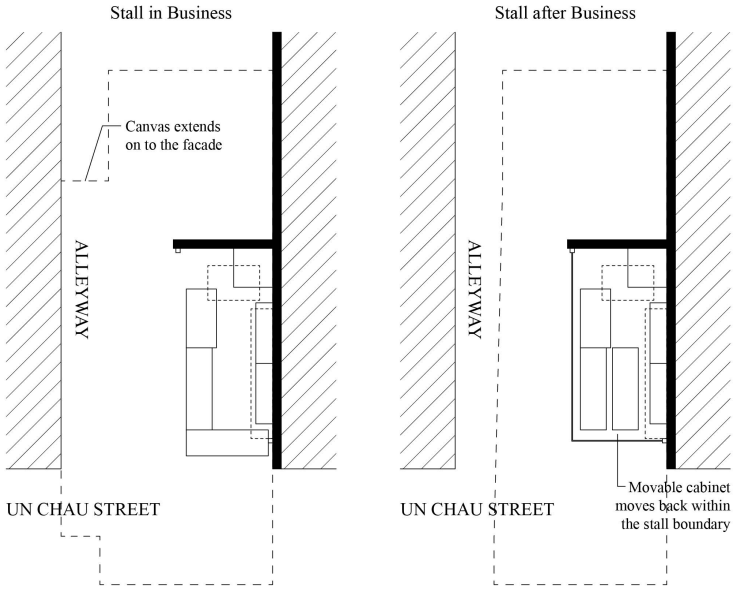


Fig. 8: The transformation of Mr. Au's stall during and after business hour. (Source: Authors, 2025).

"I think making mahjong tile is simple—you just need perseverance to learn it," Mr. Au said as he reflected on his journey as a craftsman. His father, also a mahjong tile craftsman, had learned the crafts from a master, and Mr. Au, in turn, learned from his father. As he explained the process of carving a tile, he pointed to a set of tools inside the cabinet. "All you need are these simple tools," he said. "Hold and turn the tile with one hand and carve with the other." Each tile takes about 5 to 10 minutes to complete, allowing Mr. Au to produce one to two full sets of mahjong tiles in a day. However, the tools, now rusted, suggest they have been unused for some time. Mr. Au has not carved a full set of mahjong tiles in nearly ten years, as his declining eyesight has made the intricate work increasingly difficult.

Yet, even as his craft fades, Mr. Au continues to open his stall each day. Within its modest 3-square-meter footprint, the stall is far from static (Fig. 8). It is an adaptable space, transforming between open and closed states through a series of carefully arranged movable furniture, allowing it to extend beyond its physical boundaries into the surrounding streetscape.

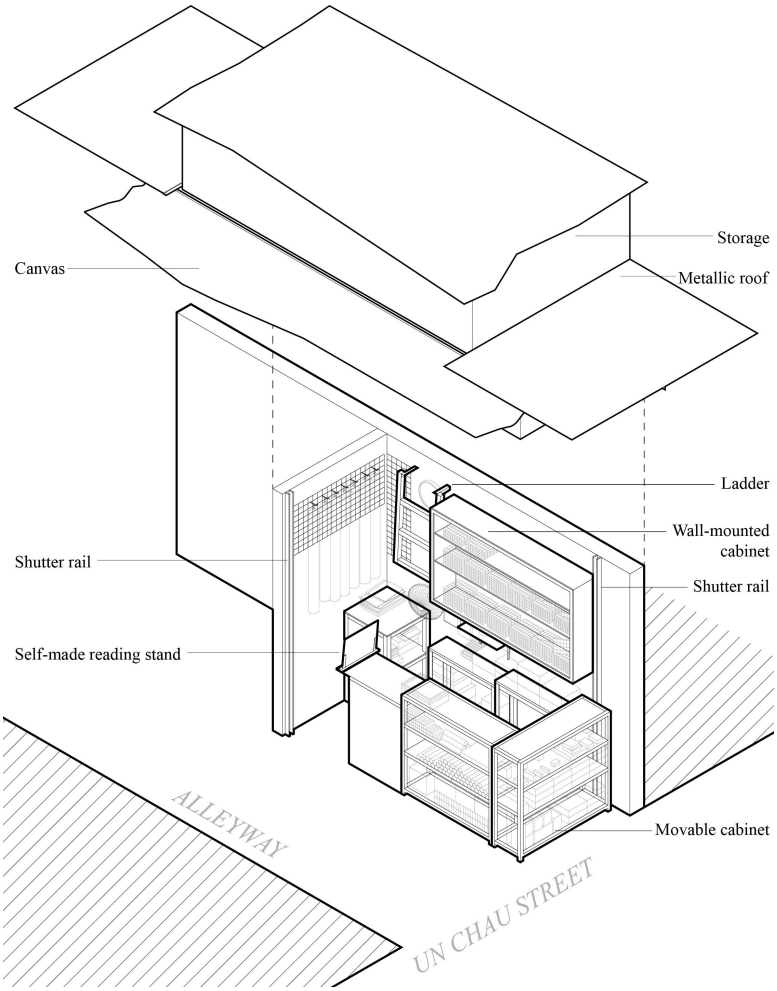


Fig. 9: The compact interior of Mr. Au's mahjong stall and its expansion towards pedestrians and the surroundings. (Source: Authors, 2025).

During business hours, the stall expands outward, occupying a presence larger than its fixed structure (Fig. 9). Three movable cabinets are positioned along its perimeter, forming a continuous display of mahjong tiles, card games, and gaming accessories. These cabinets, especially the one facing the street, not only serve as storage and display units but also function as spatial extensions, subtly encroaching into the pedestrian walkway along Un Chau Street. The walls are similarly utilized to maximize space, with a mounted display cabinet showcasing various mahjong sets. Storage is further optimized through vertical expansion—a ladder provides access to the ceiling, where additional stock is kept, effectively turning the stall into a multi-storey workspace. At the end of the stall, where Mr. Au spends most of his time, a large rattan armchair and a self-made reading stand transform a small section of the stall into a personal retreat, creating the dual function of the stall as both a workspace and a lived-in environment.

The extension of the stall is also evident in its canopy, which reveals a layered, flexible design. The canopy consists of multiple materials: a metallic roof that extends outward from the stall's main structure, providing a rigid overhead shelter, and a canvas sheet that hangs between the stall and the adjacent building's wall, offering additional coverage. This layering not only protects the stall from weather conditions but also subtly stretches its spatial influence, creating a threshold between the stall and its urban surroundings.

At the end of the day, the stall undergoes transformation as it retracts back into its compact footprint. The front display cabinet, which extends beyond the stall's boundary during business hours, is pushed into the narrow walkway, aligning with the back shelf. This act of tucking in the display is a crucial part of the stall's operation, ensuring that it remains within legal boundaries when not in use, while also reclaiming the pedestrian space occupied during the day.

Through these daily transformations, Mr. Au's stall exists in a constant state of flux, expanding and contracting in response to operational needs and urban constraints. During the day, it functions as a semi-open extension of the street, engaging with passersby and subtly integrating into the pedestrian flow. By night, it folds back into itself, conforming to the rigid spatial limitations imposed by the city's dense urban fabric. This flexibility not only allows Mr. Au to maximize his workspace within extreme spatial constraints but also reflects a broader phenomenon in Hong Kong's hawker culture, where vendors must constantly negotiate with space, regulations, and daily rhythms to sustain their livelihoods.

The market hawker exemplifies how stall transformation functions as a spatial tactic, adapting to urban constraints through expansion and contraction. What starts as a compact 1.2 × 0.9-meter metallic green box can grow to twice or even three times its original size during business hours (Fig. 10). At the core of this transformation is flexibility. Display cabinets are moved forward, not only to showcase products but also to serve as an improvised work desk. The hawker cabinet's doors, when opened, create an additional display rack for hanging merchandise, while also forming a partition between neighboring stalls, defining individual selling spaces within the market. To further maximize available space, lightweight furniture, such as stools, is strategically placed at the outermost edges of the permitted area, subtly shifting the stall's boundary outward. Above, umbrellas are set up, extending beyond the stall's footprint and encroaching into pedestrian walkways. At the end of the business day, everything retracts into the compact green box, restoring the stall to its original form—ready to be transformed again the next day.

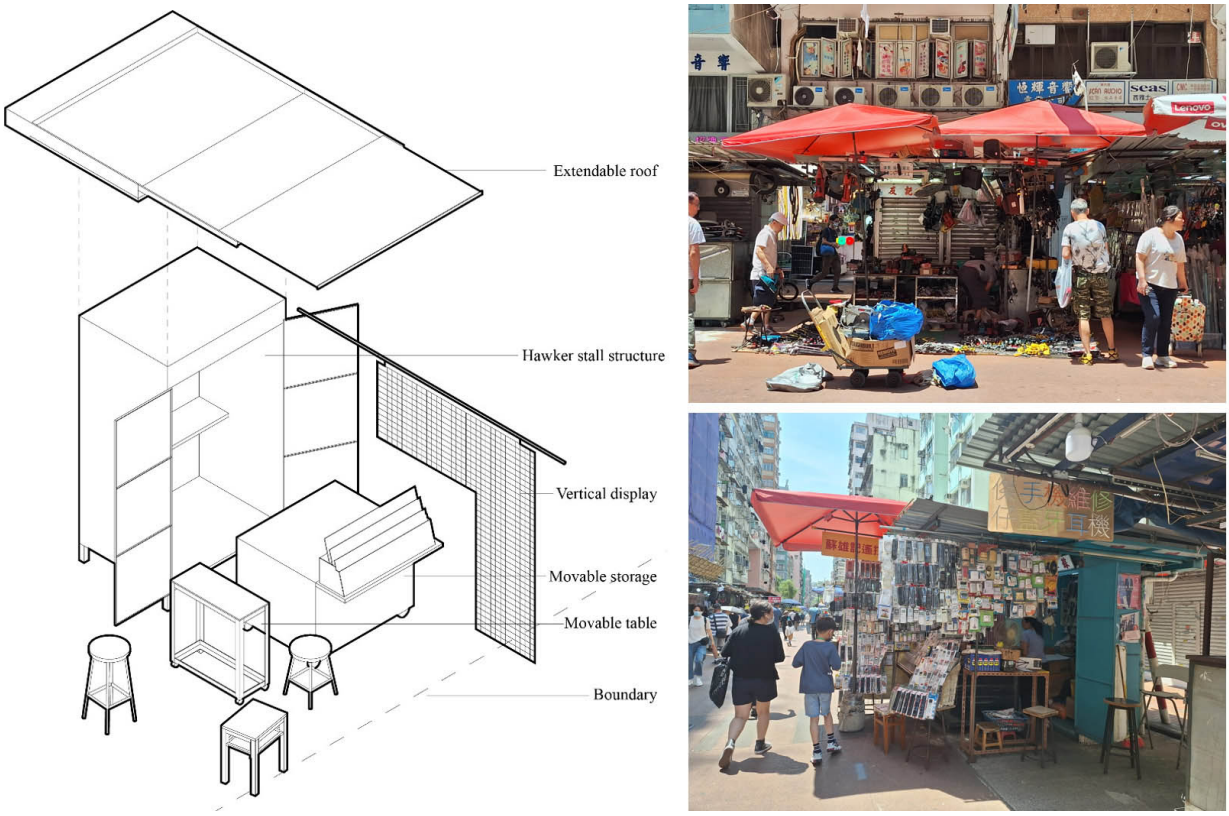


Fig. 10: Hawker stalls expand beyond their physical structure. (Source: Authors, 2025).

The use of flexibility to create a makeshift store is not limited to market hawkers with fixed stalls—it is also evident in cases where no formal stall exists at all (Fig. 11). Sometimes, a metallic trolley filled with products is simply parked by a pedestrian handrail, naturally forming a temporary trading spot. Other times, the simple act of opening an umbrella signals that the business is in operation, while closing it marks the end of the workday. These minimal yet effective gestures demonstrate how vendors creatively negotiate the in-between condition of space, adapting to their surroundings with constant appropriation.

Mr. Au's story illustrates how transformation serves as a key spatial tactic for craft practices to survive within the in-between conditions of urban space. Just as hawkers adapt to shifting regulations and spatial limitations, Mr. Au's stall embodies flexibility, allowing his craft to persist despite external constraints. Similar to the temporal tactic of public space appropriation, where vendors navigate the city's restrictive policies through short-term occupation, the ability to transform physical space becomes essential for sustaining craft practices. Even as Mr. Au carves fewer tiles, his continued presence at the stall—engaging with passersby and maintaining his workspace—keeps his practice visible within the urban landscape. By extending beyond fixed boundaries, whether through the stall's adaptable setup or the persistence of its craftsman, craft practices

demonstrate that flexibility is not merely a response to limitations, but an active force that reshapes the urban environment itself.


Fig. 11: Makeshift trading spots without formal stalls. (Source: Authors, 2024).

## 6. DISCUSSION

The case studies illustrate how in-between spaces function as active agents, enabling craftsmen and traders to navigate spatial and regulatory constraints. Rather than being passive byproducts of urban planning, these spaces reveal their creative potential, allowing informal economies and craft practices to persist within a highly regulated urban framework. This discussion synthesizes these findings and examines how they can inform the design of an architectural prototype that supports craft culture in Hong Kong's residual spaces.

With their inherent ambiguity, in-between spaces offer critical opportunities for improvisation and adaptation. As demonstrated by the Fabric Market vendors, Mr. Au, and the suitcase market traders, these overlooked urban gaps provide the flexibility lacking in rigid, planned environments. Concepts such as Sola-Morales's "vague terrain" and DeWolf's "borrowed spaces" further highlight how these spaces are not empty voids but active sites of resistance and transformation[41,42]. Understanding this potential is key to shaping a prototype that integrates and supports Hong Kong's craft culture.

### Temporality and Adaptability as Spatial Tactics

The case studies reveal two primary spatial tactics – temporality and adaptability – used by craftspeople to sustain their practices despite spatial and regulatory constraints. These tactics are not simply survival strategies but deliberate methods to negotiate constraints.

Temporality allows craftspeople to operate within short-lived timeframes, making use of urban spaces in ways that do not require permanent occupancy. Ms. Wong and Mr. Mok, for instance, activate the public space under the flyover only in short duration, utilizing the transitional nature of the residual space to avoid conflicts with formal regulations. Similarly, suitcase market traders rely on temporary setups, allowing them to be mobile and responsive to enforcement patterns. These time-based strategies enable craftspeople to circumvent bureaucratic barriers while maintaining a consistent yet flexible presence in the city.

Adaptability refers to the ability to transform and reconfigure spaces based on immediate needs. Craftspeople maximize limited spatial resources by employing expandable, collapsible, or mobile structures that allow them to operate in varied urban conditions. Mr. Au's mahjong stall, for example, expands beyond its fixed footprint through movable cabinets and vertical storage, demonstrating how small interventions can significantly enhance functionality. Similarly, hawker stalls extend into surrounding pedestrian areas, shifting spatial boundaries depending on usage needs. These adaptive tactics ensure that craftspeople can continue their work despite spatial limitations, reinforcing the idea that in-between spaces are not static voids, but dynamic environments shaped by human and spatial agency.

However, despite these resourceful strategies, craftspeople face significant challenges that threaten their long-term survival. Regulatory barriers, such as restrictive licensing and complex event permits, make it difficult for artisans to legally occupy public spaces. At the same time, gentrification and redevelopment pressures continue to displace craft economies, prioritizing commercial interests over grassroots cultural production. Additionally, the lack of intergenerational exchange in traditional crafts further exacerbates the risk of cultural loss. These challenges highlight the urgent need for a design intervention that supports flexibility and knowledge transfer, ensuring that craft practices can persist and evolve within Hong Kong's urban fabric.

**Design-By-Research: Prototyping Knowledge Through Space**

The insights from the case studies inform the development of the architectural prototype that not only provides a space for craftspeople to sustain their practices but also serves as a platform for intergenerational exchange. To develop this prototype, the project adopts a design-by-research methodology, wherein the prototype functions not merely as a representational tool, but as a mode of inquiry and knowledge production. As Raoul Bunschoten articulates, "prototypes are engines of change; they contain systems that create an output that changes an environment; they enable us to study the effect of that output[43]." Within this framework, the prototype becomes a spatial and material lens through which architectural knowledge is situated, tested, and evolved[44].

Central to this methodology is an iterative prototyping process that treats design not as a linear outcome, but as an evolving dialogue between research, making, and reflection. Rather than conveying fixed ideas, each

prototype operates as a site of experimentation—where form, material, construction techniques, and operational method are continuously re-examined. Through recursive design loops, the prototypes respond to lived experiences, failures, and insights emerging from both fieldwork and fabrication. Knowledge is, therefore, considered emergent—produced through repeated acts of making, testing, and rethinking[45]. In this way, the act of designing becomes a dynamic and situated mode of research, in which architectural understanding is not only represented, but actively constructed through doing.

**Materiality as Cultural Narrative**

Before delving into the prototypes, it is crucial to understand the material logic that grounds their design. Two key materials—cardboard boxes and red-white-blue fabric—were selected not only for their affordability and accessibility, but for their deep-rooted associations with temporality, adaptability, and the urban fabric of Sham Shui Po (Fig. 12).

- Cardboard boxes are ubiquitous in the neighborhood, used by hawkers as product displays, by vendors for storage, and by grassroots recyclers as tradeable material. Their presence in the prototypes reflects their multipurpose, transient nature, aligning with the craft culture's need for mobility and improvisation.
- Red-white-blue fabric, historically used in construction and markets, speaks to Hong Kong's craftsmen resilience and craft legacy. Despite being omnipresent, it often goes unnoticed—a material that merges into the city's background, embodying both invisibility and urban identity[46],[47].

Fig. 12: Cardbox and red-white-blue fabric as the identity of Sham Shui Po . (Source: Authors, 2025).

**Iterative Learning Through Prototyping**

Building on this methodology, the iterative design process unfolded through five distinct prototypes—each testing specific spatial and structural dimensions of the temporary making space (Fig. 13).

- *Prototype 1: Structural Experimentation*

  The first prototype explored the integration of cardboard boxes into a structural system, supported primarily by timber. The modular grid measured 1.2m x 1.2m, spanning approximately 5m by 4m. While the system demonstrated scalability and adaptability, applicable to both pavilion-scale structures and parasitic furniture installations, it revealed tensions between materiality and construction complexity.

  Key insight: While the prototype succeeded in modularity, it also exposed the limits of material coordination and assembly tolerance, prompting a simplification in the next iteration.

- *Prototype 2: Design Simplification*

  In response to issues identified in Prototype 1—such as excessive detailing, difficult installation, and insufficient box support—Prototype 2 introduced a square surface connector to stabilize the cardboard boxes. However, the weight and rigidity of the boxes continued to challenge the system's integrity.

  Key insight: This iteration underscored the need to account for the physical behavior of materials, not just their abstract form. It also revealed the necessity for deeper, more supportive joinery for heavy modular components.

- *Prototype 3: Spatial Atmosphere*

  Shifting focus from structure to spatial experience, Prototype 3 used red-white-blue fabric to create a semi-enclosed floating canopy. Inside, cardboard boxes hung from a timber ceiling structure, while the exterior offered only fleeting glimpses into the space—inviting curiosity and reinforcing the threshold between maker and observer.

  Key insight: This prototype demonstrated the potential of material layering and partial visibility to shape public engagement and spatial intimacy.

- *Prototype 4: Furniture Integration*

  Prototype 4 marked a significant advancement in the design process by introducing modular furniture units co-developed through a participatory workshop. Each unit was composed of two

timber panels, a sandwiched cardboard box, and two wrapping straps—forming a simple yet adaptable construction system. This was the first prototype to be collaboratively developed and assembled with participants, who were also invited to decorate the modules, thereby engaging both aesthetic and functional decision-making.

Designed for reconfiguration, the modules could be assembled into chairs, worktables, or storage units, emphasizing not only spatial and functional flexibility but also the importance of user agency.

Key insight: By embedding "making" into the furniture itself, this iteration illuminated the potential of modularity as both a practical strategy and a pedagogical tool—transforming users into co-creators and positioning the act of building as a shared, educational process.

- *Prototype 5: Unified Modular System*
  The fifth prototype consolidated previous lessons into a single, scalable module, capable of functioning across structural and programmatic scales—from furniture to pavilion structural elements. Constructed with timber frames and stainless-steel threaded rods, the module featured adjustable height, interlocking profiles, and easy-to-assemble screw-and-nut connections.

  Key insight: This prototype represents a culmination of research-led design, where form, material, and assembly converge into a system that is adaptable, teachable, and replicable.

The five iterations of prototyping presented here illustrate a cumulative process of architectural inquiry—one that is grounded in material experimentation, spatial testing, and critical reflection. Each prototype served not only as a design artifact, but as a lens through which to interrogate the relationship between form, function, and cultural context. The evolution from structural experimentation to participatory furniture systems and integrated modularity reflects a growing emphasis on adaptability, engagement, and knowledge-sharing. As the project moves forward, the next phase of prototyping will be developed collaboratively with local youth and craftspeople. This participatory approach aims to embed social knowledge directly into the design process, transforming the prototype into a platform for co-creation, intergenerational learning, and the sustained transmission of making practices within the urban fabric.

## 7. TOWARD A PROTOTYPE FOR CULTURAL SUSTAINABILITY

This research reaffirms the potential of in-between urban spaces as fertile grounds for reconstructing culture through creative adaptation. Within these overlooked spaces, craftspeople demonstrate resilience—employing temporal and adaptable measures to navigate spatial and regulatory constraints. Their everyday tactics provide

vital insights for designing architectural interventions that are not only flexible and responsive, but also deeply embedded in the rhythms of urban life.

Drawing from fieldwork in Sham Shui Po, this project translates these insights into a series of iterative prototypes for a temporary making space—an environment where youth can learn directly from craftspeople, ensuring that craft remains a living practice. By positioning prototypes as a mode of in-action learning, the design process itself becomes a generator of knowledge. Each iteration contributes to a growing foundation for a spatial intervention that supports intergenerational exchange, hands-on learning, and the long-term vitality of craft practices.

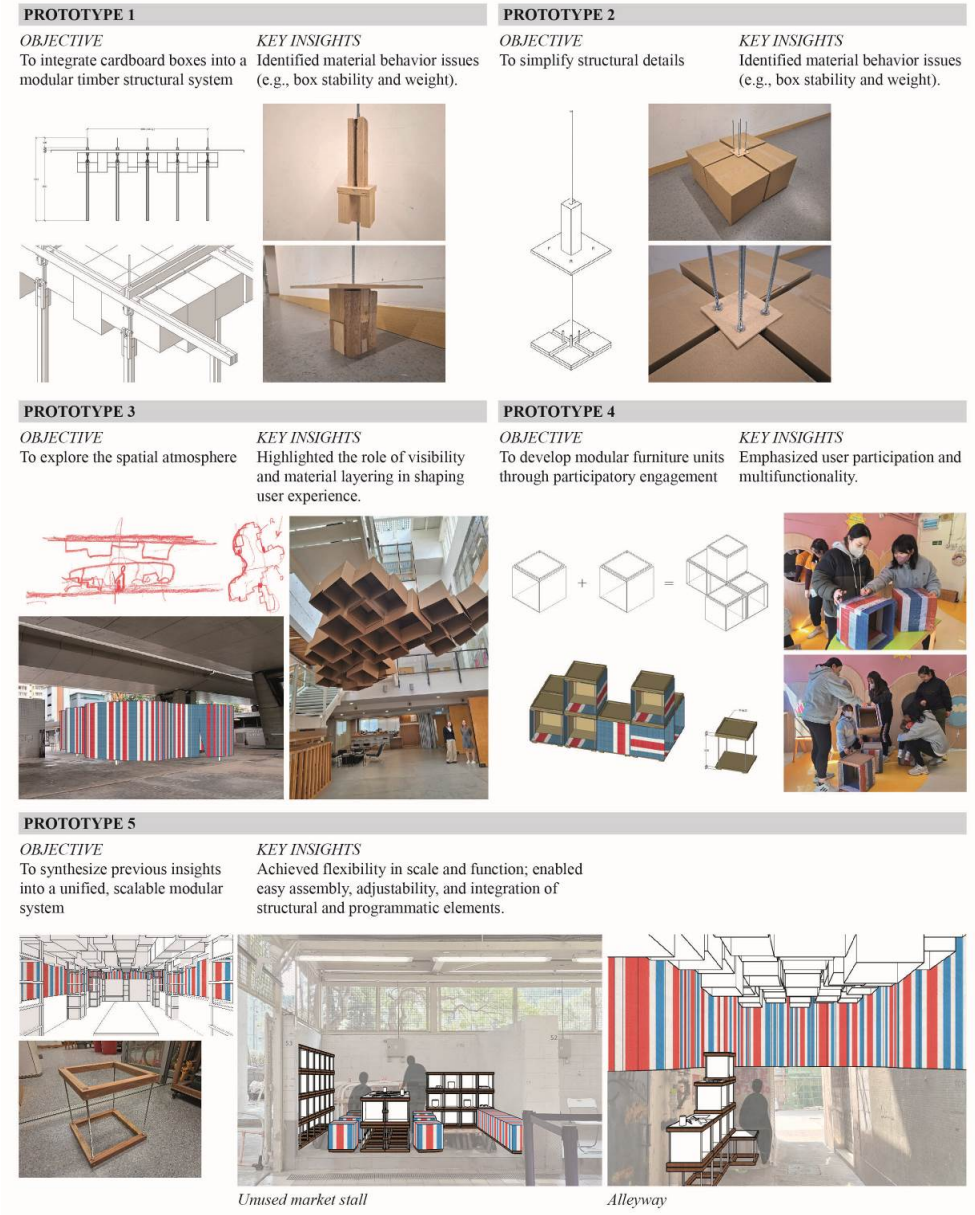


Fig. 13: An overview of the five prototype iterations. (Source: Authors, 2025).

While challenges such as regulatory barriers, gentrification, and shifting generational interests persist, this research offers a hopeful trajectory. Future development will involve direct collaboration with youth and local craftspeople—embedding participation at the core of the design process and expanding the prototype's social and pedagogical dimensions. Further research could extend this work across other districts and urban contexts, incorporate long-term testing and feedback, and explore parallels in other high-density cities with active informal economies.

Ultimately, this project contributes to reimagining how residual urban spaces can support informal cultural practices—not by preserving them in isolation, but by enabling them to evolve within the dynamic urban fabric. It envisions a future where craft is not only remembered, but actively made and remade through a network of in-between spaces.

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**Traditional Dwellings and Settlements**
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# UNDERSTANDING THE RELATIONSHIP BETWEEN FUNDING ORGANISATIONS AND HERITAGE MANAGEMENT

*May El Tabbakh*

# UNDERSTANDING THE RELATIONSHIP BETWEEN FUNDING ORGANISATIONS AND THE HERITAGE MANAGEMENT

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*In England alone there are around half a million listed buildings. Some of which generate sufficient resources for their repair and maintenance through some form of use, such as tourism and other revenue earning activities without seeking additional funds. But sometimes the market cannot secure a sustainable future for a historic building or site falling into disrepair. Eventually, it reaches a state where the scale and cost of repairs outweighs the final value of the building or site. The intervention of external sources of funding is then sought to sustain the heritage and maximise benefits to the economy and society.*

*This paper is reviewing the relationship between funders and the heritage management in terms of how connected the funding strategies and approaches are with the management of heritage projects in England.*

*In order to answer this question, the paper will start by identifying some of the potential funders and analyse their strategies and approaches, according to which some recommendations are drawn to fundraisers and heritage managers to increase the possibility of receiving grants. Finally, the current funding policies are assessed to determine whether they benefit heritage sustainability.*

## 1. INTRODUCTION

In England alone there are around half a million listed buildings. Some of which generate sufficient resources for their repair and maintenance through some form of use such as tourism and other revenue earning activities without seeking additional funds. But sometimes the market cannot secure a sustainable future for a historic building or site falling into disrepair. Eventually it reaches a state where the scale and cost of repairs outweighs the final value of the building or site. The intervention of external sources of funding is then sought to sustain the heritage and maximise benefits to the economy and society.

This essay is reviewing the relationship between funders and the heritage management in terms of how connected the funding strategies and approaches are with the management of heritage projects in England.

In order to answer this question, the essay will start by identifying some of the potential funders and analyse their strategies and approaches, according to which some recommendations are drawn to fundraisers and heritage managers to increase the possibility of receiving grants. Finally, the current funding policies are assessed to determine whether they benefit heritage sustainability.

## 2. ANALYSING THE STRATEGIES AND APPROACHES OF POTENTIAL FUNDERS

There are two main public sources for repair and conservation of historic buildings and sites in England, English Heritage (EH) and the Heritage Lottery Fund (HLF).

Funders can grant a fixed percentage of the project cost (Capital Funding). 10 % of projects less than £1 million will match funding from HLF compared to 25% of projects of £1 million or more (Jardine 2009). Other forms include Operational Funding and Revenue Funding, or Development Funding, in addition to Tax Relief schemes (DCMS 2000) and Subsidised Loans at below market rates of interest.

Programmes such as (Planning Gain and Enabling Development) involve profitable commercial developers in repairing historic building within the development area (AHF 2009).

Each funding organisation, whether public or private, has got its own strategies and approaches. The case of HLF, EH, London Development Agency (LDA) has been studied as representatives of potential public funders and World Monuments Fund (WMF) Britain has been taken as an international nongovernmental organisation to establish where the interests overarch and where they differ.

**Overarching interests**

On top of the list come enhancing public access, training and education by bringing communities together through a shared past. Creating opportunities for people of all ages and backgrounds to learn new skills, take active part in decision making and build an invaluable sense of pride and local identity. Volunteer involvement is a major component.

Another common objective is to conserve the UK's diverse heritage for present and future generations while involving some type of building re-use.

Most grants go only to registered not-for-profit organisation.

Funders are keen on promoting partnership with each other to distribute the cost, build long-term relationships and ensure that a wider range of objectives is represented.

A funded project must provide regeneration based on economical and sustainable improvements, whereas heritage-led regeneration is defined as: "*the improvement of disadvantaged people or places through the delivery of a heritage focused project"* (Ela Palmer Heritage 2008) (Economic development Committee London Assembly, 2002).

Most funding bodies will insist on a feasibility study. More complex projects may also require conservation and maintenance plan, a business plan, activity plan, disaster plan and a management plan to ensure that the improvements they have contributed towards will be maintained (Jardine 2009).

**Interests Emphasised by Individual Funding Bodies**

*Heritage Lottery Fund (HLF 2008)*

Since 1994 HLF has awarded over £4.3 billion from the National lottery to more than 28,800 projects across the UK (HLF 2008) (HELM 2008) (BBC). HLF has a very broad definition of heritage with an emphasis on the benefits to the wider community as to justify public expenditure (Clarks 2004). However, HLF appears to be focused on ways of bringing back the heritage into active use through more participation because otherwise it would not survive (Abramsky 2008).

Around 40% of HLF funding each year goes to the most deprived quarter of all local authorities across the UK. The fund changes the places physically and socially by enabling local pride to enhance quality of life (Abramsky 2008).

Quality of life is particularly sought for adults and young people aged 16 and above from priority groups argues the Department of Culture Media and Sport, which define "priority groups" as a. People with a physical or mental disability; b. People from black or minority ethnic groups; c. People in socio-economic groups C2, D and E**.** (DCMS 2007).

The strategic plan for resource allocation of the HLF for 2008-2013 is giving priorities to two main programmes, parks for people (£22million for 2008/09), since parks are often the only piece of heritage in a deprived area (Clark 2004), and repairs to places of worship (£20million 2008/09) (HLF 2008).

The applying project must satisfy all strategic priorities of HLF and be enrolled under one of the advertised funding programmes (HLF 2008).

*English Heritage (EH 2006)*

EH is the national statutory adviser on the historic environment. Acting as a champion for heritage, EH maintains the National Monuments Record of England's historic buildings, sites and monuments, promotes education and research, and cares for over 400 historic properties. Last year EH granted £32.6 million for the continued conservation of historic environment. Hence, the priority of EH is the repair and restoration of historic sites which contribute to the English heritage. The repairs are to be completed to a high standard under the concept of value for money, thus sustainable results are sought.

EH also encourages local authorities in the use of their statutory powers to ensure that work necessary for the preservation of a listed building is undertaken, and also to underwrite the cost of serving a Repairs Notice on

historic buildings which have fallen into a serious and dangerous state of decay, establish permanent specialist conservation posts in local planning authorities and commission research needed for evidence-based policy through the national strategic budget of the Historic Environment Enabling Programme.

All applications are assessed against EH's national priorities (EH 2006).

*London Development Agency (LDA 2009)*

LDA granted £2.3 billion 2007/08 on projects targeting urban regeneration. LDA works with transport for London to support highly targeted investments, urban upgrade schemes and transforming places to enhance economic prosperity.

LDA also views the quality of town centres as the keystone of physical regeneration and a fundamental component to the city's eco-system, which improves the city's attractiveness for residents and major international investors and tourists.

In response to the government's target to reduce $CO_2$ emissions by 60 % by 2025, LDA are excessively investing in the economy of green programmes that deliver maximum carbon savings to address climate change and make London a low carbon city.

A very tangible objective is to ensure that the legacy of the 2012 Games contributes to London's long-term prosperity and success. After all, the premise upon which London bid for the games was economic regeneration.

Funded project must prove to make a real impact on London's economic development (LDA 2009)

**World Monuments Foundation (WMF) Britain (WMF 2009) (Gundry 2009)**

WMF is one of the leading global non-governmental organisations for the protection of cultural heritage, especially that at risk. Their aim is therefore to secure the future of exceptional works of architecture from occurring damage as a result of procedural neglect or in response to sudden events, as disaster recovery.

One characteristic of all projects funded by WMF is the outstanding benefit they make to the communities who own and use threatened buildings.

Sites must be listed in the WMF Watch List to be granted the fund (WMF 2009). Those would have been chosen for their cultural legacy, historic and architectural significance and relevance to the wider international conservation community.

## 3. RECOMMENDATIONS TO FUNDRAISERS AND PROJECT MANAGERS UNDERTAKING A GRANT APPLICATION FOR A HERITAGE PROJECT

The success of an application depends on the way in which it is presented revealing the intrinsic merits of the project to match the funders' strategies. Common objectives include enhancing learning and participation, conservation and active reuse, partnerships with other funders, regeneration and funding charitable foundations. However, HLF is keen on the benefits to the wider community, while EH is concerned about conservation of heritage sites. LDA is investing in development projects, while WMF are funding heritage projects at risk.

According to these strategies and approaches some recommendations are drawn from successful projects to help increase the possibility of receiving funds (Figure 1.0).

It is essential to identify the potential funding bodies that might be interested in the project. The Directory of Social Change and the Architectural Heritage Fund are good sources to start the search with (Tatey 2009).

After this has been established a contact with the relevant funders should be made to figure out how decisions are taken, what the key influences are, and how to influence them and most importantly, determine if delivering the needed information within the specified time was achievable. In addition, this helps build long-term relationship with funders (Gundry 2009).

Consultation and engaging with other supporters by visiting projects and groups who have been successful is beneficial to learn from their experience and lobbying efforts (Tatey 2009).

Potential funders are more likely to support projects which have enlisted public support by raising awareness and seeking the endorsement of groups and individuals with a voice in the local community. The application should be tailored to the particular funding source's requirements, like focusing on revealing all possible social and economic benefits and not lay too much stress on historic building benefits if they are incidental to these objectives (AHF 2009).

The applicant must form a clear and realistic project plan outlining the project proposal including the desired outputs and outcomes as well as the level of expenditure they are able to incur which is a key to a successful application (Jardine 2009).

Prioritising and phasing of activities allows for long-term budgeting, improves the cash flow, allows more time to raise funds, permits certain parts of the building to remain open for rental and admission income generation and minimises disruption to works and services. There are three types of phasing, time-based,

space-based and incremental phasing which is a combination of both (Jardine 2009).

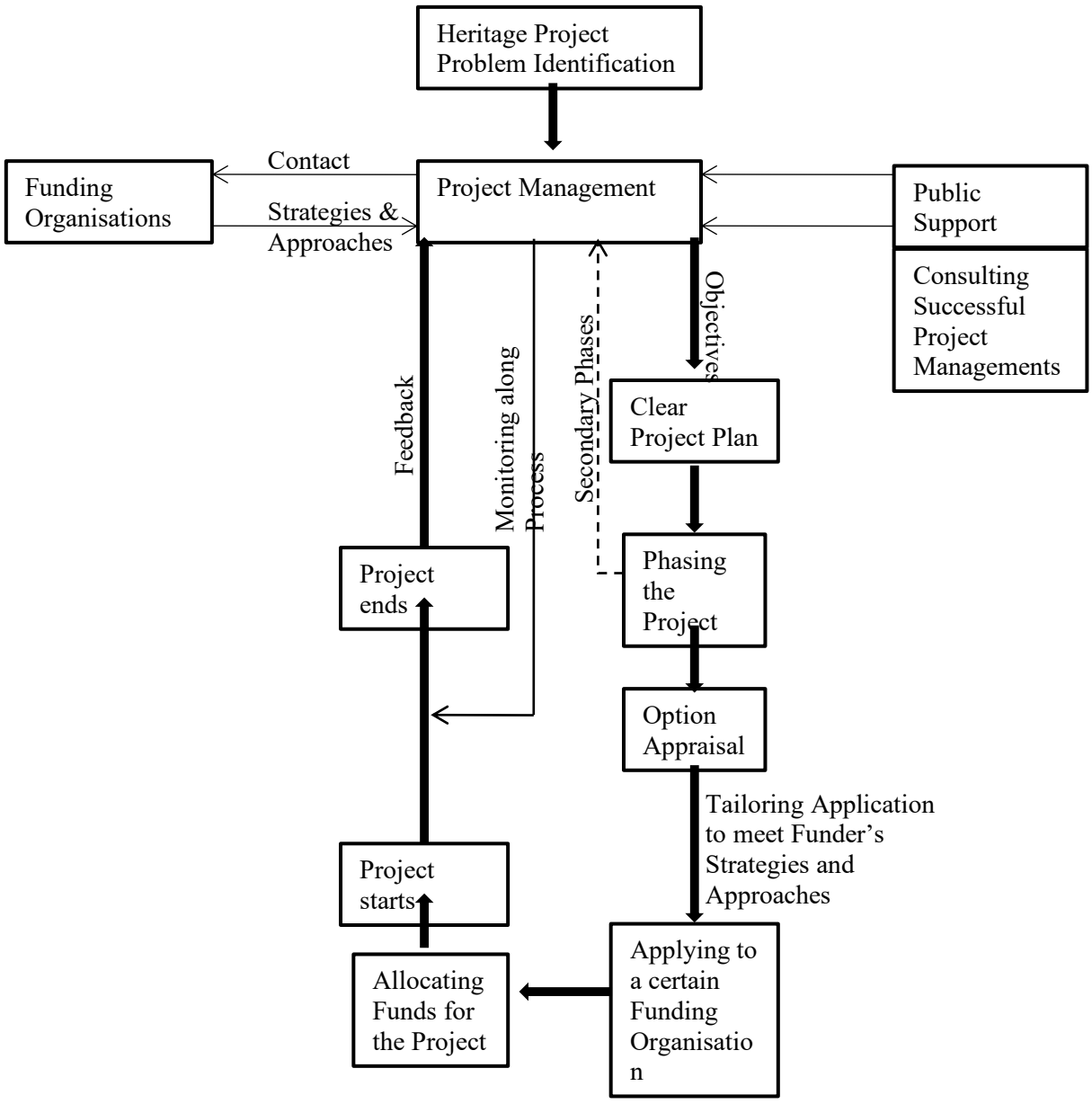


Fig. 1: The Process towards making a successful grant application.

An options appraisal is an essential element of effective project planning. This provides an assessment of whether a proposal is worthwhile in terms of best alternative ways of achieving objectives and using money and resources effectively. Appraisal and evaluation often form stages of a broad policy cycle that some departments and agencies formalise in the acronym ROAMEF (Rationale, Objectives, Appraisal, Monitoring, Evaluation and Feedback) (HM Treasury 2003).

Most importantly, a strong project leadership is crucial to manage the project and achieve good practice (Tatey 2009). According to Clarks 2004 most areas, most communities have got heritage. What they haven't got is the capacity or the ability to make a project happen.

## 4. APPLYING THE STUDIED STRATEGIES AND APPROACHES ON REAL LIFE FUNDED PROJECTS

The studied strategies of the different funders show that funding heritage projects can be approached either directly through a conservation-based project, which should prove to benefit the community socially and economically, or indirectly through a regeneration project which happens to include a historic site incidentally. The following are successful real-life examples.

**Conservation-based funded projects**

*St George's, Bloomsbury (WMF 2009)*

English Heritage and the Heritage Lottery Fund are jointly offering grant schemes for urgent repairs to listed places of worship. A successful example for that scheme is the conservation project of St George's, Bloomsbury in London, an 18th Century church by Nicholas Hawksmoor, protégé of Christopher Wren, which is also the largest project undertaken by WMF Britain.

WMF Britain project cost: £9.2 million.

Key Funders included The Paul Mellon Estate, the Heritage Lottery Fund, The Robert W. Wilson Challenge to Conserve Our Heritage and English Heritage/HLF Joint Places of Worship Scheme and others.
Since completion, church congregations have swelled; the church has a thriving concert programme and is once again in the heart of this central London community.

*Strawberry Hill, Twickenham (WMF 2009) (Strawberry Hill Trust 2009)*

The objectives of this project were to restore Horace Walpole's 18th century Grade I listed gothic villa, Strawberry Hill which is listed on English Heritage Buildings at Risk register; as well as the WMF's Watch list and the surrounding gardens, and to open it to a wider public.

Strawberry Hill is nationally and internationally famous as it inspired the popular 19th century Gothic revival movement in architecture and the tradition in literature.

Fundraising for the project secured £9 million whereas the key funders included: The Robert W. Wilson Challenge to Conserve Our Heritage, The Heritage Lottery Fund, The Foyle Foundation, The Linbury Trust, The Garfield Weston Foundation, The Wolfson Foundation and English Heritage among others.

To be granted funds, St Mary's University College, a Catholic training college and former owner of Strawberry Hill, officially transferred ownership to The Strawberry Hill Trust. It was only then that funders' requirements were satisfied, and work could begin in earnest to restore the building.

**Regeneration funded projects**

*Oxford Circus to be redesigned (BBC 2009) (Atkins 2009)*

Oxford Circus is one of the most popular destinations in the world, with more than 200m visitors a year for shopping, leisure and tourism. The new design will stop all traffic in all directions and improve pedestrian facilities and upgrade the site's features. The project forms a key part of Westminster City Council's plans to renew the West End ahead of London's Olympic Games in 2012.

The cost of the scheme is just over £5m. The funding is made up of: TfL: £2.85 m / The Crown Estate: £2.5m

Key Facts

- The area grosses a high retail at over £5.5 billion a year.
- The retail industry provides employment for over 45,000 people, and 30% of all London jobs in cinema and theatre are in the West End which contribute around £1 billion to the UK economy every year.
- Five underground stations serve the area.

*Regeneration of the Royal Arsenal, Woolwich (Stevenson 2007)*

The project is about turning the area of derelict industrial land into a successful, sustainable development using the existing historical assets.

The new approved master plan (2006) includes 3,700 new homes and 46,000 square meters of new mixed commercial and leisure development space, together with two new museums to help celebrate the site's unique heritage.

The planning permission was coupled with many planning gain agreements benefitting the site and its surrounding environment, economy, community and transport infrastructure in a way that it focused on reusing and respecting historic listed buildings and places while allowing for new build.

Key organisations in this project include London Development Agency, London Borough of Greenwich, English Heritage, Berkley Homes, Greater London Authority, Transport for London, Environment Agency, Port of London Authority, Teasland iOG, Royal Artillery Museum and residents/ Trade Associations.

LDA spent more than £45 million on the project while the figure for the private funding for 2006 is £196 million and is set to reach £577 million once the expansion into the adjacent Warren area has taken place.

## 5. ASSESSING THE CURRENT FUNDING POLICIES WITH REGARDS TO HERITAGE SUSTAINABILITY

It has been shown that securing a future for heritage projects depends on their success in receiving funds. Consequently, it is up to the funders' strategic plans, which are responding to the bigger governmental vision, that the future of historical sites is shaped. This section will tackle some of the points affecting heritage sustainability under the current funders' policies.

### Lack of separate heritage funding unit

The governmental future vision will constantly be changing which is reflected on the funders' strategies and approaches. This affects the money allocation to heritage projects and the adjustment of projects' objectives to meet funders' approaches. Moreover, the government is not convinced that heritage needs its own separate funding stream to secure its future and enable sustainable heritage strategies (Clarks 2004). An example for this is the current recession and the further commitment of £675 million from the Lottery to 2012 London Olympic Games which is dramatically reducing the value of funds and the dividend income of smaller private trusts in particular, forcing them to limit their activities in order to conserve their resources. Grant-making trusts respond to this by reducing the number of recipients, to be able to give sums of a sufficient size to make a worthwhile contribution to a project. Others spread their resources as widely as possibly, to give some assistance, however modest, to as many applicants as possible. The result is increased competition and fewer sums. (AHF 2009)

### Influence of other cultures on British Heritage

London has a large refugee population of 420,000 people, or one in 20 residents. Building sustainable, cohesive communities is a key plank of central and local government policy and is reflected on the funding

strategies. (Morris, J., Orchard, K., Davison, F. 2007) However, this could form a challenge to the British heritage sustainability in the future.

**Damage from wrong reuse**

Funds available from regeneration budgets are frequently more than those available for repairs of historic buildings (FFHB 2009). However, historic buildings can benefit from the regeneration under the condition of changing the use of the building. Kincaid 2002 argues that adaptation does not help to determine which new use is best suited to a particular building in a particular location at a particular time. Clarks 2004 adds that you can damage heritage by giving money to it.

**Ownership transfer conditions**

Another alternative is to give the property to a charity. The downside is loss of ownership and also control. The upside is the freedom from liability. The problem is that unless the present private owner is prepared to establish an endowment fund to pay for repairs, the willingness or ability of a charity to take on the ownership and management of a historic building will depend on its condition at the time and the immediate and longer-term anticipated maintenance costs involved (AHF 2009).

**Complex process**

The lengthy, complex and bureaucratic application process sometimes consumes more time than the fragile condition of the historic building can bear resulting in the physical condition being worsened which increases the overall repair cost (AHF 2009).

**Reaching agreement among funders**

Potential funders insist on sizeable levels of matching or partnership funding. With the different scopes and objectives of each organisation, it is not always easy to reach a common agreement. Gundry 2009 argues that it is sometimes difficult to work "together" rather than simply side by side.

**Carbon emissions control**

Statistics show that houses in England built before 1919 account for approximately 5 % of all the country's carbon emissions (Canliffe 2008). One reason for this is the inflexibility of the heritage bodies in accepting sustainable energy forms for aesthetic and authenticity reasons. If the government directed the funding strategy towards sustainable refurbishment, it would be a step towards meeting the target of cutting 80 % of all carbon emissions by 2050 as well as achieving heritage sustainability.

## 6. CONCLUSION

This essay has been conducted to review the relationship between the funding organisations, in terms of their strategies and approaches, and the heritage management. In addition, it has assessed whether this current relationship is benefiting heritage sustainability in England.

The common and individual objectives of the studied funders whether public like HLF, EH and LDA or nongovernmental international ones like WMF have been identified. It was found that HLF is keen on the benefits to the wider community, while EH is concerned about the conservation of heritage sites. LDA prefers investing in development projects and WMF care for heritage projects at risk.

Accordingly, key recommendations have been drawn from successful projects to help fundraisers and project managers increase their chance of receiving grants, whether it is a conservation-based project, like St. George's Bloomsbury and Strawberry Hill, or a regeneration one whereas the repairs of the historic property are incidental, like the planned Redesign of Oxford Circus, and the Regeneration of the Royal Arsenal at Woolwich.

Finally, it has been argued that the current funding policy is not always benefiting heritage sustainability because of the following:

- In the absence of a separate heritage funding body, heritage projects are dependent on the government's political and socio-economic agenda.
- The focus on involving many minority groups in heritage project could be a threat to the British heritage sustainability.
- Suggesting a new use for a historic building is risky and cannot always be well studied.
- Moving over the ownership to a charitable foundation still involves the former owner with paying for some repair costs.
- The application process has been criticised for being too long and too complicated.
- Partnership funding is beneficial but often causes problems among the funding organisations.
- The government can do more lobbying on the heritage bodies to accept more sustainable solutions by directing more funds to sustainable refurbishment if they want to meet the target of cutting 80% of all carbon emissions by 2050.

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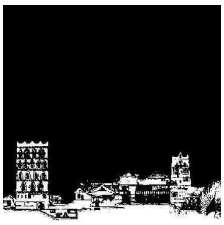

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# TECHNOLOGY, RISK, AND HERITAGE PRESERVATION

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