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Spatial inheritance and the crisis of transmission: Architectural typologies of Cantonese opera associations in Kuala Lumpur

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Abstract

The intergenerational transmission of Cantonese opera in Kuala Lumpur is increasingly threatened by the loss of the urban and architectural settings that once sustained the practice. Although existing studies have examined Cantonese opera from cultural, historical, sociological, and performance perspectives, less attention has been paid to the spatial conditions that support embodied learning, ritual practice, and cultural memory. This study addresses this gap by examining how the architectural typologies of active opera associations facilitate or constrain the transmission of tacit knowledge among practitioners. Using a qualitative case-study design, the study triangulated semi-structured interviews with senior practitioners and community custodians, archival analysis, architectural mapping, and an exploratory public-perception survey of 131 respondents. Three associations—Pat Woh Association Malaysia (PW), Yan Keng Benevolent Dramatic Association (YK), and Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)—served as the primary units of architectural and spatial analysis. The findings indicate that cultural memory remains anchored in historical markers and material traces, but public engagement is limited by fragmented archives, weak street visibility, unclear entrances, and restricted access to rehearsal and ritual spaces. Transmission is strongest where the built environment supports visual contact, acoustic coordination, backstage proximity, informal observation, and graduated ritual access. PW sustains ritual continuity, YK preserves civic and archival memory, and YW supports proximity-based learning. These findings establish spatial inheritance as a framework for balancing public visibility, cultural memory, embodied learning, and ritual privacy. The study argues that Cantonese opera should be reintegrated into Kuala Lumpur's urban fabric as a continuous living practice rather than preserved solely as a static cultural artifact.

Keywords: Intangible cultural heritage; Cultural transmission; Cultural memory; Osmotic learning; Malaysia

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1. Introduction

Cantonese opera remains a significant form of Chinese diasporic heritage in Malaysia (N. Liu *et al.*, 2023; W. C. Ng, 2015). Its continuity, however, depends not only on performers,

scripts, and audiences, but also on the environments that support rehearsal, ritual, memory, and informal learning. Historically, the transnational movement of the practice was linked to migration from the Pearl River Delta through itinerant Red Boat troupes (W. C. Ng, 2015; Yung, 2012). In British Malaya, practitioners established performance ecologies through bamboo stages, clan halls, and temple forecourts (Tan & Camacho Fernandez, 2023). These settings supported a theatrical language shaped by stylized movements, painted faces, percussive cues, and sung narratives (S. Y. Chan, 2005; Rao, 2018). They also helped encode social norms and moral exemplars through repeated communal participation (Assmann, 2011; Connerton, 1989).

These traditional settings functioned as active agents of pedagogy (Lu, 2023; Wang *et al.*, 2025). They allowed communities to encounter the practice through observation, sound, ritual proximity, and repeated participation. In this sense, learning was not confined to formal instruction. It occurred through the everyday co-presence of performers, musicians, apprentices, devotees, and audiences (Schechner, 2006). However, rapid urbanization and shifting demographics in Kuala Lumpur have weakened this integrated ecology (Z. Lin & Ang, 2025). The progressive displacement of opera practice into standardized enclosed performance venues has produced a typological tension. Such venues can improve technical presentation, but they may also weaken the visual, acoustic, and social proximity through which master–apprentice (*shifu–tudi*) transmission has historically occurred (Alan *et al.*, 2026; Gupta *et al.*, 2024).

Modern performance venues often organize performers, musicians, backstage preparation, and audiences into functionally distinct zones, improving technical control while reducing incidental visual and social contact (Gupta *et al.*, 2024; Zheng, 2020). In the context of Cantonese opera transmission, these separations can reduce the incidental observation, acoustic contact, and ritual proximity required for intergenerational learning. They affect several conditions essential to transmission: backstage proximity, through which novices observe ritual preparation; the visibility of musicians, which supports percussive coordination; acoustic intimacy, which enables vocal nuance without excessive electronic mediation; and ritual thresholds, which frame the relationship between performance and devotion. Reduced street visibility and inaccessible archives further isolate the practice from the urban realm (Rao, 2022). As a result, everyday encounters that once sustained informal learning and cultural memory have become less frequent.

Despite these challenges, the role of architecture in Cantonese opera transmission remains under-theorized. Existing scholarship has documented the historical development and preservation of Malaysian Cantonese opera (Kang, 2006), but the built environment is often treated as a background setting rather than as an active agent of cultural continuity. Contemporary preservation frameworks also risk museumification when they prioritize static artifacts and ceremonial display over the process-oriented transmission of living, embodied knowledge (Ge *et al.*, 2026; Harrison, 2013; Smith, 2006). Once detached from its urban and ritual anchors, Cantonese opera can be reduced from a dynamic cultural system to a preserved cultural object.

This unresolved relationship between cultural transmission and built form provides the basis for the present study. This research therefore develops the framework of spatial inheritance to identify the architectural conditions required for sustainable cultural transmission in contemporary urban contexts. The study advances three interconnected objectives:

(i) To analyze how material traces and spatial configurations of historical and active opera venues shape collective cultural memory and public perception among Malaysian Chinese communities in Kuala Lumpur.
(ii) To examine the mechanisms through which Cantonese opera spaces support intergenerational learning, civic pedagogy, and embodied knowledge transfer.
(iii) To derive evidence-based architectural principles from the comparative spatial analysis of three active associations—Pat Woh Association Malaysia (PW), Yan Keng Benevolent Dramatic Association (YK), and Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)—that can inform environments capable of sustaining Cantonese opera as living heritage through continued transmission.

By fulfilling these objectives, this study contributes to Cantonese opera and architectural heritage scholarship in three specific ways. First, it clarifies the architectural dimension of cultural transmission by defining spatial inheritance as the transmission of cultural practice through built conditions that support memory, apprenticeship, ritual orientation, and public encounter, thereby extending debates on cultural memory, embodied practice, and the social production of space. Second, it shifts the discussion from historical Cantonese opera typologies and generic heritage venues to active overseas Chinese associations in Kuala Lumpur, where transmission depends on relationships among street visibility, access sequence, rehearsal proximity, rehearsal–archive adjacency, altar placement, backstage privacy, and public interface. Third,

it translates the case-study findings into a case-based architectural framework that identifies how spatial form can support, constrain, or mediate the transmission of living heritage while acknowledging the influence of economic, managerial, social, ritual, and audience-related factors. Although the framework is derived from three Kuala Lumpur associations, its analytical dimensions—including public visibility, pedagogical proximity, acoustic contact, rehearsal–archive adjacency, backstage and ritual thresholds, and flexible community use—can support comparative inquiry into other traditional and community-based performing arts. Its broader relevance lies in the transferability of these analytical questions rather than in the universal replication of the spatial solutions derived from the Kuala Lumpur cases.

2. Literature review

This section critically positions the study within four strands of scholarship on Cantonese opera and intangible cultural heritage: sociocultural studies of institutional decline, cultural-memory approaches to diasporic performance, pedagogical studies of apprenticeship and embodied learning, and architectural or heritage-design studies of performance space. Across these strands, the literature also reveals three spatial scales that are especially relevant to this study: Cantonese opera spaces in the Pearl River Delta and southern China, overseas Chinese association spaces in Southeast Asia, and institutional approaches to intangible cultural heritage and theater design. Existing scholarship has established the historical, ritual, sociological, economic, technological, and educational significance of Cantonese opera, particularly in Hong Kong, Guangdong, and broader Chinese diasporic contexts (Han, 2024; Ji & Ouyang, 2022; B. Zhang, 2022). However, empirical studies situated within Malaysia's multicultural and rapidly urbanizing landscape remain limited. More importantly, the architectural dimension of preservation remains insufficiently examined. Existing studies explain why Cantonese opera is culturally important, but they rarely examine how specific spatial conditions—visibility, acoustic contact, threshold sequence, backstage proximity, archive access, street-level legibility, rehearsal area, ritual preparation, storage, informal learning, public engagement, and performance environments (Costa *et al.*, 2022; Leung, 2023a; Zheng, 2020)—enable or constrain its continuation as a living practice. This literature review therefore does not merely identify a general absence of architectural research; it argues that intangible heritage preservation is not only a sociological, institutional, or technological issue, but also an architectural one. Architecture is treated here as an active medium of cultural transmission, rather than as a passive container of heritage.

2.1. Sociocultural and institutional pressures

The literature categorizes the threats to Cantonese opera into social, environmental, and institutional dimensions (Chung, 2023; Leung, 2023b). Cantonese opera is one of the most technically demanding theatrical genres within the Sinosphere, integrating vocal performance, stylized movement, martial techniques, costume, percussion, and stagecraft (S. Y. Chan, 2005; Rao, 2017, 2018). Traditionally, mastery of these domains has relied on the *shifu–tudi* system, in which apprenticeship occurs through prolonged observation, correction, repetition, and embodied practice (Dong & Chaiyason, 2024; Leung, 2015). However, historical institutional supports, such as temple troupes and clan associations, have weakened over time (DeBernardi, 2006). This creates an economic paradox in which the institutional infrastructure that once supported technical rigor is increasingly incompatible with Malaysia's contemporary land-use conditions (Marzukhi *et al.*, 2017; Wong & Jomo, 2008).

Furthermore, rapid urbanization has replaced many traditional, permeable performance venues, including open-air bamboo theaters, clan halls, and temple forecourts (Chen & Arus, 2024a, 2024b; Ge *et al.*, 2026). In these places, cinemas, shopping malls, and digital entertainment spaces have become dominant urban cultural environments (Hou, 2022; Y. Zhang & Zhao, 2025). Opera's cyclical rhythms, once aligned with agrarian festivals, are now increasingly marginalized. Additional pressures include municipal regulations affecting festivals that involve joss paper, incense burning, and other ritual practices (Z. Lin & Ang, 2025). Consequently, the genre is often compressed into seasonal spectacles rather than functioning as an everyday community anchor (Haywood, 2025; Rao, 2016). Existing literature frequently proposes hybrid digital integration and formal conservatory curricula as responses to this decline (Fu & Choatchamrat, 2024; Oe *et al.*, 2026). However, these proposals often rely on assumptions drawn from Hong Kong or mainland China. These studies diagnose the loss of institutional support but overlook an important material condition: the ritual essence of the opera may remain, while the physical infrastructure that sustains it has weakened or collapsed.

2.2. Enacted memory and urban pressures in Malaysia

To understand the spatial stakes of Cantonese opera, it is essential to study it through the lens of cultural memory. Assmann (2011) distinguished communicative memory, which is shared through everyday embodied experience among living generations, from cultural memory, which is institutionalized through symbols, monuments, and texts. In Cantonese opera, vocal techniques, percussion

cues, and stylized gestures operate as embodied practices through which diasporic history is repeatedly performed and remembered (Rao, 2016, 2018). However, a critical theoretical limitation in existing memory studies, including the frameworks of Assmann (2011) and Halbwachs (1992), is the tendency to treat physical space as a passive container or a mere notation system. Halbwachs argued that memory requires a spatial context (*le cadre spatial*), but implies that if a specific social group disappears, its architectural memory vanishes alongside it. However, this research challenges that passive view by invoking Rossi's (1966/1982) theory of urban artifacts. Rossi argued that architectural typologies possess an inherent permanence that outlasts their original social functions. In the Malaysian context, buildings such as Chinese clan halls (*huiguan*) operate as permanent fixed points in a rapidly changing city, anchoring the collective soul of the community (Lew & Tan, 2024; Mo & Mamat, 2025).

Cultural memory in Cantonese opera is deeply mediated by material remnants, such as bamboo theaters, costumes, musical instruments, painted faces, association records, ritual objects, and archives (Leung, 2023b; Yung, 2012; Zifei *et al.*, 2025). However, current heritage frameworks often preserve these materials as static evidence rather than as active components of performance, rehearsal, and transmission (Harrison, 2013). Within Malaysia and the wider Southeast Asian diaspora, Cantonese opera and related Chinese operatic traditions have continued through community associations, ritual practices, cultural media, and informal networks (Kang, 2006; Z. Lin & Ang, 2025; N. Liu *et al.*, 2023; Long *et al.*, 2025; B. Zhang, 2022). These community-based forms of continuity position opera as a vernacular and diasporic mode of cultural memory rather than as a practice confined to formal heritage institutions. The limitation of existing memory-based scholarship is therefore not its neglect of cultural meaning, but its insufficient translation of memory into spatial requirements. For Cantonese opera to remain a living practice, memory must be designed as an active spatial system in which archives, rehearsal rooms, ritual thresholds, storage, and public interfaces remain connected rather than separated into museum-like display or private storage.

2.3. From informal apprenticeship to formalized pedagogy

The educational value of Cantonese opera extends beyond vocational theater training. Historically, it has functioned as an informal community school through which civic virtues, Confucian ethics, diasporic identity, and ritual discipline are transmitted through embodied participation (Leung, 2013, 2023a; F. P. Ng & Chan, 2015). Its multimodal pedagogy integrates gesture, song, costume, percussion, spatial etiquette, and ritual context, enabling apprentices and audiences to internalize ethical and cultural knowledge through repeated exposure and participation (Oe *et al.*, 2026; Schechner, 2006). Existing scholarship has therefore emphasized the importance of the *shifu–tudi* relationship, embodied repetition, and intergenerational learning (Anarbayevna, 2025; Q. Liu, 2023).

Comparative scholarship indicates that the transmission pressures affecting Cantonese opera are not unique to this tradition. Studies of Kabuki (Pronko, 1971) and Jinghe opera (Fu & Choatchamrat, 2024) suggest that inherited performance knowledge can be incorporated into national-theater or conservatory-style training, helping to stabilize technical practice and institutional continuity while allowing creative interpretation. Related studies of Min opera (X. Lin *et al.*, 2025) and Teochew opera (Z. Lin & Ang, 2025; Long *et al.*, 2025) show that continuity is also negotiated through cultural education, new-media engagement, ritual practice, and adaptation to contemporary social conditions. Digital tools, surtitles, short-form video, and virtual platforms may further increase the visibility of traditional performance and attract younger audiences and learners (Cheng & Leung, 2020; Oe *et al.*, 2026; Xiao, 2025). Across these traditions, however, institutionalization and digital mediation do not eliminate the need for embodied repetition, sensory exposure, and sustained contact with experienced practitioners. These comparisons position Cantonese opera within a broader performing-arts problem: how to modernize transmission without severing the social and spatial conditions through which tacit knowledge is acquired.

A limitation of this body of scholarship is that pedagogy is commonly discussed as a social, institutional, or technological process, while less attention is given to the built environments that enable it. If tacit knowledge depends on osmotic learning, the spatial setting of apprenticeship becomes central. In this study, osmotic learning refers to the acquisition of knowledge through repeated observation, listening, imitation, correction, backstage proximity, informal conversation, and gradual participation in the everyday and ritual activities of the association. A conventional classroom may support explicit instruction, but it cannot fully reproduce the spatial ecology of apprenticeship, in which novices learn by watching costume preparation, hearing percussive cues, observing senior performers, and participating in routine association activities (Leung, 2023a). Similarly, digital platforms may increase visibility and curiosity (N. Liu *et al.*, 2023), but they cannot substitute for the physical and sensory conditions through which rhythm, gesture, vocal projection, and ritual etiquette are learned.

This study therefore reframes apprenticeship as a spatial practice. The central question is not simply whether traditional pedagogy should be preserved or modernized, but how contemporary architecture can support the conditions through which embodied knowledge is transmitted. Apprenticeship requires connected rehearsal rooms, observation zones, backstage preparation areas, costume and instrument storage, archive access, ritual thresholds, and informal spaces that facilitate interaction among masters, apprentices, practitioners, and the public. Without these spatial relationships, the *shifu–tudi* model risks becoming either a nostalgic ideal or a formal instructional system detached from the communal and embodied conditions that historically sustained it.

2.4. Spatial inheritance and the specific gap in Malaysian urban heritage discourse

The key limitation of existing heritage discourse is not that it ignores Cantonese opera, but that it insufficiently theorizes spatial organization as an active agent of cultural transmission. Drawing on Lefebvre's (1991) theory of the social production of space, this study argues that opera spaces are not passive containers for performance. They are instructional environments that structure who may observe, who may participate, how knowledge circulates, and how ritual authority is maintained. A historical morphological analysis shows that Cantonese opera spaces were historically shaped by calibrated porosity: the visual, acoustic, and social interconnection of performance, ritual, learning, and community life through recognizable thresholds (Rao, 2016; Yung, 2012; Zheng, 2020). Architectural typology therefore matters because different spatial arrangements produce different forms of learning, spectatorship, memory, and exclusion.

The literature on Cantonese opera spaces can be read across three spatial scales. At the first scale, studies of the Pearl River Delta and southern Chinese opera traditions identify Red Boats, bamboo stages, temple forecourts, and itinerant performance routes as important spatial foundations of the art form (W. C. Ng, 2015; Sun, 2018; Yung, 2012). Temporary bamboo theaters in temple forecourts and 19th-century Red Boats in the Pearl River Delta functioned as flexible third spaces where performance, domestic life, and ritual were closely connected, but not necessarily boundaryless. These studies show that Cantonese opera historically developed through mobile, open, and ritualized environments in which performance, domestic life, social exchange, and devotional practice often occupied contiguous spatial fields. Their limitation, for this study, is that they do not fully explain how these spatial conditions are reconfigured when the practice is transplanted into overseas Chinese urban communities.

At the second scale, studies of Chinese diasporic communities in Southeast Asia show that opera practice was sustained through clan halls, guilds, shophouses, temple associations, and benevolent societies (DeBernardi, 2006; Kang, 2006; B. Zhang, 2022). These works are valuable because they situate Cantonese opera within migration, community formation, religious practice, and diasporic memory. However, they tend to emphasize social history, cultural identity, or institutional continuity more than the internal architectural conditions of transmission. Less attention is given to how rehearsal rooms, backstage areas, staircases, storage zones, altar placement, street frontage, and archive access shape the everyday transfer of embodied knowledge.

At the third scale, intangible cultural heritage and theater-design scholarship have examined museums, cultural centers, archives, and formal performance venues as mechanisms of preservation (Ge *et al.*, 2026; Harrison, 2013; Smith, 2006). This discourse is useful for understanding how heritage is institutionalized, displayed, and managed, but it can also reinforce a separation between preservation and active practice. In broader heritage and performance-design contexts, efforts to institutionalize traditional performance have frequently relied on enclosed proscenium theaters, cultural centers, and standardized venues. Such settings may provide technical safety, controlled lighting, acoustic treatment, seating capacity, and formal cultural visibility, but they can also reorganize performance into a predominantly frontal relationship between performers and audiences (Führer & Schoene, 2022; Kong, 2024; Zheng, 2020).

Comparable spatial tensions are evident beyond Chinese opera. Research on contemporary British and Irish productions documents the use of unconventional spaces outside established theater settings (McIvor, 2018; O'Neill, 2009), while studies of performing-arts centers describe the increasing specialization and technical control of formal venues (Amałowicz, 2019; Gupta *et al.*, 2024). These contexts differ historically, culturally, and performatively from Cantonese opera and should not be treated as architecturally equivalent. Nevertheless, they raise a shared question: whether a venue supports only the presentation of a completed performance or also the rehearsal, observation, preparation, memory work, social encounter, and informal participation through which a practice is reproduced.

The issue is therefore not enclosure or technical specialization in themselves, but whether spatial organization weakens the visual, acoustic, social, and functional relationships required for learning, ritual orientation, and informal transmission. Proscenium

arrangements may separate performers, musicians, learners, backstage preparation, and audiences into distinct zones. This differs from the more socially embedded environments of bamboo stages, temple forecourts, clan halls, and adaptive association spaces, where rehearsal, ritual, performance, and informal observation could occur in closer proximity (Liang & Gingging, 2026). This typological contrast is historical and analytical rather than the basis of a controlled causal comparison. The empirical question examined in this study is therefore how the spatial conditions of three active Kuala Lumpur associations support or constrain the proximity, visibility, ritual access, and acoustic contact required for Cantonese opera transmission.

The specific gap in the literature concerns the architectural life of active overseas Chinese opera associations in Malaysian cities. Existing scholarship explains the ritual origins of Cantonese opera in the Pearl River Delta, the social importance of Chinese associations in Southeast Asia, and the institutional logic of heritage preservation. What remains insufficiently examined is how these dimensions intersect within contemporary Kuala Lumpur, where active associations occupy shophouses, guild rooms, and historic urban corridors. In these contexts, the adaptation of existing premises may reshape circulation, street visibility, acoustic relationships, archive access, and the spatial proximity between practitioners and learners. These conditions are further affected by redevelopment pressure, accessibility constraints, fragmented archives, and changing patterns of youth participation (Zhao & Bunyasakseri, 2026).

This study addresses the gap by examining PW, YK, and YW as active spatial infrastructures of cultural transmission rather than as static heritage sites. It does not propose a literal return to historical performance settings or the uncritical adoption of professionalized theater infrastructure. Instead, it investigates how a hybrid urban typology might reconcile public visibility, ritual privacy, acoustic intimacy, archive access, and apprenticeship-based learning within Kuala Lumpur's dense and multi-ethnic urban fabric.

2.5. Conceptual definitions and synthesis of the literature

On the basis of the preceding scholarship, this study uses four related but distinct analytical terms. Spatial inheritance refers to the transmission of cultural practice through built conditions that sustain memory, apprenticeship, ritual orientation, and public encounter across generations. It does not refer to the preservation of physical form alone, although material traces and inherited typologies may contribute to transmission. Porous typology refers to an overall spatial arrangement in which public, pedagogical, ritual, rehearsal, and backstage domains remain connected through calibrated visual, acoustic, social, circulatory, and programmatic relationships while retaining necessary thresholds. Porosity is not used synonymously with visual permeability, which refers more specifically to observable sightline continuity between designated spatial zones. Hermetic typology refers to an arrangement in which performers, learners, musicians, ritual preparation, and audiences are isolated through rigid spatial separation, concealed access, or reduced visual, acoustic, and social contact. Osmotic learning refers to tacit knowledge acquisition through repeated exposure, observation, listening, imitation, correction, and proximity within a shared environment rather than through formal instruction alone.

These concepts bring together the four strands of scholarship reviewed above: sociocultural studies of institutional decline, cultural-memory approaches to diasporic performance, pedagogical studies of apprenticeship and embodied learning, and architectural or heritage-design studies of performance space. The study's contribution lies in examining active Malaysian associations as spatial infrastructures of transmission rather than treating Cantonese opera space solely as a historical southern Chinese performance typology, a Southeast Asian diasporic institution, or a generic intangible cultural heritage venue. The spatial inheritance framework therefore integrates architectural conditions that existing studies often examine separately, including civic visibility, entrance legibility, rehearsal–archive adjacency, acoustic contact, altar orientation, backstage privacy, public-to-private thresholds, flexible association interiors, and spaces for gradual public encounter.

Within this framework, architecture is not presented as the sole cause of, or solution to, the inheritance crisis. Instead, built conditions mediate how economic, managerial, social, ritual, and audience-related factors become spatially operative. Spatial inheritance thus translates the social, ritual, and pedagogical insights of prior scholarship into a case-based architectural lens for examining how Cantonese opera may continue as a living practice amid redevelopment, municipal regulation, and weakened mentorship structures (K. K.-y. Chan, 2026; Ji & Ouyang, 2022; Yun, 2024).

Although the framework is derived from three Cantonese opera associations in Kuala Lumpur, the underlying analytical problem has wider comparative relevance. Other traditional and community-based performing arts may also depend on relationships

among public visibility, pedagogical proximity, backstage preparation, archival continuity, acoustic contact, informal participation, and culturally regulated thresholds. The framework may therefore serve as a comparative lens for examining how built environments support or constrain living cultural transmission in other performance traditions. Its application must nevertheless remain sensitive to each tradition's ritual authority, institutional structure, pedagogical system, audience relationship, and urban context. It is therefore proposed as a transferable set of analytical questions rather than as a universal architectural model or evidence that all performance traditions require the same spatial configuration.

Taken together, the literature establishes the sociological and cultural value of Cantonese opera but leaves unresolved how spatial organization supports or constrains its continuity within active Malaysian associations. Existing studies tend either to romanticize traditional performance settings or to adopt institutional theater models without sufficiently examining calibrated porosity, embodied learning, public visibility, ritual thresholds, and urban regulation. This study addresses that gap by investigating how the spatial conditions of PW, YK, and YW mediate cultural memory, apprenticeship, ritual practice, and public encounter within Kuala Lumpur's changing urban fabric. The resulting analysis provides the empirical basis for considering a hybrid typological logic that reconciles living transmission with contemporary urban and institutional constraints.

3. Research methodology

This study addresses the architectural gap identified in the literature review by examining how physical space mediates the intergenerational transmission of Cantonese opera. It adopted a constructivist qualitative research design to investigate the relationships among spatial conditions, embodied learning, ritual practice, and cultural continuity. The research design treated spatial meaning and heritage transmission as processes co-produced through human interaction, ritual practice, and the built environment. Four complementary methods were triangulated: semi-structured interviews, architectural site mapping, a supplementary public-perception survey, and archival and documentary analysis. This multimethod approach combined in-depth practitioner perspectives with the spatial evidence required for an architectural investigation of intangible cultural heritage. The research was conducted in three sequential phases. The first examined the mnemonic dimensions of historical urban traces. The second investigated the pedagogical implications of contemporary spatial transformation. The third synthesized the findings into architectural principles for spatial inheritance.

3.1. Participant selection and interview protocol

To capture specialist practitioner perspectives on cultural transmission, semi-structured interviews were conducted with a purposively sampled cohort of four key practitioners (Table 1). The sample was designed as an information-rich practitioner sample rather than as a statistically representative sample of all stakeholders involved in Cantonese opera transmission. The participants were selected because they occupied distinct positions within the practice ecology: an 83-year-old master practitioner and association honorary president representing institutional leadership and long-term historical memory; a 57-year-old musician-educator representing acoustic, rhythmic, and instrumental transmission; a 65-year-old female master (*shifu*) and founder representing pedagogical practice, backstage knowledge, and gendered dimensions of training; and a 32-year-old apprentice (*tudi*) representing contemporary learner experience, learning barriers, and youth engagement.

Table 1. Interview participants and practitioner roles

Practitioner name	Age	Role	Association/Affiliation
Mr. Lawrence Wong Kin Hung	83	Master practitioner and Honorary President	Pat Woh Association Malaysia (PW)
Mr. Yang Wei Hong	57	Musician-educator	Pat Woh Association Malaysia (PW)
Mdm. Yeung Bao Xiang	65	Cantonese opera master (*shifu*) and founder	Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)
Mr. Daniel Wong Yan Xun	32	Apprentice (*tudi*)	Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)

The sample therefore provides depth across selected practitioner roles, but it does not exhaust the full stakeholder ecology. In particular, the study did not include separate interview groups with apprentices below the age of 30, ordinary theatergoers, clubhouse or property managers, heritage officers, or urban planning managers. The interview data were therefore interpreted as specialist practitioner testimony within a broader case-study design rather than as a complete or saturated account of all actors involved in the governance, reception, and future planning of Cantonese opera spaces. These interviews were triangulated with repeated site observations, spatial–behavioral mapping, archival documents, and an exploratory public perception survey.

The interviews lasted between 45 and 210 min and were conducted primarily in Cantonese and Mandarin, with occasional use of English. Before the interviews began, explicit verbal and written consent was obtained from all participants for both participation and audio recording. The semi-structured interview questions addressed cultural memory, the contemporary *shifu–tudi* relationship, educational transmission, adaptation to modern and temporary venues, the role of digital media, and the spatial priorities of a proposed Cantonese Opera Knowledge Center (Appendix A). Following the interviews, the audio recordings were transcribed verbatim in Chinese and translated into English by the primary researcher to preserve the accuracy of the theatrical and architectural terminology.

3.2. Site observation and architectural mapping

The core empirical architectural data were gathered through systematic site observations and spatial–behavioral mapping at three active Cantonese opera practice sites in Kuala Lumpur (Figure 1):

(i) Pat Woh Association Malaysia (PW), 12A Jalan Brunei Utara, Pudu, 55100 Kuala Lumpur;
(ii) Yan Keng Benevolent Dramatic Association (YK), 51 Jalan Sultan, 50000 Kuala Lumpur;
(iii) Yuet Wan Cantonese Opera Association Kuala Lumpur (YW), 67B Lorong Loke Yew, Pudu, 55200 Kuala Lumpur.

These sites were selected because they represent three active typological conditions: a civic-institutional monument, a multi-purpose guild, and a compressed micro-academy.

For the comparative analysis, the study distinguished between spatial and contextual variables. Spatial variables included street visibility, entrance legibility, internal zoning, visual permeability, acoustic conditions, circulation, rehearsal–archive adjacency, altar placement, backstage access, and public-to-private thresholds. Contextual variables included building age, property rights, income model, operating funds, institutional role, target audience, and frequency of use. This distinction was necessary because the inheritance crisis cannot be attributed to spatial form alone. Spatial form was therefore treated as a mediating condition that interacts with institutional, financial, audience-related, and ritual factors.

A structured observation protocol was applied to improve the consistency and comparability of the site analysis. Eight site visits were conducted between September 2025 and March 2026: three at PW, three at YK, and two at YW. The visits ranged from 1.5 to 6.0 h and documented different operational states, including periods when the associations were inactive, administrative activities, interviews, a private lecture, and rehearsals. For each visit, the researcher recorded the date, start and end times, duration, operational state, activities observed, areas accessed, and forms of documentation collected. The complete visit schedule is provided in Appendix B.

A standardized observation record form incorporating a behavioral checklist was used across all three case-study sites. The form documented public-access conditions, street frontage, signage and entrance visibility, doors, windows, partitions, stairs, thresholds, circulation routes, observation points, sightlines and obstructions, observed acoustic conditions, ritual elements, learning activities, storage and archive conditions, and the forms of evidence collected. It also recorded the site name, visit date, start and end times, duration, operational state, areas accessed, activities observed, and researcher comments.

Observations were documented through still photographs, annotated field sketches, concise field notes, dimensional measurements, plan annotations, and plan-based behavioral mapping. Relevant findings were cross-checked against practitioner interviews and archival sources where applicable. Applying the same observation categories and recording fields across the three associations provided a consistent basis for the comparative assessment. Appendix C provides the criterion-specific spatial observation rubric and the complete observation record form.

Spatial mapping was conducted through field sketches, photographic documentation, and annotated spatial–behavioral observations of accessible areas. Because original measured dimensions were unavailable, the plans were prepared as approximate, not-to-scale, fieldwork-based annotated plans rather than full measured survey drawings. They record, where accessible and verifiable, walls, partitions, doors, windows, stairs, entrances, circulation routes, observation points, sightlines, altar

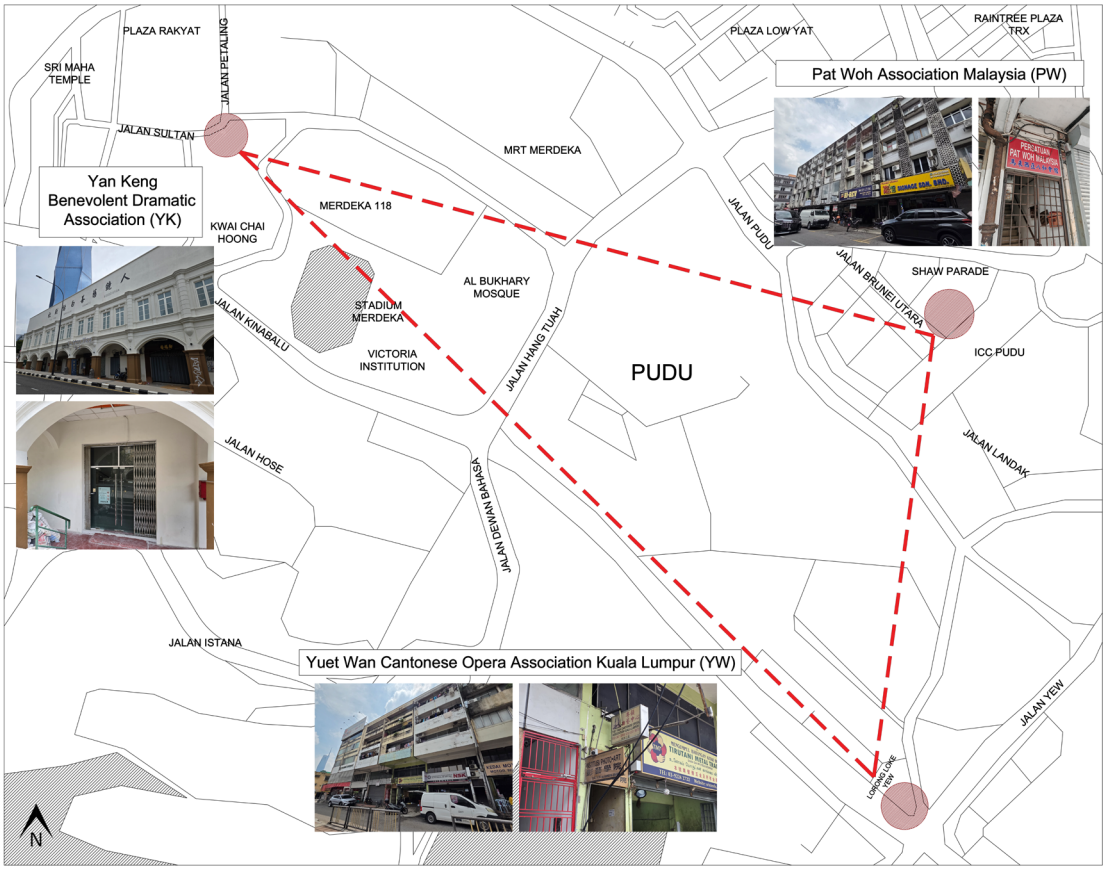


Figure 1. Location and street-facing conditions of the three case-study associations within the Jalan Sultan–Jalan Petaling–Pudu cultural corridor, Kuala Lumpur: Pat Woh Association Malaysia (PW), Yan Keng Benevolent Dramatic Association (YK), and Yuet Wan Cantonese Opera Association Kuala Lumpur (YW). The author-redrawn location map identifies the relative positions of the three sites, while the accompanying fieldwork photographs document their façades, signage, entrance visibility, and immediate streetscape conditions. Sources: Map by the authors based on Google Maps, 2026; photographs by the authors (2025–2026)

locations, rehearsal or performance zones, backstage or storage areas, archive areas, approximate floor-level changes, approximate ceiling-height indications where observable, and principal material finishes. Areas that were inaccessible, private, ritually sensitive, operationally restricted, or not approved for documentation are identified in the drawing notes rather than reconstructed speculatively.

Fieldwork photography was used as a systematic form of spatial documentation to strengthen the visual basis of the architectural analysis. On-site photographs were cross-referenced with the annotated plans and field notes to verify spatial claims. The photographic documentation focused on exterior façades, street-facing entrances, signage, doors, windows, stairs, thresholds, rehearsal halls, stage or practice areas, altar placement, backstage or storage zones, floor materials, obstructions, circulation routes, and visual connections between public and semi-private spaces. Selected photographs were annotated to identify spatial relationships among public access, semi-public learning areas, ritual zones, backstage privacy, and visual obstruction. These visual records were used to verify claims concerning street visibility, open or enclosed spatial conditions, sightlines, circulation, acoustic conditions, ritual thresholds, and transmission capacity. Where photographs include ritual objects, backstage activities, or identifiable individuals, only images approved for publication are used.

The spatial model was tested through the combined reading of annotated plans, field photographs, field notes, behavioral mapping, and practitioner accounts. Particular attention was given to the relationship between doors, windows, stairs, circulation routes, observation points, rehearsal or stage areas, altar placement, backstage or

storage zones, and public-facing façades. These elements were recorded because they directly affect the conditions through which learners observe, listen, imitate, and participate in practice. The analysis therefore treats the open/enclosed distinction not as an abstract binary, but as a set of observable spatial relationships involving access, visibility, proximity, acoustic contact, and ritual privacy.

Four spatial criteria were applied consistently across the three case studies: visual permeability, acoustic performance, urban legibility, and transmission capacity. The criteria were assessed using the spatial observation rubric provided in Appendix C. Each criterion was rated on a four-point ordinal scale from 0 to 3, with criterion-specific descriptors distinguishing absent, weak, partial, and strong conditions. The scores were used as qualitative comparative indicators rather than as statistical rankings. Conditions that could not be accessed or sufficiently documented were recorded separately as N/O and were not interpreted as evidence of absence.

Visual permeability was assessed through plan-marked sightlines, observation positions, field sketches, photographs, and the recorded effects of doors, walls, partitions, stairs, level changes, and physical obstructions. These records were used to establish whether visual connections existed among public, learning, rehearsal, performance, backstage, storage, and ritual areas. Acoustic performance was assessed qualitatively through structured observations of room volume, ceiling height, principal surface materials, external noise, vocal and percussive audibility, sound transmission between adjacent spaces, and reliance on electronic amplification. No calibrated acoustic device was used, and no sound-pressure-level, reverberation-time, or other engineering acoustic measurements were undertaken. The criterion should therefore be understood as a comparative architectural assessment of observed acoustic conditions rather than as a technical acoustic evaluation.

Urban legibility was assessed through façade photographs and field observations of street frontage, signage, entrance visibility, access difficulty, pedestrian approach, and the extent of prior knowledge required to locate the association. Transmission capacity was assessed by mapping the co-occurrence, adjacency, separation, and observed interaction among rehearsal, teaching, ritual, storage, archive, backstage, performance, and informal social functions. Particular attention was given to opportunities for watching, listening, demonstration, correction, rehearsal, informal conversation, and graduated access to ritual or backstage activities.

The observations were cross-checked using photographs, field sketches, measurements, plan annotations, practitioner interviews, and archival sources. Appendix B provides the complete site-visit log, while Appendix C contains the criterion-specific rubric and observation record form. Representative visual evidence derived from these materials is presented alongside the comparative findings in Figure 2.

3.3. Public perception survey

To establish an exploratory baseline of contemporary urban awareness and public attitudes toward Cantonese opera, a structured bilingual questionnaire in English and Chinese was developed and distributed online through Google Forms. The survey was designed as a supplementary exploratory instrument to complement the practitioner interviews, site observations, and archival analysis rather than to produce statistically representative claims about the Malaysian public. Following the participant information and consent section, the questionnaire comprised a demographic section and three thematic sections: awareness and perception, cultural memory and learning, and space and modern adaptation. These sections examined respondents' familiarity with and exposure to Cantonese opera, attitudes toward its cultural and educational value, interest in preservation and learning, preferred performance environments and modernization strategies, perceived barriers to attendance, preferred communication channels, and interest in a proposed cultural knowledge center. The English and Chinese versions were presented together to facilitate respondent comprehension. The complete bilingual questionnaire is reproduced in Appendix D, with its original item sequence, response options, and multiple-response instructions preserved.

The survey used convenience sampling and obtained 131 valid responses. This strategy was considered appropriate for the survey's limited exploratory purpose of identifying preliminary patterns of awareness, exposure, and perceived barriers within the respondent group, rather than to estimate population-wide attitudes. Online distribution enabled efficient data collection but also introduced self-selection bias and demographic imbalance. No offline street-interception survey, on-site audience survey, or community-based paper distribution was conducted. The respondent pool was therefore expected to reflect the characteristics of individuals who were digitally connected and willing to respond to an online questionnaire.

For these reasons, the survey findings are treated strictly as exploratory and descriptive evidence concerning the respondent group. They are not interpreted as representative of the wider Malaysian public, the population of Kuala Lumpur, middle-aged or elderly residents, non-Chinese communities, or ordinary theatergoers as a whole.

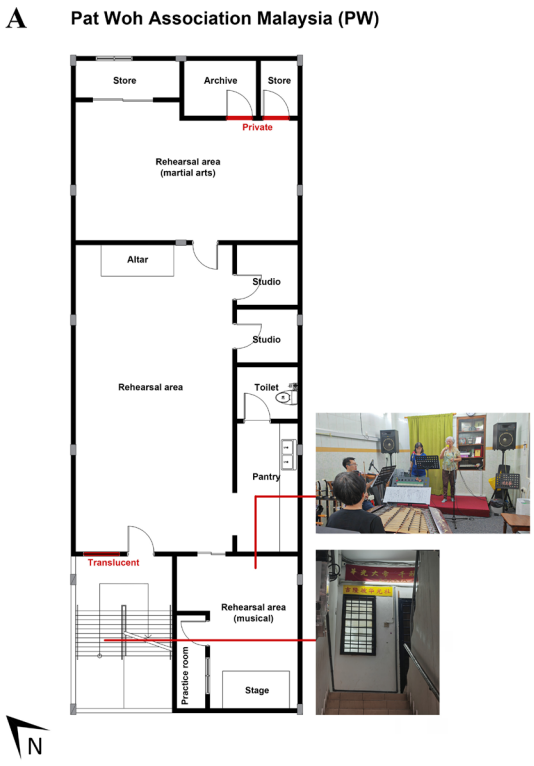


Figure 2. (*Continued*)

(*Cont'd...*)



Figure 2. Comparative annotated fieldwork-based plans and photographic documentation of the three case-study associations: (A) PW; (B) YK; and (C) YW. The approximate, not-to-scale plans identify accessible and verifiable walls, openings, stairs, partitions, entrances, circulation routes, obstructions, altar positions, rehearsal or performance areas, backstage or storage zones, and archive areas. Read together with the photographs, the plans provide spatial evidence for assessing visual permeability, acoustic contact, ritual privacy, circulation, transmission capacity, and master–apprentice learning. Sources: Drawings and photographs by the authors (2025–2026)

The questionnaire broadened the study's understanding of public awareness and perceived barriers, but did not replace qualitative interviews with audience members. Claims concerning audience experience are therefore treated as descriptive and triangulating rather than fully explanatory.

Responses were analyzed using basic descriptive statistics, specifically frequencies, raw counts, and percentages. For multi-select questions, the combined percentages may exceed 100 percent, and the valid denominator is 131 unless otherwise specified. Stratified correction and robust group-comparison analysis were not conducted because weighting the responses would not resolve the absence or underrepresentation of key demographic groups. Within the architectural methodology, the survey was used only to triangulate spatial findings where responses concerning lack of information, accessibility, or limited live attendance corresponded with observed conditions of urban legibility, venue visibility, access sequence, and public interface. The questionnaire findings were therefore cross-read with the spatial characteristics documented through site observation, annotated plans, and photographic evidence.

3.4. Archival and documentary analysis

To trace the morphological evolution of opera spaces across the last century, an extensive archival document analysis was conducted. Primary materials included committee documents, anniversary publications, musical notations, and historical photographs sourced directly from the physical repositories of PW, YK, and YW. These were supplemented by digitized historical periodicals and audiovisual media, notably the 2023 Malaysian film *Snow in Midsummer*. Documents were analyzed as situated cultural artifacts rather than neutral historical facts. Film and photographic evidence were systematically coded to extract representations of early 20th-century spatial logic, with particular attention to bamboo stages, clan hall forecourts, and street thresholds. The research compared historical spatial configurations with the spatial analysis of the three case-study sites. This comparison showed how

opera typologies responded to, and were compromised by, regulatory, commercial, and demographic pressures over time.

3.5. Data analysis

The qualitative data, comprising interview transcripts, field notes, and observational records, were analyzed using a grounded theory coding approach. Coding was conducted by a single primary researcher, thereby introducing the possibility of interpretive bias and limited intercoder verification. To mitigate this limitation, the researcher conducted peer debriefing sessions with academic supervisors. Member checking was also carried out with interviewees through the review of synthesized spatial diagrams and key interpretations, and a rigorous audit trail was maintained throughout the analysis.

The coding process proceeded in three distinct phases. First, open coding was applied line-by-line to the interview transcripts and field notes to identify discrete actions, material conditions, and spatial references. Second, axial coding grouped these initial codes into higher-order conceptual categories and established relationships between architectural conditions and pedagogical transmission. Third, selective coding integrated these categories around the core theoretical concept of spatial inheritance, categorizing the data into three dominant themes: cultural memory, spatial pedagogy, and architectural typologies.

Major interpretive claims were linked to multiple data sources where possible, including practitioner testimony, site diagrams, field observations, archival materials, and survey patterns. Claims concerning *shifu–tudi* transmission were retained only where they could be linked to at least two forms of evidence. For example, a claim about learning through proximity required support from a practitioner interview and a spatial observation, plan annotation, or photograph showing the relevant relationship between rehearsal, observation, backstage, or ritual zones. Claims about enclosure or obstruction required support from fieldwork-based plans, field photographs, or field notes identifying doors, windows, partitions, circulation routes, or blocked sightlines. Where the available evidence was insufficient, the claim was treated as an interpretive proposition rather than as a demonstrated causal finding.

The spatial observation scores were treated as ordinal comparative indicators. They were used to organize the cross-case comparison, not to produce statistical rankings. Each score was checked against at least two forms of evidence where available, such as field notes and photographs, plans and interview comments, or behavioral mapping and archival material. Where evidence was incomplete, the analysis used descriptive qualification rather than a numerical claim. This procedure was adopted to reduce reliance on subjective judgment and to improve the reproducibility of the comparative spatial analysis.

However, given the small practitioner sample and the absence of interviews with several stakeholder groups, the analysis does not claim full data saturation across the wider transmission ecology. Instead, it claims thematic sufficiency for a bounded architectural case-study analysis of three active associations in Kuala Lumpur. Table 2 summarizes the applied research paradigm.

Table 2 aligns the study's core aim with a three-phase analytical framework centered on cultural memory, education, and spatial heritage. Phase one examines the mnemonic dimensions of the built environment by triangulating questionnaires, archival documentation, and site observations. Phase two focuses on spatial pedagogy through interviews with masters and apprentices alongside observations of backstage and rehearsal practices. Phase three synthesizes these findings through comparative case studies of PW, YK, and YW. The framework translates empirical data into spatial design principles for a cultural typology that supports performance, ritual, learning, and heritage continuity within Kuala Lumpur's urban fabric.

4. Results

This section presents findings derived from site observations, practitioner interviews, archival analysis, and the supplementary public survey. To maintain a clear distinction between evidence and interpretation, it reports observed spatial conditions, interview accounts, archival traces, and survey patterns, while broader theoretical interpretation and architectural synthesis are developed in Section 5.

The spatial findings were organized using the four criteria defined in Section 3.2: visual permeability, acoustic performance, urban legibility, and transmission capacity. Visual permeability refers to sightline continuity between public, pedagogical, rehearsal, performance, backstage, and ritual zones. Acoustic performance refers to the observed relationships among room volume, surface materials, ceiling-height indications, external noise, and reliance on amplification. Urban legibility refers to street-level visibility, signage, entrance clarity, and ease of pedestrian access. Transmission capacity refers to the spatial co-presence or separation of rehearsal, ritual, archive, storage, teaching, and informal interaction spaces.

These criteria were applied as ordinal comparative indicators based on field notes, photographs, field sketches, behavioral mapping, and interview corroboration. The scores and descriptions were used to structure the

comparison between the three sites, not to produce statistical rankings. Given the exploratory survey design, small interview cohort, predominantly male practitioner sample, and single-coder qualitative analysis, the findings are presented as case-based architectural interpretations rather than statistically generalizable claims. Table 3 outlines the systematic alignment between the research questions, primary data sources, analytical procedures, and key findings.

4.1. Comparative spatial analysis and transmission capacity

The comparative analysis examines how the spatial configurations of PW, YK, and YW support or constrain cultural transmission through the four criteria established in Section 3.2: visual permeability, acoustic performance, urban legibility, and transmission capacity. Evidence was cross-read from the approximate, not-to-scale, fieldwork-based plans and photographs in Figure 2, the contextual comparison in Table 4, site observations, field sketches, behavioral mapping, archival materials, and practitioner accounts. Each association was examined using the same criteria, while differences in institutional history, property condition, funding structure, audience profile, and operational role were retained as contextual variables rather than treated as controlled conditions. The comparison therefore does not assume that spatial form alone causes the inheritance crisis. Instead, it examines how access sequence, sightline continuity, acoustic conditions, rehearsal proximity, rehearsal–archive adjacency, altar orientation, storage, circulation, and backstage privacy mediate the effects of wider institutional and economic constraints. The findings are consequently presented as case-based architectural interpretations rather than as statistically generalizable or experimentally causal results.

Three recurrent spatial conditions emerged from the comparison. Calibrated porosity describes a condition in which public encounter, rehearsal, ritual, learning, and backstage preparation remain visually, acoustically, functionally, or socially connected while retaining necessary thresholds. Hermetic separation describes a condition in which these functions are isolated through concealed access, rigid boundaries, or reduced visual, acoustic, and functional contact. Compressed multifunctionality describes a condition in which multiple functions occupy a limited interior without sufficient hierarchy, circulation, storage, or threshold definition. These categories distinguish purposeful spatial connection from undifferentiated openness and necessary privacy from complete isolation. Within this framework, PW primarily demonstrates compressed multifunctionality combined with sustained ritual orientation; YK demonstrates civic monumentality and urban legibility alongside internal functional fragmentation; and YW demonstrates internal pedagogical porosity despite weak public discoverability.

Specifically, PW operates as a ritual guild and active practice space within a constrained upper-floor setting. Its limited street interface and entrance sequence require prior knowledge, reducing public visibility and incidental discovery and resulting in weak urban legibility. Figure 2 shows that the altar, rehearsal, teaching, storage, and circulation functions are concentrated within an approximately 8 m × 12 m interior. These functions remain partially visually connected, but their overlap and the limited internal hierarchy constrain sightline continuity and differentiated access, resulting in partial visual permeability. Internally, the close relationship between the altar and rehearsal area sustains a direct spatial connection between technical training and devotional practice. This co-presence allows ritual orientation to remain embedded in everyday rehearsal rather than being displaced into a separate ceremonial zone. However, the arrangement should not be interpreted as calibrated porosity. Teaching, rehearsal, ritual, storage, and circulation occupy the same limited interior without sufficient spatial hierarchy, producing compressed multifunctionality. Although several transmission-supporting functions remain connected, the overlap constrains circulation, storage, observation positions, and differentiated thresholds between learning, ritual, and backstage activities. PW therefore demonstrates partial transmission capacity.

Field observations also identified hard, reflective interior surfaces, reverberant conditions, and reliance on electronic amplification, indicating weak observed acoustic support for vocal clarity and percussive coordination. Because no calibrated sound-level, reverberation-time, or other engineering acoustic measurements were undertaken, this assessment should be understood as a qualitative architectural interpretation of the operating conditions encountered during the visits. Overall, PW demonstrates sustained ritual–practice continuity, but its transmission capacity is constrained by limited spatial hierarchy, weak acoustic support, inadequate storage, and restricted circulation. The case shows that functional co-occurrence can sustain living practice while simultaneously limiting the spatial conditions required for its longer-term transmission.

Meanwhile, YK functions as an institutional monument and archival custodian. Among the three cases, it possesses the strongest urban legibility, with its prominent Jalan Sultan frontage, identifiable façade, visible signage, and clearly recognizable street-facing

Table 2. Applied research paradigm

Research aim: To develop a framework of spatial inheritance by examining how the spatial configurations of active Cantonese opera associations in Kuala Lumpur support, limit, and transform cultural memory, embodied learning, and ritual practice within contemporary urban contexts.				
Research objective	**Research question**	**Research method**	**Data/Instrument**	**Analytical output**
To analyze how material traces and spatial configurations of historical and active opera venues shape collective cultural memory and public perception among Malaysian Chinese communities in Kuala Lumpur.	How do material traces and spatial configurations of historical and active Cantonese opera venues shape collective cultural memory and public perception among Malaysian Chinese communities in Kuala Lumpur?	Mixed qualitative and descriptive methods, including archival study, site observation, spatial documentation, practitioner interviews, and exploratory public questionnaire.	Archival photographs and documents; field observation notes; fieldwork photographs; annotated spatial plans; interview transcripts; bilingual public survey responses.	Descriptive interpretation of how collective cultural memory is sustained through archival traces, spatial remnants, oral recollections, ritual practices, public awareness, and the continuing or diminished visibility of Cantonese opera spaces in Kuala Lumpur.
To examine the mechanisms through which Cantonese opera spaces support intergenerational learning, civic pedagogy, and embodied knowledge transfer.	How do Cantonese opera spaces support or constrain intergenerational learning, civic pedagogy, and embodied knowledge transfer?	Qualitative case-study method using semi-structured practitioner interviews, rehearsal and teaching observations, documentation of backstage spatial conditions and ritual elements, and spatial–behavioral mapping.	Interview transcripts from senior performers, masters, apprentices, and association members; field notes from rehearsals and backstage routines; photographs of learning, rehearsal, and preparation spaces; annotated plans showing observation points, circulation, thresholds, and proximity between learners and practitioners.	Thematic and spatial interpretation of how apprenticeship, correction, observation, acoustic contact, backstage proximity, ritual access, and informal participation are supported or constrained by the spatial organization of Cantonese opera associations.
To derive evidence-based architectural principles from the comparative spatial analysis of three active associations—Pat Woh Association Malaysia (PW), Yan Keng Benevolent Dramatic Association (YK), and Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)—that can inform environments capable of sustaining Cantonese opera as living heritage through continued transmission.	What evidence-based architectural principles can be derived from the comparative spatial analysis of PW, YK, and YW to inform environments capable of sustaining Cantonese opera as living heritage through continued transmission?	Comparative case-study method using visual–spatial analysis, annotated architectural mapping, photographic documentation, archival interpretation, and cross-case synthesis.	Fieldwork-based annotated plans of PW, YK, and YW; site photographs; field sketches; spatial–behavioral observations; video and photographic archives; relevant films and visual records; interview findings; and comparative spatial assessment criteria.	Evidence-based architectural principles for sustaining Cantonese opera transmission, including civic visibility, entrance legibility, rehearsal–archive adjacency, acoustic intimacy, calibrated public-to-private thresholds, backstage privacy, altar orientation, flexible learning spaces, and integrated ritual, pedagogical, and public interfaces.

entrance. Figure 2 nevertheless shows that this strong civic presence does not automatically correspond with internal connectivity among the entrance hall, archival areas, main hall, rehearsal space, and other association functions. Internally, doors, partitions, inaccessible rooms, and vertical separation restrict sightlines between public-facing, archival, and active practice areas, resulting in limited visual permeability. The association's vertical and functional organization places commercial activity, association rooms, archive storage, and rehearsal functions in distinct spatial conditions. Its historical documents provide substantial institutional memory, but the archival materials were observed to be stored in fragmented, unlabeled, and non-climate-controlled conditions. Their separation from active rehearsal and learning areas limits opportunities for historical records to function as part of everyday teaching, interpretation, or public encounter.

Although a rehearsal was observed, the available evidence was insufficient to reliably assess the acoustic

Table 3. Triangulation of research questions, primary data sources, analytical procedures, and key findings

Research question	Primary data sources	Analytical procedures	Key findings
How do material traces and spatial configurations of historical and active Cantonese opera venues shape collective cultural memory and public perception among Malaysian Chinese communities in Kuala Lumpur?	Public survey responses; archival photographs and documents; fieldwork photographs; site mapping; annotated spatial plans; material traces observed during site visits; practitioner recollections.	Descriptive statistical analysis of survey responses; survey-site triangulation; archival comparison; visual analysis of photographs and material traces; morphological tracking of spatial change; assessment of urban legibility, street visibility, entrance legibility, and archive accessibility.	Historical markers and material traces remain symbolically important to cultural memory, but public familiarity with Cantonese opera is limited by fragmented archives, reduced street visibility, weak entrance legibility, and limited experiential access to active rehearsal, ritual, and performance spaces.
How do Cantonese opera spaces support or constrain intergenerational learning, civic pedagogy, and embodied knowledge transfer?	Semi-structured interviews with masters, apprentices, and association members; site observations of rehearsal and teaching activities; documentation of backstage spatial conditions and ritual elements; fieldwork photographs; annotated spatial plans; and spatial–behavioral field notes.	Thematic coding of practitioner interviews; spatial–behavioral mapping of observation, correction, circulation, and backstage proximity; assessment of visual permeability and acoustic conditions; cross-reading of fieldwork-based plans, photographs, field notes, and practitioner accounts.	Intergenerational learning is supported when spaces allow visual contact, acoustic coordination, backstage proximity, informal observation, and gradual access to ritual or rehearsal activities. However, rigidly separated venues can weaken these conditions, while excessively compressed multifunctional rooms can also constrain transmission when rehearsal, ritual, storage, and circulation overlap without legible thresholds or adequate spatial support.
What evidence-based architectural principles can be derived from the comparative spatial analysis of Pat Woh Association Malaysia (PW), Yan Keng Benevolent Dramatic Association (YK), and Yuet Wan Cantonese Opera Association Kuala Lumpur (YW) to inform environments capable of sustaining Cantonese opera as living heritage through continued transmission?	Comparative case-study data from PW, YK, and YW; practitioner interviews; fieldwork-based annotated plans; site photographs; field notes; archival materials; survey findings; spatial observation rubric.	Comparative spatial analysis using the observation rubric; cross-case comparison of visual permeability, acoustic performance, urban legibility, and transmission capacity; survey-site triangulation; assessment of relationships among ritual, rehearsal, and archive functions; architectural synthesis into spatial inheritance principles.	The three associations reveal different spatial strengths and constraints: PW sustains ritual continuity under spatial compression, YK preserves civic visibility and archival memory but has weak active transmission, and YW supports proximity-based learning despite limited public discoverability. These findings indicate the need for architectural principles that balance civic visibility, ritual privacy, archive access, acoustic intimacy, backstage thresholds, and flexible learning spaces.

conditions. Acoustic performance was therefore recorded as N/O rather than assigned a numerical score. This designation indicates insufficient evidence for assessment and should not be interpreted as evidence of absent or poor acoustic support. Overall, YK demonstrates strong civic visibility and archival depth but weak integration between institutional memory and active practice. Its public-facing areas, archive, and rehearsal functions remain spatially fragmented and weakly connected, resulting in limited transmission capacity. The case shows that civic monumentality and historical significance are not, by themselves, equivalent to spatial inheritance; their transmission value depends on stronger visual, functional, and pedagogical connections between archival material and everyday practice.

On the other hand, YW operates as a compact upper-floor teaching studio or micro-academy. Its concealed or visually understated access, narrow entrance sequence, and dependence on prior knowledge limit incidental discovery and result in weak urban legibility. Figure 2 shows the contrast between this restricted public discoverability and the spatial intimacy of the principal rehearsal and teaching environment. Within the studio, the limited use of physical barriers creates strong internal sightline continuity. Learners remain in proximity to masters, rehearsal activities, demonstrations, corrections, and informal observation, resulting in strong visual permeability. This compact arrangement supports the proximity-based learning central to osmotic transmission by enabling learners to watch, listen, imitate, and receive direct correction within a shared teaching environment. YW therefore demonstrates that an enclosed upper-floor studio is not necessarily hermetic when visual contact, participation, and pedagogical interaction remain spatially supported. This internal openness is nevertheless moderated by the need for backstage and ritual privacy.

Table 4. Contextual and spatial variables informing the comparative analysis of the three case-study associations

Variable category	Pat Woh Association Malaysia (PW)	Yan Keng Benevolent Dramatic Association (YK)	Yuet Wan Cantonese Opera Association Kuala Lumpur (YW)
Architectural identity	Ritual guild and practice space	Institutional monument and archival custodian	Small-scale teaching studio/micro-academy
Primary typology	Altar-oriented guild space where training occurs near ritual space	Vertical stratification: commercial retail at ground level and private association space above	Glass-walled or compact studio within a shophouse setting
Building age (years)	58	106	17
Property rights/ Tenure condition	Shared	Owned	Rented
Income model/ Operating funds	Community micro-funding, "pink slip" donations, and co-tenancy savings	Commercial rent and banquet donations	Low-cost, passion-driven, self-funded membership model
Target audience	Professional musicians, traditional masters, and devotees	Elderly members, banquet guests, and façade-oriented tourists	Gen Y/Z hobbyists and English-educated beginners
Visual permeability	Partial visual connection among the altar, rehearsal, storage, circulation, and teaching areas, but the overlap of functions and limited interior hierarchy constrain sightline continuity and differentiated access; score: 2	Limited internal visual connection among the entrance hall, archival areas, main hall, rehearsal space, and other association functions; doors, partitions, inaccessible rooms, and vertical separation restrict sightlines; score: 1	Strong internal sightline continuity within the compact rehearsal and teaching environment, allowing learners to observe masters, demonstrations, and corrections with few physical barriers; score: 3
Acoustic performance	Hard, reflective interior surfaces, excessive reverberation, and reliance on electronic amplification indicate weak observed acoustic support for vocal clarity and percussive coordination; score: 1	A rehearsal was observed, but the acoustic conditions could not be assessed sufficiently during the visit; assessment: N/O	External noise was audible during the observed rehearsal because of limited physical separation from adjacent spaces, constraining vocal and percussive audibility and indicating weak observed acoustic support; score: 1
Urban legibility	Limited street interface and an upper-floor entrance that requires prior knowledge reduce public visibility and incidental discovery; score: 1	Strong street-facing civic presence, identifiable façade, visible signage, and a clearly recognizable entrance provide high urban legibility; score: 3	Concealed or visually understated upper-floor access and a narrow entrance sequence require prior knowledge and limit incidental public discovery; score: 1
Transmission capacity	Ritual and rehearsal remain spatially connected, but compressed multifunctionality constrains circulation, storage, observation, and differentiated thresholds; several transmission-supporting functions are present and partially connected; score: 2	Institutional and archival memory are substantial, but the archive, public-facing areas, and active rehearsal functions remain spatially fragmented and weakly integrated; score: 1	Rehearsal and teaching are closely integrated, supporting observation, demonstration, correction, and proximity-based learning, while backstage knowledge remains protected through controlled thresholds; however, the full range of ritual, archive, storage, and public functions is not shown to be fully integrated; score: 2
Dominant spatial condition	Compressed multifunctionality with sustained ritual orientation	Civic monumentality with internal functional fragmentation	Internal pedagogical porosity with external urban concealment
Principal strength	Ritual–practice continuity	Civic visibility and archival depth	Learning proximity and direct correction
Principal constraint	Infrastructural, acoustic, storage, and circulation limitations	Weak integration between the archive and active transmission	Weak public discoverability and ambient recruitment

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Mdm. Yeung explained: "How can you let outsiders see what we are doing? These things are private." The finding indicates that transmission does not require unrestricted visibility. Instead, it depends on controlled thresholds that permit observation, demonstration, correction, and gradual participation while protecting dressing, backstage preparation, and other forms of restricted knowledge. Rehearsal and teaching are therefore closely integrated, but the full range of ritual, archive, storage, public, and backstage functions is not fully connected, resulting in partial transmission capacity.

External noise was audible during the observed rehearsal because of the limited physical separation between the rehearsal area and adjacent spaces. This interference constrained vocal and percussive audibility and indicated weak observed acoustic support. Because no calibrated sound-level, reverberation-time, or other engineering acoustic measurements were undertaken, this assessment should be understood as a qualitative interpretation of the operating conditions encountered during the visit. Overall, YW demonstrates strong internal visual and pedagogical connectivity but weak urban legibility and public discoverability. Its principal strength lies in learning proximity and direct correction, while its principal constraint lies in its concealed relationship with the surrounding urban environment and the incomplete integration of ritual, archive, storage, backstage, and public functions.

The cross-case comparison shows that no association performs strongly across all four spatial criteria. YK provides the strongest urban legibility and institutional presence but does not fully integrate archival memory with active rehearsal and learning. YW provides the strongest internal visual and pedagogical proximity but remains difficult to discover from the street. PW maintains the most direct co-occurrence of ritual and everyday practice but does so under compressed conditions that constrain circulation, storage, visual organization, and acoustic support. Transmission capacity therefore depends neither on openness nor enclosure alone. It emerges from the relationship among external legibility, internal visual and acoustic connections, functional adjacency, and calibrated thresholds protecting ritual and backstage knowledge. These findings provide the empirical basis for the architectural interpretation developed in Section 5.

4.2. Public perception and urban accessibility

Among the 131 survey respondents, 77.1 percent were aged 18–25 (n = 101/131), indicating that the respondents were concentrated among younger, digitally active Chinese Malaysians. This demographic concentration reflects the convenience-sampling and online-distribution limitations explained in Section 3.3. The findings are therefore interpreted as exploratory patterns within the respondent group rather than as representative public-opinion data. They are cross-read with the spatial characteristics of the three case-study associations, particularly street visibility, entrance legibility, access sequence, public interface, and the relationship among rehearsal, ritual, storage, and public encounter spaces, as summarized in Table 5.

Within this limited respondent group, the survey suggests a contrast between support for preservation and limited reported experience of Cantonese opera. Among the respondents, 82.4 percent (n = 108/131) agreed that Cantonese opera should be preserved, while 44.3 percent (n = 58/131) reported having attended or watched a Cantonese opera performance. A separate multiple-response item asked respondents where they first learned about Cantonese opera. Film and television were selected by 56.5 percent of respondents (n = 74/131) as one source of initial exposure. Because respondents could select more than one option, this percentage should not be interpreted as identifying a single primary source of cultural contact. Community events were selected by 14.5 percent of respondents (n = 19/131) as one source of initial exposure. These findings should be interpreted cautiously because the sample is demographically skewed. Nevertheless, they suggest that mediated formats formed one important route of exposure among this online respondent group. This pattern corresponds with the site observations showing that active practice is frequently located in upper-floor rooms, enclosed interiors, or association spaces that require prior knowledge to locate, thereby limiting incidental street-level encounters.

Respondents also identified several barriers to engagement. For the multi-select question on barriers to attending Cantonese opera performances, 55.7 percent (n = 73/131) cited lack of information, 47.3 percent (n = 62/131) cited lack of time, 36.6 percent (n = 48/131) cited language barriers, and 27.5 percent (n = 36/131) cited accessibility issues (Figure 3). These responses do not prove a direct causal relationship between individual respondents and specific sites, because the questionnaire did not require respondents to evaluate PW, YK, and YW separately. However, they correspond analytically with the observed spatial conditions of the case studies. PW's limited street interface and constrained interior reduce public visibility. YK's stronger façade presence is weakened by the limited integration between public-facing space, archival material, and active rehearsal. YW's concealed upper-floor access limits incidental discovery. The questionnaire data therefore support the spatial

Table 5. Survey-site triangulation matrix linking questionnaire findings with observed spatial characteristics

Questionnaire finding	Spatial issue indicated	Corresponding site evidence	Architectural implication
82.4% of respondents agreed that Cantonese opera should be preserved	Symbolic support exists despite limited everyday encounters	The three associations retain cultural value, but their active transmission spaces are unevenly visible to the public	Preservation strategies should move beyond symbolic recognition toward accessible spaces for rehearsal, archive, and public learning
Only 44.3% reported direct live experience	Limited direct spatial encounter with the art form	Active practice is concentrated in association interiors, upper-floor rooms, or constrained guild spaces rather than highly visible public settings	Design strategies should increase opportunities for low-threshold public encounters with live practice
56.5% identified film and television as their primary source of exposure	Mediated exposure substitutes for direct urban encounter	The absence of regular street-facing performance or visible rehearsal reduces ambient public familiarity	Digital outreach should be linked to physical spaces that guide audiences toward live rehearsals, workshops, and association visits
55.7% cited "lack of information" as a barrier	Weak public communication and reduced urban legibility	YW's concealed access sequence and PW's limited street interface make discovery dependent on prior knowledge; YK's façade presence does not automatically translate into visible active practice	Clear signage, public-facing displays, street-level information, and visible program interfaces are needed
27.5% cited accessibility issues	Access sequence and entry thresholds affect participation	Upper-floor access, narrow staircases, unclear entrances, and spatial compression reduce ease of entry and observation	Future adaptive reuse should address entrance clarity, circulation, universal access, and public-to-semi-public transition spaces
Low live attendance compared with support for preservation	Preservation is valued, but participation pathways are weak	Rehearsal, ritual, storage, and archive functions are often separated from public encounter	A spatial inheritance framework should connect civic visibility, learning spaces, archives, and ritual thresholds within a coherent public-to-private gradient

Abbreviations: PW: Pat Woh Association Malaysia; YK: Yan Keng Benevolent Dramatic Association; YW: Yuet Wan Cantonese Opera Association Kuala Lumpur.

analysis as exploratory triangulating evidence rather than as independent statistical proof.

4.3. Archival and interview evidence of typological displacement

Archival analysis and practitioner interviews corroborate that this spatial invisibility is the result of a century-long typological displacement. As a senior practitioner informant affiliated with PW, Mr. Lawrence Wong recalled that, during the 1950s Rediffusion era, the acoustic presence of opera permeated open-fronted coffee shops and facilitated ambient, uninstructed learning among local youth. The exploratory survey provides partial support for this interpretation. Among the 131 respondents, 55.7 percent (n = 73/131) identified "lack of information" as a barrier to engagement, while 47.3 percent (n = 62/131) cited "lack of time." These barriers should be understood not only as communication problems, but also as indicators of reduced spatial visibility. When an art form is no longer encountered in public space, it becomes dependent on intentional searching, prior knowledge, or mediated exposure.

Figure 4 visualizes this typological displacement by juxtaposing an archival photograph of a Cantonese opera performance in a teahouse setting with PW's 2025 state-sponsored performance at Kuala Lumpur Performing Arts Centre (KLPAC). This comparison shows a shift from socially embedded performance environments to formal institutional venues, where Cantonese opera is increasingly framed as a staged cultural event rather than an everyday ritual practice. This shift is most clearly expressed in the modern proscenium theater, which introduces a typological mismatch with Cantonese staging conventions. Mr. Yang explicitly criticized the enclosed configuration of Western-style theaters, noting that steeply raked seating distorts the two-dimensional perspectival logic inherent to Cantonese staging. More critically, recessing the orchestra into a concealed pit can reduce the visual permeability required between musicians and actors, weakening rhythmic coordination. To properly support embodied

practice, venues must supply flat or shallow-raked audience floors and highly visible downstage musician alcoves. This suggests that institutional recognition may sometimes place vernacular heritage within architectural settings that do not fully support its spatial and performative requirements.

4.4. Practitioner adaptation and digital outreach preferences

Despite spatial and economic constraints, practitioners continue to adapt their modes of teaching, outreach, and engagement. Interview data indicate that the traditional full-time *shifu–tudi* framework is increasingly difficult to sustain under contemporary economic conditions. Practitioners reported limited performance opportunities and irregular working patterns, which affect the viability of continuous full-time training. Younger participants also emphasized the need to reduce barriers for new learners who may be attracted to the visual and performative aspects of Cantonese opera but remain unfamiliar with its ritual protocols and technical discipline.

The survey findings support the importance of outreach strategies that connect contemporary audiences to embodied practice. Respondents most frequently endorsed interventions involving digital media and short-form video, with 74.8 percent (n = 98/131) supporting these strategies. These preferences suggest that digital platforms can function as entry points for awareness and recruitment. However, interview evidence also indicates that digital exposure alone cannot replace physical rehearsal, backstage observation, costume handling, ritual preparation, and direct contact with masters and musicians.

The empirical findings therefore show two parallel needs. First, Cantonese opera associations require physical spaces that can sustain rehearsal, ritual practice, storage, teaching, and informal social exchange. Second, they require outreach mechanisms that connect younger audiences to those physical spaces. The architectural implications of this relationship between digital visibility and embodied practice are interpreted further in Section 5.

5. Discussion

The preceding section reported the empirical patterns identified through spatial mapping, practitioner interviews, archival analysis, and the public perception survey. This section interprets those findings through cultural memory theory, embodied transmission, and architectural typology. In doing so, it relocates the conceptual implications of the findings from description to analysis: survey evidence is interpreted in relation to memory transmission, site observations are examined as typological conditions, and practitioner adaptations are developed into the proposed spatial inheritance framework.

The spatial inheritance framework should therefore be read as a synthesis of literature positioning, concept

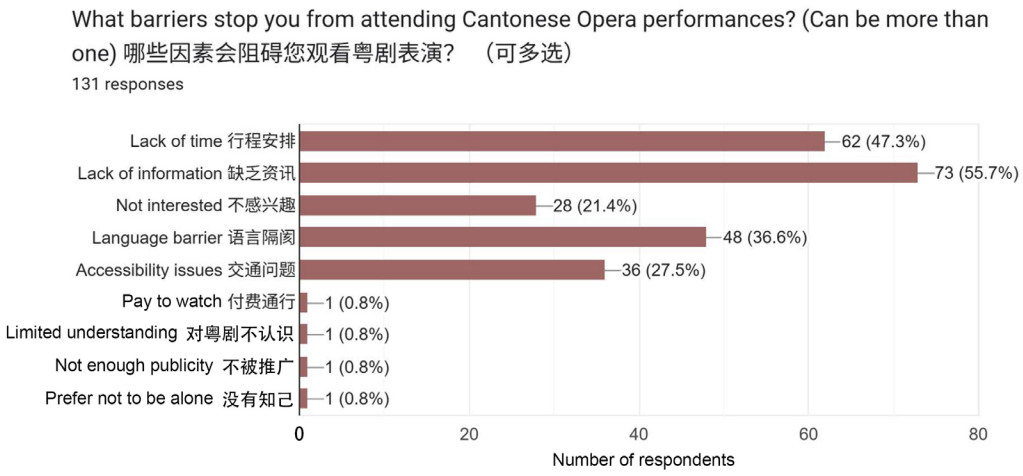


Figure 3. Respondent-reported barriers to attending Cantonese opera performances. The chart presents the question and responses from the exploratory bilingual public-perception survey (N = 131). Multiple responses were permitted; therefore, the combined percentages exceed 100 percent. Source: Chart by the authors



Figure 4. Typological displacement of Cantonese opera performance environments. (A) Archival photograph of a Cantonese opera performance in a teahouse setting; location, date, and photographer unknown. (B) PW's 2025 state-sponsored performance at the Kuala Lumpur Performing Arts Centre (KLPAC). Sources: (A) YK archive, reproduced with permission from YK; (B) Photograph by the authors (2025)
Abbreviations: PW: Pat Woh Association Malaysia; YK: Yan Keng Benevolent Dramatic Association.

clarification, and empirical case-study evidence. It builds on historical studies of Cantonese opera spaces by identifying which spatial logics remain relevant to contemporary transmission. It builds on scholarship on overseas Chinese associations by examining how active guilds and associations function as learning, ritual, archival, and civic infrastructures. It also builds on intangible cultural heritage and theater-design discourse by shifting attention from display and formal performance to the spatial conditions of everyday practice. The framework's originality lies in bringing these strands together through the three Kuala Lumpur case studies and translating them into architectural principles for living transmission.

Assmann's (2011) distinction between communicative memory, understood as living and everyday transmission, and cultural memory, understood as institutionalized preservation, provides the primary analytical lens. Within the exploratory respondent group, 44.3 percent reported having attended or watched a Cantonese opera performance, while 56.5 percent selected film and television as the source through which they first learned about the art form. Because the exposure question permitted multiple responses, these findings do not establish a single primary mode of cultural contact. They nevertheless indicate that mediated formats constituted an important route of exposure among this predominantly younger online sample. This pattern is consistent with a possible shift from direct, enacted encounters toward represented or mediated forms of cultural memory, although it should not be treated as representative of the wider Kuala Lumpur public.

Assmann's (2011) framework suggests that such a shift is not necessarily detrimental where adequate institutional infrastructure supports both preservation and continued practice. However, the three case studies indicate that existing association spaces in Kuala Lumpur face difficulties in accommodating living transmission alongside archival preservation and public engagement. Archival deterioration at YK and fragmented digital repositories at PW illustrate the limited spatial and organizational integration of memory resources with everyday practice. This study therefore extends Assmann's framework cautiously by proposing that the relationship between communicative and cultural memory is spatially mediated within the three case-study associations. Although historical association halls supported living practice, their present configurations may not fully accommodate the archival, pedagogical, and public-interface functions increasingly required for heritage continuity.

The findings also refine Connerton's (1989) theory of the incorporation of practices, which posits that social memory is inscribed through habitual bodily performance, by exposing its lack of spatial specificity. While the practitioner interviews support the embodied nature of Cantonese opera learning, the small interview cohort means that these findings should be read as specialist testimony rather than comprehensive evidence for all practitioners. Within this limitation, the data suggest that embodied transmission depends on identifiable spatial supports, including observation areas, acoustic contact, backstage access, storage, ritual thresholds, and opportunities for prolonged participation. Relying on electronic amplification in contemporary, acoustically compromised venues degrades the rhythmic knowledge historically acquired on organically resonant bamboo stages (W. Lin *et al.*, 2025). Furthermore, while Lave and Wenger's (1991) theory of legitimate peripheral participation accurately characterizes historical apprenticeships, empirical findings reveal this interpretation requires further architectural qualification when divorced from material constraints. Peripheral participation depends on specific architectural affordances: graduated spatial boundaries and programmatic capacity for prolonged occupation. Malaysian practitioners operate within a volunteer-driven, amateur context, highlighting community resilience. Architectural interventions must support this resilience by providing flexible, community-resourced spatial solutions rather than imposing rigid conservatory models (Bakri *et al.*, 2023; Zhu *et al.*, 2025).

The survey findings reported in Section 4.2 indicate that public support for preservation does not automatically translate into direct cultural participation. The high level of symbolic endorsement, combined with low live attendance and heavy reliance on mediated exposure, suggests a shift from proximate encounter toward represented cultural memory. This does not mean that mediated formats are inherently detrimental. Rather, the findings show that mediation becomes problematic when it is not connected to accessible physical spaces where practice can be encountered, rehearsed, and transmitted. The theoretical issue is therefore not a simple opposition between live and digital culture, but the architectural disconnection between mediated awareness and embodied participation.

These theoretical insights are further clarified through the comparative analysis of the three associations, which suggests how specific architectural configurations may facilitate or constrain knowledge transfer within the bounded scope of the selected case studies. The distinction between open and enclosed spatial conditions is therefore grounded in the documented relationship among façades, entrances, doors, windows, circulation routes, rehearsal areas, altars, backstage or storage zones, and observed obstructions, rather than in typological description alone. YK operates as an institutional monument, aligning with

Lefebvre's (1991) concept of representational space. Its civic permanence is mobilized primarily for institutional self-representation rather than for active pedagogy. The case evidence suggests a misalignment between YK's authoritative exterior and its interior operational reality, shaped by passive storage functions and structural constraints. Conversely, YW functions as a micro-academy, prioritizing proximity over representation. Its compressed floor plan reflects the intimate environment of traditional apprenticeship but reduces the graduated boundaries essential for sequential learner induction. Furthermore, its concealed upper-floor location may limit incidental discovery and reduce opportunities for ambient youth engagement. YW successfully sustains proximity-based learning but inadvertently suppresses the spatial complexity and urban legibility required to recruit new practitioners.

Meanwhile, PW exemplifies the multi-purpose guild, sustaining active practice out of necessity despite acute spatial deficits. Its operational burdens include acoustic distortion and programmatic overload, both of which are material consequences of chronic under-resourcing, yet its altar-facing practice space documents a fusion of ritual and pedagogy that purpose-built proscenium venues cannot reproduce. The relationship between vernacular practice and state institutions reveals further structural tensions. The 2025 performance at KLPAC highlights a significant typological mismatch. Our study does not claim that the Western-style enclosed theater is the sole cause of the transmission crisis. Rather, it argues that enclosed or spatially fragmented arrangements can weaken particular transmission conditions when they separate learners from rehearsal, backstage preparation, ritual orientation, acoustic cues, or informal observation. State recognition is often expressed through formal theater venues that may not fully support the spatial requirements of Cantonese opera transmission. Deep thrusts, steep rakes, and concealed orchestra pits are structurally incompatible with the flat-floor conventions of Cantonese staging. The visual placement of musicians is important for rhythmic coordination. When the state measures cultural value against dominant institutional standards rather than the community's endogenous spatial logic, it inadvertently compromises the performance, suggesting that spatial design should align closely with vernacular requirements.

The analysis therefore suggests that spatial form is not an isolated cause of the transmission crisis, but a mediating condition through which institutional, financial, ritual, and audience-related constraints become materially visible. For this reason, the proposed spatial inheritance framework should be read as an architectural response to interacting constraints rather than as a claim that redesigned space alone can resolve all problems of cultural transmission. It should also be understood as a case-based model derived from drawings, field observations, photographs, and practitioner testimony, rather than as a universal causal model of all Cantonese opera venues. The questionnaire findings informed the design framework only after being cross-read with the spatial characteristics of the three case-study sites. Reported barriers concerning information, accessibility, mediated exposure, and limited live attendance were therefore translated into architectural concerns about street visibility, entry sequence, public interface, archive access, and the connection between rehearsal and public encounter.

Spatial inheritance is therefore not used in this study to indicate the simple continuation of historical spatial form. A building may preserve an inherited façade, archive, or institutional memory without sustaining the spatial relationships needed for living practice. Conversely, a modest adapted interior may contribute to spatial inheritance if it enables observation, correction, acoustic contact, ritual orientation, and intergenerational participation. Spatial inheritance refers to the capacity of built conditions to carry cultural knowledge across generations by linking memory, pedagogy, ritual, and public encounter.

To synthesize these findings and address these typological deficits, this study advances the Civic Stage and Apprenticeship Chamber framework as a spatial strategy derived from fieldwork evidence rather than from diagrammatic abstraction alone. At the center of this proposed model is a public civic stage connected to the street edge, functioning as the first point of encounter between the association and the urban public. Surrounding it are semi-public studio zones that allow rehearsal and learning to remain visible without removing all boundaries between observers and practitioners. Figure 5 shows this relationship through sightlines, observation points, and a circulation loop linking the public stage, studio spaces, service areas, and informal social spaces. The intention is not to make all activities fully transparent, but to create controlled visibility that can support curiosity, learning, and gradual participation while preserving the functional zoning required for rigorous apprenticeship.

The circulation loop further links pedagogical zones with communal infrastructure, such as services and pantry areas. As established in the empirical findings, everyday commensality and informal socialization, including sharing meals, preparing costumes, and informal conversations before or after rehearsal, are important mechanisms for transmitting the tacit, moral, and social

dimensions of Cantonese opera. By connecting these utilitarian spaces to the studio and public interface, the architectural layout encourages incidental encounters among masters, apprentices, practitioners, and visitors. It prevents the isolation of individual training spaces and instead supports a cohesive micro-academy ecosystem. Ultimately, the diagram suggests that sustainable heritage architecture must balance public visual permeability with controlled thresholds, social interaction, and protected spaces for embodied learning.

However, the uncritical equation of transparency with pedagogical value is complicated by the empirical data. Mdm. Yeung's insistence on the privacy of the backstage dressing space challenges the assumption that removing barriers between observers and performers invariably accelerates learning. The prohibition against photographing the altar and backstage areas identifies a category of spatial experience in which restricted access is part of ritual practice. The gradual disclosure of backstage knowledge structures the learner's relationship to the practice through a sequence of earned revelations.

Figure 6 develops the Sacred Sanctum as a spatial sequence rather than a purely symbolic label. It shows how a visitor or apprentice moves from the back-of-house edge of the association into an increasingly regulated ritual and backstage zones. The altar forms the moral and devotional center of the plan, while rehearsal areas remain connected to this ritual core so that technical training is not separated from devotional orientation. Backstage preparation and costume handling are placed beyond a controlled threshold, reflecting the need to protect ritual privacy while still allowing learners to progress gradually into more restricted areas.

Crossing this threshold, the sacred domain becomes the internalized core of the architectural program, organizing the spatial hierarchy of the practice. The altar physically embeds technical training within a moral and devotional framework, reinforcing the historical reality that the patron deity remains the first audience (Hu, 2014). Rehearsal areas sustain the acoustic and visual intimacy necessary for osmotic, proximity-based learning. Finally, protected backstage access denotes the restricted zones where novices encounter ritual knowledge through gradual initiation away from public view. Together, the choreography of offering, preparation, rehearsal, and performance constructs the Sacred Sanctum within the practice environment.

The practitioner and survey evidence reported in Section 4.4 clarifies the role of digital media within the spatial inheritance framework. Digital platforms may serve as recruitment catalysts, particularly for younger audiences who first encounter Cantonese opera through film, television, short-form video, or online circulation (Cheng & Leung, 2020; N. Liu *et al.*, 2023; Oe *et al.*, 2026). However, the interviews also show that ritual preparation, vocal discipline, percussive coordination, costume handling, and apprenticeship require physical co-presence. The proposed "phygital" strategy should therefore be understood not as a replacement for embodied transmission, but as a bridge between mediated curiosity and spatial participation.

The phygital framework extends the fieldwork findings by connecting digital outreach to the physical spaces where embodied learning, costume handling, rehearsal, and ritual preparation occur. Architecturally, this requires physical practice environments that can accommodate digital outreach without displacing embodied learning. Figure 7 clarifies the spatial role of phygital integration by positioning digital media as an entry point that can attract new audiences and learners. This digital point of entry then leads to physical zones where rehearsal, costume handling, archive access, teaching, and ritual preparation occur. The framework therefore does not treat digital engagement as a replacement for embodied learning. Instead, it shows how media production, public outreach, and physical practice can be organized within the same architectural system.

Phygital integration is one component of the broader spatial inheritance framework, which synthesizes fieldwork photographs, spatial mapping, archival materials, practitioner interviews, and survey findings. It should therefore be understood as an evidence-based interpretation of documented site conditions rather than as a purely speculative diagram. Figure 8 consolidates the proposed architectural interventions and positions Cantonese opera not as an art form that can be sustained by a conventional theater, a static archive, or an isolated rehearsal room alone, but as a cultural ecosystem requiring multiple spatial conditions to operate together.

The spatial inheritance framework translates the empirical findings into a layered architectural model. The civic layer forms the public interface through street-level visibility, exhibition, and performance, allowing Cantonese opera to regain visibility in everyday urban life rather than remain hidden in upper-floor rooms or in enclosed institutional spaces. The pedagogical layer connects archive, studio, rehearsal, and observation spaces so that learning remains linked to material memory and everyday practice, rather than being separated as static display or as inactive storage. The ritual layer protects altar space, backstage preparation, and controlled access to sacred activities. Together, these layers form a public-to-private gradient that balances civic encounter, embodied learning, and ritual privacy.

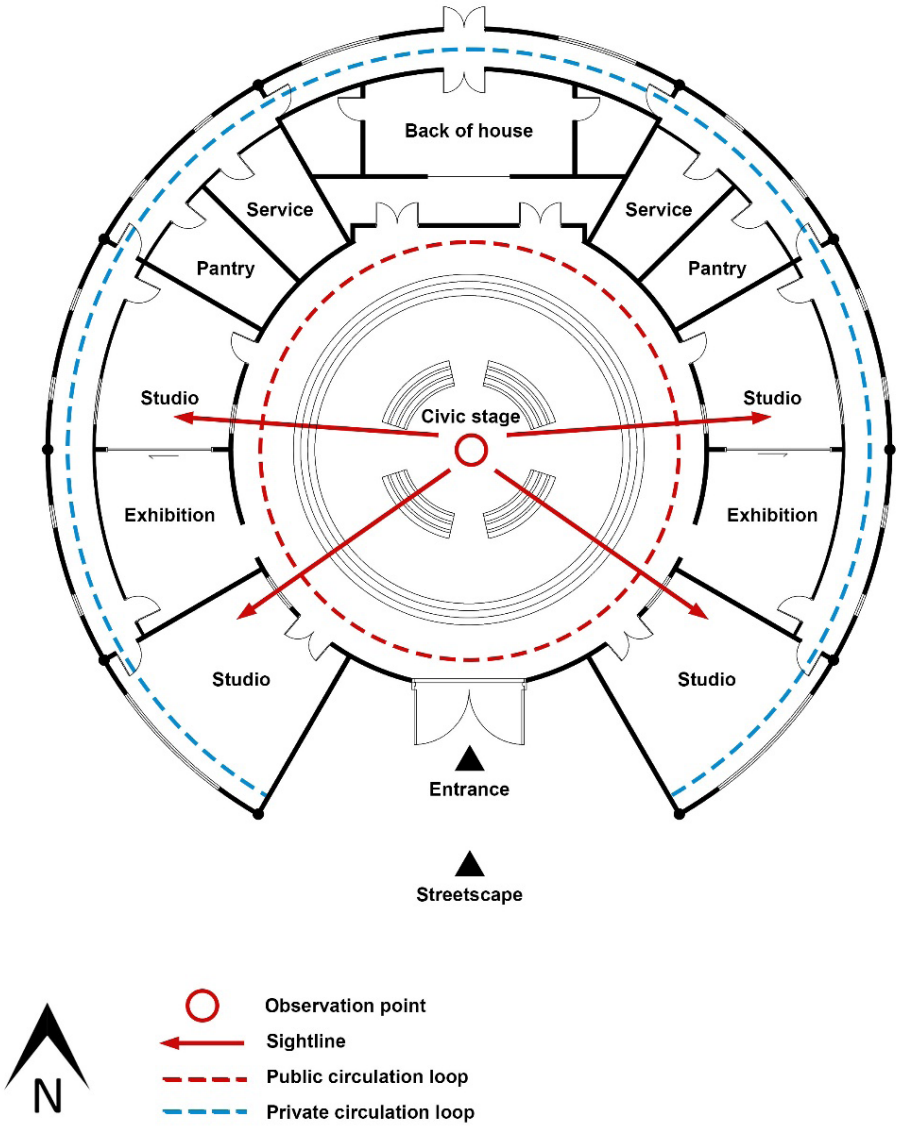


Figure 5. The Civic Stage and Apprenticeship Chamber framework showing the street interface, public civic stage, semi-public studio zones, public and private circulation loops, observation point, and sightlines between public encounter and studio spaces. The diagram presents an architectural synthesis derived from the case-study observations, including the street-frontage, rehearsal-visibility, access, and interior-learning conditions documented in Figures 1 and 2. Source: Drawing by the authors

To operationalize these layers, the framework draws from three spatial logics derived from the comparative case studies: the Civic Stage, the Apprenticeship Chamber, and the Sacred Sanctum. The Civic Stage, derived from the civic monumentality of YK, denotes an outward-facing platform for cultural encounter, public recognition, and urban legitimacy. It emphasizes the need for Cantonese opera to remain visible in everyday civic life, while also cautioning that monumentality alone is insufficient if historical presence is detached from active pedagogy. The Apprenticeship Chamber, derived from the pedagogical intimacy of YW, represents the spatial conditions for observation, correction, rehearsal, and proximity-based learning. It translates the value of close *shifu–tudi* interaction into an architectural logic of archive–studio adjacency, acoustic intimacy, and graduated access. The Sacred Sanctum, derived from the ritual continuity of PW, captures the socio-ritual organization of the practice, where altar orientation, backstage preparation, storage, teaching, rehearsal, and communal exchange remain interconnected.

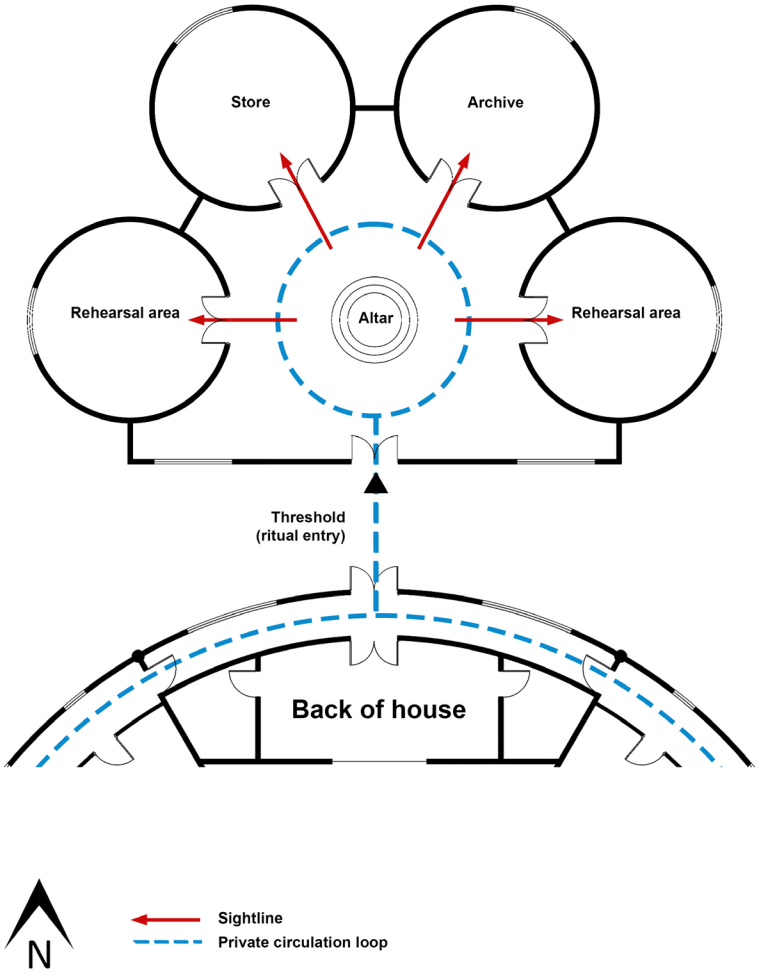


Figure 6. Sacred Sanctum framework showing the sequence from the Civic Stage's back-of-house area through the ritual threshold to the altar, rehearsal areas, and protected backstage-preparation zone. The diagram identifies graduated access, controlled ritual boundaries, and the relationship between devotional orientation, rehearsal, costume handling, and backstage privacy. Source: Drawing by the authors

Together, these three spatial logics synthesize the civic, pedagogical, and ritual lessons of the case studies into a cohesive architectural proposition. Its aim is not to reproduce historical forms literally, but to translate their operative spatial principles—civic legibility, archive–studio adjacency, acoustic intimacy, protected ritual thresholds, and layered programmatic access—into contemporary conditions for Cantonese opera transmission.

Ultimately, this spatial inheritance framework operates as a grounded architectural proposition derived specifically from the Kuala Lumpur context, rather than as a universal preservation formula. The findings should therefore be read in light of several methodological limitations. The survey design limits the breadth of the study's claims about public perception. The questionnaire was distributed online through Google Forms and relied on convenience sampling. As a result, the respondent pool was skewed toward younger, digitally active Chinese Malaysians, while middle-aged, elderly, and non-Chinese local respondents were either absent or insufficiently represented. The study also did not include offline street-interception surveys, on-site audience surveys, and community-based paper distribution through associations, temples, or heritage venues. Because the sample lacked adequate demographic balance, stratified correction and robust group-comparison analysis were not conducted. The survey findings are therefore used as exploratory evidence to triangulate

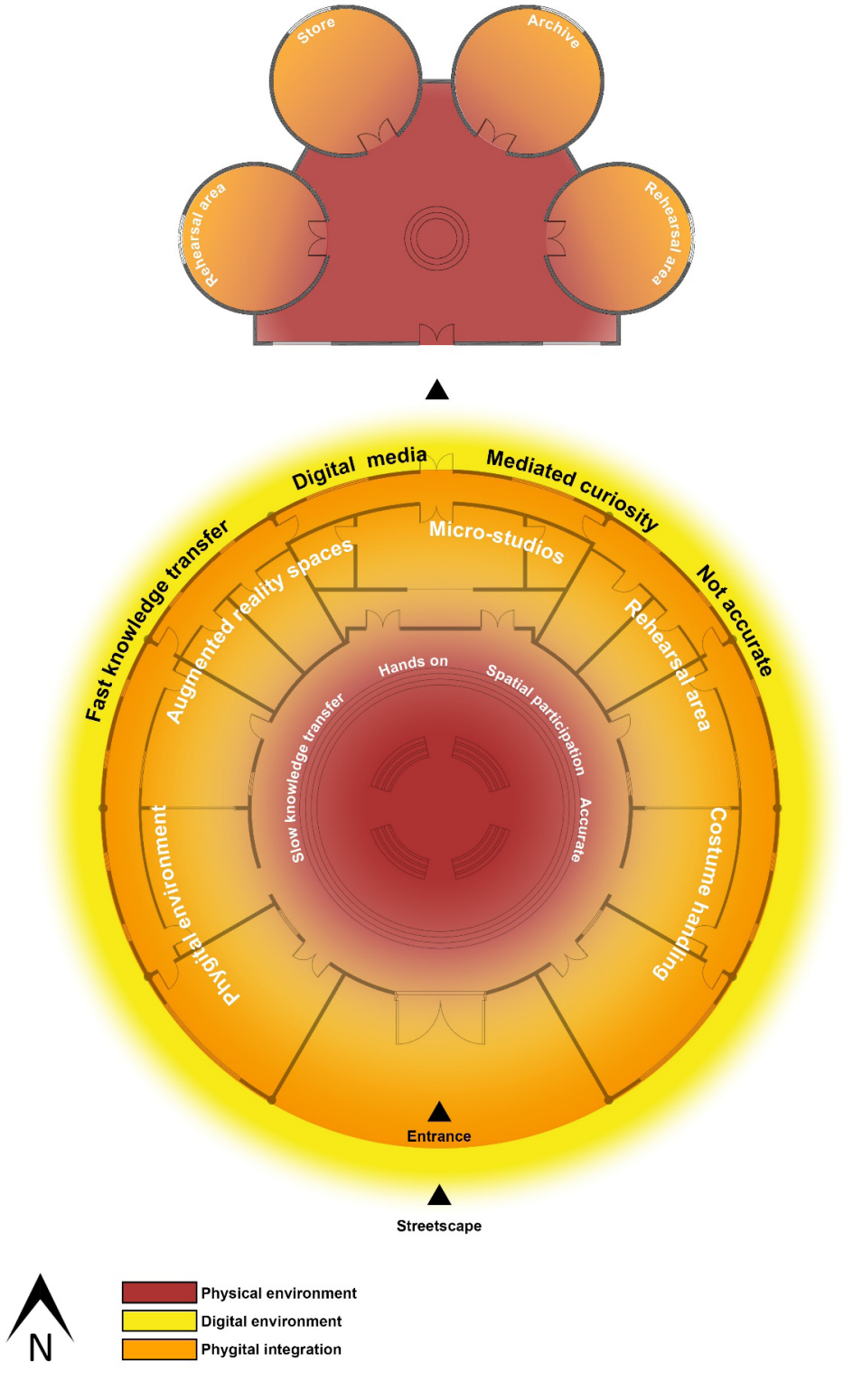


Figure 7. Phygital integration framework showing the spatial relationship among digital outreach, the public interface, micro-studios, rehearsal areas, archive access, costume handling, and embodied learning. Digital engagement is presented as an entry point to physical participation rather than as a substitute for practice. Source: Drawing by the authors

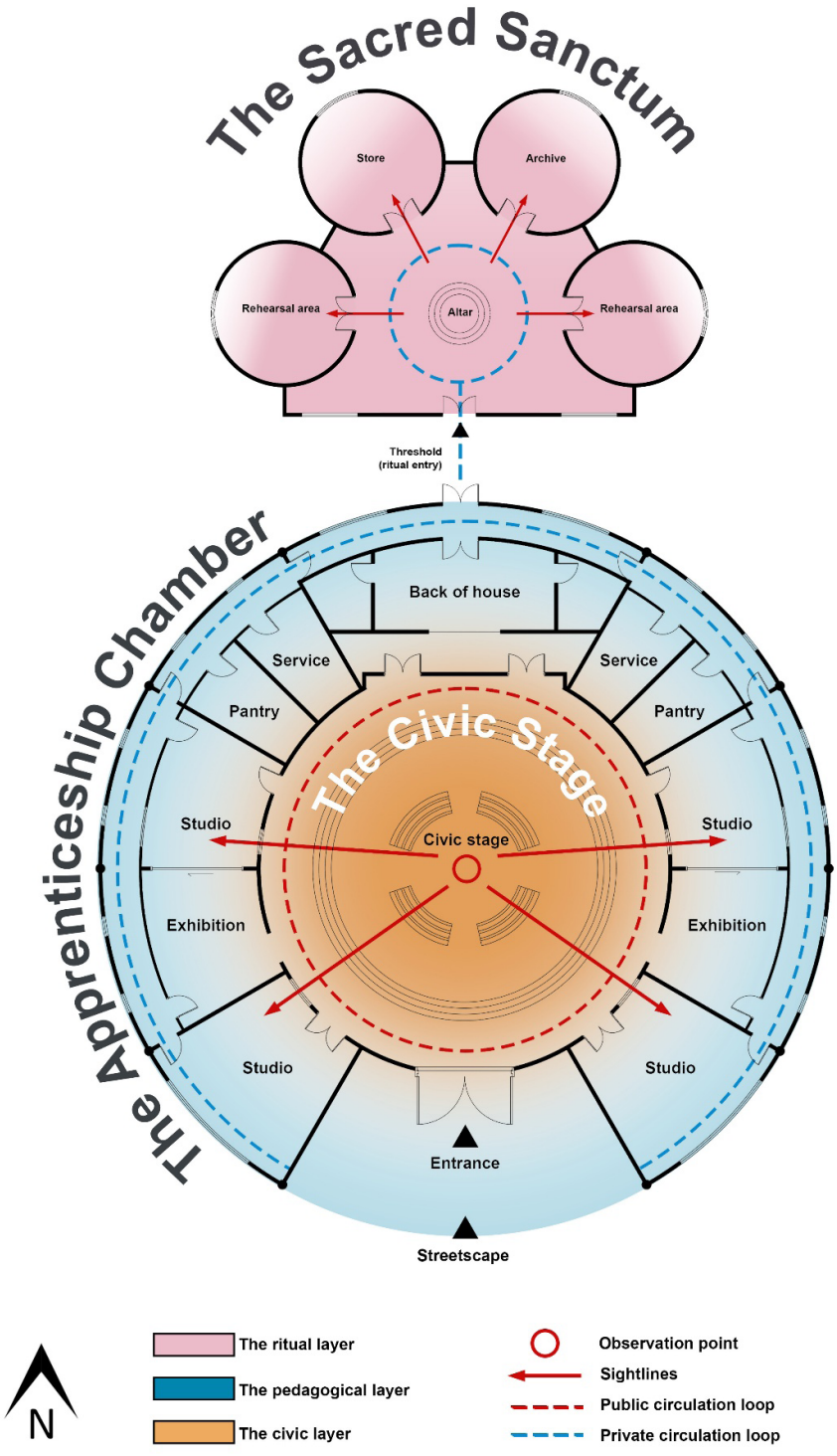


Figure 8. Spatial inheritance framework showing the public-to-private relationship among the civic, pedagogical, and ritual layers of Cantonese opera heritage space. The framework identifies street-facing civic functions, semi-public learning and archive spaces, controlled rehearsal zones, and protected ritual or backstage spaces. It synthesizes the architectural relationships documented through the three case studies into a model for living cultural transmission. Source: Drawing by the authors

spatial observations, not as representative evidence of public opinion across Kuala Lumpur.

The interview component was also based on a small purposive cohort of four practitioners and was predominantly male. Although the cohort provided specialist insight into historical memory, music transmission, pedagogy, gendered space, and youth apprenticeship, it does not constitute a saturated sample of all stakeholders involved in Cantonese opera spaces. The study includes only one female mentor and does not include separate qualitative interviews with younger apprentices below 30, ordinary theatergoers, clubhouse or property managers, theater managers, heritage officers, or urban planning managers. As a result, the arguments concerning spatial inheritance, mentorship, ritual privacy, and open or enclosed spatial models should be understood as case-based architectural interpretations derived from practitioner testimony, field observation, archival evidence, and exploratory survey data. They should not be read as comprehensive claims about all Cantonese opera communities, all Cantonese opera venues, or all heritage-planning stakeholders in Malaysia.

Furthermore, the grounded-theory analysis was conducted by a single primary researcher. Peer debriefing, member checking, and an audit trail were used to reduce interpretive bias, but they do not replace intercoder verification. Archival gaps also limit the historical reconstruction of earlier performance circuits. The spatial inheritance framework should therefore be understood as a case-based architectural proposition requiring further validation through broader interviews, more diverse stakeholder sampling, collaborative coding, and longitudinal studies of pilot spatial interventions. Future research should use stratified sampling, offline recruitment, on-site audience interception, and community distribution to compare responses across age groups, ethnic backgrounds, levels of prior exposure, and live-attendance experience. It should also expand the participant pool to include younger learners, audience members, association administrators, property managers, and municipal planning or heritage officers. While this study establishes the architectural imperatives for cultural survival, realizing these built environments will also require corresponding shifts in urban governance, heritage policy, funding structures, and community management. The continuity of Cantonese opera relies on developing an integrated architectural ecology where memory, pedagogy, and ritual actively sustain one another.

6. Conclusion

Within the bounded scope of the three case studies in Kuala Lumpur, this research shows that the transmission crisis facing Cantonese opera is shaped partly by spatial conditions that affect visibility, proximity, acoustic contact, ritual access, and the *shifu–tudi* relationship. These spatial conditions remain significant, but they operate together with broader institutional, financial, audience-related, and ritual constraints. The precarity of this intangible cultural heritage is shaped by typological displacement, economic pressures, managerial constraints, changing audience habits, and the weakening of traditional mentorship structures. As the practice moved from porous clan halls into hermetic arts centers and compromised multi-purpose rooms, the environmental conditions needed for tacit and embodied knowledge transfer were gradually eroded. This trajectory is evident across the three case studies. PW, as a guild space, maintains continuous practice within an inadequate infrastructural setting. YK, as an institutional monument, preserves static artifacts but has limited capacity for living practice. YW, as a micro-academy, sustains pedagogical proximity but lacks essential liminal thresholds. The survey findings should be understood as exploratory evidence from a demographically skewed online respondent group. They support the spatial analysis by indicating perceived barriers to information and access, but they do not establish representative public attitudes toward Cantonese opera in Kuala Lumpur.

To address this breakdown, this study introduces spatial inheritance as a framework for identifying how built conditions carry cultural knowledge across generations by supporting memory, apprenticeship, ritual orientation, and public encounter. The framework proposes that the spatial logic of an intangible cultural practice becomes a form of cultural knowledge only when it continues to organize the relationships among practitioners, learners, ritual objects, archives, audiences, and urban settings. Visual permeability, acoustic intimacy, graduated access, and embedded archival presence are not secondary architectural features; they are essential mechanisms of transmission. Disrupting this logic can alter the conditions through which cultural knowledge is transmitted. Consequently, the proposed spatial inheritance framework contributes beyond existing studies by treating active Malaysian Cantonese opera associations as spatial infrastructures of living transmission. It extends historical studies of Cantonese opera space by examining how inherited spatial logics are transformed in Kuala Lumpur. It extends studies of Southeast Asian overseas Chinese associations by analyzing how association interiors, façades, thresholds, archives, altars, and rehearsal areas support or constrain transmission. It extends intangible cultural heritage and theater-design discourse by shifting attention from display, documentation, and formal performance toward the built

conditions required for apprenticeship, ritual orientation, acoustic contact, public encounter, and adaptive reuse.

The findings also carry practical implications for urban policy, heritage planning, and adaptive reuse. At the level of urban policy, safeguarding Cantonese opera requires more than event-based cultural programming; it requires planning approaches that maintain street-level cultural visibility, support accessible cultural corridors, and reduce the displacement of active associations from historically significant urban areas. For heritage planning, assessment criteria should move beyond façade retention, documentation, and artifact preservation to include transmission capacity: rehearsal area, archive–studio adjacency, ritual thresholds, costume and instrument storage, and public interfaces that allow gradual cultural encounter. For adaptive reuse, shophouses, clan halls, and association rooms should not be converted merely into generic galleries, storage spaces, or small theaters. Their renovation should retain acoustic intimacy, visual permeability, backstage privacy, and flexible multi-use space so that training, ritual preparation, archival care, and civic engagement remain spatially connected.

By advancing the spatial inheritance framework, the study offers a case-based architectural proposition for understanding how built conditions support, constrain, or mediate cultural transmission while recognizing that funding, tenure, governance, managerial decisions, social structures, and audience composition also shape the continuity of practice. Its wider contribution does not rest on generalizing the three Kuala Lumpur associations to all Cantonese opera spaces or other performing arts. Rather, it identifies a set of spatial relationships that can be examined comparatively: urban legibility, visual and acoustic contact, pedagogical proximity, rehearsal–archive adjacency, flexible community use, and graduated public, ritual, and backstage thresholds. Further validation requires a broader stakeholder sample and comparative research beyond Kuala Lumpur. Future studies should test the framework through pilot spatial interventions, comparative analyses of Southeast Asian and other inherited performance ecologies, and quantitative acoustic assessment. Such studies should determine which dimensions of spatial inheritance are transferable, which require cultural adaptation, and which remain specific to the ritual, pedagogical, institutional, and urban conditions of Malaysian Cantonese opera.

The Tang-era (618–907) maxim adopted by YK's founders, "Using people as a mirror (*Yirenweijing*)," underscores that historical continuity cannot be sustained in isolation. It depends on repeated and proximate encounters within carefully calibrated environments, in which acoustic contact, visual access, civic thresholds, and ritual boundaries support cultural learning. In this sense, ancestral memory is not only recalled but enacted through performance, and performance depends on spaces that sustain embodied transmission.

Supplemental information

Appendices A, B, C, and D are available separately as a compressed folder (see Supplementary Material).

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Conflict of interest

The authors declare no conflict of interest.

Author contributions

Conceptualization: All authors
Formal analysis: Calvin Hoi Men Loh
Investigation: Calvin Hoi Men Loh
Methodology: Calvin Hoi Men Loh
Writing–original draft: Calvin Hoi Men Loh
Writing–review & editing: All authors

Ethics approval and consent to participate

Ethical clearance for the study was obtained from the Faculty of Built Environment, Universiti Malaya. Written informed consent was obtained from all interview participants before participation and audio recording. Where applicable, consent for transcription, translation, quotation, identification, and the publication of photographs was obtained in accordance with the options selected by each participant, and anonymity was maintained where requested. Survey respondents received an online participant-information statement and provided informed

consent before completing the bilingual questionnaire. Site observations and photographic documentation were conducted without disrupting the associations' ongoing activities. Where ritual spaces, objects, backstage activities, or identifiable individuals were documented, the relevant access and publication permissions were obtained before their inclusion in the manuscript.

Consent for publication

Participants whose names, professional roles, direct quotations, or identifiable images appear in the manuscript provided written consent for those materials to be published. Participants who did not consent to identification were anonymized. Identifiable photographs were included only where the relevant participant consent for publication had been obtained. Written permission to reproduce the archival photograph in Figure 4 was obtained from Yan Keng Benevolent Dramatic Association. Photographs showing ritual objects, backstage activities, or restricted association spaces were included only where the relevant institutional or site-level publication permission had been obtained. The authors retain the supporting consent, permission, and licensing documentation.

Availability of data

The study draws on interview recordings and transcripts, translated interview materials, field notes, spatial-observation records, annotated plans, fieldwork photographs, an exploratory survey dataset, and archival materials held by the three case-study associations. De-identified, non-sensitive survey data and selected derived analytical materials may be made available by the corresponding author upon reasonable request, subject to participant consent, applicable institutional requirements, and the access conditions imposed by the relevant associations and archives. Raw audio recordings, full interview transcripts, identifiable photographs, restricted site documentation, and third-party archival materials are not publicly available because they contain personal information, culturally or ritually sensitive content, or materials controlled by external rights holders.

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