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VALUE-BASED EVALUATION OF CULTURAL SIGNIFICANCE IN HISTORIC CHINATOWN AREAS

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ABSTRACT

Urban cultural heritage sites face growing challenged from rapid development and limited resources. Local governments must develop strategic plans to improve how they manage and protect these cultural assets. A practical solution is to rank different areas within heritage sites based on their cultural importance, allowing authorities to focus limited resources to which they matter most.

Aims: This study demonstrates how to use a systematic evaluation method to determine conservation priorities in Semarang's Chinatown, a nationally recognized cultural heritage site in Indonesia.

Methodology and results: The research used a two-step approach: (1) The initial phase entails spatial mapping of physical characteristics that contribute to cultural significance, and (2) The subsequent phase employs the Analytic Hierarchy Process (AHP) to systematically assess and rank the attributes that characterize the cultural significance of the area.

Conclusion, significance, and impact study: The AHP analysis identified three key priority factors: (1) architectural styles predominantly influenced by Chinese cultural influences, (2) the existence and spatial organization of Chinese temples within the urban landscape, and (3) land use patterns that are congruent with the historical character. These important characteristics were identified most concentrated in the Gang Warung corridor and around the Tay Kak Sie and Hoo Hok Bio temples. The findings highlight the necessity of integrating cultural value assessments into preliminary phases of heritage planning. By identifying the most culturally significant area, the study establishes a framework for devising targeted, recourse-efficient conservation strategies applicable to analogous historic urban areas.

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1. INTRODUCTION

In the face of growing pressures from urbanization and socio-economic change, urban heritage conservation has become an essential component of sustainable city development. Local governments worldwide have started initiatives to protect cultural heritage zones by adopting frameworks that value tangible and intangible cultural assets. However, in many less-developed urban areas, implementing these efforts often encounters obstacles regarding limited financial resources, institutional capacity, and time constraints. These challenges necessitate the development of optimized, strategic, and adaptable approaches to ensure the long-term sustainability of heritage area management [1], [2].

In response to these issues, UNESCO's Historic Urban Landscape (HUL) framework has gained increasing relevance. The HUL framework emphasizes integration of historical context and evolving contemporary values to allow heritage and new development to interact and enhance each other. Rather than merely dividing the city into isolated heritage zones, this approach promotes sustainable planning and design by considering the built environment, socio-economic dynamics, cultural practices, and local community values [1], [3].

A critical step in heritage area management is prioritizing sub-areas based on cultural significance. Significance is expressed through character-defining elements, such as spatial patterns, architectural forms, land use continuity, and symbolic associations [4], [5], [6]. The community deeply values the historic elements, recognizing its rich historical and cultural identity [7]. However, significance assessments are often abstract and open to interpretation, making it difficult for planners to determine which parts of a heritage site should receive the most attention and resources [8], [9].

To address this issue, multi-criteria decision-making (MCDM) tools have been proposed as a scientifically grounded means of supporting conservation decisions. One such tool is the Analytic Hierarchy Process (AHP), which was developed by Saaty [10], and is particularly effective in solving problems with multiple objectives and criteria. The AHP has been widely used in heritage studies to rank values, compare alternatives, and guide strategic interventions in complex, culturally layered environments [11], [12].

This study adopts the AHP method as a framework for quantifying the cultural significance of urban heritage areas and validating the formulation of site-specific conservation guidelines. By assigning weights to different heritage attributes, the AHP enables the prioritization of zones based on their contribution to cultural value, thus optimizing the allocation of conservation efforts. This approach aligns with the broader aims of the HUL paradigm because it promotes

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cost-effective, scalable, and periodically reviewable conservation strategies that support long-term sustainability.

This study focuses on Semarang's Chinatown (Pecinan Semarang), a designated national cultural heritage site in Indonesia with rich tangible and intangible heritage. Previous studies [13] have identified the area's key characteristics based on community perception. These characteristics include a wide range of shophouse architectural styles from different historical periods, traditional markets as socio-economic hubs, the continuation of rituals and cultural practices, and the distinctive spatial character formed by narrow alleys and zero-setback buildings. The presence of Chinese temples (kelenteng) strengthens the area's identity through their architectural form, decorative elements, symbolic colors, and strategic spatial orientation [14], [15].

The present study aims to: (1) identify character-defining elements contributing to cultural significance; (2) spatially map and classify zones within the heritage area based on significance values; and (3) apply the AHP method to measure and prioritize zones according to attribute importance. The research outcomes are expected to enhance the development of localized, scientifically validated conservation strategies that reflect the material and socio-cultural dimensions of urban heritage, while supporting broader sustainable development and community-based heritage management goals.

2. THEORY & RESEARCH METHODOLOGY

2.1 Multidimensional Cultural Values

A more contextualized and integrated view of cultural assets has replaced the previous century's narrow focus on preserving specific monuments as the primary focus of conservation strategies [16], [17]. According to Feilden [18], the initial emphasis of heritage conservation was on architectural repair, typically highlighting the historical and aesthetic value of freestanding structures. However, as urbanization began to transform traditional cities, it became clear that this "monument-centric" approach was inadequate for addressing the complexity of urban heritage environments.

International frameworks such as UNESCO's Recommendation on the Historic Urban Landscape facilitate this shift by viewing history as a strength rather than a limitation when creating inclusive and resilient urban futures. The HUL approach, introduced by UNESCO, expands the scope of heritage conservation by incorporating multiple dimensions of cultural significance. Unlike earlier models, which isolated heritage objects from their settings, the HUL

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method emphasizes the layering of values across time and space. This approach acknowledges that urban heritage is shaped by diverse communities and changing contexts [3], [19]. The conservation approach has evolved to include intangible heritage and social dimensions, reflecting a more comprehensive understanding of urban heritage [20]. This evolution allows decision-makers to consider the sociocultural dynamics and architectural and visual components present in urban space.

Studies have shown that such comprehensive value assessments facilitate more responsive and adaptable conservation strategies, particularly in contested or dynamic urban areas [21]. However, the value of a particular site, building, or heritage object comes from each of the objects itself, so each differs from the others and is multivalent [22]. Nevertheless, operational tools such as value mapping and AHP have been introduced to quantify and prioritize these multiple values in urban heritage zones. AHP defines and structures criteria for evaluating heritage value, allowing for a systematic approach to decision-making [23], [24], [25].

2.2 The AHP in Assessing Multidimensional Cultural Values

Urban heritage areas, especially those in rapidly developing cities, are under increasing threat from uncontrolled development, inadequate policy implementation, and the complexity of intangible cultural values that often evade standard planning instruments. In response, decision-makers require structured methods that allow for transparent, inclusive, and evidence-based approaches to heritage conservation. One such method is the AHP, a multi-criteria decision-making (MCDM) tool introduced by Saaty [10], [26], [27], which is gaining traction in heritage studies for its ability to evaluate complex, multidimensional problems.

The AHP significantly improves the evaluation of cultural values in heritage sites by providing a structured framework for decision-making. This method allows for the prioritization of various criteria, facilitating a comprehensive evaluation of cultural heritage attributes [28], [29], [30]. Integrating tools like the AHP into heritage preservation is urgent due to the complex challenges of conserving cultural assets. AHP facilitates the evaluation of various factors affecting heritage sites, such as environmental threats, urban development, and technological needs [29], [31]. It allows for the integration of diverse stakeholder perspectives, fostering a collaborative approach to heritage management [32]. AHP helps prioritize interventions, ensuring that limited resources are allocated to the most critical preservation needs [33]. In

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this context, the AHP offers a structured framework for prioritizing heritage components based on expert judgment, community input, and the relative importance of multiple criteria.

Several studies have successfully used AHP in the field of heritage conservation. For instance, AHP has been used to develop conservation strategies that address the complexities of cultural heritage management in China [29]. AHP methodologies have been used to evaluate interventions for historic buildings, balancing protection with performance upgrades [33]. AHP has also been adapted to evaluate the sustainable reuse of industrial heritage, ensuring minimal impact on heritage value [34].

As demonstrated across various studies, AHP effectively prioritizes among diverse and often competing criteria, enabling more strategic and transparent decision-making in contexts with limited resources and high preservation demands. AHP's strength lies in the ability to synthesize expert judgment and stakeholder input into quantifiable outcomes, fostering a collaborative approach to heritage management. Furthermore, AHP has proven adaptable across different cultural and typological settings while remaining sensitive to the authenticity and integrity of the sites involved. In the face of mounting pressures from urbanization, environmental degradation, and socio-economic change, the application of AHP in heritage conservation is essential to ensure that conservation efforts are effective and sustainable. Its increasing use signals a shift toward more evidence-based, participatory, and value-driven planning in the protection of cultural heritage assets.

2.3 The Heritage Area of Chinatown, Semarang as a Case Study

This study focuses on the Chinatown area of Semarang City. The population in this study is the entire Chinatown area, which has been designated as a cultural heritage site according to the delineation stated in Decree Number 682/P/2020 of the Minister of Education and Culture of the Republic of Indonesia concerning the Old Semarang City Cultural Heritage Area as a nationally ranked cultural heritage site. Semarang's Chinatown lies in the interconnectedness of its tangible and intangible heritage components, which are manifested through spatial patterns, architectural identity, and active sociocultural traditions.

According to Rochana [13], Semarang's Chinatown has complex and layered meanings embedded in its physical structure and social life. One of the primary contributors to its cultural significance is its architectural typology, particularly the presence of Chinese-influenced shophouses with distinct features like pitched tile roofs, detailed wooden ornamentation, narrow vertical windows, and multi-use floor plans. These architectural styles reflect a blend of

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Southern Chinese, Dutch colonial, and modern design influences, particularly visible in corridors like Gang Warung and Gang Baru. Religious landmarks such as the historic Chinese temples further reinforce the area's spiritual and communal identity. Their spatial placement at key intersections and near waterways, in alignment with Chinese cosmology principles, underscores their importance as religious sites, cultural markers, and urban wayfinding elements.

Additionally, the continued use of mixed-use buildings, with commercial activity on the ground floor and residential spaces above, maintains historical continuity and reflects the area's longstanding trading culture. This is complemented by vibrant traditional markets, such as Pasar Gang Baru, and recurring cultural events like the Semawis Market and Chinese New Year festivities. These events uphold the area's intangible heritage and promote social cohesion. The spatial character of the Chinatown corridors, marked by narrow alleys, zero setbacks, and continuous street walls, creates a strong sense of enclosure and human-scale urbanity.

Furthermore, sensory experiences such as the aromas of incense and traditional cuisine, and the sounds of community interaction, contribute to the area's intangible cultural atmosphere. These elements form a multidimensional cultural landscape in which architectural, spiritual, social, and sensory values are deeply interwoven. This affirms the heritage significance of Semarang's Chinatown and underscores the need for zone-specific conservation strategies.

2.4 Methodology

The research methodology consists of two primary stages. The first stage involves mapping the priority areas for conservation by identifying and spatially analyzing the physical attributes that contribute to the cultural significance of the heritage area. Overlay analysis is used to visualize and assess the concentration of heritage values across the study area using thematic layers.

The second stage applies the Analytic Hierarchy Process (AHP) to systematically evaluate and rank the attributes defining the area's cultural significance. Through expert-based pairwise comparisons, the AHP method assigns relative weights to each criterion based on its perceived importance in shaping the heritage character. The weighted results are then used to identify and prioritize specific zones within the heritage area that require focused conservation efforts.

In this study, the AHP method involved seven expert respondents. As noted by Saaty and Özdemir, the number of judges is not necessarily the primary concern; rather, the quality of the

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respondents' expertise and judgment is more important. Nevertheless, the number of experts can affect the reliability and validity of the results because a larger group may offer a broader, more representative perspective. However, to maintain consistency in pairwise comparisons, however, it is generally recommended to limit the number of judges to no more than seven or eight [35]. While three respondents [36] may be sufficient for basic analytical consistency, expanding the number of judges can significantly enhance the robustness and credibility of AHP outcomes, particularly in complex heritage conservation contexts. Incorporating experts from diverse professional backgrounds can enrich the evaluation by introducing multiple viewpoints and interdisciplinary insights [37] [38].

Expert interviews were conducted to determine the space or place in Chinatown that best exemplifies the character of the priority significance values of experts familiar with the Chinatown Area. Using the AHP questionnaire method in the interviews ensured that the researcher's interpretation of the previous analysis would be more objective. Informants were selected using the snowball method based on their expertise in preserving cultural heritage areas and understanding the Semarang Chinatown area, as they were directly involved in researching, planning, or developing the region.
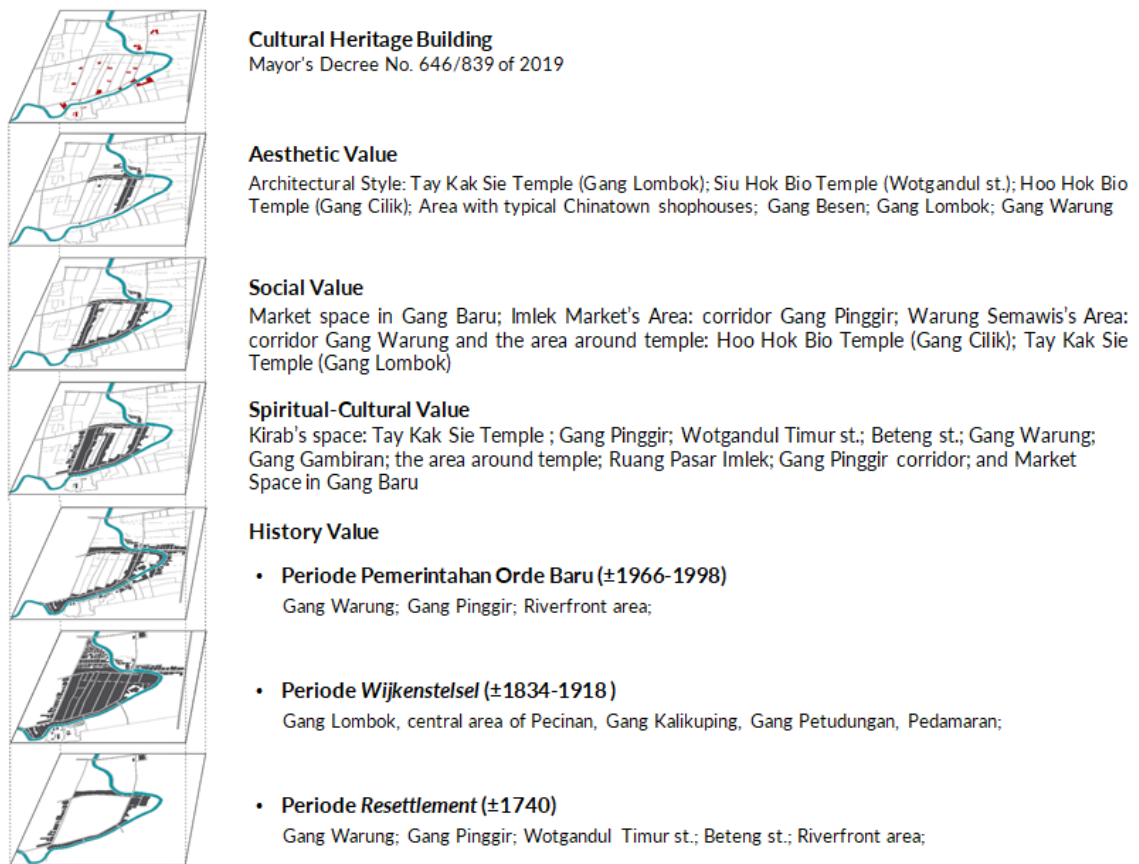
The questionnaire contained closed questions, which are questions with predetermined answer options. The AHP questionnaire asked experts to compare and assess each criterion and sub-criterion using paired comparisons. The AHP mathematical calculation in this study is supported by Super Decision Version 2.10 software. The AHP concept was used to identify culturally significant spaces and priority character elements in the Chinatown area from experts who understand the study area.

3. RESULTS AND DISCUSSION

3.1 Mapping Conservation Area Priority

The research sample was selected using the purposive sampling method, which is a non-probability sampling method based on specific selection criteria. The criteria for choosing the sample are as follows:

a. Significance of more than one value criterion.

b. Included in the delineation of the Semarang Chinatown Cultural Heritage Area.

c. It has the highest overlap intensity in overlay mapping analysis.

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Cultural Heritage Building
Mayor's Decree No. 646/839 of 2019

Aesthetic Value
Architectural Style: Tay Kak Sie Temple (Gang Lombok); Siu Hok Bio Temple (Wotgandul st.); Hoo Hok Bio Temple (Gang Cilik); Area with typical Chinatown shophouses; Gang Besen; Gang Lombok; Gang Warung

Social Value
Market space in Gang Baru; Imlek Market's Area: corridor Gang Pinggir; Warung Semawis's Area: corridor Gang Warung and the area around temple: Hoo Hok Bio Temple (Gang Cilik); Tay Kak Sie Temple (Gang Lombok)

Spiritual-Cultural Value
Kirab's space: Tay Kak Sie Temple ; Gang Pinggir; Wotgandul Timur st.; Beteng st.; Gang Warung; Gang Gambiran; the area around temple; Ruang Pasar Imlek; Gang Pinggir corridor; and Market Space in Gang Baru

History Value

• **Periode Pemerintahan Orde Baru (±1966-1998)**
Gang Warung; Gang Pinggir; Riverfront area;

• **Periode *Wijkenstelsel* (±1834-1918)**
Gang Lombok, central area of Pecinan, Gang Kalikuping, Gang Petudungan, Pedamaran;

• **Periode *Resettlement* (±1740)**
Gang Warung; Gang Pinggir; Wotgandul Timur st.; Beteng st.; Riverfront area;

Fig. 1 Overlay Mapping of Area Representing Significant Values
Source: Analysis, 2025

Based on these criteria, the priority spaces represent significant values in the area. The nine spaces that will be used as research samples are the Gang Warung corridor, the Gang Pinggir corridor, the Wotgandul Timur street corridor, the river area, the Beteng street corridor, the Gang Baru corridor, the Gang Gambiran corridor, the Tay Kak Sie Temple area (Lombok Alley), and the Hoo Hok Bio Temple area (Cilik Alley). Due to their locations, these spaces are also included in the core area of Chinatown.
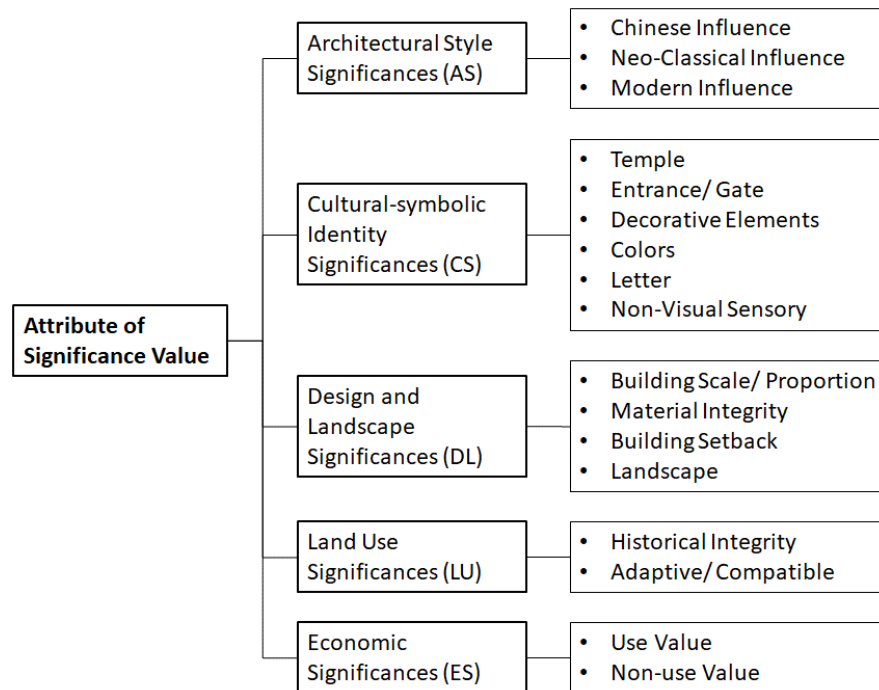
3.2 Attributes of Significance Value using AHP Method

3.2.1 Step 1: Hierarchy Model

The AHP analysis is arranged in a three-level hierarchical structure. The first level is the purpose of the AHP analysis: to determine the "priority area for conservation." The second and third levels consist of criteria and sub-criteria that define the characteristics and significance values that influence conservation interventions in the Chinatown area. The AHP modeling structure

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in this study is shown in the following Figure 2.

Fig. 2 The AHP Hierarchy structure of Attribute of Significance Values
Source: Analysis, 2025

3.2.2 Step 2: Pairwise Comparison and Consistency Analysis

This step compares the relative importance of the criteria and sub-criteria using a pairwise comparison. In this study, seven expert respondents familiar with the Chinatown area conducted the evaluation. The results of the local weighing of each criterion and sub-criterion were compared.

After obtaining the local priority weighting from the respondents, a consistency test was conducted to validate the weighting data. This consistency test is based on the random consistency index (RI) table. Data can be used if the local priority weighting has an inconsistency value 0.100 or less. The inconsistency value calculation process uses Super Decision Version 2.10 software during the interview process. If the results are inconsistent, the respondents are asked to re-evaluate until appropriate results are obtained.

Table 1 Results of the AHP pairwise comparison scale by experts

	AS	CS	DL	LU	ES
Architectural Style (AS)	1.0000	0.7873	3.2761	1.9019	2.7282
Cultural-symbolic (CS)	1.2702	1.0000	4.1611	2.2905	2.6718
Design and Landscape (DL)	0.3052	0.2585	1.0000	0.7460	1.2078
Land Use (LU)	0.5258	0.4366	1.1877	1.0000	1.2520
Economic Significance (ES)	0.3665	0.3743	0.8279	0.7987	1.0000

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| SUM | 3.4677 | 2.8567 | 10.4528 | 6.7370 | 8.8599 |

Source: Analysis, 2025
Note: Consistency ratio (CR) = 0.06

3.2.3 Step 3: Global Weight

The next step is to calculate the global weighting. This is done by combining all consistent assessments with a pairwise comparison assessment matrix obtained from respondents with consistent assessments. This is then combined based on the Aggregation of Individual Judgment (AIJ) method, which uses the geometric mean to reach an appropriate consensus. The steps for calculating global priorities are the same as for local priorities, but the matrix value is obtained from the geometric mean of each element criterion. The following Figure 3 shows the assessment results for the criteria and sub-criteria.
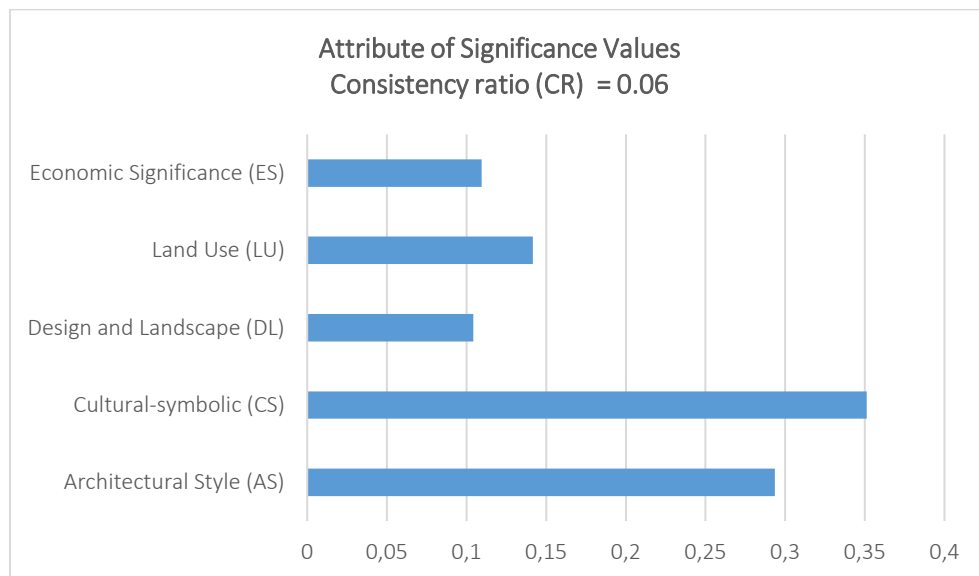
Fig. 3 The Ranking of Attribute of Significance Values
Source: Analysis, 2025

Based on the overall assessment results of respondents, the priority criteria obtained in order are cultural-symbolic Identity (35.12%), architectural style (29.35%), land use (14.16%), economic significance (10.95%), and design and landscape (10.42%).

To determine the ranking of the most significant attributes in this study area, the final weight of each secondary risk must be calculated. The final weight is determined by multiplying the local weight of each secondary attribute by the relevant primary attribute. The ranking of elements that define the most significant cultural value to cultural heritage sites in Semarang Chinatown shows that the top five secondary risks are architectural style with Chinese

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Influence, temple building, historical integrity, architecture style with neo-classical influence, and gate as identity, as shown in the Table 2 below.

Table 2 Results of the Global Weight of Attributes with Significance Value

Criteria	Main Weights	sub-Criteria	Secondary Weights		Rank
			Local Weight	Final Weight	
Architectural Style (AS)	0.2935	Chinese Influence	0.6132	0.1800	1
		Neo-Classical Influence	0.2406	0.0706	4
		Modern Influence	0.1463	0.0429	11
Cultural-symbolic Identity (CS)	0.3512	Temple	0. 2918	0.1025	2
		Entrance/ Gate	0.1822	0.0640	5
		Decorative Elements	0. 1413	0.0496	9
		Colors	0.1445	0.0507	8
		Letter	0.1192	0.0419	13
		Non-Visual Sensory	0.1210	0.0425	12
Design and Landscape (DL)	0.1042	Building Scale/ Proportion	0.2397	0.0250	16
		Material Integrity	0.2128	0.0222	17
		Building Setback	0.2730	0.0284	15
		Landscape	0.2745	0.0286	14
Land Use (LU)	0.1416	Historical Integrity	0.5493	0.0778	3
		Adaptive/ Compatible	0.4507	0.0638	6
Economic Significances (ES)	0.1095	Use Value	0.5691	0.0623	7
		Non-use Value	0.4309	0.0472	10

Source: Analysis, 2025

The top five secondary risks are architectural style dominated by Chinese influence, temple buildings with the architecture and position in the Pecinan landscape that aligns with historical integrity.

3.2.4 Step 4: Rating Model

A rating model was developed to measure and prioritize conservation interventions in each space in the Chinatown area. Each sub-criterion is assigned an indicator to facilitate assessment of each space. The indicators are 'good', 'medium', and 'bad', or 'high', 'medium', and 'low'.

The assessment of each indicator is based on the author's observations and analysis of the existing conditions of the priority spaces. The rating model assessment results show that the highest-priority spaces are in the Gang Warung corridor and around the Tay Kak Sie and Hoo Hok Bio temples, with a not-too-significant score difference. The overall results of the analysis can be seen in Figure 4 and Table 3.

Table 3 The Results of the Priority Area for Conservation

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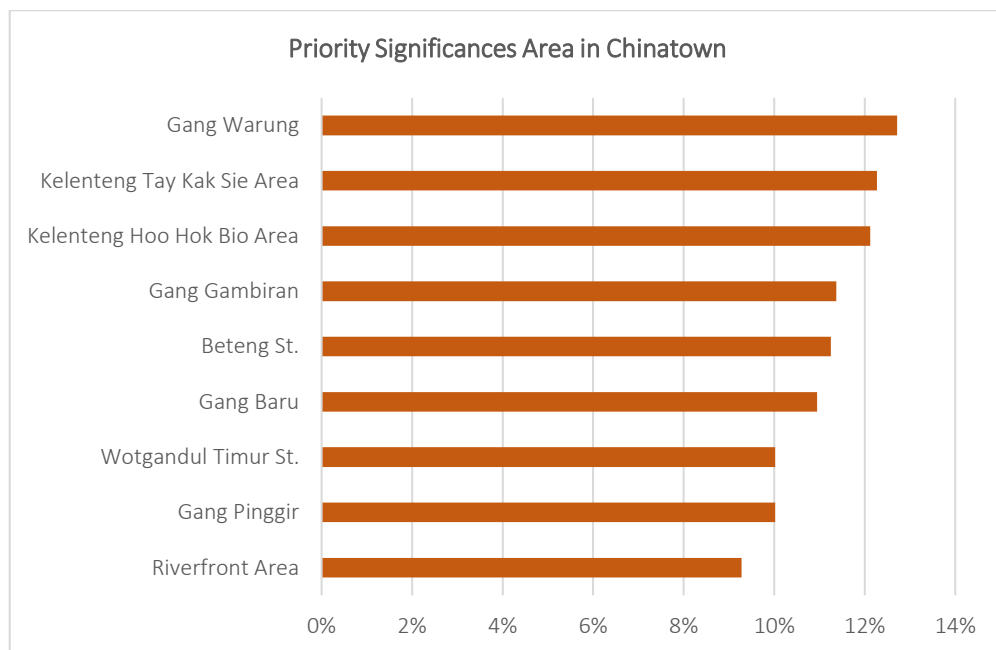| Priority Significance Area	Architectural Style (AS)			Cultural-symbolic Identity (CS)						Design and Landscape (DL)				Land Use (LU)		Economic Significances (ES)		SUM	Priority (%)	Rank
	Chinese Influence	Neo-Classical Influence	Modern Influence	Temple	Entrance/ Gate	Decorative Elements	Colors	Letter	Non-Visual Sensory	Building Scale/ Proportion	Material Integrity	Building Setback	Landscape	Historical Integrity	Adaptive/ Compatible	Use Value	Non-use Value			
Gang Warung	0.4055	0.1644	1.0000	0.4055	1.0000	0.2000	1.0000	0.2000	1.0000	1.0000	0.4055	1.0000	0.1644	1.0000	0.1644	1.0000	0.2080	0.581432	12.72%	1
Gang Pinggir	0.1644	0.1644	1.0000	0.4055	0.1644	1.0000	1.0000	0.2000	1.0000	0.1644	0.1644	0.1644	0.4055	0.1644	1.0000	1.0000	0.1644	0.458154	10.02%	8
Wotgandul Timur St.	0.1644	0.1644	1.0000	0.1644	0.1644	1.0000	1.0000	0.2000	1.0000	0.4055	0.1644	0.4055	0.1644	0.4055	1.0000	1.0000	0.1644	0.458183	10.02%	7
Riverfront Area	1.0000	0.1644	0.1644	0.4055	0.1644	0.2000	0.2000	0.2000	0.2000	0.4055	0.1644	1.0000	0.4055	0.1644	0.1644	0.2000	1.0000	0.42439	9.28%	9
Beteng St.	0.1644	1.0000	1.0000	0.4055	1.0000	0.2000	0.2000	0.2000	0.2000	0.1644	0.1644	0.4055	0.1644	0.4055	1.0000	1.0000	1.0000	0.514465	11.25%	5
Gang Baru	0.4055	0.1644	0.4055	1.0000	0.1644	0.2000	0.2000	0.2000	1.0000	0.1644	0.1644	1.0000	0.1644	1.0000	0.4055	1.0000	0.1644	0.500562	10.95%	6
Gang Gambiran	1.0000	0.1644	0.4055	0.4055	0.1644	0.2000	0.2000	0.2000	0.2000	1.0000	0.4055	1.0000	0.4055	1.0000	0.1644	0.2000	1.0000	0.519927	11.37%	4
Kelenteng Tay Kak Sie Area	0.4055	0.1644	0.4055	1.0000	0.4055	1.0000	1.0000	0.2000	1.0000	0.4055	1.0000	0.4055	0.4055	1.0000	0.4055	0.2000	0.1644	0.560963	12.27%	2
Kelenteng Hoo Hok Bio Area	0.4055	0.1644	0.4055	1.0000	0.4055	1.0000	1.0000	0.2000	1.0000	0.4055	1.0000	0.4055	0.1644	1.0000	0.4055	0.2000	0.1644	0.554068	12.12%	3

Source: Analysis, 2025

Fig. 4 The Results of the Priority Significance Area in Chinatown
Source: Analysis, 2025

3.3 Proposed Conservation Strategies

Based on the AHP prioritization of cultural significance in Semarang's Chinatown, a set of conservation strategies has been proposed to ensure effective and contextually sensitive intervention. This first strategy addresses the highest-priority criterion, "architectural styles influenced by Chinese heritage." This strategy focuses on preserving and rehabilitating shophouses, emphasizing the restoration of key features such as traditional roofs, facades, windows, and ornamentation. This includes implementing facade improvement programs and design guidelines that regulate renovations in accordance with heritage character.

Second, regarding the presence and spatial positioning of Chinese temples, conservation strategies should prioritize protecting view corridors, maintaining sightlines, and preventing visual obstructions from new developments. Buffer zones should be established around

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temples, and development controls should ensure that surrounding buildings do not exceed height or massing limits that would compromise the temples' landmark value.

Third, to maintain land use patterns aligned with historical integrity, zoning regulations should preserve the area's mixed-use character, supporting the coexistence of traditional markets, residences, and small-scale commerce. In addition, cultural activity revitalization programs, such as traditional festivals, religious processions, and local markets, should be formally supported to maintain the intangible heritage embedded in the urban fabric.

These strategies should be accompanied by community-based management models that involve local stakeholders in the decision-making process, to ensure the long-term sustainability and relevance of conservation actions. Aligning intervention efforts with the weighted significance criteria provides a pathway for adaptive, heritage-led urban development in Semarang's Chinatown.

3.4 Challenges and Opportunities

Implementing these targeted conservation strategies presents significant opportunities and critical challenges. One key opportunity is the potential to establish value-based planning models that more accurately reflect the layered cultural significance of heritage zones. Aligning interventions with clearly prioritized, valuable attributes allows local governments and heritage authorities to optimize limited resources, increase the effectiveness of planning decisions, and enhance public appreciation of cultural heritage. Furthermore, integrating community-driven programs and supporting traditional socio-economic activities can strengthen local identity and stimulate sustainable cultural tourism.

However, several challenges must be addressed to ensure successful implementation. First, the lack of technical and financial capacity among local stakeholders may hinder the restoration of heritage architecture, particularly for privately owned properties that require specialized conservation efforts. Second, enforcing development controls and zoning regulations, particularly around temples and historically sensitive zones, may encounter resistance from developers and property owners, especially in areas undergoing rapid urban transformation. Third, although emphasizing preserving land use and socio-cultural practices is important, the absence of formal recognition of intangible heritage in planning policy can lead to the undervaluing or commodification of cultural traditions. Lastly, sustained community participation requires careful negotiation of interests because residents may prioritize economic gains over heritage preservation without clear incentives or legal protections.

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Addressing these challenges requires a collaborative, cross-sectoral approach involving municipal authorities, heritage professionals, local communities, and private actors. Strengthening institutional frameworks and offering incentives are essential.

4. CONCLUSION

This study demonstrates that the AHP method is valuable for determining priority areas and ranking the significant criteria within heritage zones. The AHP method effectively establishes priority areas and ranks significant criteria that are often open to interpretation, providing a scientific basis for decision-makers to determine the priority of compiling site-specific conservation guidelines.

The AHP results highlight three primary criteria based on order of importance: (1) architectural styles predominantly influenced by Chinese heritage, (2) the presence and spatial configuration of Chinese temples within the urban landscape, and (3) land use patterns that align with the area's historical integrity. The spatial prioritization analysis reveals that the highest-ranking heritage areas are concentrated in the Gang Warung corridor and the surroundings of prominent temples such as Tay Kak Sie and Hoo Hok Bio. There are relatively narrow score margins between these areas.

These findings underscore the AHP's effectiveness in organizing complex, multi-interpretable cultural significance values into a scientifically grounded framework that can guide decision-makers in developing site-specific conservation strategies. However, this study has one limitation: the AHP weighting process was conducted in a single evaluation session without iterative feedback or broader participation from community members or stakeholders. Future research should therefore incorporate multi-stage stakeholder engagement to enhance the validity, inclusiveness, and contextual relevance of significance assessments.

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