

# Assessing Aristocratic Architectural Styles Through the Malay Classical Evaluation Tool

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## ABSTRACT

The architectural heritage of the Malay aristocracy is a vital reflection of cultural identity and historical significance in Southeast Asia. Despite its importance, its recognition and preservation challenges persist due to the absence of a systematic taxonomy for classifying its distinctive styles. This study introduces the Malay Classical Evaluation Tool, a framework designed to classify and assess Malay aristocratic architecture through stylistic parameters such as structural expression, proportions, and ornamentation. Using a mixed-methods approach, the research analysed 60 case studies, incorporating archival research, field visits, measured drawings, and expert interviews. Findings reveal an evolutionary continuum within Malay aristocratic architecture, from timber vernacular origins to hybrid forms integrating colonial influences, often obscuring the distinct attributes of classical Malay design. The evaluation tool addresses gaps in understanding stylistic transitions, providing a structured scoring system to identify missing strands and classify buildings based on their adherence to Malay stylistic grammar. This framework advances documentation and preservation efforts and bridges the gap between traditional and modern architecture, ensuring cultural resilience and inspiring future conservation and urban design initiatives.

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## INTRODUCTION

The architectural heritage of the Malay aristocracy embodies a profound narrative of cultural identity and historical significance in Southeast Asia. This rich legacy, characterised by intricate craftsmanship and regional influences, remains a focal point for scholarly inquiry and conservation efforts. However, despite its importance, the recognition and preservation of Malay aristocratic architectural styles pose significant challenges due to the absence of a systematic taxonomy framework tailored to these structures (Ahmad Sarji, 2002; Gullick, 2000). Rapid urbanisation and modernisation in Malaysia intensify these challenges, threatening the integrity of heritage buildings and necessitating urgent conservation measures (Turnbull, 1989; Ooi, 2013). The architecture of a city or culture shapes its identity, and Malay nobles' architectural heritage reflects Southeast Asia's culturally diverse history.

Unlike Thai royal architecture, which often emphasises grandeur through scale and gilded ornamentation, Malay aristocratic structures prioritise proportional harmony, intricate wood carvings, and climate-responsive designs. Javanese aristocratic styles, which integrate Hindu-Buddhist influences, contrast with Malay architecture's Islamic motifs and vernacular grammar. These comparisons underscore the unique synthesis of cultural identity, Islamic influence, and regional adaptation that defines Malay aristocratic architecture. The intricate designs and symbolic representations observed in Malay aristocratic architecture provide insights into the region's socio-political influences, culture, traditions, and beliefs. Historically, the Malays perceived beauty at the physical level and in spiritual dimensions that transcended outward appearances (Salam, Nik Lukman, & Mohd Farid, 2023). These gaps highlight the pressing need for a comprehensive framework to classify, document, and preserve the stylistic evolution of Malay aristocratic architecture.

Malay aristocratic architecture, encompassing palaces, mansions, and fortresses, reflects the Malay nobility's socio-political influences, culture, and traditions. Its distinctive features—elaborate construction techniques and decorative patterns—symbolise social status, authority, and distinction while showcasing exceptional craftsmanship and profound symbolic significance. Malay classical architecture, as the architectural manifestation of the aristocracy, incorporates indigenous Malay traditions, Islamic influences, and foreign stylistic elements. These structures serve as tangible archives of Malay history, embodying the Malay nobility's ideals, convictions, and practices. Nevertheless, these buildings' stylistic grammar and principles remain underexplored and lack systematic categorisation, which hinders efforts to understand their unique evolution and adapt them to modern contexts.

Malay aristocratic architecture sometimes incorporates foreign architectural styles into local Malay buildings, symbolising social status, authority, and distinction within Malay society. Malay classical architecture serves as the architectural manifestation of the Malay aristocracy, symbolising their cultural identity, social status, and historical heritage. It consistently evokes admiration and recognition for its aesthetic appeal, craftsmanship, and cultural significance as tangible symbols of Malaysia's prosperous architectural history. The distinctive design aspects of Malay aristocratic structures set them apart from other architectural motifs. The architecture of a city or culture shapes its identity. The Malay nobles' architectural heritage reflects Southeast Asia's culturally diverse history. The intricate designs and symbolic representations observed in Malay aristocratic architecture provide insights into the region's socio-political influences, culture, traditions and beliefs.

Historians and ethnographers have noted a distinct stylistic silence among Malay aristocrats in colonised regions like Malaysia during the 1800s and early 1900s. Although this era introduced colonial influences, the Malay aristocracy retained elements of cultural custodianship, merging external stylistic components with vernacular traditions (Miller, 2014). This period saw the development of stylistic branches from dominant vernacular styles, reflecting both local ingenuity and external adaptations (Jahnkassim et al., 2017). However, these hybrid styles are often oversimplified as "colonial," masking the nuanced evolution of Malay architectural language and its classical expression. This Malay classical architecture is deeply

rooted in Malay culture and identity, incorporating elements of indigenous Malay architectural traditions, Islamic influences, and other cultural motifs. Serving as cultural icons and archives of Malay history, these structures were created with the ideals, convictions, and practices of the Malay nobility in mind. These had absorbed elements from external influences while retaining their awareness as cultural custodians towards their population (Müller, 2014). The local identities and ingenuities peak within this era, identified as styles and substyles of branches to the dominant vernacular style.

Classicality in Malay architecture refers to recurrent formal prototypes rooted in timber systems of the Sultanate era, emphasising symmetry, proportion, and harmony (Asia, 2004; Tzonis & Lefaivre, 1986). While colonial technology and aesthetics influenced the architectural responses of local elites, there remains a lack of clear differentiation between vernacular Malay styles and colonial stylisations. This gap underscores the need for a scoring method to classify and characterise the evolving Malay style and document its transition from timber to hybrid forms incorporating masonry and external influences. At the same time, a colonial style refers to the dominant or essential intention of colonial aesthetic dressing and form. However, all 'Classical' timber 'vernacular' structures of the Malay world refer to systems of crafted timber that arose from the essential Sultanate.

Classicality can refer to recurrent formal prototypes regarded as society's standard-bearers (Asia, 2004). They are frequently the result of a desire to build an entire piece of architecture rather than allowing it to develop naturally and make an impression on passers-by. Classical architecture necessitates a visual approach in which the composition is conceived and produced for a specific outward visual appearance (Tzonis & Lefaivre, 1986). On the other hand, composing is based on an additive or more organic process or simply by putting on decorative touches. The link to the research is that the cases appear to represent and mirror the responses of local elites to the infusion, then dominance of Colonialist technology, construction methods, and aggressive architectural style. Nevertheless, there was an era when the local vernacular flowered into the symbolic structures of the region, and this is argued as a final phase in the evolution of society.

The selected case studies highlight such disparate examples and say there were forms before the Malay vernacular's final evolution, sometimes identified as colonial. Although they faced aggressive modernity, some managed to preserve the roots or essences of language and proportion. According to (Templer, 1990), a classical language is a 'composition of elements mixed. It shows the relationship of all parts. The classical architect sought symmetry and harmony. The principle of composing a series of combined elements in a simple yet visual approach was prevalent in a particular era of the Malay world. This approach was reflected in the 'public' façade of the Malay vernacular palaces, which are representative of the aristocrats' intentions as they are communities with higher resources, capabilities, and a sense of order (Shireen et al., 2017). During the colonial era in Malaysia and Indonesia, notably in the 1800s, stylistic architectural alterations were always simplistically 'lumped' together as the colonial style (Abidin et al., 2017).

A characterisation is needed with a scoring method to classify by differentiation the evolving Malay style and the changes attributed to colonial stylisations. In some cases, the influence of the Sultan and his courtiers was strong and influenced the degree of modernisation of local palatial forms. This stylisation reflected the local's essential elements, and the aristocratic style reflected the locality. This study addresses these gaps by introducing a systematic taxonomy framework for Malay aristocratic architecture. By examining case studies, it identifies stylistic transitions, characterises architectural principles, and proposes a scoring method to classify these structures. This approach aims to preserve the essence of Malay aristocratic architecture while highlighting its distinct contributions to Southeast Asia's cultural and architectural heritage. Ramele et al. (2021) highlighted on the modernisation of Malay buildings that commenced during the British colonial era, when contemporary construction materials and living amenities were brought. Zinc is designated as the roofing material, while brick and cement have supplanted timber as building materials, and contemporary furnishings such as sofas and tables are utilised.

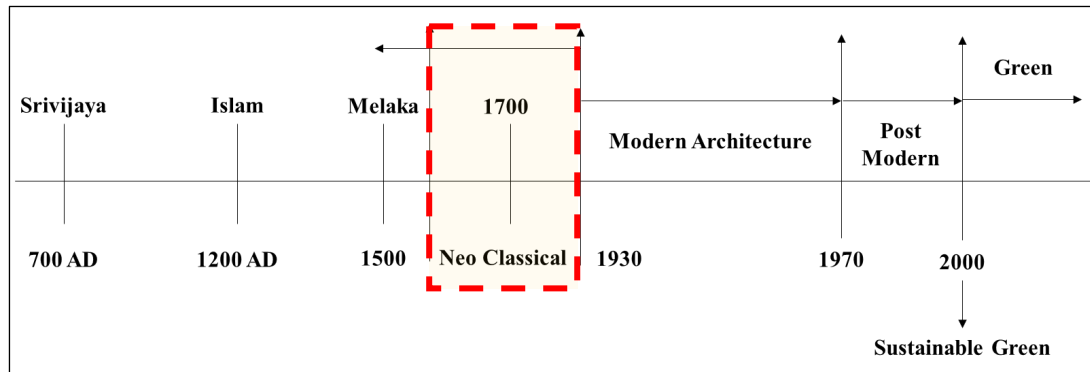


Fig. 1. The evolutionary framework of local history incorporates an era marked as 'Classical'.

Source: Authors (2024)

## THE EVOLUTION OF THE MALAY ARCHITECTURE (THE TAXONOMY)

The evolution of Malay aristocratic architecture can be traced back to the pre-colonial era when the construction of palaces, residences, and ceremonial buildings served as symbols of power and authority. This period laid the foundation for a rich architectural language rooted in localised grammar, distinctly Malay proportions, tectonics, and artistic motifs, reflecting indigenous traditions and cultural expressions. Rather than mere adaptations of colonial or European styles, these forms were inventions and appropriations emphasising local ingenuity. As the architectural language evolved, a stylistic "tree" emerged, rooted in indigenous timber construction and gradually branching out into "hybrid" identities that combined timber with masonry. This transition reflects the influence of technological advancements, trade, and socio-political changes while retaining Malay architectural principles' essence.

A critical gap in this evolution lies between the Traditional and Modern Malay styles—a "missing strand" referred to as the Classical styles, which flourished between 1700–1900. This period, often categorised under "Neoclassical Malay," represents a transitional phase where Malay aristocratic architecture incorporated refined stylistic elements such as symmetrical proportions, elaborate ornamentation, and an increasing use of masonry alongside timber. While maintaining its cultural roots, this style also began to reflect influences from colonial aesthetics, trade networks, and regional exchanges. Fig. 2 illustrates the taxonomy of Malay architectural styles, mapping their evolvments and emphasising the emergence of Classical Malay architecture as a distinct strand. Extending from Powell and Ozkan's model (Powell et al., 2018) and the narrative by Jahn Kassim et al. (2018), the taxonomy situates the Neoclassical period as a pivotal stage in the stylistic continuum. This phase balances traditional Malay design principles and the external influences that shaped aristocratic palatial and ceremonial structures.

This study bridges gaps in the stylistic continuum by classifying these styles through a structured taxonomy. It highlights the importance of the Neoclassical period in preserving and evolving Malay architectural identity. This phase embodies the aesthetic and symbolic aspirations of the Malay aristocracy and serves as a critical link in the broader narrative of Southeast Asian architectural history. The timeline illustrates the gaps in current architectural taxonomies, particularly in recognising the transitional and hybrid styles that emerged during the late classical and colonial periods. These "missing strands" in the stylistic continuum highlight the challenges in preserving Malay aristocratic architectural identity (Kassim, Abdullah & Salleh, 2018).

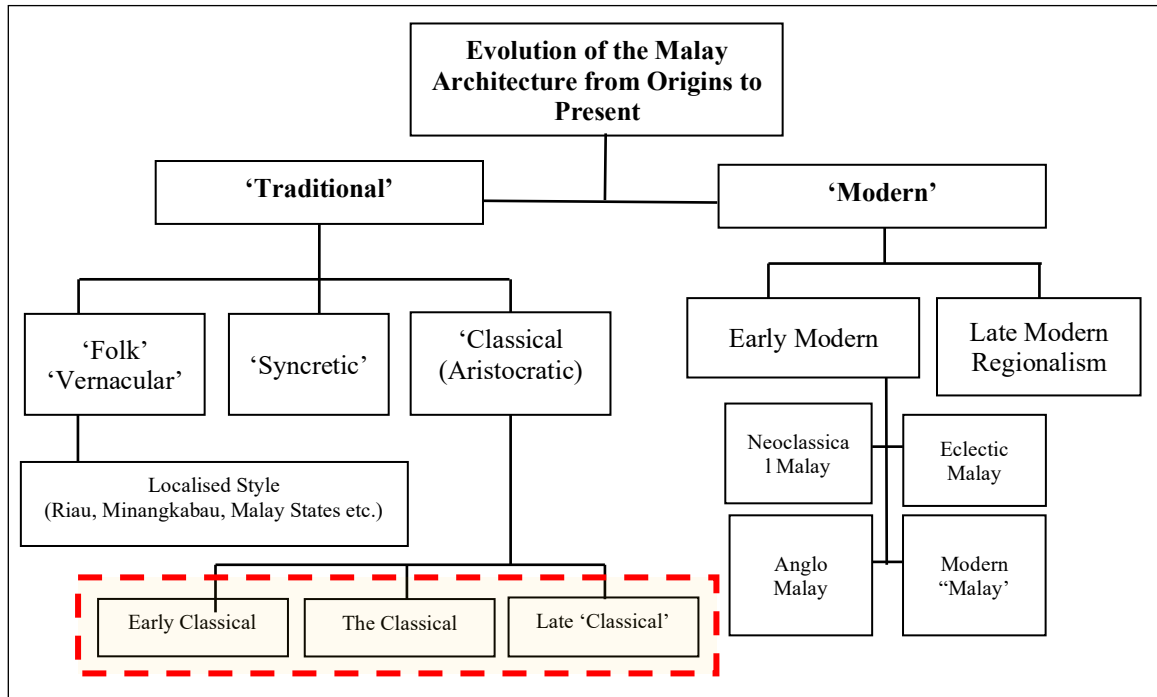


Fig. 2. A taxonomy of Malay architectural style and the Classical strands

Source: Authors' research extending from Powell and Ozkan's (1981)

To further classify these subsets in styles and re-position them under a Malay taxonomy, it is necessary to revisit the meaning of "Malay" style or character in architecture. The extent of acculturation of style and forms must be considered while defining Malay character. Acculturation is changing one's culture directly through the military or political conquest of another's culture. Acculturation typically results in changes in culture, customs, religious practices, food, healthcare, and other social institutions at this group level. Changes in diet, clothes, and language are some of the most visible group-level effects of acculturation. On the other hand, enculturation is generally known as the process by which people learn the dynamics of their surrounding culture to acquire values and norms appropriate or necessary in that culture and worldview. The question of the essential cultural character of the Malays in terms of architecture must be answered as to what constitutes that character. The principal Malay style is still the dominant form in some cases as the parameters remain Malay, although embellishments have started to absorb a degree of European stylisation. These factors are related to:

1. The origin of the design intentions is from the Sultan with the Sultanate and artisan's partnership as a social structure
2. The adherence to the tectonic systems as outlined earlier
3. The devotion to the stylistic character of archetypes
4. The inclusion of decorative style has evolved

Fig. 3, 4, 5 and 6 represent the early Classical (full timber palaces – many of which have been destroyed), mature Classical and late Classical Malay language. These frontages exemplified the strands which evolved from timber to hybrid to essentially masonry yet still retain critical essences of the Malay regional language. The evolution from timber to masonry hybrids reflected the natural development of the

Malay world. Trade and commerce links and dynastic dynamics were channelled into cultural forms and styles (Bosman & Whitfield, 2015). Metal and ceramic can be included in the discourse and variations, from the natural evolution of timber houses, which essentially has included metal as critical elements, to total masonry mutations with infusions of cast iron (Andaya, 2004). In some cases, the Malay style is still the dominant form as the parameters remain Malay, although embellishments have started to absorb a degree of European stylisation.

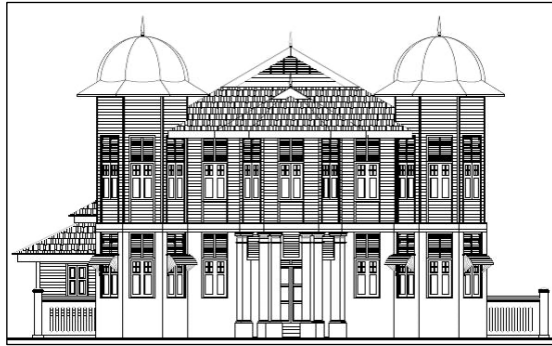


Fig. 3. Istana Leban Tunggal, Pahang (1932)

Source: Heritage, IIUM (2012)

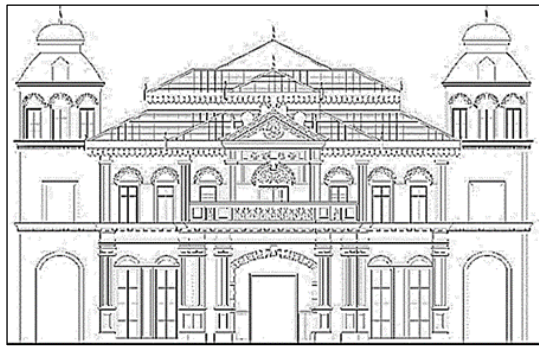


Fig. 4. Istana Hulu, Perak (1880)

Source: Heritage, IIUM (2013)

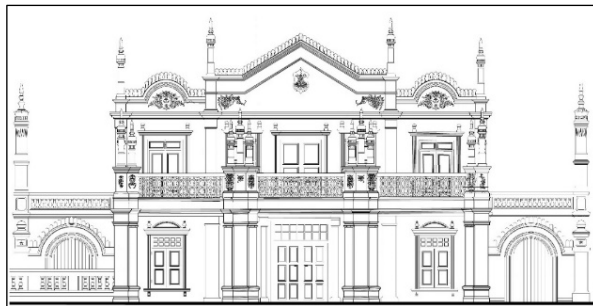


Fig. 5. Istana Jugra Bandar, Selangor.

Source: Taylor's University (2014)

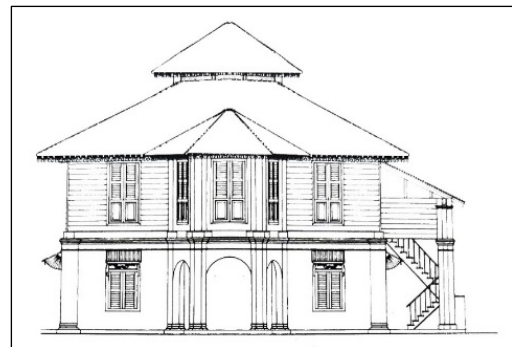


Fig. 6. Istana Raja Bilah, Perak (1896)

Source: KALAM, UTM

## The Parameters of Malay Architectural Style

The stylistic progression of the frontages can be seen in the Classical Malay buildings, which range from those built entirely of wood to hybrids with a brick or masonry ground floor, staircase base, or bottom pillar (Nawawi et al., 2018). In general, the amount of wood as a component building material declined throughout time, demonstrating the pressure of modernisation and how the barometer of modernity is represented in the materials. However, in all cases, Malay is still mapped and categorised within the evolution, as the changes did not drastically negate the Malay style. These simple structures, embellished with craftsmanship, will inevitably undergo mutation and, to some extent, petrification as modernity takes its course. The forms remain the same in many cases, even though the stylistic expressions had been transmuted from timber to masonry. The building frontages are thus representative of their era, yet they reflect the breadth of the Malay world's cultural and technological changes and patterns. The frontages may evolve into a full masonry version yet still be identified as Malay if it complies with the essential rules of character based on identification parameters. These parameters can be deemed as 'Malay' despite all these changes, which are: (Shaffee & Said, 2008).

1. The origin and formal design intention of the frontages
2. The stylistic grammar includes columns, brackets and pedestals.
3. The proportionate ratio of the frontages and their stylistic elements.
4. The consistent expression of structure or frame.
5. The consistent presence of some form of decorations or ornamentations.

## METHODOLOGY

This study aims to understand Malay aristocratic architectural styles using a systematic evaluation tool by examining 60 case studies, of which 24 were selected as samples. These selected case studies reflect hybrid construction and express a new fused style with elements of Classicality, including palaces and aristocratic residences from the late 1800s and early 1900s that underwent cultural and technological changes. The architectural language of the Malay people nowadays displays a division between modernity and vernacularism. Table 1 indicates the 24 case studies were selected from Southeast Asian countries, built between 1700 and 1930, with different key features and cultural and environmental expectations.

Table 1. List of Selected Samples for Case Studies with Their Key Features and Cultural And Environmental Context Summary.

No	Palace Name and Location	Const. Year	Key Features	Cultural/ Environmental Context
1	Istana Kadriah, Pontianak, Indonesia	1771-1778	Timber structure, stilted design, Malay carvings, pitched roof	Istana Kadriah blends Malay and Middle Eastern styles, featuring yellow and green tones symbolising religion, prosperity, and harmony.
2	Rumah Beruas, Perak, Malaysia	19th century	Traditional Malay house, timber framework, intricate wood carvings	Adapted for local climate and social hierarchy; reflects vernacular Malay traditions. This traditional Malay house features intricate wood carvings and arched columns design elements.
3	Istana Woodneuk, Singapore	19th century	Masonry foundation, colonial influences, gabled roof	It was designed by colonial architects, reflecting trade relationships and colonial dominance, and was a departure from traditional stilted Malay architecture.
4	Istana Jahar, Kelantan, Malaysia	1887	Timber structure, intricate carvings, Islamic-inspired motifs	Commissioned by Sultan Muhammad II of Kelantan, located near urban centres, it reflects Islamic and Malay identity.
5	Istana Melaka, Malacca, Malaysia (*Re-constructed)	15th century	Timber palace, stilted structure, large, pitched roof	It reflects the Malacca Sultanate's wealth and trade-based cosmopolitan culture, one of the earliest examples of Malay aristocratic architecture.
6	Istana Lima Laras, Batubara, Indonesia	19th century	Unique five-tiered roof, timber and masonry hybrid	It reflects Batak influences (Sumatra) and showcases cultural exchange and aristocratic expression.
7	Istana Langkat, North Sumatra, Indonesia	19th century	Masonry structure, Islamic arches, intricate detailing	It reflects Islamic influences and was commissioned during an era of trade expansion between Malaysia and Sumatra.
8	Istana Gunung Sahilan, Riau, Indonesia	19th century	Timber architecture, pitched roof, simple ornamentation	Built as a regional administrative palace, its proximity to rivers enabled trade and governance.
9	Istana Kuning, Kedah, Malaysia.	1920s	Timber structure painted yellow, stilted foundation	Yellow symbolises Malay royalty in Kalimantan, representing royalty and reflecting traditional Malay aristocratic styles.

10	Baitul Rahmah, Kuala Kangsar, Perak, Malaysia	1910s	Masonry building, colonial facade, Malay proportions	Influenced by colonial trade relationships and the modernising aspirations of the Malay aristocracy.
11	Dato Biji Sura, Terengganu, Malaysia	1920s	Masonry structure, pitched roof, Malay detailing	Built during an era of reduced reliance on timber, it reflects urbanisation and increasing architectural permanence.
12	Istana Maimun, Medan, Indonesia	1891	Hybrid Malay-Dutch style, masonry and timber combination, European-inspired arches	Built by Sultan Ma'moen Al Rasyid of Deli, it reflects strong colonial and trade influences in Sumatra.
13	Rumah Tok Menteri, Alor Setar, Kedah, Malaysia	19th century	Timber house, stilted foundation, verandah	It reflects vernacular traditions built for regional aristocrats with local craftsmanship.
14	Istana Bandar, Jugra, Selangor, Malaysia	1905	Timber-masonry hybrid, intricate wood carvings, pitched roof	Commissioned by Sultan Ala'eddin Suleiman Shah, it reflects adaptation to modern materials while preserving traditional Malay proportions.
15	Balai Besar, Kedah, Malaysia	1735	Grand timber structure, Malay roof detailing, elevated platform	Built-in Alor Setar as a ceremonial hall reflects Kedah's early aristocratic traditions and the resilience of timber craftsmanship.
16	Istana Yaring, Patani, Thailand	18th century	Timber architecture, intricate carvings, stilted design	Reflects traditional Malay craftsmanship and adaptation to flood-prone environments in Patani. Aring Palace's design language highlights Pattani's architectural syncretism, blending Thai and Malay identities.
17	Istana Rokan, Riau, Indonesia	18th century	Timber architecture, intricate carvings, stilted design	Istana Rokan showcases traditional Malay architecture, including intricate dragon carvings, symbolic pillars, "tali berlin tiga," and cultural reflections.
18	Istana Indragiri, Riau, Indonesia	18th century	Timber structure, stilted foundation, pitched roof	Located in Sumatra, it is built near rivers, reflecting the environmental adaptation of Malay architecture.
19	Istana Sepahcendra, Kedah Malaysia	19th century	Timber structure with European influences	It reflects trade and colonial interactions and has a transitional architecture combining Malay and European styles.
20	Istana Hulu, Perak, Malaysia	1880	Timber-masonry hybrid, symmetrical proportions, Malay ornamentation	Built-in Perak reflects the colonial influence and modernisation aspirations while maintaining Malay proportions and cultural symbolism.
21	Istana Leban Tunggal, Pahang, Malaysia	19th century	Timber stilt structure, vernacular ornamentation	Adapted to regional environmental needs; used primarily for aristocratic family purposes. Have two protruded spaces on left and right facades.
22	Istana Abu Bakar, Johor, Malaysia	1866	Masonry structure, symmetrical design, colonial features	It symbolises modernisation, commissioned by Sultan Abu Bakar of Johor and influenced by European architecture.
23	Istana Bulongan, Kalimantan, Indonesia	19th century	Hybrid structure, ornamental carvings, Malay proportions	It reflects transitional architecture with colonial influences; it was built near rivers in Kalimantan.
24	Istana Maziah, Terengganu, Malaysia	1897	Masonry palace, traditional Malay arches, colonial detailing	Built for the Terengganu royal family, it reflects modernisation during British influence while preserving traditional cultural elements.

Source: Authors (2024)

#### a) Visual analysis of architectural styles

The methodology uses imageability through the Visual Appraisal Representation of the Architectural Styles, Pattern-Matching Logic, and cultural mapping of the palaces to define and identify substyles arranged into a taxonomy. This requires closely examining their distinguishing characteristics, which make



Malay aristocratic architecture unique. This visual appraisal representation method entails going through architectural drawings, photographs, and sketches to distil the core of the structures' visual identity. Apply the Pattern-Matching Logic to identify themes and patterns that come up again in various buildings. A technique is created to distinguish between examples with local and colonial influences, recognising local masonry components as petrified instead of merely imitating colonial architecture. This study combines qualitative insights from archival research, measured drawings, field visits, and expert interviews with quantitative data translated into attributes of six (6) parameters. This study utilises the Malay Classical Evaluation Tool, a structured framework designed to classify and assess Malay aristocratic architecture through systematically evaluating six (6) key parameters: origin and typologies, structural expression, stylistic grammar, ratio and proportion, roof form, and ornamental motifs. Each parameter contributes uniquely to understanding the stylistic and cultural attributes of Malay aristocratic buildings:

- i. **Origin and Typologies:** This identifies the structure's Malay roots, ensuring its authenticity as part of Malay architectural heritage.
- ii. **Structural Expression:** Evaluates the visibility and articulation of the building's framework, distinguishing Malay vernacular styles from colonial influences.
- iii. **Stylistic Grammar:** Assesses non-structural elements, such as columns, brackets, and fenestrations, which embody cultural and regional identities.
- iv. **Ratio and Proportion:** Measures harmony and balance in design elements, reflecting timeless principles of Malay architectural aesthetics.
- v. **Roof Form:** Considers pitch and overhangs essential for climatic suitability and cultural symbolism.
- vi. **Ornamental Motifs:** Analyses decorative elements that signify Malay identity and craftsmanship.

#### b) Weighting and Impact of Parameters

Each parameter was assigned a specific significance based on its ability to differentiate architectural styles. For example, "stylistic grammar" and "ratio and proportion" were given higher weights as they are primary indicators of Malay classical identity. A high score across these parameters signifies strong adherence to Malay stylistic principles, whereas lower scores indicate external influences or deviations from traditional norms. The scoring system is calibrated to identify hybrid styles and transitional forms within the Malay stylistic continuum.

#### c) Mitigating Subjectivity in Visual Assessments

Recognising the potential for subjectivity in visual analyses, the study employed multiple measures to ensure consistency and reliability:

- i. **Expert Panels:** Three (3) experts in Malay architecture, each with substantial academic and field experience, conducted independent evaluations. Their scores were aggregated, and discrepancies were resolved through consensus.
- ii. **Inter-Rater Reliability:** Statistical tests, such as Cohen's Kappa, were applied to measure agreement among raters, achieving a reliability score of a value considered strong.

- iii. **Predefined Criteria:** Each parameter was operationalised with clear, measurable criteria. For instance, "proportion" was assessed through specific ratios such as column-to-pedestal height and roof-to-wall height.
- iv. **Calibration Exercises:** Calibration sessions ensured all evaluators interpreted parameters uniformly before formal evaluations.

#### d) Evaluation Scoring Framework

To contextualise the tool's application, Table 2 demonstrates how scoring across parameters determines a building's classification.

- i. Structures scoring  $\geq 50\%$  across key parameters are classified as adhering firmly to Malay stylistic traditions.
- ii. Scores below 50% indicate substantial external influence or divergence from classical Malay design principles.

This systematic and replicable approach minimises subjectivity, ensuring that the Malay Classical Evaluation Tool provides a robust method for categorising architectural styles while preserving the authenticity of Malay aristocratic heritage. Applying the Malay Classical Evaluation Tool across 60 case studies yielded insights into the stylistic evolution of Malay aristocratic architecture and its classification within a systematic taxonomy. The findings reveal a complex continuum of architectural styles, ranging from traditional timber vernacular forms to hybrid designs influenced by colonial and modern elements. The results regarding scoring parameters, their impact on classification, and the mitigation of subjectivity in assessments are presented.

## FINDINGS AND DISCUSSION

The case studies show the stylistic progression of the frontages, which range from those built entirely of wood to hybrids with a brick or masonry ground floor, staircase base, or bottom pillar. In general, the amount of wood used as a component building material declined throughout time, demonstrating the pressure of modernisation and how the materials represent the barometer of modernity. The six parameters—origin and typologies, structural expression, stylistic grammar, ratio and proportion, roof form, and ornamental motifs—were critical in distinguishing Malay aristocratic architectural styles. The results of the analysis and mapping further identified 'missing' strands of this continuum, which combines its evolution during the colonial and post-colonial eras. It begins with the traditional timber traditions taken as 'the root'. A scoring system based on stylistic parameters assesses the dominant elements, with 50% or above scores indicating adherence to Malay form and attributes of classicality such as symmetry, proportion, and refined style. These characteristics reflect timeless rules of form and cultural decorum. Scores below 50% suggest external influences, including colonial impacts, which may dilute or compromise the Malay character.

- i. **High-Scoring Structures:** Buildings scoring  $\geq 50\%$  across all parameters strongly adhered to Malay stylistic principles, reflecting traditional values and cultural identity. For example, Istana Hulu scored 11/17, showcasing key features such as timber-based structural expression, proportional ratios, and intricate ornamental motifs that signify Malay classical design.
- ii. **Low-Scoring Structures:** Structures with scores  $< 50\%$ , such as Istana Woodneuk (4/17), exhibited substantial external influences, such as gabled roofs and colonial decorative elements, which diluted the classical Malay identity.

A comparative investigation determines whether a structure is colonial-style, Malay-aristocratic, or Malay vernacular by examining features and their adherence to Malay formal language traits. Some hybrid timber and masonry structures represent early Malay-colonial forms, showcasing the pinnacle of Malay aesthetic language and the evolution of the growing masonry style. This style can be seen as the final branch in the traditional progression of Malay architecture, maintaining its roots and lineage despite colonial influences. The study combines qualitative insights from archival research, field visits, and expert interviews with quantitative data to form this evaluation tool. These parameters were converted into a matrix and scoring board. This matrix helps to measure the value of a Classical Building, and which strand it belongs.

This Evaluation Tool helps to validate and classify which buildings fall under which stand in the taxonomy. Expert consultations and reliability testing were also conducted to validate the method and accuracy of using this systematic evaluation tool to comprehensively understand Malay aristocratic architectural styles and their preservation. Tables 2 and 3 were extracted from previous studies on the Classification and Characterisation of Classical Malay Architecture, indicating the parameters in detail. The evaluation tool highlighted gaps in the stylistic continuum, identifying "missing strands" in transitioning from traditional to modern styles. Hybrid forms, such as masonry-timber combinations, were often misclassified as colonial styles. However, their adherence to Malay proportions and grammar affirmed their position within the Malay stylistic tree. This finding underscores the need for nuanced categorisation to preserve these transitional forms as part of the architectural heritage.

Table 2. The Parameters of the Architectural Language of Classical Malay

Parameters		Descriptions
1	Origins and Typologies	Its origins are located within the 'Malayness territory', owned or built by a Malay aristocrat and controlled by Malay patron decisions that help to demonstrate Malay architectural identity.
2	Structurally expressive	<p>The vernacular character is associated with a certain degree of structural or architectonic expression, as opposed to 'volume' or 'mass'. Instead of hiding its structural system, the essential Malay style expresses it. Modernity was reflected in the infusion of masonry elements into the region's architecture, but it retained its structural expression.</p> <p>The language and grammar of the building distinguish and historically identify the architectural style characterised by its elements. Grammar is a set of features or strategies that might include shape, construction method, and regional character.</p> <p>Stylistic grammar refers to the non-structural elements which arise from elements inserted within the frame or structural system. These typically evolve into stylised components and language elements, commonly stylised from constructions to elements composition. The Stylistic Grammar (The key design strategies):</p> <ul style="list-style-type: none"> <li>- Deep projections and recesses formed by a verandah (More than 1.5m)</li> <li>- On Silt Structure</li> <li>- Slender Columns</li> <li>- Pedestal or stylised bases</li> <li>- 'Larik'/ architrave /ventilative panel/ transom design</li> <li>- Intercolumniation – distance from column to column</li> <li>- Brackets, stylised struts, or decorative archways</li> <li>- Fenestration and opening of windows, doors, and grilles</li> <li>- Walls and Balustrades design</li> <li>- Pitch roof with overhangs</li> </ul> <p>Those stylistic grammar have detailed features and characters that define styles and usually have their semantical names. For example, 'Janda Berhias' and 'Tindih Kasih' are for walls.</p> <p>Theories of appropriate proportions have evolved throughout history, but the Malay ratio is still instilled. Aristocratic building elements were calculated and averaged to get ratios and proportions.</p>
3	Stylistic grammar	<ol style="list-style-type: none"> <li>1. The diameter of column-to-column height</li> <li>2. The intercolumniation space of the column-to-column</li> <li>3. The height of the pedestal to the size of the column</li> <li>4. The height of the bracket to the height of the column</li> <li>5. The total area of the opening/window to the total walls</li> <li>6. The height of level 1 (kolong) to the height of level 2</li> </ol>
4	Ratio and proportion	

		7. The height of the wall to the height of the roof
		8. The area of the ornament panel to the area of the wall
		9. The degree of the pitched roof
		These proportioning methods provide the dimensions of form and aesthetic logic.
5	Roof	The roofs have certain degrees of roof pitch related to the roof's climate, material, and function.
6	Ornamental motif	The façade includes any ornamental motif that is symbolic of the Malay world. Roof – ‘Pemeleh’, ‘Ande-ande’, ‘Tunjuk Langit’.

Source: Authors (2024)

Table 3. Malay Classical Evaluation Tool

LIST OF CASE STUDIES		9- Istana Kuning				18-Istana Indragiri							
	1- Istana Kadriah	10-Baitul Rahmah				19-Istana Sepahcendra							
	2- Rumah Beruas	11-Dato Biji Sura				20-Istana Hulu							
	3- Istana Woodneuk	12-Istana Maimun				21-Istana Leban Tunggal							
	4- Istana Jahar	13-Rumah Tok Menteri				22-Istana Abu Bakar							
	5- Istana Melaka	14-Istana Bandar				23-Istana Bulongan							
	6- Istana Lima Laras	15-Balai Besar				24-Istana Maziah							
	7- Istana Langkat	16-Istana Yaring											
	8- Istana Gunung Sahilan	17-Istana Rokan											
Stylistic Parameters		1	2	3	4	5	6	7	8	9	10	11	12
1	Origin	√	√	X	√	√	√	√	√	√	√	√	X
2	Typology	√	√	X	√	√	√	√	√	√	√	√	√
3	Structural Expression	√	√	√	√	√	√	√	X	√	√	X	√
Stylistic Grammar													
4	Deep Recesses Formed by Verandah ( > 1.5m )	√	√	X	√	√	√	√	X	X	√	√	√
5	Slender Columns	√	√	X	√	√	√	√	X	√	√	X	X
6	Pedestal	√	√	X	√	√	√	X	√	√	√	√	X
7	Larik(Architrave) / Kekisi	√	√	√	√	√	√	√	X	X	√	√	X
8	Intercolumniation	√	√	X	X	√	√	√	X	√	√	√	√
9	Brackets or Decorative Arches	√	√	√	X	√	√	X	X	X	√	√	X
Ratio and Proportion													
10	Columns	X	X	X	√	√	X	X	√	√	√	X	√
11	Pedestal	√	√	X	√	√	√	X	√	X	√	X	√
12	Larik / Kekisi	√	√	X	X	√	√	√	X	X	√	√	X
13	Bracket	√	√	√	X	√	X	√	X	X	√	√	X
14	G Floor: 1 <sup>st</sup> Floor	√	X	X	√	√	√	√	√	√	√	√	X
15	Windows	√	√	X	√	√	√	√	√	√	√	√	√
16	Roof Pitch	√	√	X	√	√	√	√	√	√	√	√	X
17	Ornamental Motif	√	√	X	√	√	√	√	√	X	√	√	X
ASSESSMENT SCORE		16/17	15/17	4/17	13/17	17/17	15/17	13/17	9/17	10/17	17/17	13/17	7/17
Stylistic Parameters		13	14	14	15	17	18	19	20	21	22	23	24
1	Origin	√	√	√	√	√	√	√	√	√	√	√	√
2	Typology	√	√	√	√	√	√	√	√	√	√	√	X
3	Structural Expression	√	√	√	√	√	√	X	√	√	√	√	X
Stylistic Grammar													
4	Deep Recesses Formed by Verandah ( > 1.5m )	√	√	√	√	X	√	√	√	X	√	√	X
5	Slender Columns	X	X	√	√	√	√	X	X	X	√	√	X
6	Pedestal	√	√	√	√	√	√	X	√	√	X	√	X
7	Larik(Architrave) / Kekisi	X	√	√	√	√	√	X	X	√	X	√	X
8	Intercolumniation	X	√	√	√	√	√	X	√	X	√	√	X

9	Brackets or Decorative Arches	√	X	√	X	√	X	X	√	X	X	√	X
Ratio and Proportion													
10	Columns	X	X	√	√	√	√	X	X	X	√	√	X
11	Pedestal	√	X	√	√	√	√	X	√	√	X	X	X
12	Larik / Kekisi	X	X	√	X	√	√	X	X	√	X	√	X
13	Bracket	X	X	√	√	√	X	X	X	X	X	√	X
14	G Floor: 1 <sup>st</sup> Floor	√	X	X	√	√	√	X	√	√	X	√	X
15	Windows	√	√	√	√	√	√	X	√	√	X	√	√
16	Roof Pitch	√	√	√	√	√	√	X	√	X	√	√	√
17	Ornamental Motif	√	√	√	√	√	√	√	√	X	√	X	√
<b>ASSESSMENT SCORE</b>		<b>11/17</b>	<b>10/17</b>	<b>16/17</b>	<b>15/17</b>	<b>16/17</b>	<b>15/17</b>	<b>4/17</b>	<b>11/17</b>	<b>9/17</b>	<b>9/17</b>	<b>15/17</b>	<b>4/17</b>

Source: Authors (2024)

Thus, the assessment based on the parameters above shows the stylistic character's leaning or predisposition, which suggests that the lower scores of 3/11 indicate that the case studies do not belong under the Malay stylistic tree. Hence, its nomenclature and definition of style should reflect this. The cases which scored 5/11 and above had essentially held on to the essence of the Malay form. The language is argued as 'the Classicalised vernacular' as it depicts attributes of Classicality. Such characteristics like symmetry, proportion, and a highly refined style reflect specific timeless rules of form. The Malay aristocracy has always been a custodian of its cultural institutions, hallmarks, and forms (Abidin et al., 2017). These include its palaces, which reflected an essential set of rules and represented the identifiable character of the culture while embodying a sense of decorum characteristic of the Malay world. However, their evolution was occasionally interrupted by colonial elements that had infused and juxtaposed their Malay characteristic forms. They sometimes diluted its essence, yet they did not compromise it in some instances.

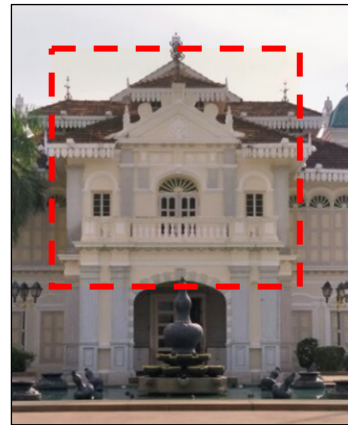
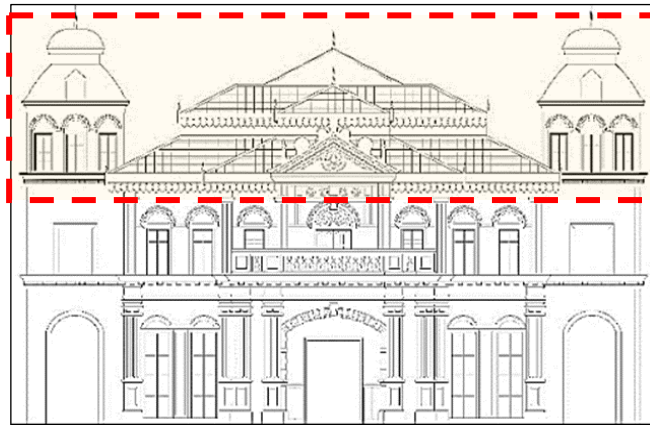


Fig.7 And 8. The Façade of Istana Hulu Clearly Shows The 'Colonial' Features of Parapet Walls, Etchings, Engraving And Window Frames (Annotations By Authors).

Source: Fig.7 - Heritage, IIUM (2013) & Fig. 8 – Authors (2024)



Fig. 9 And 10. Malay Architecture, Featuring the Typical Malay Architectural Form, Ratio and Proportion.

Source: Authors (2024)

Fig. 7, 8, 9 and 10 show the case study of Istana Hulu Perak. Istana Hulu, Perak (number 20 in Table 2) had 11/17 scores, classifying this building under the Malay stylistic tree. Even though the frontal façade of Istana Hulu clearly shows the 'colonial' features with parapet walls, etchings, engraving and window frames, other elevations and façades portray the Malay architectural features. Some features of the Malay elements have been replaced with pediment or moulded pilaster ornate window frames with or without keystone or parapet walls. The palace portrays the Sultan's attentiveness to show their power and richness by expressing the impact of 'modernity' in their palaces, not denying other influences. However, the different façades of the building still emphasise Malay features, especially the architectural elements, ratios, and proportions—Fig. 11 and 12 show Malay architecture, featuring fascia boards, filigrees, and full-height windows. From the table, 11 parameters were found, which justifies the buildings' classification as Malay Classical. In certain instances, the Malay style remains the predominant form, retaining its core characteristics, though it has begun integrating European decorative influences.

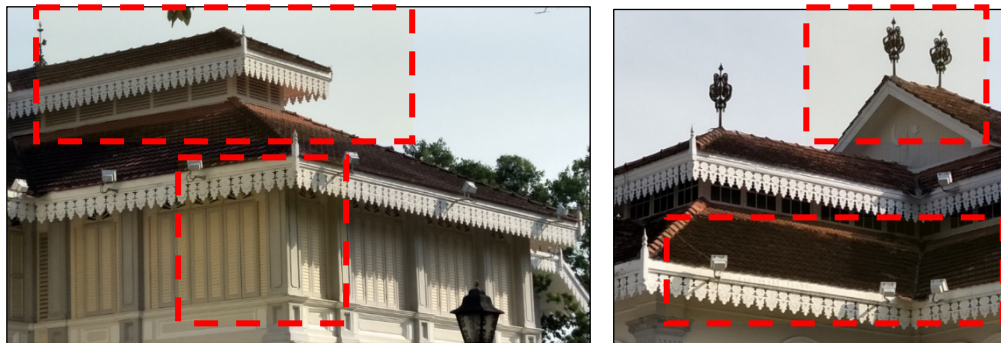


Fig. 11 and 12. Malay architecture, featuring fascia boards, filigrees, and full-height windows (annotations by authors).

Source: Authors (2024)

Compared to Istana Hulu, Istana Woodneuk got 4/17 scores on the Evaluation Assessment, indicating that the building does not belong under the Malay stylistic tree. Istana Wooden York was redesigned by Denis Santry of Swan and Maclaren and built by Nanyang Structural Co. for Sultan Ibrahim and his Scottish wife, Sultanah Helen. The reasons are quite apparent, especially when non-locals designed the buildings. The intricate Malay form and features were no longer being emphasised. Fig. 13 shows the building form and façade. The pitch roof is gable and does not follow the standard pitch degree found in Malay buildings.

The ratio, proportion, openings, structural expression, and decorative elements were no longer there. This palace does not qualify with the Malay architectural principles, which no longer define it as Malay.



Fig. 13. The Building Façade of Istana Woodneuk, Singapore.

Source: About Singapore City MRT Tourism Map and Holidays (2015)

From the results, the three (3) primary case studies illustrate the findings; - a) Istana Hulu, Perak, with a score of 11/17, emphasising Malay features such as proportional symmetry and vernacular ornamentation, despite some colonial facade elements; b) Istana Woodneuk, Singapore with a scored 4/17, reflecting minimal Malay stylistic adherence and predominant colonial features, leading to its exclusion from the Malay stylistic taxonomy and c) Istana Bandar, Selangor with a scored 13/17, blending traditional Malay structural grammar with adaptive masonry techniques, preserving the essence of Malay classical architecture. Malay elements that survive the onslaught of modernity through colonialism can be argued as part of Malay architecture's same 'tree' belonging to the same root and genealogy (Pieterse, 2018).

The parameter assessment can define cases under the 'colonial style', the Malay-Classical and the Malay vernacular classifications to differentiate the positions and characteristic stylisations. The evaluation identified variations in stylistic changes over time, influenced by each period's cultural and environmental context. For instance, palaces built in the early 19th century, such as Istana Hulu (constructed in 1880), predominantly utilised timber and followed traditional Malay stilted designs, reflecting the socio-environmental need to avoid floods and venomous animals. However, later examples, such as Istana Bandar (1905), integrated masonry, influenced by trade relations and the evolving socio-political landscape. The shift from timber to masonry observed in many Malay aristocratic palaces can be partly attributed to changes in topography and environmental conditions. For instance, the drying of rivers and reduced flooding risks in certain regions diminished the necessity of stilted designs, allowing for the adoption of masonry foundations.

Additionally, the rise of trade relationships during the colonial period introduced new materials and construction techniques, which were gradually integrated into Malay architecture. These factors, combined with urbanisation and increasing permanence in aristocratic residences, contributed to the stylistic transitions documented in this study. They are linked to the predominance of some aspects of the Malay formal language and the notion of archetypes. Some cases depicting timber and masonry hybridity that appear to be early Malay-colonial forms represent a high point of a classically based Malay aesthetic language. The lowest score is reflected in the increasing masonry style, representing the last branch of the tree of Malay's architectural 'traditional' evolution. Istana Sepahcendera and Istana Woodneuk scored lowest despite being near or within one of the fastest expanding regions, Penang and Singapore. The Straits Settlements exerted a cultural force with an intensity of its own. In these states, the main administrative palaces are charged with colonial power. The buildings in the Straits Settlements tremendously changed into hybrid styles and modern constructions due to the impact of colonisation.



## CONCLUSION

The Malay Classical Evaluation Tool categorised architectural styles and provided a replicable framework for evaluating regional vernaculars. By identifying stylistic strands and scoring thresholds, the tool contributes to heritage preservation and supports contemporary interpretations of classical styles. The findings underscore the resilience of Malay aristocratic architecture, even amidst external influences. The systematic approach enabled the classification of transitional styles often overlooked in traditional typologies. The results also highlight the tool's potential as a resource for future conservation efforts, emphasising a balance between preserving traditional identity and embracing modern adaptations. The architectural styles of Malay Aristocratic buildings can be classified through a matrix and scoring system. Clustering case studies based on their scores reflect the degree to which they embody the Malay stylistic language of facades. Although the scoring incorporates various influencing factors, it explicitly measures the influence of the frontage and the extent of colonial impact or 'disturbance.' This colonial influence can be seen as a layering of external power upon indigenous forms, altering the traditional vernacular language. This research establishes a fundamental framework for discourse on architectural language and style.

Classifying forms and characteristics contributes to a resource on vernacular architecture that can be adapted into new stylistic variations. This framework can be connected to and developed concerning the cultural, environmental, climatic, functional, and aesthetic aspects of different climates, regions, and cities. Malay architecture's stylistic grammar and rules should be semantically described and identified, detailing their language and vocabulary. These classical evolutions are crucial for preserving identity and vernacular elements amidst significant regional changes. In the face of the alarming loss of architectural character in the Malay region and Asian cities in general, classical Malay architecture, expressed through modern materials, can contribute to the emergence of a new urban architectural language. This contemporary interpretation of classical styles ensures the survival of traditional elements and supports the development of distinctive, culturally resonant urban architecture. Through this tool and research, the resilience and adaptability of Malay architecture can be highlighted, promoting a balance between preserving heritage and embracing modernity.

The evolution of Malay aristocratic architecture reflects a distinct synthesis of cultural identity, Islamic influences, and external adaptations, distinguishing it from other Southeast Asian styles such as Thai or Javanese aristocratic architecture. This study introduced the Malay Classical Evaluation Tool, a taxonomy and scoring framework that systematically classifies stylistic transitions and highlights missing strands in the architectural continuum. By prioritising proportional harmony, structural expression, and ornamental motifs, the tool aids in documenting and preserving Malay heritage while offering practical applications for restoration and sustainable urban development. Its comparative insights emphasise the unique traits of Malay styles, and its structured parameters provide authenticity in conservation efforts. Future research could explore comparative analyses of regional hybrid styles, leverage digital reconstruction for education and preservation, and investigate climate-adaptive applications of traditional Malay features.

This framework bridges the gap between tradition and modernisation, ensuring Malay aristocratic architecture remains vital to Malaysia and Southeast Asia's architectural heritage. This study lays the foundation for understanding the evolution of Malay aristocratic architecture and its contribution to Malaysia's national identity. Future research could investigate how topographical changes and trade dynamics influenced material use and design evolution. Additionally, integrating oral histories and archival narratives could provide richer cultural insights into the social and environmental factors shaping these architectural forms. Such studies could also explore contemporary applications of these findings to inform sustainable design practices and identity-focused urban development.



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## CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted without any self-benefits or commercial or financial conflicts and declare the absence of conflicting interests with the funders.

## AUTHORS' CONTRIBUTIONS

All authors participated in performing the research, contributed to the drafting and revision of the article, came up with the central research topic, and provided feedback for the theoretical framework. In addition, they all reviewed and agreed to submit the paper.

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