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AI-ASSISTED TRANSFORMATION OF MALAY WOOD-CARVING MOTIFS INTO CONTEMPORARY KERONGSANG TOK: *A PRACTICE-BASED DESIGN APPROACH TO CULTURAL SUSTAINABILITY*

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Abstract: *Malay traditional wood carving represents an important visual expression of cultural identity, craftsmanship and indigenous knowledge. Its motifs, particularly flora, fauna, geometric and stylised organic forms, have historically been applied to traditional architecture and craft objects. However, the continuity of traditional motifs faces challenges associated with changing lifestyles, contemporary aesthetics, declining craft practices and limited adaptation into new product contexts. This study explores an AI-assisted practice-based design approach for transforming selected Malay wood-carving motifs into contemporary* ***Kerongsang Tok****, a traditional Malay jewellery form. The study integrates cultural research, visual analysis, motif extraction, digital ideation, AI-assisted visualisation and jewellery design development. The design process consists of five stages: cultural and visual documentation, motif identification and abstraction, AI-assisted ideation, design refinement and contemporary Kerongsang Tok development. The approach positions artificial intelligence not as a replacement for cultural knowledge or craftsmanship, but as a creative support tool for exploring alternative visual compositions and accelerating early-stage design development. The study proposes that culturally informed AI-assisted design can contribute to cultural sustainability by creating new contexts in which traditional motifs remain visible, meaningful and relevant. The resulting design framework demonstrates a pathway for connecting Malay wood-carving heritage with*

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contemporary jewellery while maintaining recognisable cultural characteristics. The research contributes to practice-based design scholarship by demonstrating how traditional visual knowledge can be translated into a contemporary wearable artefact through an iterative relationship between heritage research, human creativity and AI-assisted visual experimentation.

Keywords: *Malay wood carving, Kerongsang Tok, cultural heritage, cultural sustainability, AI-assisted design, practice-based research, contemporary jewellery, motif transformation*

Introduction

Cultural heritage encompasses the knowledge, skills, practices, visual expressions, and material traditions transmitted across generations. Within the framework of intangible cultural heritage, traditional craftsmanship represents an important form of cultural expression because it embodies not only physical artefacts but also the knowledge, techniques, values, and creative practices associated with their production (UNESCO, 2003). UNESCO emphasises that safeguarding traditional craftsmanship should extend beyond preserving craft objects and should support the continuation and transmission of the knowledge and skills that sustain craft traditions within communities (UNESCO, n.d.). Consequently, the continuity of traditional craft depends not only on documentation and preservation but also on opportunities for creative adaptation and contemporary application.

In the Malaysian context, traditional Malay craftsmanship represents an important visual and cultural vocabulary through which identity, philosophy, aesthetics, and local knowledge are expressed. Among these traditions, Malay wood carving is particularly significant because its decorative motifs have been applied to architectural elements, furniture, interior components, and other forms of visual culture. One of the distinctive visual vocabularies within Malay wood carving is *Awan Larat*, which is characterised by flowing organic lines, interconnected vegetal forms, floral elements, and rhythmic compositions. Kamaruddin (2011) identifies variations in the composition of *Awan Larat* as an important feature of traditional Malay wood carving, demonstrating that the motif can occur through different arrangements while maintaining visual unity and continuity.

The characteristics of *Awan Larat* provide considerable potential for contemporary design reinterpretation. Its flowing lines, organic forms, floral structures, repetition, rhythm, and balanced compositions can function as design principles rather than merely decorative motifs. Such an approach allows the designer to move beyond literal reproduction towards abstraction, transformation, and contextual reinterpretation. In this study, *Awan Larat* is therefore regarded as a visual vocabulary from which selected formal characteristics can be analysed and translated into another cultural artefact category, namely traditional Malay jewellery.

Traditional Malay jewellery constitutes another important component of Malaysia's material heritage. Among the forms associated with Malay dress is the *Kerongsang Tok*, a traditional jewellery set consisting of three brooch elements traditionally used to secure and decorate the *baju kebaya*. Previous research has identified *Kerongsang Tok* as an established form of Malay traditional jewellery and has highlighted concerns regarding its declining popularity and the need for renewed design inspiration to support its continued appreciation among contemporary users (Shamsuddin et al., 2023). Earlier work by Shamsuddin et al. (2022) similarly

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demonstrates the potential of design innovation and the incorporation of Malay motifs to generate new interpretations of *Kerongsang Tok* while maintaining its cultural identity.

The reinterpretation of traditional motifs into contemporary products presents an important opportunity for cultural heritage preservation. Rather than treating heritage as a static collection of historical objects, design research can approach heritage as a living source of knowledge capable of generating new forms and applications. This perspective is consistent with the safeguarding principles promoted by UNESCO, which emphasise the continuation, transmission, and vitality of traditional craftsmanship rather than the preservation of objects alone (UNESCO, n.d.). In the context of jewellery design, reinterpretation can therefore provide a means of maintaining connections with traditional visual languages while responding to contemporary aesthetic expectations, technologies, and modes of production.

However, reinterpretation requires a systematic design process to ensure that the relationship between the source heritage and the new design remains identifiable and meaningful. Direct copying of a traditional motif may preserve its visual appearance but may provide limited opportunities for creative transformation. Conversely, excessive abstraction may result in the loss of recognisable cultural characteristics. The challenge is therefore to identify the essential visual principles of the source motif and transform them into a contemporary design language while retaining meaningful connections to the original heritage. In the present study, this relationship is explored through the analysis of *Awan Larat* and the structural characteristics of *Kerongsang Tok*, particularly floral emphasis, flowing lines, composition, balance, repetition, decorative density, and the relationship between the central and secondary brooch elements.
Recent developments in generative artificial intelligence (AI) have further expanded possibilities for design ideation and visual exploration. AI-assisted design tools can support designers during the early stages of concept development by generating multiple visual alternatives from textual or visual prompts. Berni et al. (2024) identify design ideation as one area in which AI can provide support for inspiration and exploration, while emphasising that AI should not be regarded as a replacement for designers. Similarly, Kwon et al. (2024) demonstrate the potential of a designer–generative AI process in which prompt development, iterative image generation, and result analysis are integrated into early-stage product design exploration. These findings suggest that generative AI can function as a creative support mechanism while the designer retains responsibility for interpretation, selection, refinement, and design decision-making.

Despite the increasing application of AI in creative design, the integration of generative AI with culturally grounded motif reinterpretation remains an emerging area of investigation. In particular, there is a need to examine how traditional Malay visual knowledge can be systematically analysed and translated before being introduced into an AI-assisted ideation process. The use of AI without an established cultural and visual framework may produce aesthetically attractive outcomes that are disconnected from the source heritage. Therefore, a methodology that begins with cultural investigation and motif analysis, followed by abstraction and controlled AI-assisted ideation, can provide a more structured approach to culturally informed design development.

Accordingly, this study proposes a systematic design research process for reinterpreting *Awan Larat* Malay wood-carving motifs into contemporary *Kerongsang Tok* design. The process begins with cultural and visual heritage investigation, followed by *Awan Larat* motif analysis, motif abstraction, AI-assisted ideation, *Kerongsang Tok* design development, design

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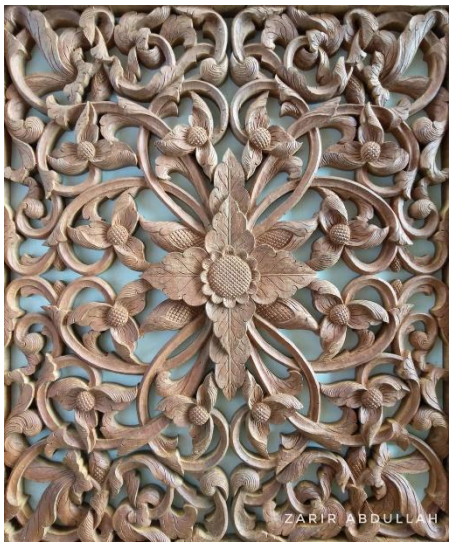
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refinement, and visual evaluation. The approach focuses on relationships and underlying design principles rather than literal replication, allowing selected characteristics of *Awan Larat* to be transformed into a contemporary jewellery context.

The study aims to investigate how the visual characteristics of *Awan Larat* can be systematically analysed, abstracted, and translated into a contemporary *Kerongsang Tok* design while maintaining meaningful connections to Malay cultural heritage. Specifically, the study seeks to (1) identify the cultural and visual characteristics of *Awan Larat* and *Kerongsang Tok*; (2) analyse and abstract selected *Awan Larat* design elements into a contemporary visual vocabulary; (3) explore the role of generative AI in the early ideation and visual development of *Kerongsang Tok*; and (4) develop and evaluate a contemporary *Kerongsang Tok* design derived from the reinterpretation of *Awan Larat*. Through this process, the study contributes to the discussion of heritage-based contemporary jewellery design by demonstrating how traditional visual knowledge can be transformed through a structured design methodology while retaining its cultural reference and relevance.

Literature Review

Malay Wood-Carving Heritage



Malay traditional wood carving is an important component of Malaysia's architectural and cultural heritage. Wood-carving motifs are commonly incorporated into traditional Malay houses and other heritage structures, where they function as decorative elements as well as expressions of cultural identity. Research has documented floral, geometric and calligraphic forms within Malay wood carving and highlighted the importance of understanding these motifs before they are lost through changes in the built environment and traditional practices (Rashidi et al., 2022).

Yusof et al. (2023) investigated wood-carving motifs in 60 traditional Malay houses in Johor through site visits, photography, documentation and interviews. Their study identified 13 motifs organised into 12 typologies and found that the Labu Maya motif was particularly prominent. The researchers emphasised that documentation and classification are important for maintaining the authenticity and regional identity of Malay wood-carving heritage.

Similarly, Mohd Zaine and Ab. Aziz (2024) examined wood-carving motifs at Masjid Lama Tanjung Beringin in Seri Menanti, Negeri Sembilan. Using site observation, interviews and library research, the study identified 16 motifs comprising 12 flora motifs, one fauna motif, one calligraphic motif, one geometric motif and one still-life motif. The findings demonstrate the diversity of Malay wood-carving vocabulary and the importance of continued documentation to support the preservation of Malay identity.

These studies establish that Malay wood carving contains a rich visual vocabulary that can provide a valuable source of inspiration for contemporary design. However, much of the

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existing research focuses on architectural documentation, classification and conservation. Less attention has been given to translating these motifs into contemporary jewellery products.



Figure 1. Sample of wood carving motif (awan larat motif) to be interpret into new design of Kerongsang Tok.

1. **A - Symmetrical Awan Larat:** Characterised by a prominent central flower surrounded by gracefully curling tendrils, creating a balanced and symmetrical composition.
2. **B - Flowing Awan Larat:** Features continuously extending and curving tendrils, making it suitable for translation into the flowing contours and curved structure of Kerongsang Tok.
3. **C - Complex Floral Awan Larat:** Combines large and small flowers with leaves and tendrils to create a rich and intricate ornamental composition.
4. **D - Minimal Awan Larat:** Focuses primarily on tendrils and leaves, making it suitable for simplification and abstraction into a contemporary jewellery design.

Awan Larat is treated in this study as a Malay floral and vegetal design system rather than as a single flower. Its vocabulary may include flower, leaf, stem, branch, tendril, shoot, repetition, curvature, rhythm, and negative space. The following visualisation is used only as an AI-assisted conceptual reference.



Figure 2. AI-assisted conceptual visualisations of four Awan Larat-inspired Malay wood-carving compositions.

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The variations demonstrate different structural possibilities, including symmetrical floral organisation, extended flowing movement, denser floral arrangement, and simplified tendril-and-leaf composition. For jewellery transformation, the most transferable units are flower heads, leaf clusters, curved stems, tendrils, and controlled negative spaces.

Kerongsang Tok and Malay Jewellery Heritage

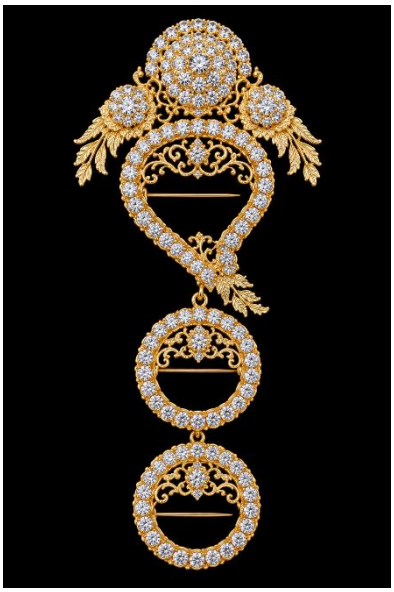
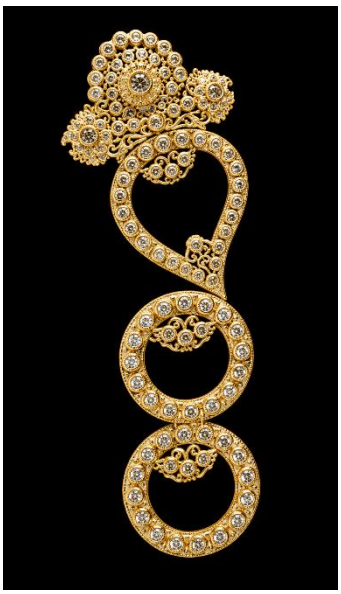
Kerongsang Tok is a traditional Malay jewellery form that provides an appropriate platform for the reinterpretation of cultural motifs. Previous research has explored the development of new Kerongsang Tok designs as a strategy for preserving Malay traditional jewellery while responding to contemporary design requirements.

Shamsuddin et al. (2023) investigated new design inspiration for Kerongsang Tok and demonstrated the potential for developing contemporary interpretations of the traditional jewellery form. This research established the importance of innovation in maintaining the relevance of traditional Malay jewellery.

Shamsuddin et al. (2024) subsequently investigated the integration of Seni Tekat motifs into Kerongsang Tok design. The study used an ideation process to incorporate traditional Malay patterns into new jewellery designs and included feedback from academics, students, goldsmiths and jewellery designers. The findings demonstrated that traditional motifs can provide new design inspiration while supporting cultural preservation.

The present study extends this line of research by introducing Malay wood-carving motifs as the principal source of visual inspiration. While previous research focused on Seni Tekat, this study examines how the floral, organic, scrolling and symmetrical characteristics associated with Malay wood carving can be translated into the smaller scale and aesthetic requirements of Kerongsang Tok.

Table 1: Traditional Jewellery Design of Kerongsang Tok

TRADITIONAL DESIGN 1	TRADITIONAL DESIGN 1	TRADITIONAL DESIGN 1
		

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Kerongsang Tok visual reference: an ornate three-piece ibu–anak arrangement in gold-toned jewellery.	*Kerongsang Tok visual reference: a central brooch with two matching circular anak pieces.*	*Kerongsang Tok visual reference: a vertically arranged three-piece brooch composition with floral and scrolling ornament.*

Cultural Sustainability Through Design Transformation

Cultural sustainability involves maintaining cultural knowledge, identity and practices while allowing them to remain meaningful within contemporary contexts. In traditional craft, sustainability does not necessarily require the complete preservation of historical forms without modification. Instead, cultural knowledge can continue through appropriate reinterpretation and transmission.

Malay wood-carving studies emphasise that documentation is necessary to prevent the loss of local identity (Yusof et al., 2023; Mohd Zaine & Ab. Aziz, 2024). However, documentation alone may not ensure that traditional visual knowledge remains active in contemporary society. Transforming traditional motifs into new products can provide another pathway for cultural continuity.

In the context of jewellery, the use of Malay wood-carving motifs in Kerongsang Tok creates a connection between two traditional craft domains: **wood carving and jewellery design**. This transformation provides an opportunity to introduce traditional visual knowledge to contemporary audiences through a wearable cultural product.

Cultural Sustainability Through Design Transformation

Cultural sustainability in design concerns the continued transmission, visibility, interpretation, and use of cultural knowledge. For traditional craft, sustainability does not necessarily require exact replication of historical objects. It can also involve meaningful continuation through contemporary practice, provided cultural references are researched and interpreted responsibly. UNESCO identifies traditional craftsmanship as an important area of intangible cultural heritage and emphasises transmission of knowledge and skills.

Generative AI in Design Ideation

Generative AI can support early-stage concept exploration by producing visual alternatives from textual and visual prompts. Kwon, Jung, and Kim (2024) discuss the importance of aligning AI-generated images with designer intent during early concept exploration. The value of AI in this context is therefore not simply the speed of image production, but the possibility of expanding the visual search space. The designer remains responsible for interpreting the output, rejecting unsuitable results, and translating selected ideas into a feasible design.

Practice-Based Design Research

Practice-based research recognises designed and fabricated artefacts as important forms of research knowledge. Zimmerman, Forlizzi, and Evenson (2007) and Bardzell et al. (2016) describe Research Through Design as an approach in which making and reflection contribute to knowledge development. Korkmaz (2024) demonstrates the relevance of generative design approaches in jewellery design and digital fabrication. The present study adopts this orientation by treating the design process, documentation, and resulting Kerongsang Tok prototype as the central research artefact.

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Research Methodology

This study employed a qualitative practice-based design research approach to explore the transformation of Malay wood-carving motifs into contemporary Kerongsang Tok. The approach was selected because the study focuses on visual interpretation, creative exploration and the development of actual design artefacts. Practice-based research is appropriate in art and design because knowledge can be generated through creative practice and the outcomes produced through that practice (Candy & Edmonds, 2018).

The research began with a review of Malay wood-carving motifs and their visual characteristics. Previous research has documented and classified Malay woodcarving motifs through observation, photographic documentation and visual analysis. Yusof et al. (2023), for example, documented woodcarving motifs in 60 traditional Malay houses in Johor and identified 12 typologies derived from 13 motifs. Such documentation provides a cultural and visual reference for identifying characteristics that can be interpreted in contemporary design.

The selected motifs were then analysed according to their forms, lines, curves, symmetry, repetition and ornamental characteristics. The researcher did not directly reproduce the original wood-carving patterns. Instead, selected visual characteristics were simplified, stylised and reorganised to suit the scale and aesthetic requirements of contemporary jewellery.
The next stage involved the development of the Kerongsang Tok design. The researcher developed an initial hand-drawn sketch, followed by a refined coloured design and a final design proposal. This iterative process is consistent with previous Kerongsang Tok research in which Malay heritage motifs were developed through ideation and design exploration before being translated into contemporary jewellery (Shamsuddin et al., 2024).

Artificial intelligence was incorporated as a supportive tool for design ideation and visual exploration. AI-assisted exploration was used to investigate possible motif combinations, compositions and contemporary design variations. However, the researcher remained responsible for interpreting the cultural motifs, selecting appropriate design elements and refining the final jewellery design. AI was therefore positioned as a creative support mechanism within a human-led design process.

The final designs were analysed through qualitative visual analysis. The analysis considered the relationship between the Malay wood-carving-inspired elements and the traditional Kerongsang Tok structure, together with visual balance, ornamental composition, proportion and contemporary aesthetic qualities. The actual design artefacts therefore function as important practice-based evidence of the transformation process.

The methodology can be summarised as a continuous process of cultural investigation, motif analysis, motif abstraction, AI-assisted ideation, design development and reflective evaluation. The resulting design artefact represents the outcome of this practice-based process.

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Table 2. Research Methodology and Design Development Process

Stage/Phase	Research Activity	Description	Output
1. Cultural Investigation	Review Malay wood-carving motifs	Relevant literature and visual documentation were examined to understand the characteristics and cultural context of Malay woodcarving.	Cultural and visual references
2. Motif Analysis	Analyse visual characteristics	Selected motifs were examined according to form, line, curve, symmetry, repetition and ornamentation.	Selected motif characteristics
3. Motif Abstraction	Simplify and stylise motifs	Selected visual elements were transformed rather than directly copied to suit contemporary jewellery.	Abstracted motif elements
4. AI-Assisted Ideation	Explore design possibilities	AI was used as a supportive tool to explore possible motif combinations, compositions and variations.	Design ideas and variations
5. Design Development	Develop Kerongsang Tok sketches	The researcher developed the initial sketch, refined coloured design and final design proposal.	Actual Kerongsang Tok designs
6. Design Refinement	Refine form and ornamentation	The selected design was refined according to composition, proportion, symmetry and contemporary jewellery aesthetics.	Refined design
7. Visual Evaluation	Analyse the final design	The design was examined according to cultural reference, motif transformation, visual balance and contemporary relevance.	Evaluated design outcome
8. Practice-Based Outcome	Present the final artefact	The final Kerongsang Tok design represents the outcome of the creative research process.	Contemporary Kerongsang Tok design

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Methodology Flow

Malay Wood-Carving Motifs
↓
Motif Analysis / Motif Abstraction
↓
AI-Assisted Ideation
↓
Kerongsang Tok Design Development
↓
Design Refinement
↓
Visual Evaluation
↓
Actual Contemporary Kerongsang Tok Design

Results and Findings

Phase 1 – Kerongsang Tok And Malay Wood-Carving Heritage Investigation



Figure 3. The visual characteristics of both heritage forms are subsequently examined to identify common and transferable design principles.

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Phase 2 – Motif Analysis/Motif Abstraction Results



Figure 4. Motif abstraction process from traditional Awan Larat wood-carving motifs to contemporary design elements for Kerongsang Tok development.

Phase 3 – AI-Assisted Ideation

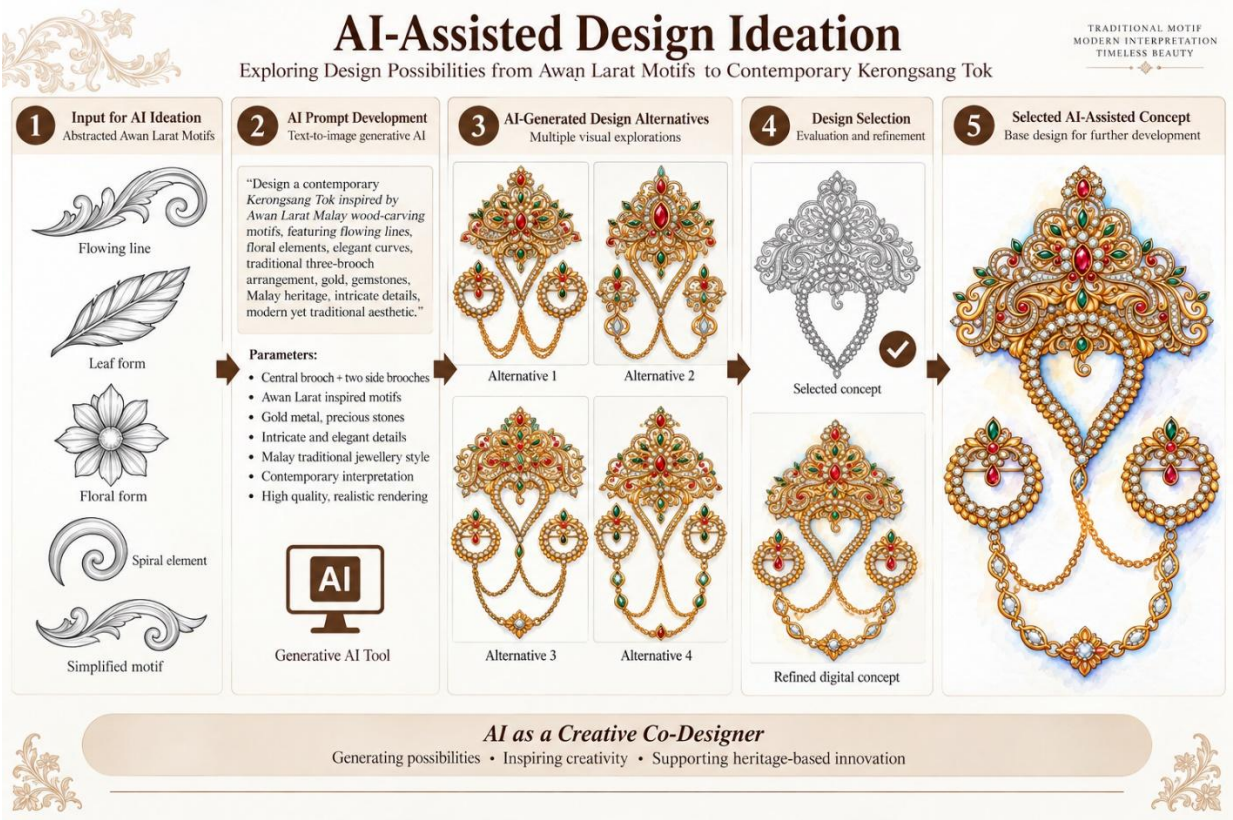


Figure 5. The development process maintained the traditional three-piece structure of *Kerongsang Tok*, consisting of one central brooch (*kerongsang ibu*) and two secondary brooches (*kerongsang anak*), while introducing a contemporary interpretation of the *Awan Larat* visual language.

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Phase 4 – Kerongsang Tok Design Development

Phase 5 – Design Refinement

Phase 6 – Visual Evaluation

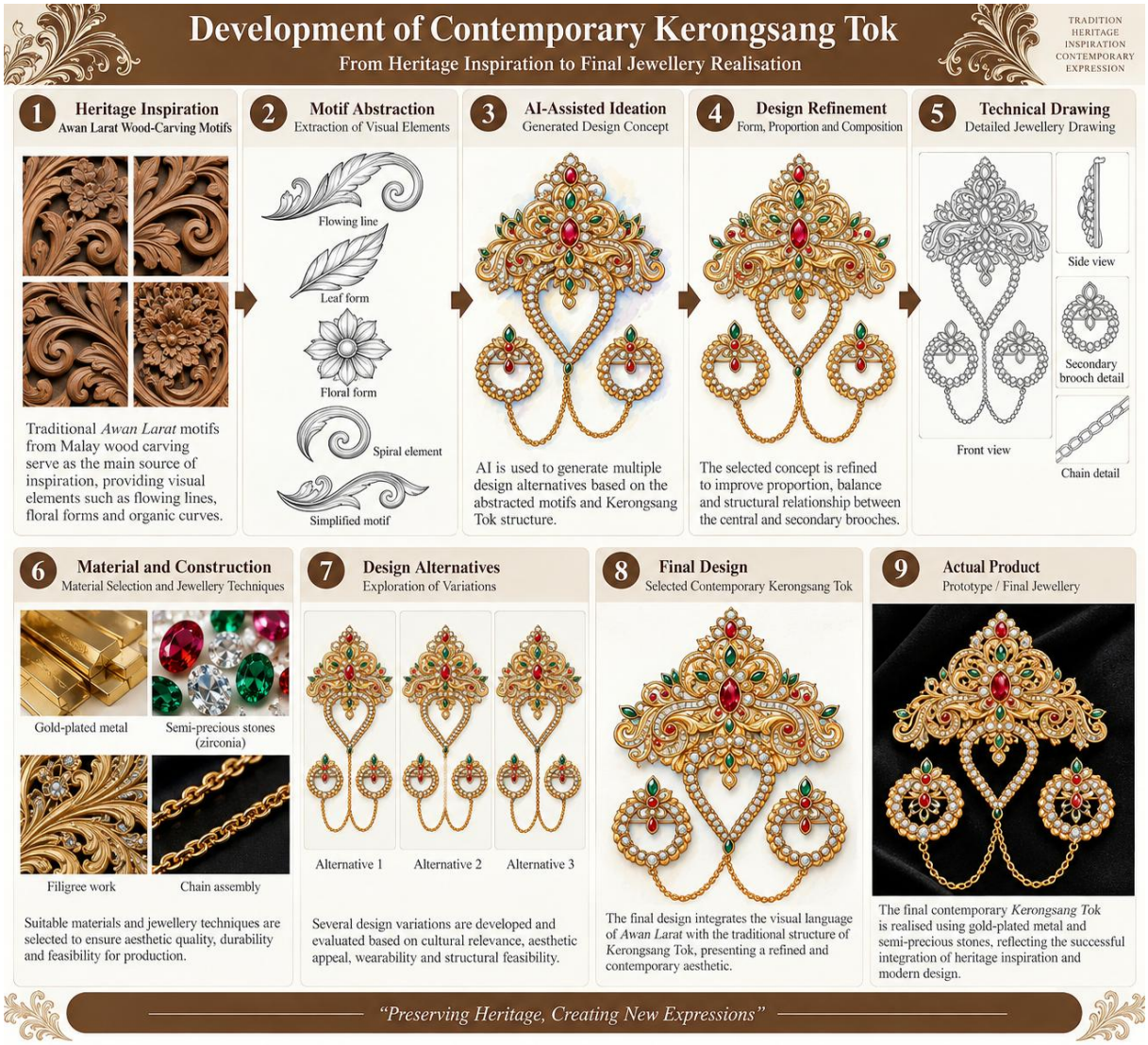


Figure 6. The composition was developed by organising the abstracted motifs around a central focal point and extending the flowing forms towards the lateral areas of the main brooch.

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Phase 7 – Actual Contemporary Kerongsang Tok Design

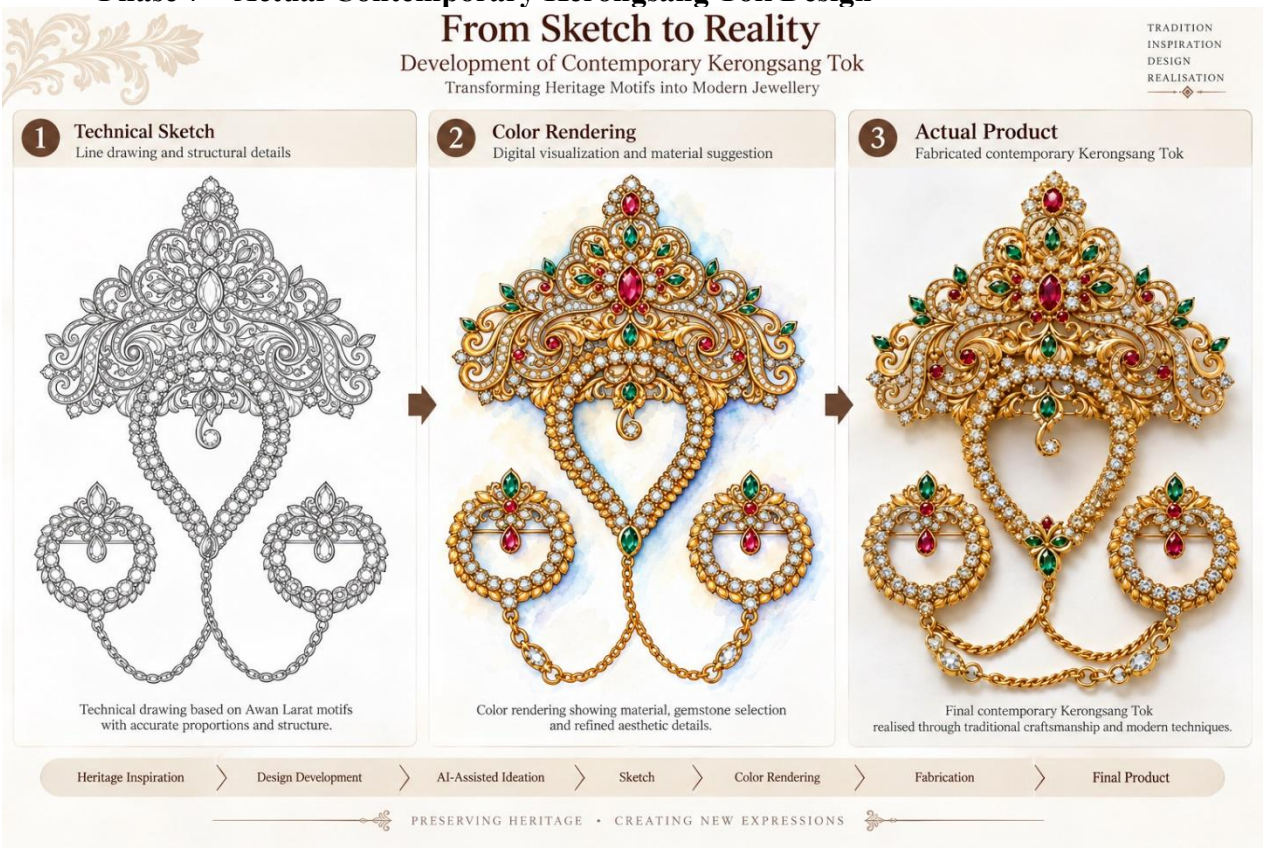


Figure 7. The final *Kerongsang Tok* therefore represents a design transformation rather than a direct reproduction of the traditional *Awan Larat* motif.

The results of this study are presented through the actual Kerongsang Tok design artefacts developed from the transformation of Malay wood-carving visual characteristics. The design process resulted in three main stages: the initial hand-drawn design, the refined coloured design, and the final Kerongsang Tok design proposal.

The primary result is a documented design transformation pathway from Malay Awan Larat wood-carving vocabulary to a contemporary Kerongsang Tok concept. The process demonstrates that the motif can be transformed through selective extraction rather than direct copying. Flower, leaf, stem, tendril, curvature, rhythm, and negative-space relationships form the main transferable design vocabulary.

A second result is the integration of AI into the early visual exploration stage. AI enables rapid generation of alternative compositions that can help the designer examine possible arrangements before committing to a refined drawing. However, AI output remains subordinate to human design decisions.

A third result is the development of a practice-based framework connecting cultural investigation, motif analysis, AI-assisted ideation, human refinement, and physical realisation. The framework can be adapted to other Malay heritage motifs and jewellery forms.

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Discussion

The study supports a distinction between motif preservation and motif replication. Preservation can occur through continued use and reinterpretation of a motif's underlying visual language, while replication requires much closer reproduction of the original form. For contemporary jewellery, transformation is necessary because source and target craft contexts have different scales, functions, materials, and structural requirements.

The role of AI is most useful when it expands the designer's visual search while remaining under human control. The designer determines the cultural source, formulates the prompt, evaluates generated images, identifies useful elements, rejects inappropriate results, and reconstructs the selected concept. This human-led process reduces the risk of treating AI output as culturally authoritative.

The study proposes cultural sustainability as an active process of continuation. A heritage motif can remain visible when its underlying principles are carried into new products, audiences, and design contexts. The contemporary Kerongsang Tok does not replace the traditional craft form; rather, it creates another design context in which the visual language of Malay wood carving can be encountered.

Conclusion

This study demonstrates that Malay wood-carving motifs, particularly Awan Larat, can be transformed into a contemporary Kerongsang Tok design through a human-led, AI-assisted practice-based process. Rather than replicating the original motif, the study emphasises the interpretation of its visual language through selected elements such as floral forms, leaves, tendrils, curved lines, rhythm, and balance. AI-assisted visual exploration provides opportunities to generate and compare design possibilities during the early ideation stage, while the human designer remains responsible for cultural interpretation, selection, abstraction, technical refinement, and final design decisions.

The proposed framework connects Malay wood-carving heritage with contemporary jewellery development through a sequential process of motif identification, element extraction, AI-assisted exploration, human-led design transformation, technical refinement, and physical prototype realisation. In this context, cultural sustainability is understood as an active process of continuing and reinterpreting heritage within new design contexts. The resulting approach provides a structured pathway for bringing the visual language of Malay Awan Larat into contemporary Kerongsang Tok while maintaining human agency and respect for the cultural source.

The study contributes a documented method for transferring Malay wood-carving visual language into contemporary jewellery. Its main methodological contribution is the integration of AI-assisted visual exploration into a human-led practice-based design sequence. Its design contribution is the application of Awan Larat as a structured motif vocabulary for Kerongsang Tok transformation. Its cultural contribution is the proposition that heritage motifs can remain relevant through responsible contemporary reinterpretation.

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