Integrating Batik and Shibori Techniques in Contemporary Batik Design Inspired by Pua Kumbu Motifs

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Abstract

The traditional textile industry in Malaysia faces significant challenges in preserving cultural heritage such as Pua Kumbu while remaining relevant in the modern market. Limited innovation in adapting traditional motifs and the constrained use of batik production techniques underscore the need for new creative approaches. This study investigates the integration of Pua Kumbu motifs into contemporary batik design through the fusion of batik and Shibori techniques. The research aims to evaluate the potential of Pua Kumbu motifs within the batik design system and to experiment with combining batik and Shibori processes to produce innovative textile patterns. A qualitative methodology was adopted, incorporating expert interviews and studio-based visual experimentation. Semi-structured interviews with three textile experts assessed the cultural, structural, and aesthetic adaptability of Pua Kumbu motifs. The findings indicate that these motifs possess strong potential for integration due to their geometric balance and symbolic richness. Experimental outcomes demonstrated the technical and visual success of merging metal block batik with Shibori resist-dyeing using Remazol reactive dyes. The integrated textiles achieved clear wax-resist boundaries, colour stability, and visual harmony, balancing traditional structure with experimental fluidity. Overall, this study proposes a hybrid design framework that merges Malaysian and Japanese textile traditions, reinforcing cultural identity while fostering innovation in contemporary textile design.

Keywords: Batik Technique; Contemporary Batik; Pua Kumbu; Shibori Batik; Textile Design.

1.0 Introduction

Pua Kumbu is a heritage textile of the Iban ethnic group in Borneo, renowned for its rich cultural and symbolic values (Kiyai & Tugang, 2020). Traditionally, it has been used in various ceremonial rituals, including weddings, childbirth, and funerals. Motifs such as birds, flowers, and pucuk midin (fern shoots) are not merely decorative but embody profound meanings that reflect the close relationship between the Iban community and nature (Sultan & Jusilin, 2018). However, the advancement of modern textile industries and the shifting preferences of contemporary consumers have posed challenges in maintaining the relevance of this heritage in today's market. There is a lack of innovation in adapting traditional motifs such as Pua Kumbu into contemporary design patterns that align with modern trends (Cai et al., 2022). Furthermore, traditional batik-making techniques require diversification to meet

the growing demand for unique and modern textile products (Yayasan Budi Penyayang Malaysia, 2017). Batik, a traditional Malaysian textile art, is widely recognised for its use of wax-resist dyeing techniques to create intricate patterns on fabric (Wahida et al., 2022). It stands as a significant symbol of Malaysia's cultural heritage. In contrast, *Shibori*, a Japanese textile art form, employs binding, folding, and twisting techniques to produce abstract patterns through controlled dyeing processes (Yusrina & Ramadhan, 2018).

This study addresses a notable gap in contemporary textile research by exploring the integration of batik and *Shibori* techniques as a means of developing innovative textile patterns rooted in cultural heritage. The fusion of these two resist-dye traditions not only enhances aesthetic expression but also contributes to the preservation and reinterpretation of local identity through creative practice. Drawing inspiration from the *Pua Kumbu* motifs of Sarawak, this study recontextualises traditional symbolism within the framework of contemporary batik design. The research seeks to advance Malaysia's textile industry by establishing a hybrid design approach that merges heritage and experimentation, producing textiles that are both culturally meaningful and globally relevant. Accordingly, the objectives of this study are: (i) to identify the potential of *Pua Kumbu* motifs for adaptation in contemporary batik design, and (ii) to experiment with the integration of batik and *Shibori* techniques to produce innovative textile patterns.

1.1 Innovation in Contemporary Batik

Innovation in contemporary batik often involves the adaptation of traditional motifs to meet modern aesthetic demands. A study by Sapiai et al. (2021) demonstrates that the reinterpretation of *sarong pelikat* motifs into abstract batik designs not only enriches pattern diversity but also increases acceptance in international markets. Samin et al. (2018) emphasize that the exploration of new techniques in Malaysian batik production can strengthen its global competitiveness. Similarly, Xiao (2024) found that innovation in batik must align with global fashion trends to ensure continued relevance. In addition, Ariffin et al. (2024) stress that innovation in batik-making techniques can enhance both the aesthetic and commercial value of textile products. These insights open opportunities for designers to explore cultural adaptation in the creation of new design patterns.

1.2 Integrating Techniques for Creative Design

The integration of multiple techniques in textile production can generate unique and visually compelling patterns. Lias et al. (2020) demonstrate that the use of natural materials, such as bamboo, in the production of batik blocks results in abstract and environmentally friendly designs. Abdullah et al. (2019) further argue that the combination of *canting* and dyeing techniques introduces a new dimension to textile design. Research by Pauzi and Said (2018) finds that the fusion of traditional and modern techniques produces distinctive patterns that surpass what can be achieved through a single method. Collectively, these findings suggest that technical innovation serves as a crucial driver in attracting market interest.

1.3 Shibori Technique as an Inspiration

Shibori is a traditional Japanese dyeing technique renowned for its ability to produce abstract patterns. Janice (2017) highlights that *Shibori* offers designers the freedom to experiment with various folding and binding methods. The flexibility of this technique makes it highly relevant in modern textile design. Combining *Shibori* with other techniques, such as block printing or digital printing, can result in textile patterns that appeal to global markets. This technique also inspires designers to integrate it with other traditional elements in the pursuit of innovative outcomes.

1.4 Cultural Adaptation of Pua Kumbu Heritage

Pua Kumbu, as a symbol of the Iban community's cultural heritage, holds significant potential for adaptation within modern design contexts. Sultan and Jusilin (2018) assert that Pua Kumbu motifs not only embody cultural values but also function as artistic elements rich in symbolism. However, the decline in traditional Pua Kumbu production necessitates innovative efforts to preserve this art form. Che Ya (2019) demonstrates that the adaptation of Pua Kumbu motifs through the combination of traditional and modern techniques, such as Shibori, is not only visually appealing but also resonates with contemporary consumer preferences. Figure 1 presents a Pua Kumbu fabric.



Figure 1: Pua Kumbu fabrics as design inspiration.

Overall, the integration of traditional and contemporary elements, as evidenced by previous studies, provides a solid foundation for this research. It not only elevates the status of heritage art but also creates new pathways for innovation and creative advancement within Malaysian textile design.

2.0 Methodology

This study adopted a qualitative research approach that combined expert interviews and visual-based experimentation. The methodology was structured into two phases aligned with the research objectives:(1) to identify the potential of *Pua Kumbu* motifs for integration into contemporary batik design, and (2) to experiment with the integration of batik and *Shibori* techniques to produce innovative textile patterns. This dual-phase methodological framework enabled both conceptual and practical exploration within a culturally informed and creative context.

2.1 Phase 1: Expert Interview

The first phase focused on exploring the potential of *Pua Kumbu* motifs for integration into contemporary batik design. Data were collected through semi-structured interviews with three purposively selected textile experts (Shuib, 2019) who specialise in contemporary batik design, traditional resist-dye production, and textile and cultural research. The purpose of these interviews was to gather professional insights regarding the cultural symbolism, visual adaptability, and technical compatibility of *Pua Kumbu* motifs in batik applications.

Each interview lasted approximately 10–20 minutes and was conducted in person. All sessions were audio-recorded with participants' consent and subsequently transcribed for analysis. The data were analysed using qualitative descriptive interpretation, focusing on recurring design-related insights rather than formal thematic coding. This analysis identified relationships between motif structure, cultural meaning, and integration feasibility within the context of batik design. Table 1 presents the expert interview participants.

Table 1: Expert Interview Participants

Code	Age	Years of Experience	Working sector/ Category	Area of Expertise
P1	45	14	Batik Designer	Contemporary Batik Design
P2	40	12	Batik Designer/ Producer	Traditional Resist Techniques
Р3	42	12	Textile Lecturer/ Researcher	Textile Culture & Design Studies

2.2 Phase 2: Studio-based Experimentation

The second phase involved studio-based visual experimentation that integrated batik and *Shibori* techniques to develop innovative textile patterns derived from *Pua Kumbu*-inspired motifs. Several studio experiments were conducted to combine block batik and *Shibori* methods in the creation of new design outcomes. The experimental process included fabric folding techniques, wax application for generating abstract and contemporary patterns, and subsequent dyeing procedures. Each stage of the process was systematically documented through photographs and recorded in a design logbook.

2.2.1 Materials and Tools

Experiments were conducted using 100% cotton (viscose) fabric, metal batik blocks, batik wax, and Remazol reactive dyes for colouring. Two *Shibori* resist techniques were employed: *Arashi Shibori* (pole-wrapping), which produced diagonal rhythmic line effects, and tied-resist (*ikat cerut*), which formed organic circular and linear patterns.

2.2.2 Procedure

The experimental procedure was carried out in five main stages. i) Simplified *Pua Kumbu* motifs were applied onto 100% cotton fabric using metal batik blocks. ii) The waxed fabrics were subsequently folded and bound according to the selected *Shibori* resist techniques. iii) The prepared fabrics were then dyed with Remazol reactive dyes under controlled temperature conditions. iv) After dyeing, the wax was removed through boiling, and the samples were thoroughly rinsed and air dried. v) The final textile samples were documented through photographic recording and detailed observation notes.

2.2.3 Visual Analysis

The experimental outcomes were assessed through comprehensive visual analysis, focusing on four key criteria: motif clarity and resist performance, colour layering and contrast, rhythmic composition and movement, and variations in tactile and surface texture. This visual evaluation was further supported by interpretive feedback from the same three experts (P1–P3) to validate both the aesthetic quality and cultural relevance of the outcomes. The collective findings were subsequently organised into key visual themes, which served as the foundation for the discussion presented in Section 3.0.

Stage	Technique/	Focus of Observation	Expected Outcome
	process		
1	Tied-resist	Organic texture	Natural irregularity and
	(Ikat cerut)		softness
2	Arashi pole	Directional rhythm	Linear flow and movement
	wrapping		
3	Metal block	Motif clarity, structure	Sharp motif lines with
	wax		wax integrity
	application		
4	Remazol dye	Colour behaviour	Vibrant, even colour
	immersion		saturation
5	Wax removal	Surface finish	Layered visual and tactile
	& drying		depth

Table 2: Studio-based Experimental Design Overview

3.0 Results and Discussion

Data from both phases were analysed using qualitative descriptive interpretation, a method appropriate for exploratory and studio-based research. For the interview data (Phase 1), the analysis emphasised the identification of design insights and recurring expert perspectives related to motif adaptation and cultural significance. For the experimental data (Phase 2), visual analysis was employed to interpret the aesthetic and technical outcomes of the hybrid batik–Shibori process. The two data sets were subsequently synthesised to develop a holistic understanding of motif-technique integration and its potential contribution to contemporary textile innovation.

3.1Identifying the Potential of Pua Kumbu Motifs for Integrating in Contemporary Batik Design

This objective focused on identifying the potential of *Pua Kumbu* motifs for integration into contemporary batik design. The aim was to examine how traditional Iban motifs could be reinterpreted through modern wax-resist processes while maintaining cultural authenticity and design coherence. Semi-structured interviews were conducted with three textile experts: P1 designer). P2 (batik designer/producer). and P3 lecturer/researcher). The experts agreed that Pua Kumbu motifs possess strong potential for incorporation into batik design systems due to their visual harmony, geometric logic, and symbolic richness. Notably, all three experts also emphasised that these motifs could extend beyond traditional batik applications when combined with other resist techniques such as Shibori. The analysis revealed eight key themes (Table 3).

Table 3: Interview Findings and Themes on Integrating Pua Kumbu Motifs in Contemporary Batik Design

No.	Theme/ Finding	Description	Supporting Expert Statements
1	Cultural continuity and symbolism	Pua Kumbu motifs can preserve and extend Iban cultural narratives when integrated into batik design, ensuring cultural continuity through creative reinterpretation.	P1: "When Pua Kumbu motifs appear in batik, it's not just decoration, it's storytelling." P2: "These motifs keep indigenous identity alive within modern design." P3: "Integration offers continuity, it allows culture to evolve without erasure."
2	Structural geometry and design balance	The symmetrical structure and proportional rhythm of <i>Pua Kumbu</i> motifs complement batik's block repetition and layout principles.	P1: "The geometric balance fits batik's repetitive grid perfectly." P2: "It's easy to align the motifs using metal blocks—the symmetry works well." P3: "Pua Kumbu's structure naturally matches batik's logic of pattern repetition."
3	Visual rhythm and repetition	The rhythmic repetition found in <i>Pua Kumbu</i> motifs aligns with the patterned nature of batik, creating cohesive visual compositions.	P1: "Both traditions use repetition as a core visual language." P2: "Repetition produces visual flow that feels harmonious." P3: "This shared rhythm makes integration aesthetically seamless."

4	Adaptability for wax-resist technique	The motifs' clear borders and strong linear outlines make them suitable for wax application using metal blocks, ensuring motif clarity	P1: "The sharp lines help the wax resist flow precisely." P2: "Metal blocks capture motif details effectively." P3: "Technically, the motifs are perfect for resist-dyeing because they have strong linework."
5	Cultural reinterpretation through colour	during dyeing. Integrating Pua Kumbu motifs within batik allows reinterpretation of symbolism through modern colour combinations and palettes.	P1: "Modern colours refresh the meaning of the motifs." P2: "Colour can reinterpret cultural emotion; softer tones attract modern users." P3: "Colour redefinition gives the design a new identity while keeping symbolic roots."
6	Potential for cultural innovation	The integration creates hybrid expressions that merge traditional identity with contemporary creativity.	
7	Expansion through Batik Shibori integration	Experts suggested that <i>Pua Kumbu</i> motifs can be further explored through hybrid techniques such as Shibori, offering new texture and colour expressions while maintaining cultural roots.	P1: "Pua Kumbu can blend beautifully with Shibori to create layered effects." P2: "The motif's strong structure contrasts well with Shibori's softness." P3: "Combining batik and Shibori with Pua Kumbuinspired motifs could redefine contemporary Malaysian textile design."

The findings clearly demonstrate that *Pua Kumbu* motifs possess strong potential for integration into contemporary batik design, both in form and meaning. Traditional motifs inspired by flora, such as *pucuk midin* (fern shoots), provide a foundation for developing modern abstract designs that align with current consumer preferences. Furthermore, their geometric structure and symbolic depth naturally harmonise with batik's repetitive block system, while extending this integration through *Shibori* introduces new possibilities for creative and cultural innovation. This finding supports the work of Sultan and Jusilin (2018), who highlighted that the compositional strength and symbolic richness of *Pua Kumbu* are adaptable to diverse creative contexts. Collectively, the experts emphasised that this integrative

approach—combining *Pua Kumbu* motifs, batik, and *Shibori*—not only reinforces Malaysia's cultural identity but also enhances its potential for global relevance through hybrid design experimentation.

3.2 Experimenting with the Integration of Batik and Shibori Techniques to Produce Innovative Textile Patterns

This objective aimed to examine how batik and *Shibori* techniques could be integrated to produce innovative textile patterns inspired by *Pua Kumbu* motifs. The experimentation focused on observing the visual and material outcomes generated through the interaction between structured batik motifs and the organic resist effects characteristic of *Shibori*. Figure 2 illustrates the experimental process and research development. During the studio-based experimentation, metal batik blocks were used exclusively to apply wax-resist motifs derived from simplified *Pua Kumbu* elements onto 100% cotton fabric.



Figure 2: Experimental process and research development.

The process employed metal batik blocks to apply simplified *Pua Kumbu* motifs in wax, followed by the application of *Shibori* techniques, *Arashi* (polewrapping) and tied-resist (*ikat cerut*). *Remazol* reactive dye was used throughout the dyeing process due to its colour brilliance, strong fibre bonding, and excellent wash fastness. The dyed fabrics were subsequently analysed through visual observation, focusing on colour behaviour, motif clarity, and compositional balance.

Table 4: Visual Analysis Findings on the Integration of Batik and Shibori Techniques

N	Visual	Description of Visual	Analytical Interpretation
О	Finding /	Observation	(Supported by Experts)
	Theme		
1	Clarity of	The Pua Kumbu-inspired	The wax-maintained integrity
	wax-resist	motifs printed with metal	under immersion, proving
	motifs	batik blocks retained clear	compatibility between batik and
		outlines even after	Shibori. P1: "The motifs remained
		multiple dye baths.	crisp; no bleeding occurred."
2	Colour	Overlapping Arashi and	This layering created optical
-	layering and	batik processes produced	depth, giving the fabric a three-
	visual depth	multi-dimensional colour	dimensional quality. P3: "The
	visual acptii	planes with visible	layers draw the eye, there's real
		transitions from dark to	movement."
		light tones.	movement.
3	Directional	Diagonal Arashi patterns	The interaction between linear
٦	rhythm	introduced rhythm and	Shibori striations and geometric
	(Arashi	movement across the	_
	`		batik motifs conveyed energy and
	lines)	structured batik motif	flow within the composition.
		layout.	771
4	Organic	The tied-resist created	This visual contrast between
	diffusion	circular organic spots that	control and spontaneity added
	(ikat cerut)	overlapped with wax	harmony and balance to the
		motifs, softening the rigid	textile.
		geometric structure.	P4: "The softness complements the
			structure."
5	Contrast	Reactive dye formed strong	The balance of high and low
	and	contrast between waxed	saturation areas contributed to
	harmony of	and dyed areas, with	visual equilibrium within the
	colour zones	smooth transitions in	composition.
		secondary tones.	
6	Texture	The combination of	The visual texture implied
	variation	smooth waxed surfaces	craftsmanship and layered
	and tactile	and textured resist folds	making process, enhancing
	impression	generated tactile diversity	aesthetic richness.
	_	visible under light.	
7	Colour	Remazol reactive dye	The brilliance accentuated motif
	brilliance	produced vivid hues with	clarity, reinforcing the design's
	and	smooth tone transitions;	visual impact.
	consistency	colour remained stable	P2: "The colour intensity highlights
		after rinsing.	every motif."
8	Aesthetic	The overall visual	The integration symbolises
	and cultural	character reflected a blend	modern cultural hybridity,
	hybridity	of cultural influences,	merging local heritage with global
	11y Dilaity	Malaysian batik structure	design sensibility.
		with Japanese Shibori	P5: "It's a visual dialogue between
		_	<u> </u>
1		expression.	two traditions."

The visual analysis confirmed that the integration of batik and *Shibori* techniques produced distinctive and innovative surface designs that balanced structure, movement, and texture. The batik wax-resist motifs provided compositional order and conveyed cultural symbolism, while the *Shibori* resist patterns introduced organic variation, fluidity, and rhythmic qualities. Furthermore, the use of *Remazol* reactive dye contributed strong colour consistency and aesthetic vibrancy.

The integration achieved both technical successes, evidenced by the absence of wax bleeding, clear wax-resist boundaries, and stable colour retention and visual harmony, resulting in textiles that are simultaneously traditional and experimental. The experimentation confirmed that combining metal block batik with the *Arashi Shibori* technique using *Remazol* reactive dyes is both technically feasible and artistically innovative. Additionally, the folding and binding processes inherent in *Shibori* produce patterns unattainable through other traditional methods (Utomo et al., 2021). Moreover, the tools and techniques applied in this combined method offer an alternative approach to developing contemporary textile designs (Samin et al., 2018). The resulting designs exemplify cultural hybridity, a synthesis of Malaysian and Japanese textile traditions, reinterpreted for contemporary contexts. This integration opens broader opportunities for creative experimentation and innovation within contemporary batik design (Ramli & Said, 2024).

3.3 Synthesis of Finding

The synthesis of findings establishes a clear connection between the outcomes of Objective 1 and Objective 2, forming a holistic understanding of how cultural motifs and resist-dye techniques can merge to create a new visual and cultural language in Malaysian textile design.

From Objective 1, expert interviews confirmed that *Pua Kumbu* motifs possess strong potential for integration into batik due to their geometric structure, symbolic meaning, and rhythmic visual qualities. Their compatibility with batik's block-repetition system makes them both technically feasible and aesthetically coherent. Experts further suggested that hybridising *Pua Kumbu* motifs with other dyeing techniques, such as *Shibori*, could enhance creative innovation. Objective 2 realised this concept through studio experimentation that integrated metal-block batik motifs derived from *Pua Kumbu* with *Shibori* resist-dyeing using *Remazol* reactive dyes. The visual analysis revealed that the structured precision of batik and the organic fluidity of *Shibori* complemented each other, producing textiles rich in layered colour, texture, and rhythmic movement.

Overall, the synthesis demonstrates that merging *Pua Kumbu* motifs with batik *Shibori* techniques establishes an innovative framework for contemporary Malaysian textile design. This framework embodies cultural hybridity, uniting tradition and experimentation and highlights that sustainable innovation can emerge through cross-cultural reinterpretation, where heritage motifs are not only preserved but reimagined for global relevance.

4.0 Conclusions

This study demonstrated the effective integration of Pua Kumbu motifs into contemporary batik design and their expansion through the fusion of batik and Shibori techniques to produce innovative textile patterns. Expert interviews confirmed the motifs' strong geometric and symbolic potential, while studio experimentation validated their compatibility through successful application of metal block batik and Shibori resist-dyeing using Remazol reactive dyes. The resulting textiles exhibited visual harmony between structured batik motifs and organic Shibori effects, reflecting cultural hybridity that bridges tradition and modern innovation. The research contributes to contemporary textile design by establishing a hybrid design framework rooted in heritage and cross-cultural creativity, demonstrating that innovation in craft can emerge through reinterpretation rather than replacement of tradition. Limitations include small-scale experimentation, qualitative analysis, and cotton-only dye tests. Future research should investigate broader applications, technical performance, and educational integration. In summary, the integration of Pua Kumbu motifs with batik and Shibori techniques represents a significant creative and advancement, preserving heritage while inspiring new directions in Malaysian textile design.

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Author Contributions

M. S. Che Ya: Conceptualisation, Studio Practice (Design Experiment), Writing-Original Draft; M. A. S. Jamaluddin: Writing-Reviewing and Editing.

Conflicts of Interest

The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its Submission and declare no conflict of interest in the manuscript.

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