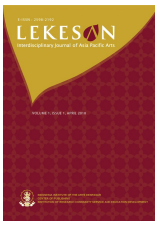

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DEVELOPMENT OF STANDARD LAYOUT FOR TRADITIONAL BALINESE TEXTILE EXHIBITION TO SUPPORT VISITOR APPRECIATION AND TEXTILE MATERIAL STABILITY

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Textile preservation presents significant challenges in non-commercial exhibition contexts in Indonesia, particularly in Bali, where many exhibition spaces have yet to implement adequate conservation standards. At the same time, research on exhibition layout design remains fragmented between interior architecture and museum studies, limiting the development of integrated approaches. This gap becomes increasingly important alongside the growing emphasis on sustainability in exhibition practices. This study adopts a qualitative approach through a systematic review of literature published within the last five years. The analysis focuses on the relationship between spatial configuration, environmental control, and textile conservation, aiming to identify design strategies that respond to both material preservation and visitor needs. The findings suggest that textile exhibitions require careful and holistic planning that not only protects fragile materials but also creates a meaningful and comfortable experience for visitors. Key considerations include controlling light exposure, maintaining stable humidity and temperature, and organizing spatial layouts that minimize physical interaction while supporting visual accessibility. Circulation design plays a critical role in achieving this balance. While unstructured layouts encourage exploratory movement, they may lead to overcrowding and uneven distribution. In contrast, directed circulation systems provide better control over visitor flow, viewing duration, and spatial experience, making them more suitable for sensitive textile exhibitions.

Keywords: Balinese Textile, Layout, Lighting, Exhibition Audience

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INTRODUCTION

Traditional Balinese textiles are an integral part of cultural heritage, possessing not only high aesthetic value but also profound symbolic, social, and spiritual meanings. Fabrics such as endek, songket, and geringsing are not merely material products but serve as mediums for expressing cultural identity that is passed down through generations. In the contemporary context, growing attention to cultural heritage preservation has encouraged various institutions, such as museums and non-commercial galleries, to organize textile exhibitions as a means of public education and cultural appreciation (Nugraha & Setiawan, 2020). However, the main challenge in presenting textiles lies in balancing the need for optimal visualization for visitors with the protection of fabric materials that are prone to degradation. Over the past decade, global trends in exhibition design have shown a shift from static display approaches toward more immersive and interactive visitor experiences. This perspective emphasizes the importance of spatial experience as a key factor in enhancing visitor engagement (Falk & Dierking, 2016). However, in the case of textile-based objects, this approach cannot be freely applied due to the material's sensitivity to environmental factors such as light, temperature, and humidity. Excessive light exposure, for example, can cause color fading and fiber damage, thus requiring a layout arrangement that considers preventive conservation aspects.

This problem becomes increasingly complex in the context of non-commercial exhibitions in Indonesia, particularly Bali, where many exhibition spaces have not fully implemented adequate textile conservation standards. Studies show that most temporary exhibition spaces still prioritize visual aesthetic aspects without considering the long-term impact on material condition (Putri et al., 2021). This indicates (Ashley-Smith, 2017) a gap between exhibition design practices and textile conservation principles, which has the potential to threaten the sustainability of this cultural heritage.

On the other hand, research on exhibition layout design has tended to be fragmented between interior architecture studies and museum studies. Design approaches often focus on aspects of circulation, zoning, and visual composition of space (Ching, 2014), Meanwhile, museum studies emphasize visitor experience and interpretation of meaning (Falk & Dierking, 2016). On other hands textile conservation studies tend to focus more on the technical aspects of materials without directly integrating them with spatial design. This lack of integration indicates a significant research gap in the development of holistic exhibition layout standards.

The urgency of this research is further reinforced by the growing attention to the concept of sustainability in exhibition design. The sustainable exhibition design approach emphasizes the importance of minimizing damage to objects while enhancing the quality of the visitor experience (Bogle, 2018). In the context of traditional Balinese textiles, this approach becomes crucial as it involves the preservation of cultural artifacts that cannot be identically reproduced. Therefore, a design framework is needed that can integrate material conservation aspects with layout strategies that optimally support visual appreciation.

Based on these dynamics, the layout design of a traditional Balinese textile exhibition requires an approach that not only considers visual aspects and spatial experience but also sensitivity to the characteristics of the displayed materials. The relationship between visitors, objects, and space becomes increasingly complex when textiles, as cultural artifacts, have limitations in terms of environmental exposure. This condition demands a more integrated understanding of how spatial elements can contribute to shaping an appreciative experience while preserving the physical sustainability of the objects. Therefore, exploring exhibition layout principles is essential to bridge interpretive and conservative needs within a cohesive design framework.

In that context, this study is directed at revisiting various theoretical approaches that have developed in exhibition design, visitor experience, and textile conservation as a

foundation for formulating a more comprehensive understanding. The synthesis of these perspectives is expected to contribute to enriching the discourse on textile-based exhibition design. Furthermore, the reinterpretation of the relationship between layout, spatial experience, and material conditions opens opportunities for developing more contextual and sustainable design references, both in academic and professional practice.

RESEARCH METHOD

The research method in this article is designed to support the development of conceptual understanding regarding the layout standards of traditional Balinese textile exhibitions through a systematic and scientifically accountable approach. This section explains the research design, data sources, data collection techniques, and analysis procedures used, enabling readers to comprehensively assess the validity and reliability of the findings.

The research design used is descriptive qualitative with a literature-based study approach. This approach was chosen because the research focuses on exploring and synthesizing theoretical concepts related to exhibition layout design, visitor experience, and textile conservation. Qualitative research enables a deep understanding of the relationships between complex concepts, especially in a design context that is interpretive and contextual (Creswell & Poth, 2018). Literature study is used as the main strategy to examine, compare, and integrate various relevant scientific findings, thereby producing a structured conceptual framework (Snyder, 2019).

This research did not involve direct human participants or subjects, thus no empirical sampling techniques were used. Instead, the unit of analysis consisted of scientific literature documents selected purposively. Inclusion criteria included publications from the last five years, relevance to the research topic (exhibition layout, visitor experience, and textile conservation), and credibility of sources such as indexed journals and academic books. Exclusion criteria included literature without direct relevance to the exhibition context or that did not meet academic standards. Through this approach, source selection was done selectively to ensure the quality and relevance of the analyzed data (Xiao & Watson, 2019).

Data collection was carried out through a search and analysis process of literature published in the last five years. Data were obtained from academic databases such as Scopus, Google Scholar, and ScienceDirect using structured keywords, including “exhibition layout design,” “visitor experience museum,” and “textile conservation display.” The data collection process included stages of identification, selection, and classification of literature based on the main research themes. To maintain data quality and reliability, each source used was verified based on the publisher’s reputation, content relevance, and consistency with the theoretical framework under study (Snyder, 2019).

Data analysis was conducted using qualitative analysis techniques based on conceptual analytics, focusing on testing and developing relationships between concepts. The analysis procedure consisted of three main stages: (1) data reduction, by selecting and summarizing important information from the literature; (2) categorization and analysis, by grouping concepts into themes such as layout elements, visitor experience, and material stability; and (3) synthesis and interpretation, integrating findings to build a coherent understanding and test the consistency of relationships between concepts as a basis for developing design standards. This process refers to a systematic qualitative analysis approach to ensure that data interpretation is carried out logically and transparently (Miles et al., 2019).

Overall, this research method emphasizes the integration of research design, data source selection, and analysis techniques. By relying on current literature and systematic conceptual analysis, this study is expected to produce findings that are valid, reliable, and

relevant, contributing to the development of textile exhibition design studies based on a qualitative approach.

RESULT AND DISCUSSION

1. Stability of Traditional Balinese Textile Materials

The stability of traditional Balinese textile materials is an important aspect to consider in exhibition layout design. In Balinese culture, textiles serve not only as clothing but also hold philosophical value and play a vital role in religious ceremonies. Three prominent textiles are endek, songket, and geringsing. Endek is the most common ikat fabric, evolving from a symbol of nobility to a cultural identity widely worn by the community. Songket is known as a luxurious fabric for ceremonies and performances, made with additional threads, such as gold and silver, reflecting social status. Meanwhile, geringsing is a sacred textile from Tenganan, made using the rare double ikat technique, with strong religious significance and characterized by natural colors and complex motifs. All three represent the fusion of aesthetics, status, and spirituality in Balinese culture (Darmastuti & Diantari, 2024).

Figure 1. Endek Textile

(Source: Diantari, 2025)

Figure 2. Geringsing Textile

(Source: Pondok Gringsing, 2026)

Figure 3. Songket Textile

(Source: Dian Songket, 2026)

Conservation literature indicates that textiles are highly vulnerable to degradation due to exposure to light, humidity, and temperature (Ashley-Smith, 2017). A study by (Michalski, 2016) confirms that environmental control is a key factor in maintaining the material condition of textiles in exhibitions. The analysis shows that each type of textile has different characteristics, in terms of material, these three textiles generally use natural fibers (cotton and silk) which are hygroscopic and sensitive to environmental changes. Gringsing, with its double ikat technique and natural dyes, has high sensitivity to light, while songket is prone to oxidation due to its metal content. Endek, although more flexible, still requires protection against humidity. A study by (Timar-Balazsy & Eastop, 2012) explains that fiber structure and natural dyes greatly influence the level of textile vulnerability.

From a technical perspective, production complexities such as the ikat in endek, the supplementary weft in songket, and the double ikat in geringsing cause the fiber structure to experience repeated stress during the production process, making it more susceptible to mechanical damage during display. Research in Studies in Conservation shows that most natural dyes experience rapid fading during the initial stages of light exposure, which then slows down over time, highlighting the importance of early control in museum display conditions (Crews, 1987). Furthermore, a recent study in the Journal of Cultural Heritage confirms that textile degradation due to light exposure affects not only the color but also the condition of the fabric substrate, so that differences in light intensity can result in uneven levels of damage within a single textile object (Gervais et al., 2026).

Thus, in the context of traditional Balinese textiles, display serves not only as an aesthetic presentation medium but also as part of a scientifically based conservation strategy. Control of light, humidity, and support systems is crucial to maintaining the stability of textile materials, which are inherently fragile due to the use of natural materials and traditional techniques. This approach is crucial not only for maintaining visual quality but also for preserving the cultural value and symbolic meaning inherent in each fabric.

The implications of these findings indicate that layout design must integrate conservation principles as part of the design process. This research contributes to linking design and conservation as two inseparable aspects. This approach supports the concept of preventive conservation, which emphasizes preventing damage through proper design. However, the application of conservation principles often faces obstacles such as technological limitations and costs. A study by Ashley-Smith (2017) shows that many institutions encounter difficulties in implementing ideal conservation standards. In the context of Bali, the tropical climate with high humidity poses an additional challenge in maintaining material stability.

2. Development of a Traditional Balinese Textile Exhibition Layout

The development of exhibition layout standards in the context of traditional Balinese textiles such as endek ikat woven cloth, songket, and gringsing needs to be understood through the framework of exhibition design as a spatial communication system. Literature studies show that layout functions as an interpretive medium that regulates the relationship between objects, space, and visitors. (Bogle, 2018; Macdonald, 2016). In this context, Balinese textiles are not only seen as visual objects but also as cultural artifacts with symbolic and ritual value. Research by Vickers (2017) emphasizes that Balinese textiles such as *gringsing* hold sacred meaning within the social structure of the community, so their exhibition arrangement requires contextual sensitivity.

In a textile exhibition, beyond considering how traditional textiles are displayed according to their material characteristics, the visual interaction experience and their utility must also be felt by visitors. This discussion emphasizes how two aspects—conservation continuing as needed and the curatorial narrative guiding how objects are arranged and experienced in space—work together. The narrative is not presented solely as text but is translated into layout, circulation flow, and lighting arrangement within the exhibition space.

However, the implementation of layout standards is influenced by various factors such as space limitations, facilities, and human resources. According to Lord and Piacente (2014), institutional constraints often affect the quality of exhibition design, particularly in non-commercial contexts. Additionally, the need for flexibility in temporary exhibitions can lead to compromises on established standards.

In the interior design perspective, spatial organization principles such as zoning, circulation, and visual hierarchy serve as the foundation for designing an effective layout. (Ching, 2014). A study by Dernie (2016) Dernie shows that clear spatial structure can improve object readability and strengthen the narrative of an exhibition. In the context of Balinese textiles, the differences in character between lighter *endek*, metallic-textured songket, and technically complex *gringsing* require different display approaches. This indicates that layout standards must be adaptive to the material characteristics of the textiles.

Adaptive spatial layout design can apply several types of spatial organization approaches that allow the space to develop and merge with other forms. In the context of exhibition design, the concept of additive form can be linked and applied to interconnected display elements to form a cohesive spatial composition. The integration between elements is important so that visitors can understand the relationship between objects visually and narratively. Spatial relationship patterns also play a role in directing the experience and maintaining the order of visitors and objects. Ching, in his book Architecture: Form, Space,

and Order (Ching, 2014), explains that these spatial diagrams classify additive forms based on the nature of the relationships between their constituent elements, as well as their overall configuration. The types of spatial arrangements are linear form, axial form, grid form, centralized form, radial form, and clustered form.

The implications of these findings indicate that the development of layout standards needs to integrate design principles with an understanding of local materials and culture. This research contributes to formulating a more contextual approach, where the layout functions not only as a visual system but also as a curatorial strategy. A study by Smith (2017) emphasizes the importance of a context-based approach in exhibition design to enhance cultural relevance.

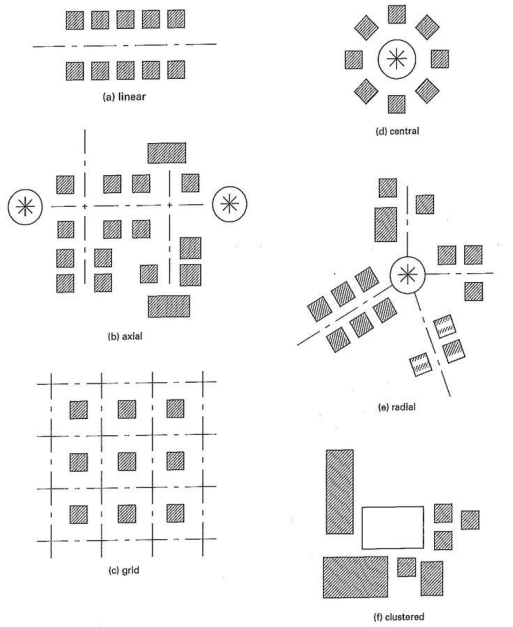

Figure 4. Space Organization

(Source: Ching, 2014)

Circulation patterns in exhibitions can be categorized into several approaches: unstructured flow, directed flow, and semi-directed flow. Unstructured circulation gives visitors the freedom to determine their own path, but this condition has the potential to cause disorientation and uneven distribution of visitors within the space. In contrast, directed circulation is designed with a clear and structured path, enabling more effective control of visitor movement, supporting the delivery of the exhibition narrative, and minimizing risks to the exhibited objects. Meanwhile, semi-directed circulation falls between these two approaches, combining directional guidance with flexibility, thus providing freedom for exploration without compromising spatial readability. This approach aligns with studies in exhibition design and museum studies that emphasize the importance of regulating visitor flow as part of the spatial experience (Bogle, 2018; Falk & Dierking, 2016).

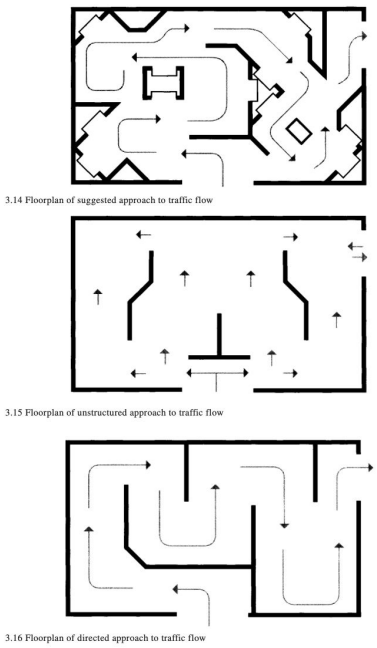

Figure 5. Circulation Type

(Source: Dean, 1996)

The limitation of this research lies in its literature-based approach without empirical validation. Therefore, future research is suggested to conduct case studies at Balinese textile exhibitions to directly test the application of layout standards. This approach will strengthen the validity of the findings and enable the development of more applicable standards.

3. Apresiasi Pengunjung terhadap Tekstil Tradisional Bali dalam Pameran

Visitor appreciation of traditional Balinese textiles is greatly influenced by how the exhibition layout is designed to facilitate visual and interpretive experiences. The museum experience model proposed by Falk and Dierking (2016) suggests that visitor experience is shaped through the interaction of personal, social, and physical contexts. In this regard, the

exhibition layout serves as a physical element that directs attention and shapes the flow of experience.

Literature studies indicate that elements such as viewing distance, lighting, and spatial density have a significant influence on the quality of appreciation (Black, 2012; Macdonald, 2016). In the context of Balinese textiles, the complex gringsing motif requires a close viewing distance with controlled lighting, while songket requires a specific light angle to highlight the shimmer of gold threads. Research by Serrell (2015) states that proper visual arrangement can increase the duration of visitor interaction with objects.

In this case, there are two subjects to consider: the textile itself and the visitors. Conservation must continue, and the message to be conveyed must also be delivered clearly and effectively. Lighting in an exhibition not only serves as a visual element but also as a factor affecting the durability of the displayed objects. Exposure to light, particularly ultraviolet and infrared radiation as well as the heat generated, can trigger degradation processes such as color fading and damage to fiber structure. Therefore, controlling light intensity is a crucial part of exhibition planning. Materials with high sensitivity, such as textiles, require low-intensity lighting, generally limited to around 50 lux, to reduce the risk of damage from long-term exposure (Bogle, 2018).

Table 1: Materiasl and Light Levels

(Source: Bogle, 2018)

Tingkat Cahaya Maksimum	Jenis Material
200 lux (20 foot-candles)	Most ceramic, metals and glass
150-200 lux (15-20 foot candles)	Oil and tempera paintings, undyed leather, lacquer, wood, horn, bone, ivory, stone.
50 lux (5 foot-candles) atau kurang	Watercolor paintings, manuscripts, prints, drawings, vulnerable textiles, photographs

The implications of this finding indicate that layout design should be user-experience oriented. This research contributes to strengthening the understanding that visitor appreciation depends not only on the objects but also on the quality of the surrounding space. This aligns with the visitor-centered design approach, which places visitor experience as the main focus in exhibition design.

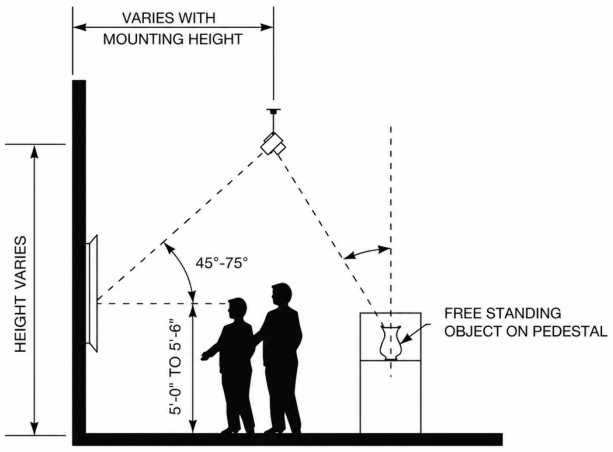

Figure 6. Lighting, art and audience distance

(Source: De Chiara & Panero, 1991)

In the context of exhibitions, lighting is a crucial factor directly related to conservation efforts as well as the quality of visitors' visual experience. The decision to display an object is often influenced by the material's sensitivity to light, especially for artifacts with fine details and rich colors. Excessive light intensity can potentially cause material degradation, while insufficient lighting can reduce aesthetic value and hinder visual appreciation of the exhibited object (Bogle, 2018).

Besides affecting material conditions, the level of lighting also influences the perception of space and the atmosphere felt by visitors. Bright lighting tends to increase visual stimulation and create a more active experience, while dim lighting produces a calmer and more reflective atmosphere. However, a gradual decrease in light intensity also implies a reduction in visitors' ability to capture visual details. Objects with fine ornaments or complex textures become increasingly difficult to recognize when lighting levels decrease, which can reduce the overall quality of the visual experience (Bogle, 2018).

Therefore, lighting design in exhibitions needs to consider a balance between material preservation and visual legibility of objects. This approach becomes increasingly important in traditional textile exhibitions that have high sensitivity to light, so lighting strategies must be carefully designed to maintain material condition while preserving the quality of visitor appreciation.

However, there are factors that influence the level of appreciation, such as the cultural background and knowledge level of visitors. A study by Hooper-Greenhill (2013) shows that visitor interpretation is heavily influenced by social and cultural contexts. In the local context of Bali, local visitors may have a deeper symbolic understanding compared to general visitors, thus affecting the way they appreciate textiles.

The limitation of this study is the absence of empirical data on visitor behavior. Therefore, future research is recommended to integrate observation and survey methods to gain a deeper understanding of visitor interactions with the layout. This approach will provide a stronger foundation for the development of experience-based design.

CONCLUSION

Various circulation approaches in exhibition design, ranging from unstructured to directed patterns, reflect different ways of organizing visitor movement within a space. Unstructured layouts offer greater freedom of exploration, but may lead to overcrowding, excessive interaction, and uneven visitor distribution. In contrast, directed circulation provides better control over visitor flow, movement rhythm, and overall spatial experience.

In the context of Balinese traditional textile exhibitions, where materials are highly sensitive to light exposure and physical interaction, a one-way circulation pattern is considered more effective. This approach allows for controlled visitor movement, maintains safe viewing distances, regulates observation time, and ensures a more even distribution of visitors throughout the space, reducing localized increases in temperature and humidity.

Distance and lighting are also critical considerations in the design. The recommended viewing distance between visitors and textile objects ranges from approximately 60–100 cm to prevent direct contact while maintaining visual clarity. Meanwhile, spacing between displays can be arranged at around 1.5–2 meters to ensure smooth circulation and avoid congestion.

In terms of lighting, sensitive textiles should be exposed to low light levels, ideally not exceeding 50 lux, with indirect lighting strategies to minimize direct exposure and ultraviolet radiation. Soft and evenly distributed lighting not only protects the material but also enhances the overall atmosphere, supporting a more contemplative viewing experience.

Therefore, a one-way circulation system, supported by appropriate distancing and controlled lighting, serves as an effective spatial strategy to balance textile conservation with visitor comfort in exhibition environments.

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