

When tradition becomes expression: The transformation of interpretative frameworks of Balinese traditional architecture in a global Airport

Sonia Zipora^{*ID}, Purnama Salura^{ID}

Department of Architecture, Faculty of Engineering, Universitas Katolik Parahyangan
Ciumbuleuit 94 Street, Bandung, Indonesia



ARTICLE INFO	ABSTRACT
<i>Article history:</i> Received January 09, 2026 Received in revised form Feb. 10, 2026 Accepted April 18, 2026 Available online June 01, 2026 <i>Keywords:</i> Architectural expression Balinese traditional architecture Global airport Transformation of interpretative frameworks Vernacular architecture	<i>This study examines the transformation of Balinese Traditional Architecture (BTA) in public buildings operating within the context of global architecture, using I Gusti Ngurah Rai International Airport as a case study. The application of traditional architectural elements in contemporary buildings is often understood as an effort to express local identity; however, such approaches generally remain at the level of visual and symbolic representation, without further investigating the more fundamental shifts in architectural meaning that occur. This research adopts a qualitative, analytic-interpretative approach by formulating a framework for reading the transformation of expression through four interrelated mechanisms: reduction, rescaling, rematerialization, and recontextualization. These four mechanisms are not positioned as design techniques, but rather as conceptual tools for understanding how architectural meaning changes when Balinese Traditional Architecture is displaced from its original context. Initially rooted in spatial systems, ritual practices, and cosmological principles, it is transformed as it enters global infrastructure characterized by different functional requirements, scales, and technological demands. The findings indicate that the expression of BTA in airport buildings does not function as a continuation of its traditional spatial system and meanings. The Domestic Terminal tends to emphasize reduction and rematerialization, while the International Terminal demonstrates a stronger intensity of rescaling and recontextualization. Traditional architectural elements undergo a systematic transformation, shifting from functional and symbolic components within a system of dwelling into representational devices that construct territorial identity and visual recognition. This transformation signifies a change in the ontological status of BTA, from architecture as a system of habitation to architecture as a language of expression. By positioning this transformation as an epistemic process, the study contributes to the development of a conceptual framework for understanding vernacular architecture within contemporary public buildings. The findings further provide broader theoretical implications for examining the relationship between tradition, modernity, and architectural meaning in the context of globalization.</i>
*Corresponding author: Sonia Zipora Department of Architecture, Faculty of Engineering, Universitas Katolik Parahyangan, Bandung, Indonesia Email: sonia.zipora@unpar.ac.id ORCID: https://orcid.org/0009-0001-5659-4595	

Introduction

Phenomena

In contemporary architecture, large-scale public buildings are increasingly positioned as media for representing regional identity (Frampton 1983; Jencks 1977; Relph 1976; Norberg-Schulz 1980). Museums, transportation terminals, and other public facilities are no longer designed solely on the basis of functional efficiency, but are also expected to convey cultural imagery and local character (Salura and Fauzy 2012). Local character and living cultural memory, as represented through experience, tradition, and symbols, are often articulated through artistic and cultural expression rather than exclusively through formal archives (Nuri 2025). This phenomenon indicates a shift in the role of architecture from a mere container of activities toward a symbolic instrument that constructs perceptions of place within a global context (Lynch 1960; Augé 1995; Liu, Chiang, and Ko 2023; Pamungkas and Prabowo 2024). Architecture thus provides a physical embodiment of both material and non-material needs as shaped by contextual conditions (Abbas Ali Hamza 2023).

Alongside this tendency, vernacular architecture in various regions has undergone changes in the way it is manifested within modern buildings, thereby influencing the cultural formation of the Indonesian nation (Pranajaya 2021). Vernacular architecture is no longer reproduced as an intact spatial system, but is instead presented through fragments of form, iconic elements, or easily recognizable visual languages that shape individual perceptions and expand the ways cultural memory is preserved and experienced in the twenty-first century (Nuri 2025).

Balinese Traditional Architecture (BTA) is not merely understood as an architectural style, but as an architectural system rooted in cosmology, ritual practice, and social order (Paramadhyaksa and Dwijendra 2021). The elements of BTA possess functions, positions, and meanings that are bound to specific spatial structures through the concepts of Tri Angga, Tri Mandala, and cosmological orientation (Salura 2018; Ardika 2015). However, within the context of contemporary development, particularly in non-traditional public buildings, BTA is

increasingly adapted into functions that are far removed from its original context (Nas 2011).

Airports represent one of the most iconic architectural building types embodying new waves of globalization, including new methods of cultural presentation (Elmoghazy, Afify, and Alzenifeer 2025; Zipora, Arif, and Widjaja 2023). This condition encourages BTA elements to undergo various forms of adjustment, ranging from the simplification of form, the enlargement of scale, the substitution of materials, to the displacement of functional context (Venturi 1966; Semper 1851; Frampton 1983).

Issue Addressed: Although the application of Balinese Traditional Architecture (BTA) elements in modern buildings has been widely practiced, academic studies still tend to interpret it primarily as a matter of visual representation or symbolic identity (Nas 2011; Jencks 1977; Heath 2009). Such approaches generally remain limited to descriptions of form, ornament, or cultural icons, thereby treating BTA as a visual language that can be directly transferred across different building contexts (Venturi 1966).

When BTA elements are applied to large-scale modern public buildings such as airports, significant contextual changes occur: ritual functions shift, spatial structures are altered, scale is enlarged, and materials are substituted (Semper 1851; Frampton 1983). However, these changes are rarely examined as processes of transformation in architectural meaning (Hillier 2007; Till 2009).

Novelty: A substantial body of recent airport architecture research addresses issues such as the understanding of terminal trends and sustainability (Berenguel Felices, González-Lezcano, and Ros-García 2025; Duliński 2025; Lukas and Sukada 2024), the visual characteristics of airport architecture in different regions (Hilmy, Sardjono, and Pandelaki 2019; Wibawa and Jamaludin 2025), the integration of airport building systems (Ridzqo and Dwiyanto 2024), and airport cultural identity (Aulia et al. 2022). In addition, there are studies examining material transformations in Balinese buildings (Winardi 2024); however, these do not address the epistemic framework, findings, or conclusions regarding the transformation of expression occurring in such buildings. Previous studies have predominantly focused on evaluation and design development, while relatively few have formulated or generated theoretical findings.

This research offers novelty by formulating a framework for reading the transformation of expression in Balinese Traditional Architecture (BTA), consisting of four principal mechanisms: reduction, rescaling, rematerialization, and recontextualization. These mechanisms are not positioned as design techniques nor merely as tools of visual analysis, but as means of understanding the process through which architectural meaning changes when BTA is displaced from its traditional context, rooted in spatial systems, ritual practices, and cosmology, into modern public buildings subject to global demands.

The objectives of this study are to: (1) analyze the expression of the transformation of Balinese Traditional Architecture (BTA) in Bandara Internasional I Gusti Ngurah Rai as a public building operating at a global scale; (2) formulate and test the mechanisms of transformation in BTA expression through the interpretative framework of reduction, rescaling, rematerialization, and recontextualization; and (3) explain the shift in architectural meaning experienced by BTA as a result of changes in context, scale, material, and function when applied to airport architecture. This research is expected to provide several benefits: (1) theoretical benefits, by enriching architectural discourse on vernacular transformation through an approach centered on changes in meaning rather than merely on the adaptation of form or symbols; (2) methodological benefits, through the introduction of a framework for reading the transformation of expression that can be applied to other traditional architectures within modern and global building contexts; and (3) practical benefits, as a conceptual reference for architects, planners, and policy-makers in formulating strategies for expressing local identity in public buildings without becoming confined to purely decorative approaches.

Methods

Material

Bandara I Gusti Ngurah Rai has become one of the busiest airports in Indonesia, and its international terminal is ranked among the busiest airports in the world. The case study in this research consists of the Domestic Terminal Building and the International Terminal Building

of I Gusti Ngurah Rai Airport. This airport has undergone various phases of change and expansion, beginning in 1931. A development phase in 1989 focused on the continuation of terminal building construction and airside facilities. The subsequent phase commenced in 1998, followed by a major expansion carried out between 2010 and 2013. Most recently, I Gusti Ngurah Rai Airport undertook the construction of the Shelter and Bridge pedestrian crossing, which began in 2023.

The analysis in this study is conducted on the arrival and departure façades of both the Domestic Terminal and the International Terminal, as these constitute the initial and final points of the user experience of the airport.

Research method

This study employs a qualitative approach with an analytic–interpretative character to understand the transformation of architectural expression as a process of change in meaning (Creswell 2009; Groat and Wang 2013). This approach is selected because the expression of Balinese Traditional Architecture (BTA) cannot be comprehended solely through quantitative measurement, but rather through an interpretative reading of the relationships among form, function, context, and meaning (Norberg-Schulz 1980; Salura 2018). The study positions BTA not as a style or a typology of form, but as a meaningful architectural system (Rapoport 1969; Habraken 1998), and adopts an exploratory research orientation in which new phenomena are investigated (Putra and Widjaja 2025). Accordingly, the research method is directed toward revealing how this system is transformed when adapted to modern public buildings of global scale (Frampton 1983; Hillier 2007). The research was conducted in 2025, with direct field observation at I Gusti Ngurah Rai Airport in August 2025. The study aims to explore emerging phenomena (exploratory approach) and to formulate and test mechanisms of transformation, rather than to test pre-existing variables. Therefore, this research does not require the formulation of hypotheses as part of its methodological completeness.

Theoretical elaboration of the interpretative framework for the transformation of BTA expression

The interpretative framework for the transformation of Balinese Traditional

Architecture (BTA) expression, consisting of reduction, rescaling, rematerialization, and recontextualization, is not constructed as an ad hoc classification, but rather as a theoretical foundation derived from the intersection of several architectural traditions of thought that address the relationship between form, meaning, and context. For this reason, the study continues to rely on foundational literature, while also being substantially informed by contemporary phenomena and discussions.

Reduction: filtering essence and conventions of meaning

The concept of reduction originates from critiques of architecture as a system of communication. Venturi (1966) demonstrates that within complex and contradictory contexts, architecture often operates through the simplification and selection of elements considered to be the most communicative. Jencks (1977) further asserts that architectural meaning in contemporary society is no longer constructed through an intact system, but rather through symbolic fragments that can be rapidly recognized. Within this framework, reduction is understood as a process of selective reading, namely the choice of BTA elements deemed to represent the “core” or essence of Balinese identity. Reduction is not merely an act of elimination, but a condensation of meaning, in which complex spatial and ritual systems are reduced into particular expressive elements. This mechanism explains why the transformation of BTA is frequently initiated through the selection of gateways, roofs, ornaments, or specific symbolic figures as representatives of the entire traditional system.

Rescaling: Shifts in Scale and the Hierarchy of Meaning

The mechanism of rescaling is grounded in the understanding that architectural meaning is inseparable from scale and proportion. (Venturi 1966) has shown that changes in scale can alter the way architectural elements are read, while Jencks (1977) emphasizes that scale constitutes one of the principal media in the production of architectural meaning. When such elements are transferred into global-scale public buildings such as airports, significant changes in proportion and hierarchy inevitably occur.

Rematerialization: Material Transformation and the Separation of Form and Meaning

The concept of rematerialization is rooted in Semper (1851) notion of *Stoffwechsel*, which asserts that architectural form may persist and migrate even when its material changes. Frampton (1983) further develops this idea in the context of modern architecture by demonstrating that material change often emerges as a response to technological, constructive, and production conditions.

Within this interpretative framework, rematerialization is understood as a process involving the relative separation between expressive form and the original material of BTA. Traditional materials, which were originally directly tied to climate, construction methods, and local craftsmanship, are replaced by modern materials that satisfy structural and operational requirements. This mechanism explains how BTA remains visually “legible” while simultaneously undergoing a shift in meaning due to changes in the relationships among material, function, and construction technique.

Recontextualization: The Transfer of Meaning into a New Spatial System

The mechanism of recontextualization is derived from phenomenological thought on meaning and place. Norberg-Schulz (1980) argues that architectural meaning does not reside solely in form, but in its relationship to context, orientation, and spatial experience. Salura and Fauzy (2012) reinforce this notion through the function–form–meaning relationship, whereby changes in context directly influence the structure of architectural meaning.

In this study, recontextualization is understood as an interpretative mechanism that explains the relocation of BTA elements into entirely new spatial systems, functions, and logics of use. Elements that in traditional contexts function within specific social and ritual systems, when placed within an airport, generate new meanings oriented toward global user experience, spatial orientation, and identity imagery. Thus, recontextualization confirms that the transformation of BTA involves not only physical change, but also a transformation of the field of meaning.

The Position of the Four Mechanisms as an Interpretative Framework

The four mechanisms reduction, rescaling, rematerialization, and recontextualization are positioned as tools of interpretation rather than as design techniques or procedural steps. This framework enables a systematic tracing of changes in the relationships among form, function, context, and meaning in the transformation of BTA expression (Groat and Wang 2013; Salura 2018).

Accordingly, the four mechanisms do not operate independently, but function in layered and interrelated ways.

Research Procedures

Based on this interpretative framework, the study is conducted through the following steps. First, the identification of BTA expression in the airport buildings is carried out by observing architectural elements that represent Balinese Traditional Architecture on the building façades. Second, reduction analysis is undertaken by examining which BTA elements are retained or simplified to represent the essence of Balinese architecture in the airport context. Third, rescaling analysis is performed by investigating changes in scale, proportion, and the hierarchy of BTA elements resulting from the demands of a global-scale public building. Fourth, rematerialization analysis is conducted by comparing traditional BTA materials with those employed in the airport buildings, along with their implications for architectural expression and meaning. Fifth, recontextualization analysis is carried out by examining shifts in function and meaning experienced by BTA elements when placed within the airport as a modern infrastructure. Sixth, the synthesis of findings is undertaken by linking the four mechanisms in order to explain the overall pattern of transformation in BTA expression. These steps constitute the basis for structuring the Results and Discussion sections, in which each mechanism of transformation is discussed systematically on the basis of the case study findings.

Results and discussion

Transformation of Architectural Expression at Bandara I Gusti Ngurah Rai

This section presents the results of the analysis of the transformation of Balinese Traditional Architecture (BTA) at I Gusti Ngurah Rai Airport based on four interpretative mechanisms: reduction, rescaling, rematerialization, and recontextualization. The analysis focuses on the arrival and departure façades of the Domestic Terminal and the International Terminal as the initial and final points of the user's experience of the airport.

1. Reduction: filtering the essence of BTA as an expression of reception

Analysis Result: In the Domestic Terminal, the mechanism of reduction is evident through the selection of iconic and easily recognizable BTA elements, particularly *Candi Bentar*, *kekarangan* ornaments, *patra* Bali motifs, and guardian statues (*Dwarapala*). These elements are positioned at the main entrance area as markers of transition from the exterior to the interior space of the airport.

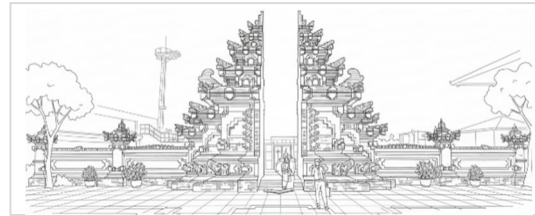


Figure 1. Reception Area of the domestic terminal of I Gusti Ngurah Rai Airport

In the International Terminal, reduction is also carried out through the adoption of the Paduraksa form, panyenger walls, bale kulkul, and representations of the traditional Balinese house. These elements are not applied as an intact spatial system, but rather as fragments that visually represent Balinese identity.

Discussion: Reduction in both terminals indicates that BTA is primarily understood through symbolic elements associated with meanings of reception and boundary. However, the original functions of these elements undergo simplification. *Candi Bentar* and *Paduraksa*, which in traditional contexts function as sacred thresholds, are reduced to territorial visual markers within the airport context.

2. Rescaling: changes in scale and the hierarchy of meaning

Analysis Result: The mechanism of rescaling is most strongly manifested in the International Terminal. Representations of the traditional Balinese house, which are typically single-storey in scale, are enlarged into two-storey structures with proportions adjusted to the operational requirements of the airport. The conceptual division of *Nista–Madya–Utama Angga* is maintained, yet applied to a large-scale public building.



Figure 2. arrival façade of the international terminal of I Gusti Ngurah Rai Airport

Rescaling is also evident in the *Paduraksa* and *bale kulkul*, which are constructed at dimensions far exceeding their traditional scale. These elements become visual landmarks that assert Balinese identity at a global scale.



Figure 3. Departure façade of the international terminal of I Gusti Ngurah Rai Airport

Discussion: Rescaling does not merely alter the physical size of BTA elements, but also shifts the way they are interpreted. At the airport scale, BTA elements no longer function as components of a communal spatial system, but as devices of orientation and image-making. In this way, rescaling contributes to a shift in meaning from social–ritual function toward representational function.

3. Rematerialization: shifts in material and the function of meaning

Analysis Result: The mechanism of rematerialization occurs in nearly all BTA elements applied in the airport. Traditional materials such as *ijuk*, *ilalang*, timber, and Balinese red brick are replaced by clay roof tiles, steel, glass, and synthetic materials such as *phomi*. In the Domestic Terminal, traditional Balinese roofs that originally used organic

materials are replaced by clay tiles, while ornaments continue to employ natural stone and brick. In the International Terminal, roof structures use steel to meet long-span requirements, and Balinese brick walls are represented through *phomi* materials with similar texture and color.

Discussion: Rematerialization reveals a fundamental shift from material as a functional element to material as an image carrier. Traditional Balinese materials, which were originally closely tied to protective function, construction techniques, and local craftsmanship, now operate primarily as visual references. This shift marks the transformation of BTA from an architecture grounded in natural materials toward a representational architecture adapted to the technological and operational demands of the airport.

4. Recontextualization: the transfer of meaning into a global context

Analysis Result: The mechanism of recontextualization is evident in the placement of BTA elements within the functional context of the airport as a global infrastructure. Glass canopies in both domestic and international departure areas, for instance, respond to circulation and passenger protection requirements, while BTA elements serve as an expressive layer.

Panyengker walls, which traditionally function as site boundaries, no longer enclose space comprehensively but appear as partial elements marking symbolic territory. Likewise, the *bale kulkul*, originally used as a community communication device, now functions as a visual marker and a tool of spatial orientation.

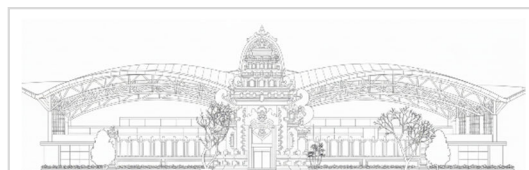


Figure 4. Panyengker wall appearing only on one side, indicating expression rather than function

Discussion: Recontextualization demonstrates that BTA no longer operates within its original system of meaning, but instead generates new meanings aligned with the airport context. BTA elements are transferred from social–ritual systems into a global system emphasizing image, orientation, and visual user experience. In this

sense, recontextualization becomes the mechanism that consolidates the transformation of BTA into an expression of identity within modern public architecture.

5. Synthesis of results: patterns of transformation in Balinese Traditional Architecture

Based on the four mechanisms, it can be concluded that the transformation of BTA expression at I Gusti Ngurah Rai Airport does not occur through a single process, but through layered combinations of reduction, rescaling, rematerialization, and recontextualization. The Domestic Terminal tends to emphasize reduction and rematerialization, while the International Terminal exhibits stronger intensities of rescaling and recontextualization. These findings confirm that BTA expression at the airport no longer functions as a complete traditional architectural system, but as a structure of identity expression that has undergone a shift in meaning. The Balinese airport thus becomes an arena for the transformation of BTA from an architecture rooted in ritual and community toward a representational architecture within a global context.

Strengths and limitations of the study

The principal strength of this study lies in its positioning of BTA not as a style or a collection of visual elements, but as a meaningful architectural system that undergoes transformation when applied to global-scale public buildings. The analysis systematically traces shifts in the relationships among form, function, context, and meaning, ensuring that the findings are not fragmented into visual elements alone. In addition, the selection of I Gusti Ngurah Rai Airport as the case study provides strong empirical grounding.

Limitation: This study focuses on exterior architectural expression and therefore does not include an in-depth analysis of interior spatial experience and circulation. Second, the research employs a single primary case study; thus, the findings are not intended to be directly generalized to all public buildings in Bali or to other vernacular contexts. These limitations are methodological and intentional, as the objective of the study is to construct a deep conceptual understanding rather than statistical generalization. Further research through cross-case comparison, complementary quantitative approaches, or integration with user-behavior

studies may constitute productive directions for future development.

Conclusions

I Gusti Ngurah Rai Airport employs all four mechanisms, with the Domestic Terminal tending to emphasize reduction and rematerialization, while the International Terminal demonstrates stronger intensities of rescaling and recontextualization. The transformation occurs in layered ways, whereby Balinese Traditional Architecture (BTA) shifts from a system of habitation into a language of identity expression. What initially appears as the application of traditional elements to modern buildings is revealed to be a deeper process: the transition of BTA from a spatial and dwelling-based system of meaning toward a structure of identity expression within global architectural contexts.

Through the framework of reduction, rescaling, rematerialization, and recontextualization, this study shows that BTA elements do not disappear but undergo a change in ontological status. Elements that in traditional contexts functioned as sacred boundaries, markers of spatial hierarchy, and social-ritual devices are transformed in the airport context into visual markers, tools of spatial orientation, and symbols of reception. This shift signifies a movement from architecture as a system of dwelling to architecture as a medium of representation.

The principal contribution of this study lies in the formulation of an interpretative framework that introduces new conceptual tools for understanding the transformation of BTA expression through reduction, rescaling, rematerialization, and recontextualization. This framework enriches architectural discourse by shifting discussion from stylization and symbolization toward an understanding of how architectural meaning changes when context changes. Consequently, the study is relevant not only to the Balinese context, but also to other vernacular architectures confronting modernity and globalization. This research opens several significant directions for future studies. First, the reduction-rescaling-rematerialization-recontextualization framework should be tested through comparative case studies, both in other public buildings in Bali and in traditional architectures from different regions, in order to

examine its consistency and limits as an interpretative framework. Second, future research may extend the analysis from exterior expression to interior spatial experience and dwelling practices, including how users understand, interpret, and use spaces expressed as “vernacular.” Such an approach would deepen understanding of the transformation of BTA from phenomenological and user-behavior perspectives.

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Author(s) contribution

Sonia Zipora contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Purnama Salura contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

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