

Symbolic Meaning of Space: Interpreting Cosmological Order in Indigenous Balinese and Javanese Architecture

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Abstract: Studies on Nusantara architecture often isolate spatial systems and disregard their shared cosmological foundations. This comparative study examines how cosmology shapes spatial planning in the Balinese *Tri Mandala* (a tripartite spatial hierarchy) and the Javanese *Catur Gatra Tunggal* (a quadripartite civic order), with a focus on orientation, zoning, and structure. Using an interpretive qualitative approach, the research draws on Gadamer's philosophical hermeneutics, Ricoeur's symbolic hermeneutics, and spatial phenomenology. The findings show that both traditions project cosmology into space through different spatial logics: Bali emphasizes a vertical sacred-profane hierarchy, whereas Java stresses horizontal integration of social, religious, and political domains. Variations in spatial form do not indicate distinct cosmological paradigms but rather different symbolic expressions of comparable ontological concepts. The novelty of this study lies in synthesizing zoning, structure, orientation, and philosophical meaning into a unified analytical model that views architecture as a spatial knowledge system mediating relationships among humans, nature, and transcendence.

Keywords: architectural cosmology; *tri mandala*; *catur gatra tunggal*; spatial hermeneutics; traditional spatial symbolism

1. Introduction

Although Indonesian architectural traditions are renowned for their rich symbolism and cosmological linkages, academic research frequently focuses on documenting forms rather than explaining the underlying principles that shape their spatial organization. To address this weakness, this study employs the frameworks of the phenomenology of place (Norberg-Schulz, 2019) and philosophical and symbolic hermeneutics (Gadamer, 2008; Ricoeur, 1971). These approaches view a constructed space as a cultural text whose

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meaning emerges through a dialogue among material form, tradition, and interpretation. From this perspective, architecture is seen as a system of signs articulating relationships among humans, cosmology, power, and social order, instead of simply a physical product or visual style. This theoretical framework allows the analysis to move beyond morphological description and structural explanation toward an examination of the spatial logic underlying traditional spatial systems.

As Javanese and Balinese architectural are the most well-documented cosmological systems in Indonesia, both show similar metaphysical roots but differing spatial configurations due to different political histories, social structures, and religious transformations (Graaf & Pigeaud, 1985; Kusno, 2014; Santosa & Noorwatha, 2025; Wicaksono, 2024). In contrast to previous studies, which tended to study each tradition separately or focused on features of typology, environmental performance, or contemporary adaptation (Ardana, 2023; Aryani & Tanuwidjaja, 2013; Rajendra, 2012; Semadi, 2023), this study uses cosmology as the key analytical variable to explain how metaphysical concepts are applied to spatial orientation, hierarchy, and zoning. The key question is how local cosmologies anchored in history, power dynamics, and diverse structure of society in Java and Bali are spatially translated through architectural systems and cultural spatial planning.

To ensure analytical clarity, this study distinguishes between two dimensions that are frequently conflated in the literature: architecture as a physical artifact and cultural spatial planning as a system of spatial organization. This distinction is significant a concept like *Catur Gatra Tunggal* or a quadripartite civic order, a Javanese architectural concept of four elements uniting in one unified space and function, operates at the urban scale as configurations of political-religious-economic-public relations (Adityaningrum et al., 2021; Nas, 2002), whereas *Tri Mandala* or a tripartite spatial hierarchy, a Balinese concept of dividing the temple complex space into three zones based on their level of holiness, operates directly on the organization of architectural and ritual space. Thus, the comparison offers a spatial logic distinctive to each tradition by examining how cosmology is realized at two different scales of buildings and spatial arrangements rather than combining categories. In the Javanese context, the concepts of dualism and spirituality constitute a spatial semantics organizing the oppositions of inside-outside, high-low, and center-periphery as a relational spectrum instead of an absolute dichotomy (Eliade, 1959; Fox, 2006; Pemberton, 1994).

Through this framework, the study's contribution extends beyond reaffirming the widely recognized proposition that architecture reflects cosmology. More specifically, it compares the epistemological mechanisms

through which cosmological principles are expressed in different spatial configurations. The study demonstrates that traditional spatial planning cannot be reduced to a single universal model, as each architectural system constitutes a local articulation of broader cosmological logic. This approach broadens the discourse on Southeast Asian architecture by positioning buildings and spatial organization as conceptual media through which societies understand and construct reality. It also provides an analytical foundation for studies on heritage preservation, interpretation, and architectural theory grounded in local knowledge systems.

2. Literature Review

2.1 *Cosmology of Traditional Javanese and Balinese Architecture*

Studies on Nusantara vernacular architecture reveal that traditional spaces serve not only as symbols of cultural cosmology in addition to serving as venues for activities. In the Balinese context, most studies confirm that spatial organization is based on a sacred-profane hierarchical system manifested through mountain-sea orientation and zoning concepts such as *Tri Mandala*, which organizes space based on levels of sacredness and ritual function (Cuthbert & Suartika, 2017; Eiseman, 2011; Rajendra, 2012). Balinese architecture is seen as an open system facilitating interactions between humans, nature, and the transcendent dimension through the principle of cosmic balance (Lansing, 2012).

In contrast, Javanese architectural cosmology displays a more centralized and symbolic spatial configuration. Its spatial structure is typically associated with concepts of duality, inner balance, and cosmic hierarchy that mediate the relationship between humans, power, and nature (Kusno, 2014; Pemberton, 1994). In a traditional urban context, the *Catur Gatra Tunggal* model demonstrates how cosmology is expressed through communal spatial planning integrating political, religious, social, and economic elements within a unified spatial system (Adityaningrum et al., 2021; Nas, 2002). Archaeological and historical studies indicate that this pattern is rooted in the transformation of Hindu-Buddhist cosmology into a Javanese Islamic framework, resulting in a hybrid spatial configuration that retains cosmic symbolism (Graaf & Pigeaud, 1985; Soekmono, 1976).

Previous comparative literature has tended to examine the two traditions separately or to emphasize aspects of typology, climate performance, or aesthetics (Aryani & Tanuwidjaja, 2013; Semadi, 2023). Consequently, the epistemological relationship between cosmology and spatial structure has not been analyzed integratively. This gap underlies the need for comparative philosophical studies.

2.2 *Symbolic Foundation of Architectural Concept in Theoretical Perspective*

The conceptual framework of this study is based on the phenomenology of space and symbolic hermeneutics. They view architecture as a manifestation of human existential experience in the world, where spatial structures reflect ontological orientations toward the cosmos (Norberg-Schulz, 2019). In this perspective, orientation, axis, center, and boundaries are not only geometric elements, but also categories of meaning that shape the identity of a place.

Philosophical hermeneutics adds an interpretive dimension by emphasizing that the meaning of space is not fixed, but rather is formed through a historical dialogue between tradition and interpreter (Gadamer, 2008). This approach allows us to view architecture as a cultural text with symbolic, mythological, and social layers. Ricoeur (1971) further elaborates this concept by asserting that symbols always have layered meanings that must be interpreted through an analysis of the relationship between form, context, and belief system. In the context of traditional architecture, this theory allows for the interpretation of structural elements such as axes, spatial hierarchies, and orientations as sign structures that encode cosmological concepts, rather than simply technical decisions.

Through combining spatial phenomenology and symbolic hermeneutics, this study positions Javanese and Balinese architecture as distinct yet internally coherent systems of world representation. This approach simultaneously addresses criticisms of previous descriptive studies by providing analytical tools to explain how cosmological meanings are interpreted into concrete and conceptually comparable spatial configurations.

2.3 *State of the Art*

The study of traditional Indonesian architecture has developed into several main streams. First, studies of religious symbolism and cosmology interpreting space as a manifestation of belief systems, especially in Bali and Java (Eiseman, 2011; Pemberton, 1994). Second, studies on architectural morphology and typology emphasizing form, structure, and spatial composition have not provided an in-depth analysis of philosophical meaning (Handinoto, 1996; Subiyantoro, 2010). Third, an environmental and sustainability approach interprets vernacular architecture as an ecological response to a tropical climate (Aryani & Tanuwidjaja, 2013; Rajendra, 2012). Fourth, historical-cultural studies trace how the Javanese-Islamic social and architectural structures evolved from Hindu-Buddhist cosmology (Graaf & Pigeaud, 1985; Kusno, 2014).

Although this body of literature demonstrates significant progress, much of the existing study remains sector-specific. Studies on symbolism are rarely integrated with concrete spatial analysis, while morphological studies are

often detached from cosmological contexts. Furthermore, comparative studies between Balinese and Javanese traditions remains limited and typically focus on describing formal differences without using a systematic philosophical interpretative framework.

2.4 Research Gap and Research Position

First, only a few studies have simultaneously examined the interrelationship between cosmology, spatial structure, and construction symbols within a single integrated analytical framework. Second, theoretical comparisons across Nusantara architectural traditions remain rarely conducted theoretically; most studies discuss Bali or Java independently, leaving the epistemological relationship between these traditions insufficiently explored. Third, the use of interpretive approaches, such as the phenomenology of place and symbolic hermeneutics, to the analysis of traditional architecture remains limited, consequently their dimensions of meaning are often presented descriptively, instead of being examined through explicit and rigorous interpretive methodologies.

This study seeks to address these gaps by combining a qualitative comparative approach, spatial phenomenology (Norberg-Schulz, 2019), and philosophical and symbolic hermeneutics (Gadamer, 2008; Ricoeur, 1971) to interpret architecture as a cosmological text. Thus, the main contribution of this study is not simply to confirm that traditional architecture contains widely discussed symbolic meanings but to demonstrate how historically rooted cosmological systems produce distinct yet coherent spatial logics within Javanese and Balinese traditions. This approach expands the paradigm of previous research by offering a cross-traditional analytical model that conceptualizes architecture as a structure of cultural knowledge, not merely a form artifact or aesthetic product.

3. Method and Theory

This is an interpretive-comparative qualitative study in the field of architectural humanities, which focuses on interpreting the symbolic meaning of space rather than measuring physical form. This is classified as conceptual-analytical research as its primary object of study is not direct social behavior, but rather the representation of cosmology in the spatial layout of Javanese and Balinese architecture as shown in texts, images, architectural artifacts, and historical literature. Accordingly, the study is situated within the interpretive humanities tradition, which views architecture as a system of cultural signs.

3.1 Method

This research was conducted over a period of approximately three months (September to November 2025), which included the stages of data collection, interpretative analysis, and preparation of a comparative synthesis. In the initial stage, the researchers collected and curated secondary data sources in the form of architectural literature, historical manuscripts, visual documentation, and spatial diagrams related to the concept of *Tri Mandala* in Balinese architecture and *Catur Gatra Tunggal* in Javanese spatial planning traditions. This stage also included a review of the results of studies previously conducted by the authors independently in research activities of the Building Engineering and Urban Rural Design and Development (URDC) groups that examined the configuration of traditional urban spaces in the Central Java region, especially in Yogyakarta and Surakarta.

In the next stage, researchers conducted remote observation of the spatial configuration of Balinese architectural complexes through visual documentation and spatial maps, complemented by online academic discussions with Balinese architectural experts through virtual meetings (Zoom). These discussions focused on understanding the principles of *Tri Mandala*, the sacred orientation of mountains and seas, and the relationship between temples, settlements, and landscapes in Balinese cosmology. All data obtained during the research period was then analyzed through a process of hermeneutic interpretation and conceptual comparison to identify patterns of cosmological similarities and differences in spatial articulation between Balinese and Javanese architectural traditions.

3.2 Theory

The main theoretical basis of this research is the philosophical hermeneutics developed by Hans-Georg Gadamer (2008), which views the process of understanding as a dialogue between the interpreter and the tradition that forms a cultural text. In this perspective, meaning is not seen as something fixed or completely objective, but rather emerges from the interaction between the historical horizon inscribed in the object of study and the researchers' own horizon of understanding. Thus, spatial architecture is not only understood as a physical structure or formal composition, but as a "cultural text" that records the historical experiences, cosmological values, and knowledge systems of the society that built it. Through this hermeneutic approach, architectural elements such as building orientation, spatial organization, and symbolic configuration are viewed as interpretive expressions of the worldview that develops within a cultural tradition.

This approach was then enriched with symbolic hermeneutics developed by Paul Ricoeur (1971), who emphasized that cultural symbols contain layers of meaning that go beyond their literal function. Within this framework, architectural symbols, such as the division of sacred zones, ritual gates, or spatial hierarchies, are understood as forms of symbolic expression that harbor cosmological and religious meanings. Ricoeur (1971) argued that symbols not only represent reality but also open up new interpretive possibilities that connect human experience with deeper dimensions of cultural and spiritual reality. Using this approach, research can interpret how spatial elements in traditional Balinese and Javanese architecture function as symbolic media that articulate the relationship between humans, the social order, and the cosmos.

In addition, the theoretical framework of this research is also enriched by the perspective of spatial phenomenology which views space as an existential experience directly experienced by humans. In the phenomenological approach, architectural space is not merely understood as a venue for activity, but rather a structure of experience that shapes how humans understand their existence in the world. Through integrating philosophical hermeneutics, symbolic hermeneutics, and spatial phenomenology, this research views architectural characteristics, such as the axis of orientation, zoning, and vertical structure, as symbolic codes that represent the cosmic hierarchy and the relationship between humans, nature, and transcendence. The synthesis of these three approaches allows for a more comprehensive analysis of traditional architecture as a system of meaning that combines material, symbolic, and cosmological dimensions in one interpretive unity.

4. Results and Discussion

This section examines sacred architecture in Bali and Java, including temple complexes and ritual spatial organization in Bali, as well as mosques, palaces, and related structures in the Javanese tradition. The analysis explores how spatial orientation, zoning systems, sacred hierarchies, and relationships between buildings and landscapes are articulated within each tradition through the interpretation of spatial configurations and symbolic elements. Differences between Balinese and Javanese architecture are not treated as fixed or absolute categories but as tendencies arising from distinct ways of spatializing cosmological principles and social structures. In general, Balinese architecture tends to externalize cosmology through explicit relationships among sacred orientations, architectural forms, and the natural landscape, whereas Javanese architecture emphasizes symbolic spatial hierarchies associated with spirituality, political authority, and social order. A conceptual comparison between the two traditions is summarized in Table 1.

Table 1. Balinese and Javanese Sacred Architectural Philosophies and Designs

Analytical Aspect	Balinese Architecture	Javanese Architecture
Cosmological Foundations	<i>Tri Hita Karana</i> ; <i>Mandala</i> cosmology; mountain–sea axis; Mount Mahaeru symbolism	Syncretic Hindu–Buddhist–Islamic cosmology; cosmic axis; sacred mountain orientation
Spatial Hierarchy	<i>Tri Mandala</i> zoning; <i>Catus Patha</i> settlement pattern; temple–village–landscape integration	<i>Catur Gatra Tunggal</i> concept; palace–mosque–square–market axis
Architectural Symbolism	Sacred gateways (<i>candi bentar</i> , <i>paduraksa</i>); ritual thresholds; open–closed spatial gradation	Tiered roofs; layered interior hierarchy; ceremonial spatial sequence
Architectural Expression	Rich ornamentation; processional temple layout; integration with landscape	Monumental forms; restrained ornamentation; emphasis on permanence
Socio-religious Structure	Temple-centered ritual life; communal religious authority	Kraton-centered cosmology; linkage between power and sacred order

Source: Authors (2025)

As shown in Table 1, the main differences between Balinese and Javanese sacred architecture lie in their cosmological foundations and how these principles are translated into spatial organization and architectural expression. In the Balinese context, the spatial system is strongly influenced by the *Tri Hita Karana* philosophy, which emphasizes the balanced relationship between humans, nature, and God. This principle is embodied in the concept of *Tri Mandala*, which divides space into three sacred zones and establishes a close relationship between temples, settlements, and the natural landscape.

In contrast, Javanese architecture developed through a more syncretic cosmology that blends Hindu-Buddhist, Islamic, and local traditions. Concepts such as *Catur Gatra Tunggal* demonstrate how traditional urban planning integrates the palace, mosque, town square, and market into a single cosmological structure that represents the relationship between political power, religious life, and the social order of society. Thus, Balinese architecture tends to emphasize the integration of landscape and ritual space, while Javanese architecture emphasizes cosmological symbolism related to power structures and urban organization.

4.1 Cosmological Foundations in Balinese and Javanese Architecture

Balinese and Javanese architectural systems are both grounded in cosmological conceptions of the relationship between humans, nature, and transcendence, yet they differ markedly in their philosophical foundations, spatial logic, and symbolic expression. Balinese architecture is primarily informed by the philosophy of *Tri Hita Karana*, which contends that human well-being is achieved through harmony among the divine (*parhyangan*), human society (*pawongan*), and the natural environment (*palemahan*) (Eiseman, 2011; Lansing, 2012; Sau et al., 2021). This framework is not only intellectual, but it also influences how Balinese environments are structured, produced, and inhabited. Balinese building design emphasizes the alignment between the physical and spiritual realms, and every housing, temple, or village plan becomes a microcosm of the universe. In Balinese cosmology, harmony between the physical and spiritual realms is a normative principle. However, in practice, this principle is primarily articulated explicitly at the scale of traditional villages and ritual architecture, while its application to individual dwellings depends heavily on the social and economic context and the degree of continuity of local traditions.

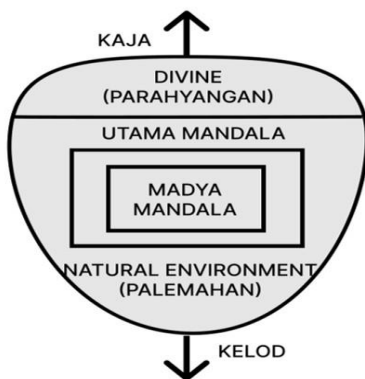


Figure 1. Balinese Traditional Spatial Concept (Adapted from Eiseman, 2011).

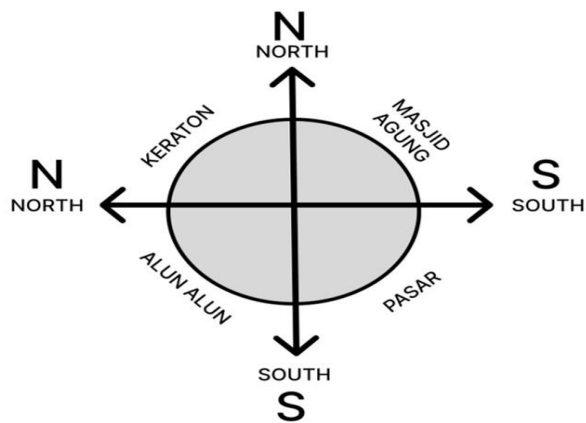


Figure 2. Javanese Traditional Spatial Concept (Source: Authors, 2025).

Figures 1 and 2 are not intended as universal diagrams explaining the entirety of Balinese and Javanese architectural practice, but rather as conceptual models that demonstrate how specific cosmologies are translated into spatial logic at the communal and sacred architectural scale. In the Balinese tradition (Figure 1), the *Tri Mandala* and *Tri Hita Karana* systems are represented through a hierarchical and oriented spatial organization, where the *kaja-keled* directions serve as symbolic references to differentiate levels of spatial sacredness. This

orientation is not always literally realized in the form of a single building, but is primarily manifested in the layout of temples, traditional villages, and the spatial relationships between ritual elements.

In contrast, in the Javanese tradition (Figure 2), cosmological concepts are realized through communal spatial formations such as the *catur gatra tunggal*, which organizes the relationships between the palace, mosque, town square, and market into a symbolic whole. Structurally, this pattern bears similarities to the *catus patha*, a Balinese concept of crossroad used as a central point for urban growth, operates within a different socio-political and religious framework. The comparison of these two diagrams is not intended to reaffirm that cosmology influences architecture, a long-established notion, but rather to ask how this historically effective system of spatial signification has become increasingly fragmented or lost its operability in the context of contemporary architectural planning and practice. These drawings thus serve as analytical tools for examining the tensions between traditional cosmologies and modern spatial systems, and for reflecting on the limitations and possibilities of reinterpreting these principles in contemporary social and economic conditions (Sarjana et al., 2020; Sarjana & Anshori, 2023).

The layout of *Catur Gatra Tunggal* represents a Javanese communal-urban spatial formation not a building scale that is structurally comparable to the Balinese *Catus Patha*, because both arrange four social elements in a cosmological grid oriented to the cardinal points: the palace in the northwest (political authority), the mosque in the northeast (spiritual), the town square in the southwest (public space), and the market in the southeast (economic), thus creating a political-religious-civil-economic synthesis that reflects cosmic balance (Alhazmi, 2020; Marlina, 2020). In Javanese tradition, this kind of symbolism is rarely a normative formula, but rather appears through landscape and orientation, as seen in the tiered composition of Borobudur which signifies the mandalic journey of enlightenment (Soekmono, 1976).

In the classical to Islamic period, this cosmological pattern developed into a hybrid configuration that combined animism, Hindu-Buddhist metaphysics, and Islamic mysticism, consequently the spatial orientation expressed a cosmopolitical harmony between power, nature, and mythology (Kusno, 2014; Nas, 2002). Yogyakarta's north-south axis diagram depicts a cosmogram connecting Mount Merapi, the palace, and the South Sea, a concept chosen by Prince Mangkubumi based on the premise of determining cosmological sacred locations, which positions the city at the center of the upper-middle-lower triadic. This axis is both geographical and spiritual in Javanese philosophy, consistent with the *Sang Hyang Tattwa Jnana* text and Magnis-Suseno's (1996) and Pemberton's (1994) interpretations of cosmic ethics. The Merapi-Palace-

South Sea route is therefore interpreted as a symbolic journey from holiness to the mortal world and back to the cosmic origin; even ecologically, the flow of volcanic material and the *Labuhan* rituals in the mountains and on the coast emphasize the reciprocal relationship between humans, nature, and transcendence in a spatial structure that functions as a living cosmogram. This makes the imaginary axis closely related to the *Catur Gatra Tunggal* (Figure 4) as an expression of the unity of spiritual, political, social, and ecological order (Nas, 2002; Revianto, 2000; Tjahjono, 1989).

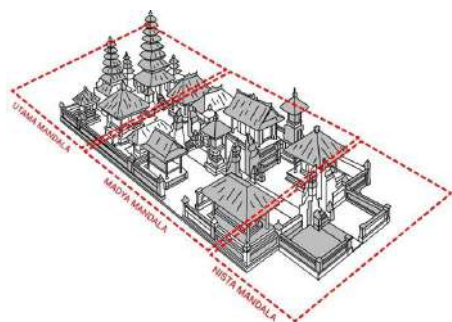


Figure 3. *Tri Mandala* as a conceptual spatial hierarchy in Balinese cosmology (Source: Authors)

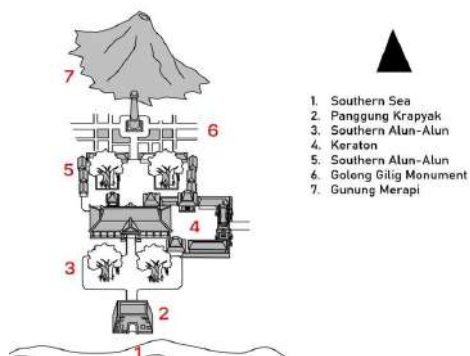


Figure 4. Javanese Imaginary and Philosophica Axis (Source: Authors)

Mandalas are used in both traditions as cosmological models to portray sacred order and spatial hierarchy (Figure 3). This concept is embodied in Balinese architecture by the *Tri Mandala* spatial organization, which is aligned with the sacred *kaja-kelod* axis, where *kaja* represents the direction toward the mountain (sacred) and *kelod* represents the direction toward the sea (profane). Spatial zoning distinguishes between sacred and secular areas, situating the most sacred spaces nearest to the mountain and the least sacred spaces towards the sea (Eiseman, 2011; Ramseyer, 1987). Temple compounds (*pura*) exhibit this hierarchical arrangement through three successive zones: *Nista Mandala* (the outer courtyard), *Madya Mandala* (middle courtyard), and *Utama Mandala* (inner sanctuary), which together depict the symbolic journey from profane to sacred (Figure 5).

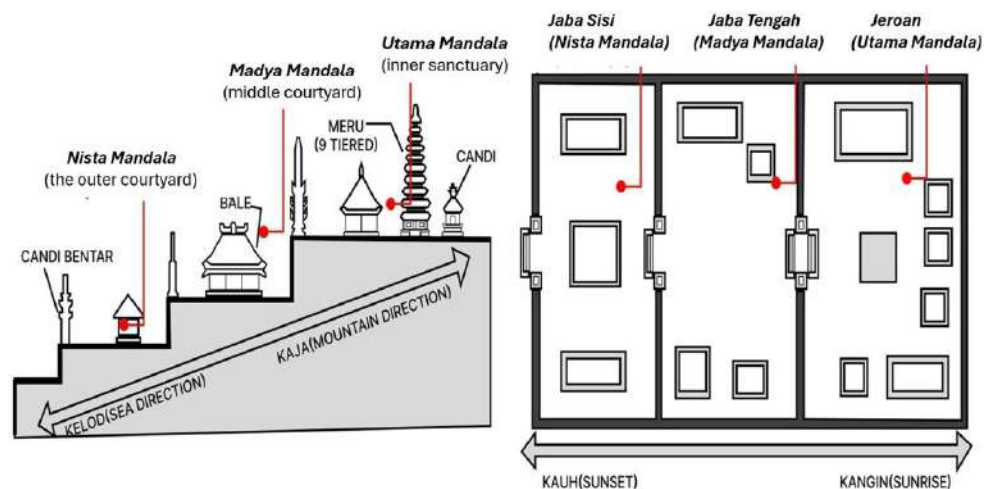


Figure 5. Application of the Tri Mandala concept in the layout of a Balinese temple along the *kaja-kelod* axis (Source: Authors)

The *Tri Mandala* notion is an essential concept of spatial arrangement in Balinese architecture, dividing the environment into three hierarchical zones based on sacredness and ritual function. The outermost zone, *Nista Mandala* (*jaba sisi*), is seen as the most profane, providing a support or transitional space from the outside world. The middle zone, *Madya Mandala* (*jaba tengah*), is an area with a moderate level of sacredness that is often used for social activities or ritual preparations. Meanwhile, the innermost and most sacred zone is the *Utama Mandala* (*jeroan*), which houses the sacred elements or main building. This layered form embodies the cosmological concept of the spiritual journey from the profane to the sacred, highlighting that spatial design is more than simply a physical arrangement; it also represents a hierarchy of spiritual values.

The *Sanga Mandala* philosophy expands on this concept by organising space based on cosmic alignment using two symbolic axes: *Kaja-Kelod* (mountain-sea) and *Kangin-Kauh* (east-west). The *Kaja-Kelod* axis represents the sacred-natural orientation, with the mountain direction representing purity and the sea representing profane elements, whereas the *Kangin-Kauh* axis represents the ceremonial orientation determined by the movement of the sun. The intersection of these two axes creates a grid of nine spatial zones with varied levels of symbolic meaning, allowing us to view space as a living map of the cosmos. Thus, the *Tri Mandala* provides a vertical-spiritual hierarchical structure, and the *Sanga Mandala* provides a cosmic-horizontal framework; both works synergistically to ensure that every spatial arrangement is in line with the order of the cosmos as described in Balinese cosmology.

4.2 Spiritual Spatial Hierarchy in Traditional Balinese Architecture

Traditional Balinese architecture's spatial hierarchy is based on Hindu-Balinese cosmology, which combines elements of the Vedas, ancestor worship, and local animism, thereby incorporating religious practices into residential area planning (Eiseman, 2011; C. Geertz, 1973; H. Geertz, 1999). In the context of a dwelling, the most essential principle is the *Tri Mandala*, which divides space into three levels of sacredness; *utama*, *madya*, and *nista*, and governs zoning from most sacred to most profane areas. However, in the practice of traditional yard layout, as illustrated in the image, the *Tri Mandala* principle is expanded in more detail through the *Sanga Mandala* structure, which maps nine zones based on the cosmic orientations of *kaja-kelod* (mountain-sea) and *kangin-kauh*. Therefore, *Sanga Mandala*, basic principles of traditional Balinese spatial planning, is not a distinct concept, but rather a site-specific operational development of *Tri Mandala*. The Sanctuary and *Bale Daja* are located in the *kaja-kangin* sector of the mandala, representing the realm of gods and ancestors. *Bale Dangin*, located on the east side, belongs to the sacred-ritual zone and is still part of the *utama-madya* realm. The *Lumbung* or *Jineng* and *Bale Dauh* occupy the middle zone as venues for the family's social and economic activities, indicating that the space's role is determined by the cosmological map rather than by practical necessities (Figure 6).

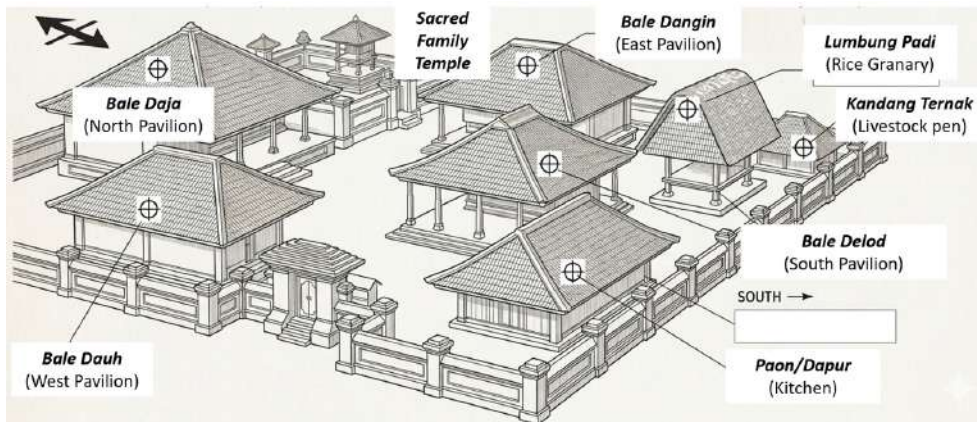


Figure 6. *Sanga Mandala* Spatial Concept (adapted from Putra et al., 2025)

The *nista mandala*, located in the courtyard's southern zone, is reserved for the most profane chores, such as the *Paon* or Kitchen, *Bale Delod*, and animal enclosures, because the *kelod* direction is associated with earth, material work, and physical transformation. This design stresses the spatial structure of the Balinese house as a microcosm, transforming holy order into household spatial organization (Cuthbert & Suartika, 2017). *Bale Dangin* is an important part of this

composition; it serves as a family ritual pavilion in the eastern sector, representing birth, purity, and the start of life. Its symbolic importance is accentuated by the *saka guru* (supporting pillars) structure, the four main pillars, which are not only structural supports but also emblems of the cosmos' stability and the four corners of nature. The stone base, pillars, and the ornate ceiling reflect the vertical tripartition of the underworld, human existence, and the divine world (Aranha, 1991). Thus, the overall spatial arrangement demonstrates that Balinese house architecture operates as an integrated symbolic system, with the *Tri Mandala* serving as the basic conceptual principle, the *Sanga Mandala* as the spatial application tool, and building elements such as *Bale Dangin* and *saka guru* serving as the physical articulation of this cosmology (Figure 7).

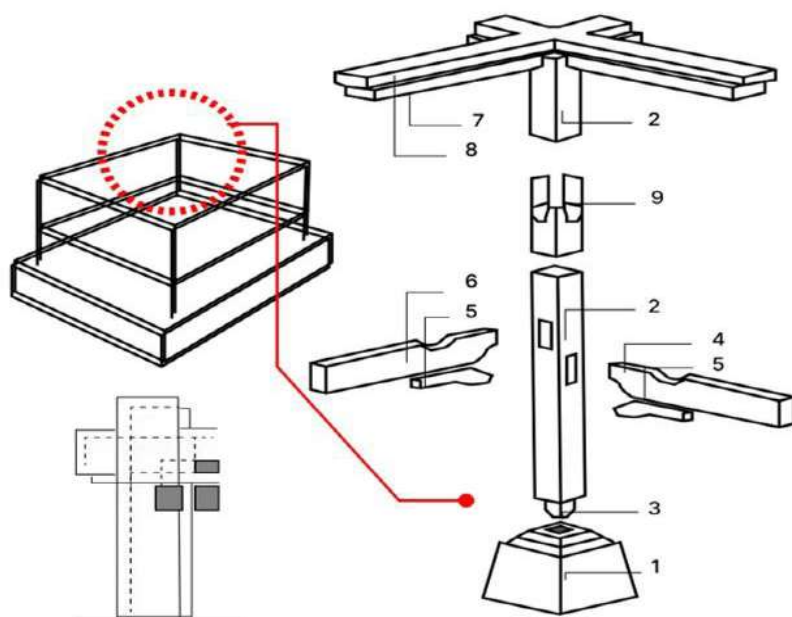


Figure 7. *Saka Guru* (supporting pillar) (Source: Authors).

The *Bale Dangin* framework structure in traditional Balinese architecture displays a hierarchical wooden construction system from the foundation to the roof frame. At the very bottom is the *umpak* or joint (1), a stone foundation that serves as a base for the pillars and protects the wooden elements from soil moisture. Above it stands the *saka* or main pillar (2), which serves as a vertical element supporting the entire building structure. This pillar is connected to the foundation through *purus* to joint (3), a wooden dowel or joint that locks the column to the *umpak*. In the center of the framework is the *sunduk bawak* (4), a horizontal tie beam that connects the pillars to maintain structural stability, and the *lait* (5) as a connecting element that strengthens the joints between the

beams. At the top of the framework is the *sunduk dawa* (6), a main tie beam that connects the pillar caps and functions to support the load of the roof frame. This structure is then reinforced by the *sineb* (7) as an additional tie beam and the *lambang* (8) which acts as a crown beam on which the roof frame elements rest. The entire system is locked using *purus* to *lambang* (9), a wooden dowel that unites the joints between the elements so that the structure becomes a stable whole (Suwirya, 2017). This construction system demonstrates the distinctive character of Balinese architecture, which uses traditional wooden joints without metal nails, where each element mechanically interlocks to distribute the load from the roof to the columns and then to the stone foundation.

Hindu-Balinese cosmology is visualized through structural language in the *saka guru* exemplified in *Bale Dangin*. The vertical arrangement, the stone base, the pillar shaft, and the carved pillar cap represent the tripartition of the cosmos *bhur-bwah-swah* (lower, middle, and upper realms), while the four main pillars symbolize *catur loka pala* (guardians of the four corners) and the principle of balance in the universe. The base, which is detached from the ground, represents the severance of the earth's profane elements, resulting in the structure's sacred ritual status, while the nailless wooden joints depict the organic concord between humans and nature. The carved floral and fauna ornaments and tendril motifs on top are beyond simply decoration; they represent life energy (*prana*) rising from the earth to the realm of the gods, so that the entire pillar system functions as a mini cosmic axis (*axis mundi*), emphasizing *Bale Dangin* as a transitional space between human activities and the sacred realm of the ancestors.

4.3 *Joglo as a Representation of Cosmology and Spatial Hierarchy in Javanese Architecture*

The *Joglo* house can be viewed as a symbolic representation of Javanese cosmology principles, which also underpin traditional urban planning concepts such as the Catur Gatra Tunggal, namely the unification of the center of supremacy, spiritual space, social space, and economic space. In this sense, *Joglo* architecture is more than simply a type of house; it is a miniature cosmos that resembles the structure of the universe, according to classical Javanese concepts. *Joglo's* spatial hierarchy, from *pendapa* (public), *pringgitan* (transition), to *dalem* (private core), follows a concentric pattern similar to the structure of royal cities like Surakarta and Yogyakarta, where the town square, grand mosque, market, and palace form a cosmological unity (Yusran et al., 2021). The *Joglo* house thus operates as a micro-representation of the kingdom's macro-order: the house becomes a "small palace," the family head serves as a symbolic center of authority, and the spatial arrangement reflects both the social and spiritual order.

It is obvious in the decorative elements and symbolic structure. The four main pillars in the center of the *Joglo* represent the pillars of the cosmos and are analogous to the four corners of royal power in royal systems such as the Surakarta Hadiningrat Palace and the Ngayogyakarta Hadiningrat Palace, whereas the layered overlapping patterns above them indicate the stratification of the universe and social hierarchy. Carved motifs consisting of *lung-lungan*, *wajikan*, and *saton* are not only decorative but also suggest the authenticity of palace culture, as they used to be associated with noble or *priyayi* status. Even the orientation of *Joglo* buildings, which takes into account the cardinal directions as well as the position of mountains and seas, corresponds to Javanese royal city design concepts. Thus, *Joglo* represents more than just a traditional architectural typology; it is a symbolic device that embodies Javanese spatial ideology: harmony between humanity, power, nature, and the spiritual realm, as monumentalized in the concept of *Catur Gatra Tunggal*.

The typology of traditional Javanese architecture represents social stratification, cosmology, and power symbols, which are prominently reflected in the shape of the *Joglo* House, an aristocratic style of housing. The *Joglo* is regarded as the highest status in the domestic sphere in the hierarchy of Javanese building forms because it has historically been associated with nobles, royal officials, or the *priyayi* elite, so that the roof shape, spatial scale, and structural complexity serve as markers of social legitimacy as well as cosmological symbols (Muktiono, 2024; Prihatmaji et al., 2014). *Joglo* houses can still be found in Central Java's interior and around Yogyakarta and Surakarta, particularly in agricultural areas where big spaces are required for crop storage and social and religious activities. Economic conditions, resource availability, the tropical temperature, and geographical uniqueness all have an impact on the building's size, material quality, and orientation, but the symbolic component remains the primary concern. The southern orientation, for example, is commonly connected with Javanese cosmology, which reveres the strength of the South Sea and the mythological figure of Nyai Roro Kidul. While the central space, such as the *senthong*, is sacred and used for offerings, the *Joglo* home is more than just an ecological or economic adaptation; it is also a symbolic space that ties humans to the natural order and spiritual forces (Budiwiyanto, 2013; Djono et al., 2012).

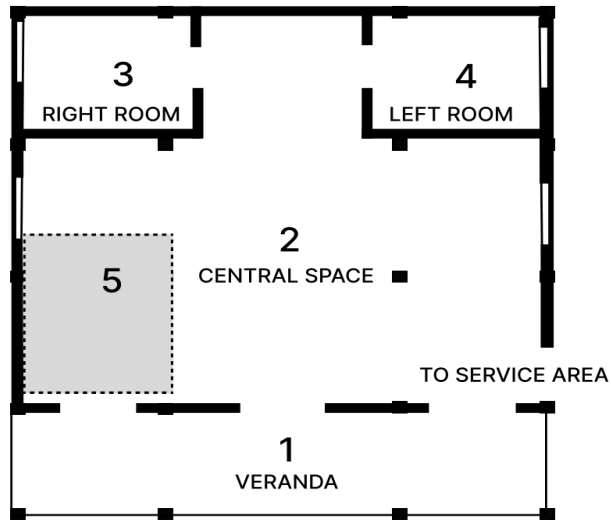


Figure 8. Traditional Javanese *Joglo* house (source: authors)

Legend: (1) *Pendopo* (public reception pavilion); (2) *Pringgitan* (transitional hall); (3) *Dalem* (main family living area); (4) *Senthong* (sacred inner chamber); (5) *Gandhok* (side wing used for supporting domestic activities and additional family spaces).

The *Joglo* house represents Javanese cosmology through a hierarchical structure of form and space: a tiered roof as a symbol of a mountain or cosmic axis, a *soko guru* as the center of universal balance, and a spatial gradation from the communal veranda to the serene interior signifying increasing sacredness towards the center. This composition maps the upper cosmos as the sky, the living space as the human world, and the foundation as the basis of existence while the sequence of the terrace, central room, and private space emphasizes socio-spiritual harmony with the *dalem* as the core of family balance.

As shown in Figure 9, the *Joglo* structural system consists of seven principal components, *mala*, *ander*, *tumpangsari*, *sunduk*, *kili*, *soko guru*, and *umpak*, which together establish both structural stability and cosmological symbolism (Maer & Pudjisuryadi, 2015; Subiyantoro, 2010).

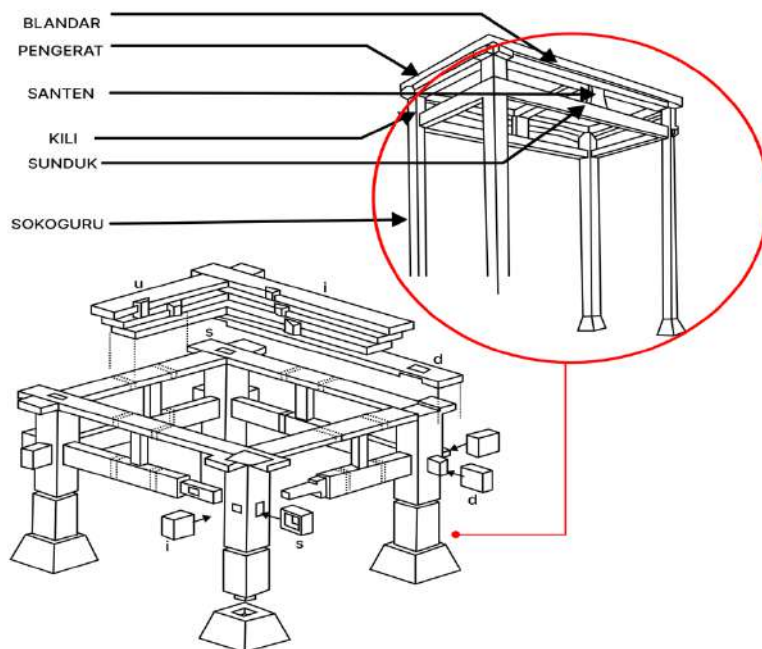


Figure 9. The structure of the main pillars (*sokoguru*) of the *Joglo* building (Source: Authors)

The urban planning of palaces such as Ngayogyakarta Hadiningrat Palace and the Surakarta Hadiningrat Palace reflects *Joglo's* cosmology, which is equivalent to the *Catur Gatra Tunggal*. The private center, *Dalem*, resembles a cosmic palace, while the public realm is *Pendapa*. The four directions and spiritual order are symbolized by the *saka guru* and the hierarchy of floors, while the horizontal *dalem-njaba* and the vertical division of feet-body-head and the vertical division of feet-body-head represent the layers of nature and the socio-sacred balance, making the house a microcosm of the family's symbolic authority (Frick, 1997; Maer & Pudjisuryadi, 2015; Subiyantoro, 2010). Based on Ricoeur (1971) and Gadamer's interpretive hermeneutics (2008), architecture is read as a cultural text; the study shows that *Tri Mandala* and *Catur Gatra Tunggal* are not identical systems, but rather two articulations of a connected cosmology: Bali emphasizes a vertical hierarchy of the sacred-profane based on a mountain-sea orientation, whereas Java emphasizes the horizontal integration of spirituality, economy, and power, confirming that the archipelago's ancient spatial arrangement is a local representation of a larger cosmological logic.

The Balinese and Javanese architectural traditions both use space to represent cosmology, although this is a methodological rather than metaphysical commonality. In the Balinese context, spatial structure is based

on the principle of cosmic harmony, which organizes the relationship between humans, nature, and the divine through the vertical hierarchy of the *Tri Mandala* and the sacred orientation of *kaja-kelod*, transforming space into a living and constantly renewed ritual medium (Eiseman, 2011; Sarjana et al., 2020; Sarjana & Anshori, 2023). This approach correlates with Geertz's (1973) symbolic reading of culture, which views spatial practices as meaning systems, as well as Cuthbert and Suartika's (2017) architectural analysis of Balinese houses and temples as ritual cosmogram configurations. In contrast, Javanese tradition portrays cosmology by horizontally integrating the *Catur Gatra Tunggal* (palace, mosque, town square, market), which forms a symbolic landscape of authority and social order (Adityaningrum, 2022; Marlina, 2020). Political-cultural studies such as Kusno (2014) and Pemberton (1994) support this perspective, viewing the palace's spatial design as more than just a physical structure but as a means for the cosmological legitimization of the state.

These differences are evident in the symbolic orientation, aesthetics, and material logic. Javanese architecture is typically closed, axial, and monumental, emphasizing hierarchical stability and spiritual contemplation (Miksic, 2012; Soekmono, 1976), whereas Balinese architecture is open, porous, and organic, creating permeability between the physical and spiritual scales while simultaneously responding to a passive tropical climate (Rajendra, 2012; Wicaksono, 2024). Consequently, the two are not variants of the same system but rather two approaches to cosmological representation that emerged from distinct political, theological, and historical contexts.

This study's primary contribution is its comparative synthesis across traditions, which simultaneously integrates spatial, symbolic, environmental, and power dimensions. This goes beyond prior studies that typically only looks at physical typology or one tradition in isolation (Alhazmi, 2020; Semadi, 2023). This approach highlights how the architecture of Nusantara can be seen as an operational cosmological text, a system of spatial knowledge that expresses the organization of reality in accordance with the inhabitants' worldview.

4.4 Sustainability and Transformation of Traditional Architecture

Rapid social, economic, and cultural upheavals have had an impact on the long-term viability of traditional Balinese and Javanese architectural concepts in the modern day. Bali's transition from an agrarian community to a tourism and creative economy has impacted the values and spatial arrangements of residential and public buildings. Changes in lifestyle, economic expansion, and modern functional demands have resulted in changes to the shape, materials, and function of classic architectural elements, such as *angkul-angkul* alterations (traditional entrance gate to a house or yard in Bali which functions as the main

access as well as a symbolic element separating the outside and inside spaces) and courtyard layouts that no longer strictly adhere to traditional patterns (Wijaya, 2017). Furthermore, rejuvenation and tourism development projects tend to shift from classic open concepts to more closed and monumental forms, indicating a weakening of the application of conventional architectural principles (Permana et al., 2024). Nonetheless, fundamental ideas such as cosmological navigation and zoning concepts (e.g., *Tri Mandala*) are frequently preserved, albeit in an adaptable form tailored to contemporary conditions (tarubali.baliprov., 2024).

Meanwhile, in the Javanese context, variations in traditional architecture have been prompted by technological improvements, urbanization, and societal changes. Javanese architecture, which was formerly inextricably linked to old cosmological systems and social structures, is now evolving into a more adaptable and contextual form that adapts to modern needs (Pitana, 2023). The recent development of contemporary house architecture that selectively integrates traditional aspects indicates a process of reinterpretation, rather than form preservation. In numerous instances, key elements such as spatial hierarchy and symbolic orientation are conceptually retained, but are implemented in a more minimalist form that does not always adhere to the traditional configuration in its entirety. This suggests that Javanese architecture is currently transitioning from a normative to a representative system that is more open to creative innovation.

Thus, historical architectural patterns in Bali and Java have not decayed completely, but have experienced a process of adaptation and negotiation with modern challenges. This study contributes to existing evidence that cosmological concepts in Nusantara architecture are dynamic and interpretive rather than static. In this setting, traditional architecture's survival is no longer dependent on the literal reproduction of forms, but rather on the ability of fundamental cosmological principles to be modified and rearticulated in response to current social, economic, and cultural concerns.

5. Conclusion

This study asserts that traditional Balinese and Javanese architecture constitute spatially embodied cosmological knowledge systems, not merely the result of aesthetic considerations or technical construction. Using a comparative-hermeneutic approach inspired by the ideas of Gadamer and Ricoeur, this study demonstrates that *Tri Mandala* and *Catur Gatra Tunggal* can be understood as two distinct expressions of the Nusantara cosmological horizon that both structure the relationship between humans, nature, and transcendence. The difference lies in the logic of spatial articulation: the Balinese system emphasizes

a cosmically oriented vertical hierarchy of the sacred and profane, while the Javanese system emphasizes the horizontal integration of social, religious, and political dimensions as a diagram of world order.

Thus, the similarity between the two lies not in their architectural forms, but rather in the ontological assumption of space as a medium for balancing the cosmos. Unlike previous studies that generally examine certain aspects separately, whether religious symbolism (Eiseman, 2011), cultural interpretation (H. Geertz, 1999), architectural morphology (Cuthbert & Suartika, 2017), or structural symbols of buildings (Aranha, 1991), this study proposes an analytical synthesis that connects cosmological zoning, spatial orientation, spatial organization, and architectural expression within a unified interpretative framework. With this approach, architecture is not understood merely as a material object, but as a cosmological text that articulates the worldview of society through spatial structures.

These comparative findings yield new conceptual contributions to the study of architecture and the study of Indonesian culture. Specifically, this research demonstrates that the diversity of spatial configurations between Bali and Java does not simply reflect local cultural differences, but can also be understood as interpretive variations of a similar cosmological logic, translated differently through the social, political, and religious systems of each society. By positioning architecture as an epistemological medium that represents the relationship between humans and the cosmos, this study broadens the perspective in the study of Indonesian architecture from a descriptive or typological approach to a more philosophical and comparative understanding. Therefore, traditional architecture can be viewed not only as a material cultural heritage, but also as a local intellectual model that reveals how societies interpret world order, social structure, and the position of humans in the cosmos.

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Disclosure of AI Use

The authors declare that artificial intelligence (AI) tools were used in a limited capacity during the preparation of this manuscript. AI-assisted tools were employed to improve the clarity and quality of the English language, enhance the resolution and readability of visual materials, and support the exploration of cultural terminology and symbolic elements relevant to the architectural analysis. All scientific interpretations, conceptual development, critical analysis, and conclusions presented in this manuscript were conceived, verified, and approved solely by the authors, who assume full responsibility for the accuracy and integrity of the work.

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