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Iconographic Analysis of the Borobudur Ship Based on Leemans' Line Drawing: Visualizing the Maritime Identity of Sriwijaya

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A B S T R A C T

Sriwijaya is historically recognized as a major maritime polity in Southeast Asia; however, its representation as a coherent maritime identity remains inconsistent in contemporary visual design practice. This study examines the iconographic potential of the Borobudur ship as a visual foundation for constructing Sriwijaya's maritime identity. The research employs qualitative visual analysis focusing on the line drawing documentation produced by Conradus Leemans, supported by epigraphic interpretation of the Kedukan Bukit Inscription, which records large-scale mobilization associated with early Sriwijaya expansion. Through iconographic analysis, structural elements of the ship, including hull configuration, outrigger system, mast, and sail formation, demonstrate characteristics consistent with ocean-going maritime technology. The findings indicate that the Borobudur ship possesses symbolic legitimacy as a visual representation of maritime culture contemporaneous with Sriwijaya. By integrating textual historical evidence and visual artefacts, this study proposes an iconographic framework that positions the Borobudur ship as a conceptual basis for developing a more coherent maritime visual identity of Sriwijaya within contemporary design discourse

INTRODUCTION

Sriwijaya is recognized as one of the major maritime polities in Southeast Asia between the seventh and ninth centuries. Its maritime character is closely related to its geographical position along the strategic Malacca Strait, enabling the formation of trade networks connecting India, China, and other regions of Southeast Asia (Fortuna et al., 2024). This position allowed Sriwijaya to function as an important trading hub that played a significant role in the distribution of valuable commodities throughout the Nusantara region (Wolters, 1967). Intensive maritime activity contributed to the development of political structures oriented toward the control of sea routes and major ports (Siregar et al., 2023). Maritime interaction also stimulated cultural exchange that enriched the development of civilization in Southeast Asia (Hall, 2011). The maritime orientation of Sriwijaya demonstrates that its social system was strongly connected to long-distance navigation and trade activities (Safna, 2023).

Historical evidence of Sriwijaya's maritime mobility is documented in Prasasti Kedukan Bukit, which records the journey of Dapunta Hyang and his followers in an expedition known as siddhayatra (Coedes & Damais, 1989).The inscription indicates that water transportation played a central role in the early political expansion of Sriwijaya (Kulke, 1991). The mobilization of a large number of followers suggests the existence of logistical capabilities and maritime technology that enabled organized long-distance travel (Manguin, 1993). Such maritime activity demonstrates the close relationship between political authority and control of navigation technology (Manguin, 1980). Epigraphic sources further confirm that sea mobility contributed significantly to the formation of Sriwijaya's territorial power (Andhifani et al., 2025).

In addition to being recognized as a maritime power, Sriwijaya also developed as an important center of Buddhist learning that influenced cultural development across Southeast Asia (Muljana, 2006). Interaction between traders and religious communities contributed to the formation of transregional knowledge networks (Hall, 2011). The cultural influence of Sriwijaya is not only evident in historical records but also in artistic expressions representing the memory of the kingdom's golden age (Utami et al., 2018). Symbolic representation demonstrates how historical values may be translated into visual forms that function as media for cultural communication (Panofsky, 1939).

Visual evidence of maritime technology in Southeast Asia can be observed in the ship reliefs of Borobudur Temple, which depict vessels equipped with outriggers functioning as stabilizing structures for navigation in open seas (Burningham, 2013). The outrigger system reflects technological adaptation to dynamic maritime environmental conditions (Horridge, 1981). The morphological characteristics of the ship's hull indicate knowledge of shipbuilding construction developed within Austronesian maritime traditions. These ship reliefs may therefore be understood as visual documentation of long-distance navigation capabilities in early Southeast Asia (Hall, 2011).

Visual documentation of Borobudur ship reliefs was further clarified through line drawings produced by Conradus Leemans in the nineteenth century (Leemans, 1873). Line drawings function to simplify the complexity of narrative

relief compositions, allowing the morphological structure of the ship to be more systematically observed (Manguin, 1980). The simplification of visual form enables identification of structural elements such as the hull, outriggers, and sail configuration (Arnheim, 2023). Such visual representation allows historical artefacts to be interpreted as references for form within design research (Panofsky, 1939).

Iconographic approaches enable visual artefacts to be interpreted as systems of signs containing cultural meaning (Panofsky, 1939). Visual perception theory explains that relationships among structural elements influence the way symbolic forms are recognized (Arnheim, 1974). The transformation of historical forms into visual symbols allows cultural meaning to be sustained within contemporary contexts (Panofsky, 1939). Therefore, iconographic analysis of the Borobudur ship based on Leemans' line drawings becomes relevant for understanding its potential as a representation of Sriwijaya's maritime identity. The integration of historical evidence and visual artefacts provides a conceptual foundation for developing visual identity grounded in cultural context.

LITERATURE REVIEW

Visual identity positions visual form as a primary medium for communicating the character, values, and meaning associated with a cultural entity. Visual identity functions as a system of signs that enables recognition through the consistent use of form, structure, and symbolic elements. Within a cultural context, visual identity operates not only as an aesthetic marker but also as a communicative framework that represents historical values embedded in cultural artefacts. Consistency of visual structure allows historical references to be translated into contemporary design expressions without losing their symbolic relevance. Visual identity therefore can be understood as constructed meaning shaped through the selection of visual forms that maintain cultural continuity and recognizability (Olins, 2008).

Iconographic theory explains that visual artefacts may be interpreted as symbolic structures containing cultural meaning embedded within historical contexts (Panofsky, 1939). Iconography enables identification of relationships between visual form and cultural narrative through systematic interpretation of representational elements. Through iconographic interpretation, historical artefacts can function as sources of meaning that inform contemporary visual representation. This perspective allows the Borobudur ship to be interpreted not only as a technological artefact but also as a symbolic representation associated with maritime mobility.

Visual perception theory explains that relationships among structural elements influence the way forms are recognized and interpreted by viewers (Arnheim, 1974). Structural relationships such as balance, direction, proportion, and unity influence the legibility of visual symbols and contribute to their communicative effectiveness. Perceptual organization enables complex forms to be simplified while maintaining recognizable characteristics. This principle allows morphological characteristics of the Borobudur ship to be translated into simplified visual configurations without losing their essential identity.

Based on these theoretical perspectives, integration of visual identity theory, iconographic interpretation, and visual perception theory provides a conceptual framework for understanding the potential of Borobudur ship morphology as a visual reference for constructing Sriwijaya maritime identity. Visual identity grounded in historical artefacts allows continuity of cultural meaning to be maintained across temporal contexts while enabling reinterpretation of cultural symbols within contemporary design practice.

METHODS

This study employs a qualitative research approach using visual analysis to interpret the iconographic structure of the Borobudur ship as representation of maritime identity. The primary object of analysis is the line drawing documentation produced by C. Leemans, which represents the ship relief carved on Candi Borobudur. The use of line drawing as research material enables clearer observation of structural characteristics because visual complexity contained in narrative relief panels can be reduced into simplified morphological forms. This simplification allows the ship structure to be examined as a visual configuration consisting of identifiable elements such as hull proportion, outrigger structure, mast orientation, and sail formation.

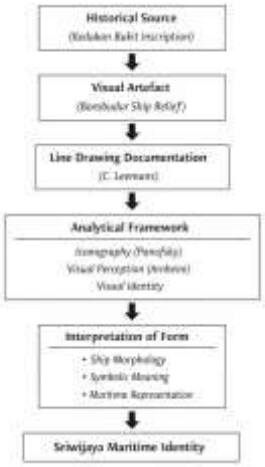

Figure 1. Conceptual Framework Integrating Historical Evidence and Visual Artefact Analysis to Interpret Sriwijaya Maritime Identity

The analytical approach integrates iconographic interpretation with visual perception analysis to identify symbolic meaning embedded in the ship morphology. Iconographic analysis is applied to interpret visual elements as cultural signs associated with maritime activity and symbolic representation. Through iconographic interpretation, visual artefacts are examined in relation to cultural context that influences the formation of symbolic meaning. Visual perception analysis is used to examine relationships among structural elements that influence recognition of form, including balance, proportion, direction, and structural coherence. These visual relationships allow identification of characteristics associated with stability, mobility, and navigational capability represented in the ship structure.

Historical interpretation is incorporated to establish contextual relevance between visual artefacts and maritime culture associated with Sriwijaya. Contextual understanding of maritime activity is supported by historical evidence recorded in Prasasti Kedukan Bukit, which describes the use of water transportation in the expansion of political authority. The integration of historical sources and visual artefacts enables interpretation of the ship not only as technological representation but also as symbolic form associated with maritime mobility.

The analytical procedure consists of three stages. The first stage involves identification of morphological elements of the ship based on Leemans' line drawing, focusing on structural components including hull configuration, outrigger placement, mast structure, and sail orientation. The second stage involves iconographic interpretation of visual elements in relation to maritime cultural symbolism, enabling identification of symbolic meaning associated with navigation, mobility, and maritime capability. The third stage involves synthesis of visual interpretation in relation to the concept of maritime identity, in order to establish the relevance of ship morphology as a potential visual reference representing Sriwijaya maritime culture.

The conceptual framework applied in this study is illustrated in Figure 1. The framework demonstrates the relationship between historical sources and visual artefacts as the basis for iconographic interpretation. The Kedukan Bukit inscription provides contextual evidence of maritime mobility associated with early Sriwijaya expansion. The Borobudur ship relief, represented through Leemans' line drawing, functions as the primary visual object analyzed in this research. The integration of iconographic interpretation, visual perception theory, and visual identity approach enables systematic identification of symbolic meaning embedded in the ship morphology. Through this analytical process, the visual structure of the ship is interpreted as a representation of maritime identity associated with Sriwijaya.

RESULTS

Kedukan Bukit Inscription as a Narrative of Sriwijaya Maritime Mobility

Understanding the maritime identity of Sriwijaya cannot be separated from epigraphic sources that constitute primary evidence for reconstructing the historical development of the polity. One of the most important sources is the Kedukan Bukit inscription dated 604 Saka (682 CE), which records the journey of Dapunta Hyang in an expedition referred to as siddhayatra (Muljana, 2006). The term siddhayatra denotes a journey that possesses both religious and political dimensions, indicating that the mobility recorded in the inscription is not merely related to geographical displacement but also associated with the legitimation of power through ritual action and territorial expansion (Suryanegara, 2008). The account of this journey demonstrates that navigation activities had become an integral component of Sriwijaya's political structure since the early formation of the polity in southern Sumatra.

The inscription states that Dapunta Hyang undertook the journey using boats and brought two laksa of troops, equivalent to approximately 20,000

soldiers (Coedès et al., 2014). This number indicates a very large scale of mobilization, logically requiring water transportation capable of accommodating the movement of people, logistics, and military equipment in significant quantities (Utomo, 2021). The magnitude of the expedition suggests that navigation technology had developed sufficiently to support long-distance voyages through riverine and maritime networks connecting strategic regions in Southeast Asia (Santun, 2013). Therefore, the boat functioned not only as a means of transportation but also as a political instrument enabling the formation of maritime power networks.

The journey recorded in the inscription demonstrates a relationship between water-based mobility and the establishment of a new political center referred to as wanua Sriwijaya (Coedès, 2013). The term wanua has generated various interpretations in historiographical studies, as it may refer to a city, settlement, fortress, or religious center (De Casparis, 1956). The debate regarding the meaning of wanua indicates that the concept of a city within the Sriwijaya context cannot be understood solely as an administrative entity, but rather as a symbolic spatial structure integrating religious, economic, and political functions within a unified system. This interpretation suggests that mobility through waterways played an important role in shaping the cultural spatial configuration that formed the basis of Sriwijaya's development as a center of trade and Buddhist learning (Suryanegara, 2008).

The relationship between maritime travel and the formation of urban structure indicates that rivers and seas functioned as integrative media within the Sriwijaya network system. The Musi River, as a primary transportation route, enabled interaction between the religious center at Bukit Siguntang and surrounding trade areas (Santun, 2013). The geographical position of Palembang, connected to regional maritime routes, strengthened the character of Sriwijaya as a polity that relied on maritime mobility to establish economic and political relations with other regions of Southeast Asia. Consequently, navigational capability and mastery of ship technology became important factors in maintaining the stability of trade networks and cultural influence.

The presence of an expedition involving thousands of troops indicates that water transportation was not merely symbolic but constituted strategic infrastructure in the process of territorial expansion. Maritime mobility enabled the distribution of human resources and territorial control through water routes that were more efficient than land routes during the period (Utomo, 2021).This condition shows that ships functioned as media connecting geographical, economic, and ideological dimensions in the construction of Sriwijaya's identity as a maritime power (Santun, 2013).

Although the Kedukan Bukit inscription provides information regarding the use of boats in the expedition of Dapunta Hyang, the inscription does not visually describe the form of the vessels used in the journey (Coedès, 1968). The absence of visual description requires reconstruction of Sriwijaya's navigation technology through other visual artefacts originating from relatively similar chronological periods (Suryanegara, 2012). In this context, ship reliefs at

Borobudur Temple constitute an important visual source for understanding the characteristics of early Nusantara maritime technology.

Borobudur ship reliefs depict outrigger vessels with structural elements such as hulls, masts, and stabilization systems that demonstrate adaptation of navigation technology to archipelagic water conditions. The outrigger structure indicates stabilization capability for long-distance navigation, enabling the distribution of people and commodities in significant quantities through maritime routes. Considering the chronological proximity and shared maritime cultural context, Borobudur ship reliefs can be used as a visual approach to understand possible ship forms capable of supporting the mobility described in the Kedukan Bukit inscription (Santun, 2013a)

Thus, the Kedukan Bukit inscription provides a historical foundation indicating that maritime mobility constituted a fundamental element in the formation of Sriwijaya as a regional political power. Information regarding the siddhayatra journey involving a large number of troops demonstrates that navigation technology played a strategic role in territorial expansion and regional integration. The need to understand ship forms that enabled such mobility encourages analysis of ship representations in Borobudur reliefs, which were later reconstructed more systematically through line drawings produced by Leemans. Integration between textual sources and visual artefacts allows iconographic analysis to be conducted more comprehensively in identifying visual characteristics contributing to the construction of Sriwijaya's maritime identity.

Borobudur Ship Relief as a Visual Representation of Maritime Technology

Visual representations of early Nusantara maritime technology can be observed in ship reliefs at Borobudur Temple dating from approximately the 8th to 9th centuries CE. The visual characteristics of the ship morphology examined in this study are illustrated in Figure 2. Borobudur ship reliefs depict outrigger vessel structures demonstrating technological adaptation to archipelagic maritime environments influenced by sea currents, monsoon wind systems, and tropical ocean conditions(Cœdès & Damais, 1996). Outrigger vessels provide improved stability for long-distance navigation and are therefore frequently associated with interregional trade and maritime mobility in Southeast Asia (Manguin, 1980). Representation of ships in the reliefs indicates that maritime technology had developed as a complex construction system consisting of hull structures, outriggers functioning as stabilizers, masts, and sail configurations enabling directional control in navigation.

Borobudur relief panels depicting ships illustrate the importance of maritime activity in the cultural environment of early Southeast Asia, where sea routes functioned as primary channels connecting various regions . The presence of ships in visual narratives indicates that maritime mobility constituted an integral part of socio-economic interaction and cultural exchange in the

archipelagic region. Maritime travel enabled circulation of commodities, knowledge, and religious influence across interconnected coastal societies.

The ship relief examined in this study presents a double-outrigger configuration with a primary mast and a tanja sail system supported by horizontal structures (Leemans, 1873). The tanja sail form demonstrates technological adaptation to regional wind patterns allowing efficient navigation within archipelagic waters. The presence of outriggers indicates stabilization mechanisms reducing the risk of capsizing caused by wave dynamics, suggesting that the vessel was designed for medium to long-distance voyages. The elongated hull structure indicates significant cargo capacity enabling transportation of people and goods across maritime routes (Suryanegara, 2008)

Figure 2. Borobudur Ship Relief Representing Early Austronesian Maritime Technology

When associated with the journey narrative described in the Kedukan Bukit inscription, the outrigger vessel configuration in Borobudur reliefs provides visual indications of maritime technology capable of supporting large-scale mobility (Andhifani et al., 2025). The siddhayatra expedition involving thousands of followers suggests the necessity of fleets capable of transporting substantial loads through riverine and maritime routes (Utomo, 2017). Chronological correspondence between the Sriwijaya period and the construction of Borobudur indicates the existence of a shared maritime cultural environment in Southeast Asia during the early medieval period.

From an iconographic perspective, the ship represented in Borobudur reliefs can be interpreted not only as a transportation technology but also as a visual sign reflecting patterns of interaction across maritime. The ship functions as a medium enabling connectivity between regions connected through trade and cultural exchange. The visual structure of the ship therefore represents technological knowledge developed through continuous engagement with maritime environments.

For the purpose of systematic visual analysis, ship forms depicted in Borobudur reliefs were reconstructed through line drawings produced by Conradus Leemans. Leemans' drawings simplify the visual complexity of the relief into clearer structural configurations, facilitating identification of morphological elements such as outriggers, mast structures, sail rigging, and hull form (Leemans, 1873). Visual reduction through line drawing enables

iconographic analysis to focus on relationships among structural visual elements without distraction from ornamental details present in the original relief.

Thus, Borobudur ship reliefs function as visual artefacts bridging the interpretative need to understand ship forms not explicitly represented in the Kedukan Bukit inscription. Representation of outrigger vessels indicates maritime technological capability supporting large-scale mobility as reflected in the siddhayatra narrative. Integration of textual sources and visual artefacts enables iconographic analysis to identify visual characteristics contributing to the construction of Sriwijaya maritime identity.

Morphological Analysis of Ship Structure Based on Leemans Drawing

Conradus Leemans produced a line drawing reconstruction of the Borobudur ship that provides a clearer representation of the vessel's morphological structure compared to the original relief, which contains complex ornamental visual elements. The line drawing examined in this study is presented in Figure 3. Line drawing functions as a process of visual reduction that preserves essential structural characteristics, enabling more objective identification of ship construction elements (Leemans, 1873). Simplification through line drawing allows analysis of proportional relationships, orientation, and configuration of visual components that characterize early Southeast Asian maritime technology.

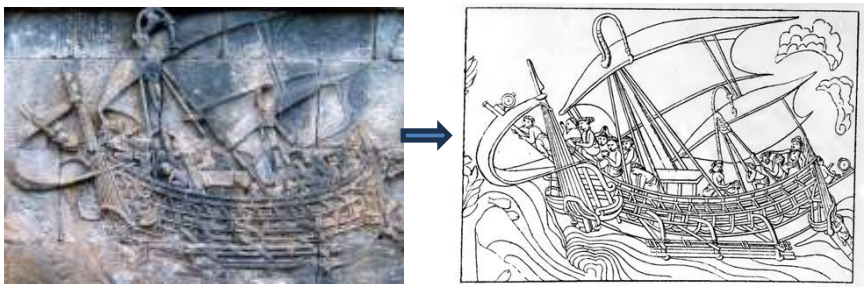

Figure 3. Leemans Line Drawing of Borobudur Ship Morphology

The primary structure of the ship demonstrates an elongated hull configuration with tapered ends, indicating hydrodynamic efficiency that reduces water resistance during navigation. The relatively slender hull form suggests a design orientation supporting speed and stability, enabling medium- to long-distance travel through open sea routes as well as major river systems. The elongated proportion also indicates sufficient cargo capacity to transport crew members, trade goods, and logistical equipment required for extended voyages.

The elongated hull configuration represents only one component of the overall ship structure. A comprehensive understanding of the vessel morphology requires identification of additional structural elements that contribute to navigational stability and functional performance. The Borobudur ship demonstrates a multi-component construction system consisting of outrigger support structures, mast orientation, sail configuration, rigging connections, and deck organization. Each element forms an integrated visual structure that reflects

technological adaptation to maritime environmental conditions. The identification of these principal components is presented in Figure 4 to clarify the structural relationships observed in the Leemans drawing.

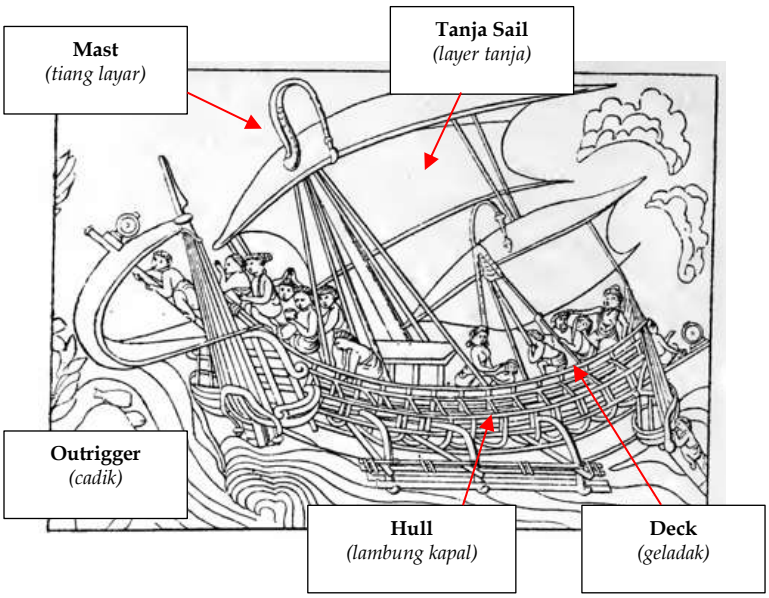

Figure 4. Identification of Morphological Elements of Borobudur Ship Including Hull, Outrigger, Mast, Tanja Sail, Rigging, and Deck Based on Leemans Reconstruction

Outrigger structures positioned along the lateral sides of the hull function as stabilizing components that reduce tilting caused by wave motion (Horridge, 1981). The outrigger system demonstrates technological adaptation to dynamic archipelagic maritime environments influenced by wind direction and sea currents (Manguin, 1980). The presence of outriggers indicates that the vessel was designed to maintain balance during navigation, allowing more stable distribution of weight when transporting people or commodities (Coedès, 1968).

The main mast structure demonstrates vertical orientation serving as the central component supporting sail propulsion through wind energy (Horridge, 1981). The tanja sail configuration indicates technological adaptation to regional monsoon wind systems characteristic of Southeast Asian maritime routes (Manguin, 1993). Sail structures enable efficient navigation by utilizing seasonal wind directions, allowing voyages to be conducted systematically within maritime trade networks (Suryanegara, 2012). The connection between mast and sail structure indicates an integrated navigational system designed to maintain directional control (Horridge, 1981).

Rigging structures indicate the presence of a construction system enabling adjustment of sail tension according to navigational needs (Manguin, 1980). The rigging system functions as a structural connector between sail components, mast, and hull configuration, forming an integrated mechanism that enables dynamic response to wind conditions during navigation (Horridge, 1981). The complexity of rigging elements indicates accumulated empirical knowledge derived from long-term maritime experience (Coedès, 1968).

Deck structure suggests an operational space enabling crew activity during voyages (Manguin, 1993). Deck configuration allows distribution of crew members responsible for sail operation, cargo management, and navigation control (Suryanegara, 2012). The presence of crew figures in Borobudur reliefs indicates that navigation activity was conducted collectively, requiring coordinated operational roles to maintain directional stability of the vessel (Horridge, 1981).

When associated with the journey narrative recorded in the Kedukan Bukit inscription, morphological configuration of the ship indicates technological capacity capable of supporting large-scale mobility (Budisantoso, 2016). The presence of large numbers of followers described in the siddhayatra narrative suggests the necessity of vessels capable of transporting substantial human resources through interconnected riverine and maritime routes (Suryanegara, 2008). The outrigger ship structure therefore reflects not only technological capability but also a mobility system enabling formation of maritime political networks associated with Sriwijaya.

From an iconographic perspective, the visual configuration of the ship demonstrates relationships between physical form and symbolic meaning associated with mobility, trade, and territorial expansion. The ship can be interpreted not merely as technological artefact but as a symbol of movement connecting geographical space and cultural interaction networks in Southeast Asia (Coedès, 2013). Structural relationships among visual components demonstrate characteristics of balance, directional movement, and unity of form representing stability within maritime mobility systems (Horridge, 1981).

Thus, Leemans' line drawing enables identification of visual elements forming technological characteristics of maritime vessels relevant to the context of Sriwijaya mobility. Morphological analysis demonstrates relationships between structural form and navigational function enabling long-distance travel across regional maritime routes. Integration of epigraphic data, visual artefacts, and reconstructed line drawings enables iconographic interpretation to be conducted systematically in identifying visual characteristics contributing to the construction of Sriwijaya maritime identity.

Iconographic Synthesis as Representation of Sriwijaya Maritime Identity

Iconographic interpretation of ship morphology indicates that the visual structure of the vessel represents not only maritime technology but also a symbolic system communicating cultural meaning. According to Erwin Panofsky, visual objects may be interpreted through levels of meaning that connect formal elements with cultural context, enabling identification of symbolic structures embedded within visual representation (Panofsky, 1939). The Borobudur ship, therefore, may be understood not merely as depiction of transportation technology but as a visual form representing patterns of mobility and interaction within maritime culture.

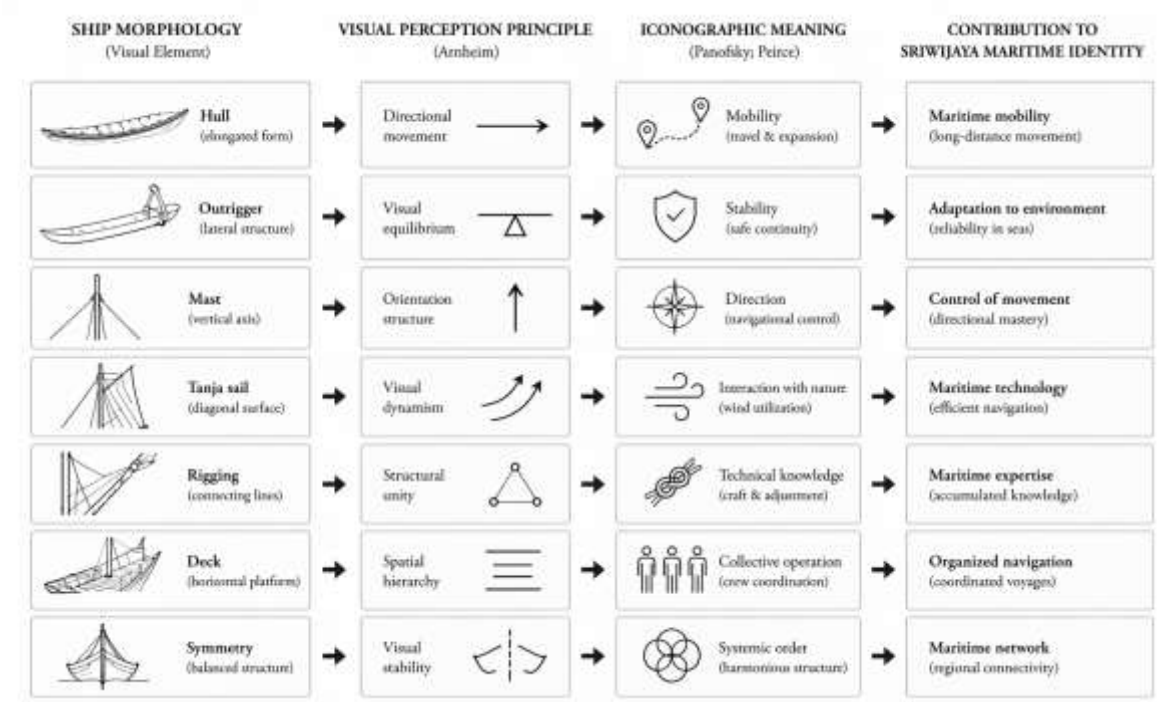

Figure 5. Iconographic Relationship between Ship Morphology, Visual Perception Principles, and Symbolic Meaning in Constructing Sriwijaya Maritime Identity

From the perspective of visual perception, structural relationships between elements such as balance, orientation, and proportional distribution influence how form is interpreted by observers. Rudolf Arnheim explains that visual balance contributes to perceptual stability, allowing viewers to interpret form as coherent structural unity (Yulius et al., 2025). The elongated hull configuration produces directional visual movement, while the outrigger structure creates equilibrium indicating stabilization within dynamic environmental conditions. These perceptual characteristics reinforce interpretation of the ship as a form representing navigational capability and mobility.

Semiotic interpretation further explains how visual forms function as signs communicating meaning within cultural systems. Charles Sanders Peirce classifies signs into icon, index, and symbol, indicating that visual resemblance may function as a representational sign referring to real objects or conceptual meaning (Hoopes, 2014). In this context, the ship form operates as an icon representing maritime activity while simultaneously functioning as a symbol of mobility and connectivity within regional networks. Through symbolic interpretation, ship morphology becomes associated with broader concepts of territorial expansion and interregional interaction.

Visual representation may also contain layers of meaning beyond literal depiction. Roland Barthes explains that images operate through denotative meaning referring to observable form and connotative meaning referring to cultural interpretation (Barthes, 1977). Denotatively, the Borobudur ship depicts a maritime vessel equipped with outriggers and sails. Connotatively, the ship may represent ideas of movement, exchange, and connectivity embedded within

Southeast Asian maritime culture. The connotative dimension allows the ship to function as a cultural sign representing patterns of interaction within maritime networks.

From the perspective of visual culture, images may function as mediators between material artefacts and cultural meaning. W. J. T. Mitchell explains that visual representation contributes to construction of cultural identity by shaping how historical objects are interpreted within contemporary contexts (Mitchell, 2005). The Borobudur ship, when interpreted through iconographic analysis, becomes part of a visual discourse connecting historical maritime artefacts with contemporary interpretation of regional identity.

Within visual communication theory, interpretation of visual form depends on recognition of structural characteristics that allow viewers to associate form with conceptual meaning. Paul Martin Lester explains that visual images communicate meaning through structural organization that guides perception toward symbolic interpretation (Lester, 2006). Structural consistency of hull, mast, and outrigger elements contributes to recognizability of the ship as representation of maritime technology.

When connected to the historical narrative recorded in the Kedukan Bukit Inscription, ship morphology may be interpreted as a visual representation of mobility constituting a fundamental characteristic of Sriwijaya as a maritime polity. Maritime mobility enabled circulation of commodities, knowledge, and religious influence across interconnected regions of Southeast Asia. The ability to organize maritime routes contributed to formation of regional interaction networks forming the basis of Sriwijaya's political and cultural influence.

Iconographic synthesis therefore indicates that the Borobudur ship may be interpreted as visual representation of connectivity linking geographical space with cultural interaction networks. Structural characteristics of the vessel demonstrate relationships between technological adaptation and environmental conditions influencing development of maritime culture. Through integration of epigraphic sources, visual artefacts, and perceptual analysis, the ship may be understood as a visual symbol representing navigation capability, regional connectivity, and mobility forming the conceptual basis of Sriwijaya maritime identity.

Table 1. Iconographic Synthesis of Borobudur Ship Morphology as Representation of Sriwijaya Maritime Identity

Visual element	**Morphological characteristic**	**Visual perception principle (Arnheim)**	**Maritime function**	**Iconographic meaning**	**Contribution to Sriwijaya identity**
Hull	elongated horizontal form	directional movement	long-distance navigation	travel and expansion	maritime mobility
Outrigger	lateral balancing structure	visual equilibrium	vessel stabilization	continuity of voyage	adaptation to marine environment
Mast	dominant vertical axis	orientation structure	sail support	navigational direction	control of movement

Visual element	Morphological characteristic	Visual perception principle (Arnheim)	Maritime function	Iconographic meaning	Contribution to Sriwijaya identity
Tanja sail	diagonal surface plane	visual dynamism	wind propulsion	interaction with nature	maritime technology
Rigging	connecting linear elements	structural unity	sail adjustment	technical knowledge	maritime expertise
Deck	horizontal platform	spatial hierarchy	crew activity space	collective operation	organized navigation
Structural symmetry	balanced configuration	visual stability	load distribution	systemic harmony	mobility order
Elongated proportion	dominant length ratio	visual continuity	travel efficiency	regional connectivity	trade network expansion

Based on the iconographic synthesis shown in Table 1, the structural characteristics of the Borobudur ship may be simplified into visual configurations that retain essential morphological features. The abstraction process emphasizes structural continuity of the hull, outrigger balance, and directional orientation of the sail as visual indicators of maritime mobility. This process enables transformation of historical artefacts into simplified visual forms suitable for contemporary visual identity construction. The visual abstraction process derived from morphological analysis is illustrated in Figure 6. The abstraction process does not aim to replicate the historical artefact literally, but to preserve essential structural characteristics that function as visual indicators of maritime identity.

Figure 6. Visual Abstraction Process Transforming Borobudur Ship Morphology Into Symbolic Representation of Sriwijaya Maritime Identity

DISCUSSION

The findings demonstrate that the representation of ships in the reliefs of Borobudur Temple may be interpreted as visual artefacts connecting historical evidence of maritime mobility with the construction of Sriwijaya's visual identity. The integration between epigraphic data derived from the Kedukan Bukit Inscription and visual artefacts in the form of ship reliefs enables interpretation beyond descriptive analysis toward symbolic interpretation that reveals relationships between visual structure and cultural meaning. This relationship indicates that Sriwijaya's maritime identity was formed not only through historical narratives but also through visual representation systems

reflecting mobility within networks of trade and cultural interaction in Southeast Asia.

From an iconographic perspective, ship morphology demonstrates relationships between physical structure and cultural meaning embedded within maritime environments. Erwin Panofsky explains that interpretation of visual objects involves identification of meaning that develops from formal description toward cultural interpretation shaped by historical context. Configuration of elongated hull structures, lateral outriggers, and tanja sail systems demonstrates visual characteristics consistently appearing in Southeast Asian maritime artefacts, indicating structural forms associated with concepts of mobility and interregional connectivity. The consistency of these visual elements suggests that maritime technology developed not only as a technical solution but also as a symbolic system reflecting the capacity to connect geographically dispersed regions through maritime routes.

Morphological analysis based on line drawings produced by Conradus Leemans demonstrates that visual reduction enables identification of structural elements forming the primary characteristics of outrigger vessels. Simplification through line drawing reveals proportional relationships among hull structures, outriggers, and sail configurations forming visual compositions associated with directional movement and structural balance. From the perspective of visual perception theory, Rudolf Arnheim explains that visual balance contributes to perceptual stability that enables viewers to interpret structural relationships as coherent forms. Distribution of horizontal and vertical elements within ship morphology produces visual equilibrium reinforcing interpretation of the vessel as representation of navigational technology adapted to maritime environmental conditions.

Semiotic interpretation indicates that ship morphology functions as a visual sign connecting physical representation with conceptual meaning. Charles Sanders Peirce explains that visual signs may function as icons when structural resemblance exists between representation and referential object. In this context, ship imagery functions as an icon representing maritime activity while simultaneously operating as a symbol communicating ideas of mobility, interaction, and territorial expansion within maritime networks. The symbolic dimension demonstrates that visual configuration of the ship communicates not only technological knowledge but also cultural concepts associated with connectivity across regions.

Within the framework of visual culture, representation of ships may be interpreted as mediating relationships between historical artefacts and contemporary identity construction. W. J. T. Mitchell explains that visual images contribute to shaping cultural understanding by connecting historical objects with present interpretative contexts. Interpretation of Borobudur ship morphology as a symbol of mobility indicates that Sriwijaya's visual identity may be constructed through reinterpretation of historical artefacts reflecting geographical characteristics of Palembang as a river-based urban environment. The relationship between visual artefacts and geographical context demonstrates

that visual identity is influenced not only by formal representation but also by the capacity of symbols to reflect cultural memory sustained across time.

Within visual communication theory, structural characteristics influence recognizability of visual forms in symbolic communication processes. Paul Martin Lester explains that visual communication effectiveness depends on the ability of forms to maintain essential characteristics despite undergoing simplification processes. Visual transformation from Borobudur relief representation toward Leemans' line drawing and simplified geometric configuration demonstrates that primary structural elements remain recognizable through basic visual components such as elongated directional form, diagonal sail planes, and lateral balancing structures. These visual characteristics enable translation of historical artefacts into simplified graphic forms while maintaining conceptual relationships with original cultural meaning.

The findings indicate that integration of textual sources and visual artefacts enables identification of consistent visual characteristics representing Sriwijaya's maritime mobility. Mobility described within the siddhayatra journey narrative demonstrates that navigational capability constituted an essential factor in formation of regional influence networks. Representation of ship morphology indicates that the concept of mobility possesses visual characteristics interpretable through iconographic analysis. Therefore, Sriwijaya's visual identity may be understood as symbolic construction grounded in maritime mobility connecting various regions of Southeast Asia through interconnected water routes.

The contribution of this study demonstrates that historical visual artefacts may function as conceptual foundations for developing contemporary visual identity possessing historical legitimacy. Integration of epigraphic data, visual artefacts, and visual perception theory enables systematic identification of structural characteristics relevant to maritime mobility concepts. This approach indicates that visual identity design constitutes not only aesthetic activity but also interpretative process connecting visual form with cultural memory shaping regional identity.

Thus, outrigger ship morphology represented in Borobudur reliefs may be interpreted as visual symbol representing navigational capability, regional connectivity, and cultural expansion characterizing Sriwijaya as a maritime power. Iconographic interpretation demonstrates that structural relationships among visual elements contribute to formation of maritime visual identity grounded in historical and geographical context of Palembang as a region shaped through maritime cultural interaction.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that the maritime identity of Sriwijaya may be interpreted through the integration of epigraphic evidence, visual artefacts, and iconographic analysis. The Kedukan Bukit Inscription provides historical documentation of large-scale mobility through water routes, indicating that navigation constituted a fundamental component in the formation of Sriwijaya as a regional political power. The description of the siddhayatra expedition

involving a significant number of followers suggests the existence of maritime technological capability enabling territorial expansion and interregional interaction across Southeast Asia.

Visual analysis of ship reliefs at Borobudur Temple demonstrates that outrigger vessel morphology reflects adaptation to archipelagic maritime environments influenced by monsoon wind systems and sea currents. Structural elements such as elongated hulls, lateral outriggers, and tanja sail configurations indicate technological knowledge developed to support stability and efficiency in medium- to long-distance navigation. Reconstruction through line drawings produced by Conradus Leemans enables systematic identification of morphological elements forming primary characteristics of Southeast Asian maritime technology.

Iconographic interpretation demonstrates that ship morphology may be understood not only as representation of transportation technology but also as symbolic structure communicating cultural meaning associated with mobility and connectivity. Theoretical perspectives derived from iconography, visual perception, and semiotics indicate that structural relationships among visual elements contribute to formation of symbolic meaning beyond functional representation. Configuration of visual balance, directional movement, and structural unity indicates perceptual characteristics enabling interpretation of ship morphology as representation of mobility within maritime cultural systems.

Integration of textual and visual sources indicates that maritime mobility constituted an essential factor shaping Sriwijaya's regional influence through trade networks and cultural interaction. Ship morphology therefore represents not merely technological capability but also conceptual representation of connectivity linking geographical space with socio-cultural exchange. The ability to navigate maritime routes enabled distribution of commodities, knowledge, and religious influence across interconnected regions of Southeast Asia, contributing to formation of Sriwijaya as a maritime-oriented polity.

The findings suggest that historical visual artefacts may serve as conceptual foundations for development of contemporary visual identity grounded in cultural memory. Transformation of ship morphology from relief representation into simplified visual structure demonstrates that essential characteristics may be preserved through processes of visual abstraction. This condition indicates that iconographic analysis may contribute to development of visual identity systems possessing historical relevance while maintaining visual clarity suitable for contemporary communication contexts.

Therefore, outrigger ship morphology derived from Borobudur reliefs may be interpreted as visual representation of maritime identity associated with mobility, connectivity, and cultural interaction characterizing Sriwijaya as a regional maritime power. The integration of epigraphic data, visual artefacts, and iconographic interpretation provides a systematic framework for identifying visual characteristics contributing to construction of maritime-based visual identity relevant to the geographical and cultural context of Palembang.

The contribution of this study lies in demonstrating that historical artefacts may function not only as objects of historical documentation but also as sources

of conceptual reference for visual identity development. Through systematic interpretation of morphological structure and symbolic meaning, the Borobudur ship may be positioned as a visual element contributing to formulation of maritime-based identity representing continuity between historical memory and contemporary visual culture.

FURTHER STUDY

This study focuses on a selected Borobudur ship relief reconstructed through the line drawing produced by Conradus Leemans; therefore, interpretation of ship morphology is limited to a specific visual artefact. Further research may expand comparative analysis by examining additional ship relief panels at Borobudur Temple as well as other maritime visual artefacts from Southeast Asia in order to identify broader morphological patterns of regional ship technology. Future studies may also explore relationships between archaeological artefacts, inscriptions, and historical manuscripts to strengthen integration between textual and visual evidence of maritime culture. From the perspective of visual identity research, empirical approaches such as visual perception testing may provide insight into how historical artefacts are interpreted by contemporary audiences. Expansion of iconographic transformation methods toward other maritime cultural contexts may contribute to development of design guidelines for culturally grounded visual identity systems representing regional heritage.

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