



## The *Perahu Tambang* of Sarawak River: Establishing Architectural Identity

Atta Idrawani Zaini<sup>1\*</sup>, Awang Hasim Awang Sulong<sup>1</sup>,  
Ruzanah Abu Bakar<sup>1</sup>, and Mervyn Wong Hsin Jyi<sup>1</sup>

<sup>1</sup>Department of Architecture, Faculty of Built Environment, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, MALAYSIA.

\*Corresponding Author (Tel: +60-82-582216, Email: [izatta@unimas.my](mailto:izatta@unimas.my)).

Paper ID: 15A4E

Volume 15 Issue 4

Received 15 January 2024  
Received in revised form 01 June 2024  
Accepted 24 July 2024  
Available online 19 June 2024

### Keywords:

Passenger boat; Design history; Malay culture; Architectural heritage; Architectural identity; Borneo culture; Malay archipelagic influence; Spatial-human operation; Architectural imageability; Human-spatial operation  
Symbolism; Semiotics.

### Abstract

There is lack of information on the Sarawak's *perahu tambang* recorded before the arrival of James Brooke. An architectural study is an apt approach to go about preliminary theorizations of the *perahu tambang* identity, as the boats are the only surviving primary source that can be understood physically. This paper explored the similarities of the boat with its possible influences and distinguish differences in establishing what can be accepted as Sarawak's *perahu tambang* architectural identity. The hypothesis of the study considers the influence may come from the *perahu kajang* and *sampan penambang* in the Malay Archipelago. Ethnographic documentation was conducted through observation on 12 contemporary samples and a measured drawing documentation on one of the samples. The findings were partly analyzed based on pictorial techniques of repertory grid as a deductive approach towards establishing imageability of the boat, with support from secondary data. The identity of Sarawak's *perahu tambang* is expressed through its influence, components, imageability and human-spatial operation. This study is preliminary and advocates further studies to be conducted on Sarawak's *perahu tambang*.

**Discipline:** Architecture, Heritage Conservation.

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### Cite This Article:

Zaini, A. I., Awang Sulong, A. H., Abu Bakar, R., and Jyi, M.W.H. (2024). The *Perahu Tambang* of Sarawak River: Theorizing Architectural Identity. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 15(4), 15A4E, 1-12. <http://TUENGR.COM/V15/15A4E.pdf> DOI: 10.14456/ITJEMAST.2024.

## 1 Introduction

When first arrived in Kuching, Sarawak, Margaret Brooke (the consort to the second Rajah, Charles Brooke), recalled seeing 'houseboats' belonging to the Malays which sheltered the inmates, propelled usually by old men sitting on the bow (Brooke, 1913). These were the *perahu tambang*,

traversing while carrying passengers crossing the picturesque Sarawak River. Despite still operating today, the concerns on whether the culture would eventually be forgotten have frequently been raised. From what have been a main mode of transportation centuries ago with hundreds were actively roaming along the river, are now reduced to a handful serving only a specific segment of local communities living in the kampong beside being a cultural attraction for touristic experience. There were efforts made to ‘face-lift’ the *perahu tambang* to make it relevant for modern Kuching, but these have been just cosmetic changes.



**Figure 1:** [A] The *perahu tambang*. [B] The redesigning proposals. Source: Mohd Yusoff (2013).

Combining inadequate understanding and underinformed yet noble efforts in ‘protecting’ the boat, it is sensible that a study on its identity should be considered as there are unprovenanced information on the boats itself. But establishing the origin of the boat’s identity alone could be hindbersome as most available yet limited historical descriptions of the boat came from the post-Brooke era, while the *perahu tambang* were already in operation before the arrival of James Brooke as the Sarawak River was the trading spot between the local Malay, Dayak, and Chinese (Manan, 2014; Tan, 2009; Pawi, 2014). While it is preferable to study the boat’s identity from the angle of humanities, there are extremely limited primary sources available apart from the boats itself. Therefore, we would argue that it needs to be studied within the framework of architecture, because:

1. Architecture could be learned directly from the boats as a primary artefact.
2. Boats in the Malay archipelagic cultures are mostly analogous to architecture.
3. The *perahu tambang*’s unique physical form that could only be found in Kuching professes the *genius* of the place, rather than being understood as an object that is insular to some influence.
4. Architectural rationales think of design from multifaceted factors which may unmask other underlying aspects related to identity.

For context, the influence of *perahu* (boat) building skills from Malay architecture has already long been recognized, as the skills may have impacted Malay architectural development since *perahu* have been used as a shelter during the sea-faring activities. For example, the works of Idrus (1996), Masri et al., (2016) and Abdul Wahab & Bahaiddin (2017) associated terminologies used in Malay *perahu* with the Negeri Sembilan Malay houses, which were influenced by the *lentik* roof of Riau, which in turn derived from the *perahu lancing*. The work of Asfarilla (2019) connected

the Mamasa traditional houses' roof and plan to a *sandeq* boat, while the *tongkonan* roof of the Toraja house also has been inspired by boats. Liebner (1992) as cited in Abdul Wahab & Bahauddin (2017) stated that names of *perahu* parts will probably tell us a great deal about the transfer of boatbuilding skills between the different islands in the archipelago. The *perahu tambang* is similarly crafted as a manifestation of the local wisdom, while serving as a shelter and providing spatial needs. We then establish that the *perahu tambang* is indeed an architectural work and therefore its identity needs to be recognized within this ontological framework. From this basis, we proceed with these objectives:

1. To theorize influences in Sarawak's *perahu tambang* architectural design.
2. To assess the spatial-human relationship in the *perahu tambang* design;
3. To establish *perahu tambang* architectural identity.

## 2 Methodology

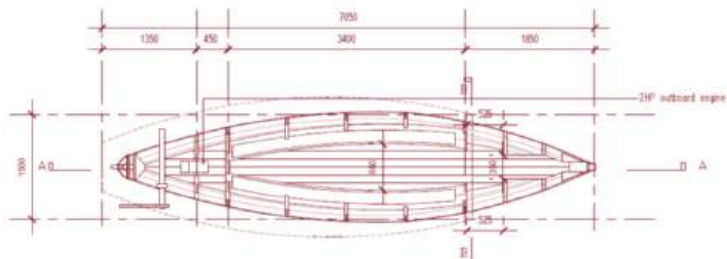
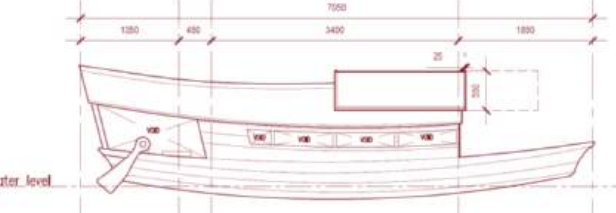
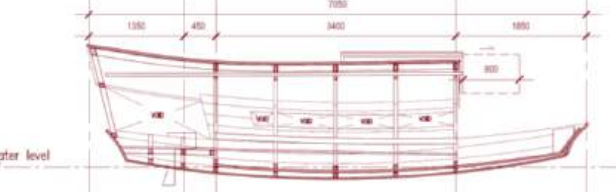
Most discussions are based on the current day *perahu tambang* as the primary source with ethnographic documentation supported by an observation on 12 contemporary samples of *perahu tambang* and one measured drawing documentation of the boat found in Kuching. It simplified the techniques used by Rahman, et. al. (2021) in reverse-engineering the documentation of *perahu kolek*. However, our study is limited to architectural design, therefore bracketing away the aspects related to engineering performances. This study also does not delve into the comparative study between the *perahu tambang* and Malay architecture as it is not the concern of satisfying that enquiry which can be discussed in other studies. The study also relied on secondary sources review, which is then supported by open-ended interviews with the local boat owners. Secondary sources were particularly taken from historical writings and archival photos. This is particularly to establish the ontological assumption of where the design could possibly receive its influence. Some findings were partly analyzed and presented through a repertory grid as a deductive approach based on the imageability of *perahu tambang* design, emulating the method performed by Wahid et al., (2021). The establishment of the architectural identity is by qualitatively synthesizing these various findings.

## 3 Literature Review

### 3.1 Descriptive Note on the *Perahu Tambang*

Abidin & Salleh (2002) reported that in the 1950s, most of the *perahu tambang* in the kampongs in Kuching were owned by the Malays and were either built by themselves or by hired carpenters. These unique passenger boats are described as made from timber with a thatch leaf roof that can carry 8 to 10 passengers at a time and have horizontal seats on both interior sides (Rahman, 2015; Manan, 2014; Yusoff, 2013). A *perahu tambang* blueprint sample is presented in Table 1 produced through a measured drawing documentation exercise on a current day sample of *perahu tambang*.

**Table 1: Drawings of a Sarawak *perahu tambang* sample (Not to scale).**

No	Figure	Description
1		Floor plan
2		Side Elevation
3		Section

### 3.2 Possible Malay Archipelagic Influence

Chang (1989) supposed that the *perahu tambang* in Sarawak might have existed as early as the 1800s, which was around the time when the first contact with the Chinese immigrants happened. According to Taboh (2014), the economic activities among the Malays in the mid-19th century still relied on the self-sustain economy but the Chinese economy was more developed, especially in fisheries, thus it is not too contentious to deduce that the *perahu tambang* could have been modelled after the Chinese *kotak* boats. This however could also be argued from the physical and functional aspects, that the *perahu tambang* do resemble closely to the *perahu kajang* (dan Kebudayaan, 2015) that can be found in West Malaysia and Indonesia. It is also sensible to contend that the *perahu tambang* may have been influenced by other Malay archipelagic cultures. This resonates with how much the Malay civilization was more advanced in maritime technology, as Lynda Shaffer (1996) cited in Musa (2019) and Johnstone (1989) pointed out that the Malays may have independently invented a woven sail, an important maritime invention at least several hundred years BCE. Only by the time of the Han Dynasty (206 CE to 221 CE) the Chinese were using such sails.

We can hypothesize that all these similar boats' design iterated within the region where Srivijaya cultures might have interacted. At its peak, Srivijaya was the supreme maritime empire in Southeast Asia history for about six and a half centuries (Masri, 2012). The western Sarawak region of Santubong was too, under the sovereignty of the Srivijaya empire in the 10th century, suggesting that Sarawak *perahu tambang* may have been modelled after the *perahu kajang* boathouse type belonging to the Orang Laut of Riau (modern-day Indonesia), as Srivijaya once made the Orang Laut as its maritime forces. Azhari et al. (2020) have elucidated that formerly the Orang Laut in the






waters of Kayu Agung in Sumatra also lived in *perahu kajang*, which not only function as transportation but also as a home or dwelling place that protects them from the hot sun, exposure to rain and hurricanes. *Perahu kajang* is a gathering place for all family members, where all life activities are carried out on it including having meals, engaging in copulation, and giving birth (Bintana et al., 2020). This type of water transportation is estimated to have been known by the people of Sumatra since the time of the Srivijaya empire in the 7th century AD. In addition to the rather similar form between the *perahu kajang* in Kayu Agung and the Riau Islands, the naming of ‘*perahu kajang*’ for houseboats were already used by the Orang Laut since the Srivijaya era. Direktorat Jenderal (2015) as cited in Wahab & Bahauddin (2017) described *perahu kajang* as such:

“.. similar to a Malay house which provides a central space for family members to relax and sleep at night. At the rear area, there is a *dapur* (kitchen) and *kamar mandi* (bathroom). Another feature that describes this Southeast Asia boat is the holes at the side surface of the board panel (wall) which functions as windows of a traditional Malay house.”

Similar boats were also found in Singapore waters in the 19th centuries belonging to the Singaporean and Malaysian Sea People (Orang Kalang) who refer to them as *sampan penambang*, *perahu tambang*, or *gubang* (Azhari et al., 2020). In the *sampan penambang* of the Orang Kalang, the families sleep, cook, eat, and undergo daily activities inside the boat (Gibson-Hill, 1952), closely mirroring that of the *perahu kajang*. Given the striking similarities in the architectural analogy, form and human-spatial interaction found in the *perahu kajang* of Kayu Agung and Riau and the *sampan penambang* of Orang Kalang, while cross-referred to what is observed and learned from the Sarawak’s *perahu tambang*, we can ascertain that there may be influences between them. Whether the design of the boat has transpired during the Srivijaya era in the 10th century, or indeed was adapted from the Chinese traders, or even may have received both influences cannot be determined at this point. But considering how there are many physical and cultural similarities with other Malay archipelagic influences as presented in Table 2, our ontological assumption is leaning towards this narrative.

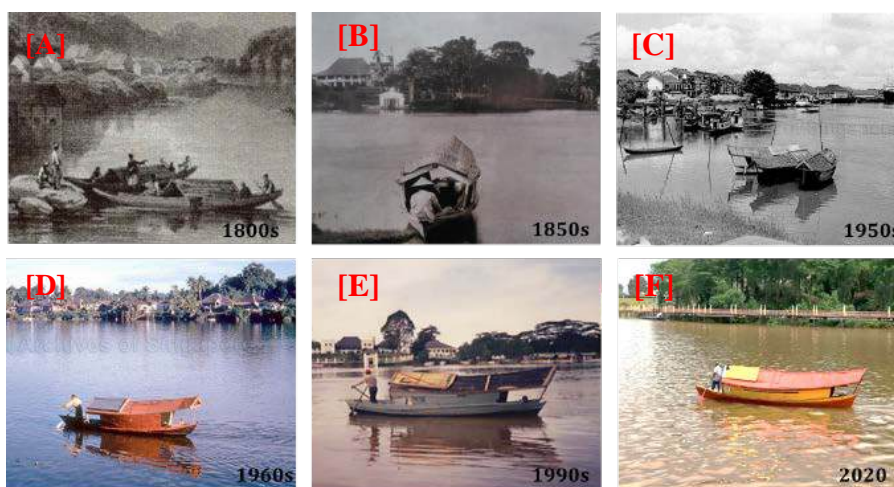
**Table 2:** Possible Malay archipelagic influences of *perahu tambang*.

Item	Photo	Description	Source
1		The Orang Laut in Perahu Kajang (Riau Islands, Indonesia)	Historia.id as cited in Bintana et al. (2020).
2		<i>Perahu Kajang</i> in Kayu Agung, South Sumatra (Indonesia)	www.morgesiew.com as cited in Azhari et al. (2020).
3		<i>Sampan penambang/perahu tambang/gubang</i> used by the Orang Kalang in Singapore and Malaysia in 20th century.	Gibson-Hill (1952)

## 4 Finding and Discussion

### 4.1 Identity based on Architectural Imageability

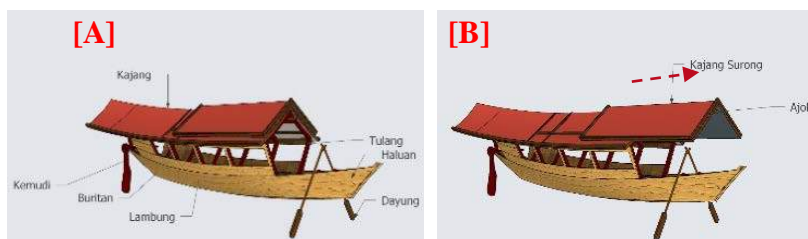
As names of *perahu* parts somewhat reflect the transference of skill and knowledge between the different islands in the archipelago, it is unsurprising that most terms used in the *perahu tambang* are shared with other archipelagic boats, which include *buritan* (stern), *haluan* (bow) and *kajang* (roof). The latter is also used by Sarawak's *perahu tambang*, which is defined as the roof covering the rear of the boat made from the nipah, mengkuang, or bamboo leaves to protect the inmates from the heat or rain (Masri et al., 2016). Another similarity is the term '*perahu tambang*' itself, which despite can directly refer to a certain boat service (literal: fare boat), instead colloquially is referring to a specific boat-house typology like the ones in Singapore. From these, we can distinguish Sarawak's *perahu tambang* identity based on differences. As time progresses, the material of natural leaves is now replaced with zinc or aluminium, the roof of *perahu tambang* is still referred to as *kajang*. In general, all *kajang* roof-type boats (or resembling their profile despite new materials) on the Sarawak River are referred to as *perahu tambang*, which indicates that the boat might be identified through its roof, informing that the form overrides functionality and materials when it comes to identity. Figure 2 shows the visual notes of *perahu tambang* architecture from 1850 to 2021 which shows the *kajang* roof in Sarawak's *perahu tambang* has evolved through time.



**Figure 2:** Evolution of *perahu tambang* architecture since the 1800s. Sources [A]: Ho (2000); [B]: Moore (2007); Source [C]; [D]: National Archives of Singapore; [E]: Abang Bohari (1992); [F] Author.

Chief difference in the Sarawak *perahu tambang* is observed to be in the *kajang surong* mechanism. The *kajang surong* (literal: slide roof) is the second layer of the roof that is resting independently on a track, and in each retraction, a long hardwood stick called *ajok* that is concealed under the rafters will be cantilevered out to lock the roof in position, as shown in Figure 3. This *kajang surong* acts as an active mechanism that can be retracted for extra coverage for the bow. Adding to the unique identity is the curvature of the roof which is not as striking as in the *perahu kajang* of Kayu Agung, and is not of a regular pitch, such as in Riau, either. Instead, it is observed

that the roofs are curved rather subtly, resembling a combination of both styles. From Figure 2, this is believed added sometime between 1850 to 1950 when the *perahu tambang* unique roof style started to evolve. Technology brought about by time has replaced the *kajang* roof material to be made from something more durable and optimistically colourful since the 1960s after Sarawak gained independence. The design has also evolved into something more reassuring to users' safety and comfort.



**Figure 3:** [A] Components of a *perahu tambang*. [B] The boat when *kajang surong* is retracted.

The shift from a personal transport into a ferry service has rendered commercialism took over as a major key in shaping the aesthetics of *perahu tambang*. Since the 1990s (Kuching was declared as a city), many *perahu tambang* roofs were clad with advertisements that generated income for the *pak tambang*. It then has become a norm for the colours would likely be chosen to suit the advertisement itself. In this sense, colours are less crucial in shaping *perahu tambang* identity. Our observations and interviews done on 12 samples of *perahu tambang* with their owners have confirmed that colours are either a personal preference or an economic choice, as shown in Table 3.

**Table 3:** Variation of colours [R =Roof; B = Body; H = Hull].

R: Blue; B: Yellow; H: Red	R: White; B: Yellow; H: Red	R: Black; B: Green; H: Red	R: Brown; B: Green; H: Red
R: White; B: Red; H: Red	R: Red; B: Red; H: Red	R: White; B: Blue; H: Blue	R: Yellow; B: Yellow; H: Yellow
R: Black; B: White; H: Red	R: Brown; B: Yellow; H: Yellow	R: Brown; B: Red; H: Red	R: White; B: Blue; H: Blue

An imageable identity of *perahu tambang* of Sarawak River may not come from the boat itself, but rather its juxtaposition with the *pak tambang* standing at the bow, giving a profound vertical element dominating the curvilinear, horizontal massing. The organic interaction in the



human-spatial operation of the boat has somewhat given the boat a unique imageability of its identity, and it is appropriate to look into how other aspects of identity can be revealed from this relationship.

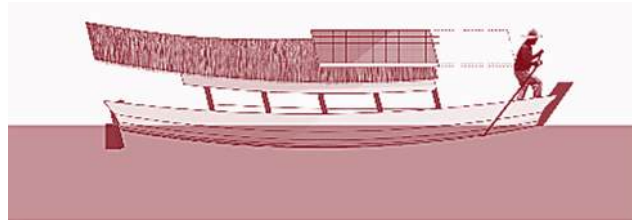


Figure 4: Visual imageability due to *pak tambang* and the *perahu tambang* seen in singularity.

## 4.2 Identity Based on Spatial-Human Operation

The *perahu tambang* used to house people more than one adult but not as significant as the Orang Laut's idea of living inside their *perahu kajang*, as Sarawakian Malays do live on dry land. Despite this, living in the Sarawak's *perahu tambang* is not uncommon. Some *pak tambang* who live outside Kuching tend to temporarily stay in the boat itself. With no supply of clean water and electricity, the boats usually are tied to a pole at night at the riverside quite arbitrarily, where *pak tambang* would either pick up water directly from the river or from nearby facilities. Electricity is generated from a generator just enough to light the interior of the boat. The engine and generator sets are installed at the stern, also the space where light cooking and dining are conducted. Bathing is observed to be conducted at the stern, while the boats are docked in such a way it is more hidden from public views. The amidship is a place to lay mats while resting, sleeping, or sitting, akin to how an Orang Laut family inhabits a *perahu kajang* (Bintana et al., 2020). However, due to its smaller space, a *perahu kajang* would typically train inmates to sleep in a curved position, and this is not seen to be the case for Sarawak's *perahu tambang*. It is also common that these boats to have curtains to drape any openings for privacy and protection from insects. Tiny space is utilized as a second home outside operating as a passenger boat, but not as glaring as the Orang Laut's *perahu kajang* where all aspects of life are committed on the boat. Sarawak's *perahu tambang* is just a temporary home used for about one or two weeks.

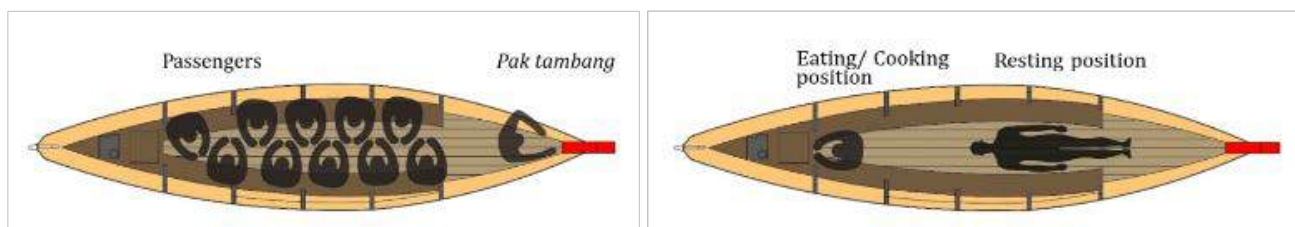
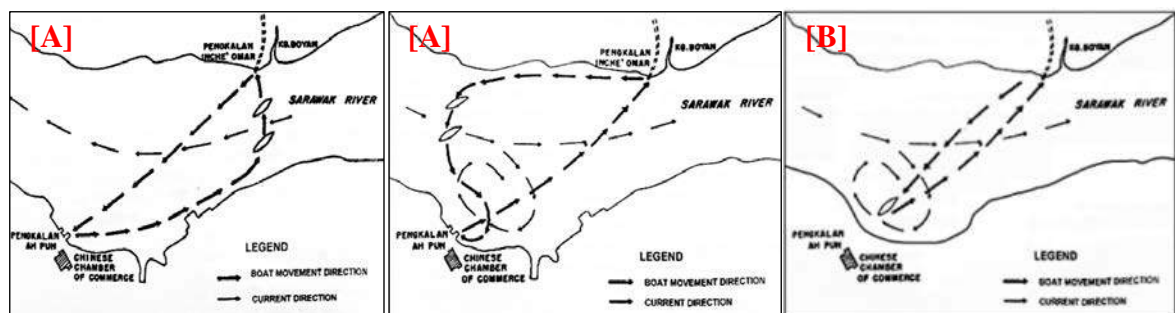


Figure 5: Diagrammatic plan of internal *perahu tambang* space use.

In terms of operation, the *perahu tambang* would cross the 400-meter wide river within almost 10-minutes to get from one end to another as the *pak tambang* would use pliers alone (Rahman, 2015). To board, a passenger must wait at a landing spot known as the *pengkalan*. The *pak tambang* would stand at the bow of the boat, facing forward, and steer it with oars attached to two



pieces of wood in the gunnel (Mohd Yusoff, 2013). As illustrated in Figure 6, the manoeuvre's principle is based on the tidal current, where it would be aided by the current which would allow them to enter the stream fast. If they were forced to travel against the water, they would hug the shore for as long as possible. As a result, they would not move the *perahu tambang* at straight angles since they needed the bow to be at a 30-degree angle. Instead, they would travel sideways rather than forwards. Similarly, the same technique was used during the rising tide. The change in today's manoeuvring pattern usually has to do with the use of 5hp outboard or inboard engines which partly replaced manual plying, significantly cutting the journey duration to be within 3-minutes. The manoeuvring pattern to some extent is intact, however, the boats now manage to propel through the middle current with such force created by the engine. But when nearing towards a *pengkalan*, the engine will be shut off and manual plying takes over, either by approaching at an angle or just simply in a straight line. A concealed cable puller to ignite and stop the engine is placed upon the purlins. When there may be times the engine fails, the traditional technique would take over. The engine is the only significant retrofitted part, due to the small stern of the boat that can only cater for such horsepower, while the *pak tambang* must be at the bow all the time without having to disturb the passengers on board going back and forth. An identity is established through this human-spatial operation as careful manoeuvring and decelerating that can only be performed by the *pak tambang*, such is made more unique with additive propelling force introduced by the engine.



**Figure 6:** [A] The traditional technique of manoeuvring the *perahu tambang* as observed in the 1950s (Zainal Abidin & Mohd Salleh, 2002) and [B] current one as modified by the author.

The size of *perahu tambang* may differ according to their place of origin and may also be due to various factors including budget, preference, and practicality (Yusoff, 2013). Thus, identity may not be directly related to size, but rather of space usage. From our observation of a sample, apart from the slight nuances in sizes, the similar space usage across the different *perahu tambang* is apparent. The storage space underneath the seating and the floor planks is used to store personal items, while the cavity between the purlins and the roof is used to store life jackets. As far as architectural form is concerned, it has not been observed to be in a need of more changes. All retrofitted and new additions to the boat do not change much of the existing traditional form, but rather utilize what is already there.

### 4.3 Identity Connected to Symbolism and Semiotics

It is possible to associate symbolism and semiotics with the architectural identity of *perahu tambang*, such as in the work of Sunani (2018) that justifies a *sandeq* boat’s bow that points upward signifying it is ‘always praying’ to the Divine. However, any association has not been revealed by any interviews, observations and literature reviews at this point.

### 4.4 Architectural Identity of *Perahu Tambang*

Based on these findings, the identity of Sarawak’s *perahu tambang* is established through its design influence, components, imageability, and human-spatial operation:

**Table 4:** Architectural identity of Sarawak’s *perahu tambang*

Item	Identity Factors	Descriptions
1	Design Influence	<ul style="list-style-type: none"> <li>• Might be influenced by <i>perahu kajang</i> of Orang Laut in Riau and Kayu Agung; and sampan <i>penambang</i> of Orang Kalang in these regards:               <ul style="list-style-type: none"> <li>○ Architecture: Form and architectural terminologies are identical especially the <i>kajang</i> roof form.</li> <li>○ Aesthetics: Natural leaves such as <i>mengkuang</i> and <i>nipah</i> were previously used.</li> <li>○ Human-spatial operation: Used as a shelter where activities of daily life are conducted inside the boat.</li> </ul> </li> </ul>
2	Components	<ul style="list-style-type: none"> <li>• <i>Kajang</i>: Subtly curved roofs, different but somewhat resemble a combination of both <i>perahu kajang</i> of Riau and Kayu Agung.</li> <li>• <i>Kajang surong</i>: Retractable second roof.</li> </ul>
3	Imageability	<ul style="list-style-type: none"> <li>• Singularity: Visual and cognitive recognizability due to pak tambang and the <i>perahu tambang</i> seen as a single entity.</li> <li>• Colour: Not significantly associated with identity.</li> </ul>
4	Human-Spatial Operation	<ul style="list-style-type: none"> <li>• Space size: Not significantly associated with identity.</li> <li>• Space use: Seating during operation can carry around 8 to 10 passengers. Amidship is used for pak tambang daily activities such as sleeping and resting when not operating. Stern is used for cooking, dining and also bathing. Available spaces are used as a storage compartments.</li> <li>• Operation: Method of maneuvering at a certain angle to counteract the river current. In modern days, this is partly propelled by engines.</li> </ul>

## 5 Conclusion

This study proposes that the Malay archipelagic influence holds the key to establishing *perahu tambang* architectural identity, which is established through identifying similarities and differences between *perahu tambang* and the influences. With the lack of contemporary information on *perahu tambang*, they might be subjected to careless modifications, appropriations, or to an extreme, extinction. Ultimately, any attempt of appraising, preserving, conserving, and even redesigning it in the future could be made more respectful of its architectural identity.

## 6 Availability of Data and Material

All data and results of this study are included in this work.

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**Dr. Atta Idrawani Zaini** is an Architecture Lecturer and the Deputy Dean (Student Affairs and Alumni), Faculty of Built Environment, Universiti Malaysia Sarawak (UNIMAS). He received his PhD in Architecture from Universiti Teknologi Malaysia (UTM). His research interests include Cultural Heritage and Borneo Architecture.



**Awang Hasim Awang Sulong** is a Professional Architect and a Senior Lecturer in the Department of Architecture, Faculty of Built Environment, UNIMAS. He graduated from Hull School of Architecture, University of Lincolnshire & Humberside, England with a Bachelor of Architecture (RIBA II). His areas of research are Professional Practice, Design Development and Cultural and Urban Transformation.



**Ruzanah Abu Bakar** is a Lecturer in the Department of Architecture, Faculty of Built Environment, UNIMAS. She obtained her Bachelor of Architecture (LAM Part II) from Universiti Putra Malaysia (UPM). Her research interests include Architectural Pedagogy, Technology and Sustainable Design.



**Mervyn Wong Hsin Jyi** is a Professional Architect and a lecturer in the Department of Architecture, Faculty of Built Environment, UNIMAS. He graduated with a Bachelor (Housing Building and Planning) in Architecture (LAM Part II) from Universiti Sains Malaysia (USM) and has practised as a graduate architect for 10 years before starting teaching architecture in 2020. His areas of research are Housing Development and Green Design.

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