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# TRANSFORMATION OF MOSQUE ARCHITECTURE IN MALAYSIA: CRITICAL ANALYSIS OF ARCHITECTURAL HISTORY APPROACHES

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## ABSTRACT

*Malaysia's rich historical background has resulted in a unique local architecture that exhibits complex and wide-ranging variations and influences. Amongst the different types of architecture, mosques are unique as it has an unchanging and eternal primary function – as a place for communal worship – whilst architecturally has been constantly evolving since the earliest mosques were erected in this country. Current inquiries in the field of architectural history of mosques in Malaysia have primarily focused on inventory-based historical studies, comparative studies and thematic studies in the form of monographs, all of which tend to be non-holistic and compartmentalized in their approach. Subsequently, the main objective of this paper is to establish a holistic approach in studying mosque architecture by linking the earliest mosques to contemporary ones and mapping their formal relationships through the use of typological classification. This paper will focus on 12 selected mosques in Malaysia which were carefully chosen to represent a wide range of mosque varieties. Their transformation will be studied from aspects of morphology, technology and design articulation characteristics which were based on 6 selected literatures on the architectural history of mosques in Malaysia. Data was collected in the form of artefact-based evidence gathered on-site, strengthened with academic research, documentation and records, and the results were contextualized and corroborated with the general history of Malaysian architecture. Initial findings have shown that mosque transformation within each characteristic exhibited different patterns and trends that may not have been explicitly highlighted using existing historical approaches. Finally, critical issues in the studies of mosque architecture in Malaysia will be foregrounded in the hope that it will shift the focus towards the larger context of the Muslim world architecture and help find a more seamless fit within its historical narrative.*

**Field of Research:** Architectural history, mosque architecture, classification, critical analysis

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## 1. Introduction

As a building typology, mosque architecture has evolved in such a way that an overview of mosques within the Muslim world would reveal widely varied interpretations and mutual adaptations. This can be traced through 1,400 years of development beginning with the first mosque archetype built during the time of the Prophet Muhammad (p.b.u.h.). Mosque architecture, in comparison to other building types within the Islamic architectural typology, has since developed tremendously and can be found at the furthest corners of the globe (Hillenbrand, 2000). This phenomenon can be attributed to the fact that there are no prescribed attributes regarding the physical form of a mosque, either in the Quran or Hadith other than related to the act of *solah* (prayer rituals) and other practical considerations. Muslim communities in Malaysia thus have the freedom to build mosques that fulfil their religious functions and architecturally embrace aspects of Islamic teachings as well as the local culture. Existing literature on the history of mosque development exhibits a tendency to marginalize Southeast Asian and Malaysian mosques within the larger context of Muslim architectural discourse, in spite of the relatively impressive range of mosque architecture

that can be found here. The general premise of these literatures – that Islamic architectural development has its roots in the Arabian heartland before it finally reached the periphery of the Muslim world – is echoed in various texts on Islamic architecture, such as the classical mosques of Muslim empires used as reference for other mosques in the Muslim world seen in the works of Mitchell (2006), the presence of numerous historical mosques and the availability of extant documentation in this region as can be deduced by the works of Fletcher and Fletcher (1905) and Frishman and Khan (2007), and the generalisation or over simplification of the variations found in the Southeast Asian region as evidenced in the works of Al-Faruqi and Al-Faruqi (1986), all layered over the cultural and religious growth of Islam from Arabia to the rest of the globe. However, there has been increasing interests in Southeast Asian and Malaysian mosques by international and regional writers such as Vlatseas (1990), Holod and Khan (1997), Sumalyo (2000) and Abdul Halim Nasir (2004). Nevertheless, this area of research is challenged by complex and multi-layered socio-cultural, geo-political, and economic influences of this region, resulting in an “unusually diffuse approach” (O'Neill, 2007, p. 225) to mosque development when compared to other cultures. Additionally, the Austronesian tradition of utilising natural building materials which can disintegrate in the region's humid climate, as well as the lack of contemporaneous documentation in early Malay literature, has compounded the problem in obtaining credible evidence and first-hand perspectives on traditional Muslim built environment.

This is the scenario in which academic research on mosque architecture by Malaysian historians, academicians, and architects began to develop in the country's post-independence years. Formal academic studies on mosques in the 1970s by local universities under newly established schools of architecture, as well as publications made widely available to the general public such as by Abdul Halim Nasir (1984, 2004), Mohamad Tajuddin Mohamad Rasdi (2000, 2007), and David Mizan Hashim (2005a, 2005b, 2005c), to list a few, have all contributed to the historical and architectural knowledge in this area. In general, these works tend to fall within 3 interrelated types. First, there are inventory-based historical studies that collect data on individual or selected groups of mosques through exhaustive measured drawings, photographic evidence, and interviews to collect oral histories, typical of the measured drawings in the collection the University of Technology, Malaysia (UTM) and the University of Malaya (UM). These works paved the way for the other 2 types of studies typical to this field, which are comparative studies focusing on a small group of mosques sharing similar or comparable characteristics, and monographs limited to a specific theme or area of interests. These can range from Alice Sabrina Ismail's research on political ideologies and its influence on West Malaysian state mosques (2008) to Rosniza Othman's investigation of mihrab design and ornamentation in Malaysian mosques (2011). An alternative interpretation of the Malayo-Muslim built environment is provided by Abdullah Mohamed (Nakula) who has written extensively on cosmological symbolisms found in mosques and other traditional buildings (1997).

These works generally utilise classifications to systematically order the different types of mosques that can be found in Malaysia. As a result, some works were necessarily limited within their approaches and outcomes due to the select focus of their research. Others, in their emphasis on classifications that tend to be rigidly yet sometimes ambiguously defined, would result in distinctly separate categories that seemed to have no influence, overlap or connection between each category. This compartmentalization makes comparison between these studies challenging due to incompatible or limiting parameters. To a certain extent this is inevitable since the premise of these studies were usually based on chronological or geo-cultural considerations which are logically viewed as being sequential or with clear separating boundaries. As a result of these conditions, this paper is an attempt to approach the subject matter in a holistic manner that could theoretically encompass all the different types of texts and architectural artefacts related to the history of mosque architecture in Malaysia, address the differences between mosques and map the connections between them.

## 2. Architectural History Approaches of 6 Malaysian Texts

Architectural historical writings employ a multitude of organization or classification system in order to organise large amount of information into manageable “historical units” (Leach, 2010). Leach proposed that the most commonly used approaches to architectural history are based on aspects of style and period, geography and culture, biography, technique, type, and theme and analogy. In this case, 6 selected literatures from 5 Malaysian academicians, historians and architects were analysed to highlight their historical approaches based on Leach’s proposal. These texts are some of the earliest examples of the use of mosque classifications and generally reflect the typical approaches applied in studying the architectural history of Malaysian mosques (Table 1).

Table 1: 6 selected literatures on architectural history of mosques in Malaysia

No.	Author (Editor/Translator)	Year	Reference
1	Abdul Halim Nasir (Eds. Mohd. Ridzuan Tumin & Ahmad Sebi Abu Bakar)	1984	Masjid-masjid di Semenanjung Malaysia
2	Ken Yeang	1992	The Architecture of Malaysia. Kuala Lumpur: The Pepin Press
3	David Mizan Hashim (Ed. Chen Voon Fee)	1998	3 entries from "The Encyclopedia of Malaysia: Volume 5 - Architecture". Singapore: Archipelago Press
4	Abdul Ghafar Ahmad	1999	"The Architectural Styles of Mosques in Malaysia: From Vernacular to Modern Structures", paper presented at the Symposium on Mosque Architecture, King Saud University, Riyadh, Saudi Arabia
5	Abdul Halim Nasir (Translated by Omar Salahuddin Abdullah)	2004	Mosque Architecture in the Malay World
6	Mohamad Tajuddin Mohamad Rasdi	2007	"Mosque Architecture in Malaysia: Classification of Styles and Possible Influence" in Jurnal Alam Bina Jilid 9, no. 3. UTM

These texts present varieties of classification systems ranging from Abdul Halim Nasir’s stylistic and cultural division between traditional regional influence and outside of the Malay World influence (1984, 2004); the more commonly encountered 3 periodic divisions into pre-colonial, colonial, and post-independence (Yeang, 1992) or the alternate division into vernacular, colonial and modern (Abdul Ghafar Ahmad, 1999; David Mizan Hashim, 2005a, 2005b, 2005c); to Mohamad Tajuddin’s expanded categorization of seven distinct stylistic division of traditional vernacular, Sino-eclectic, colonial, North Indian, modern vernacular, modernistic expressionism, and post-modern revivalism (2007). When viewed as a whole, issues with these classifications began to appear with mosques that may not fit comfortably into any category but is a combination of them, such as the significant number of traditional Melakan mosques that were built or underwent significant addition or renovation during the Dutch colonial period, or conversely related to the various community mosques that were built without any conscious adherence of architectural styles. These few examples highlight the need for a flexible or open-ended approach in architectural classifications which could include different types of mosques comprised of major and minor buildings and a range of historical and contemporary mosques in a cohesive historical narrative. To test this, the focus is shifted to the descriptive elements commonly used when writing or describing mosques in Malaysia found in these selected texts (Table 2). Forming the core of the architectural vocabulary commonly employed in architectural history texts, these elements help define the formal characteristics of mosques and could be used to restructure and enrich the currently used classification systems.

Amongst the different kinds of historical approaches previously described, an approach or classification using types most applicable here as architectural typology deals with function, form, style, materials (Leach, 2010; Pevsner, 1997). This approach could be adapted to form a holistic framework in which aspects of spatial organisation, roof form, building materials, construction

methods, decorative language, and visual order could be methodically included. These are then grouped into 3 formal characteristics of morphology, technology and design articulation that will be used to study the transformation of mosque architecture in Malaysia. It should be noted that another aspect which appeared during the research on descriptive elements is related to contextual components such as site context, cultural context, and architectural response to climatic, economic and ideological contexts, as well as design decisions made by architects, craftsmen, builders, engineers, and patrons. This aspect will not be addressed due to the emphasis on formal aspects of mosque architecture which can be readily identified from existing artefacts. However, context will be provided in the form of the general Malaysian architectural history and its development.

Table 2: Descriptive elements used to describe mosque architecture from the 6 selected literatures and grouping according to their formal components and characteristics

Sample of Descriptive Elements	Components	Characteristics
Shape and dimension of floor plan, layout and arrangement of space, orientation, symmetry, functionality of space	<b>Spatial Organisation</b>	<b>MORPHOLOGY</b>
Types of roof (pyramidal roof, domed etc.), interior volume, central roof over main space, decorations on roof, roof ridge	<b>Roof Form</b>	
Use of natural materials (timber, bamboo, nipa palm), masonry (brick, stone), plaster, marble, concrete, steel, glass, composite	<b>Building Materials</b>	<b>TECHNOLOGY</b>
Building traditions and craftsmanship, post-and-beam, stilts, plinth, structure, fenestration, technology, engineered	<b>Construction Methods</b>	
Carvings, motifs, patterns, decorations, Islamic calligraphy, geometry	<b>Decorative Language</b>	<b>DESIGN ARTICULATION</b>
Principles of decoration, visual impact, visual emphasis, proportions, scale, façade	<b>Visual Order</b>	

### 3. Methodology

There are two general aspects that influence the transformation of mosque architecture; first is its openness to external influences and responsiveness to external factors – be it environmental, cultural and historical – and second is its function as a place of communal worship, which in itself is subservient to timeless Muslim liturgy (Kuban, 1974). The confluence of the two conditions uniquely positions Malaysian mosque typology as an ideal way to study the history of the built environment in this country, since its function remains unchanging yet its architecture exhibits vast transformation. Accordingly, an accurate recollection of the past that could act as a “resource with open-ended application” (Tosh & Lang, 2006) could be established in order to take advantage of this situation. Reliance on existing historical Malaysian mosques as architectural artefacts – some with limited clues on the designers, builders, and craftsmen involved – requires a qualitative interpretivist approach which can be defined as observations based on available information coupled with aspects of historical judgment and connoisseurship (Rogers, 1991). Thus a historical-comparative research approach (Neuman, 2011) or interpretive-historical research approach (Groat & Wang, 2002) was adopted for this study. From the data collection to analysis of evidence, this approach is characterized by thick and detailed descriptions of mosque history and their tangible physical attributes, referral to available records and documentations (both archival and contemporary) as well as evidence gathered from existing architectural artefacts to contextualize the findings (Hjørland, 2008; Neuman, 2011). Three primary and interrelated sources of evidence for the collection of primary and secondary data were considered: selected buildings to be studied, texts on history of mosque architecture in Malaysia, and texts on the general architectural history of Malaysia. To test the proposed formal characteristics and components of a typological approach in studying mosque architecture in Malaysia, 12 mosques were shortlisted from the 6 selected literatures to represent a range of mosque variations currently existing in this country (Figure 1).





1. *Tengkeru Mosque, Melaka (1728)*
2. *Kampung Laut Mosque, Kelantan (1730s)*
3. *Pengkalan Kakap Mosque, Kedah (1800s)*
4. *Kuala Lumpur Jamek Mosque (1909)*
5. *Kapitan Keling Mosque, Penang (established 1803, major renovation completed in 1916)*
6. *Ubudiah Mosque, Perak (1917)*
7. *Sultan Ibrahim Jamek Mosque, Johor (1930)*
8. *Ihsaniah Iskandariah Mosque, Perak (1936)*
9. *Mersing Jamek Mosque, Johor (1956)*
10. *National Mosque, Kuala Lumpur (1965)*
11. *Putra Mosque, Putrajaya (1999)*
12. *Sultan Mizan Zainal Abidin Mosque, Putrajaya (2009)*

Figure 1: 12 selected mosques in Malaysia based on 6 selected literatures, with year of completion of extant mosques given in parentheses (Source: Author)

These mosques were selected using maximum variation sampling that included typical as well as unusual or extreme variations of Malaysian mosques to be included in the discussion (Palys, 2008) in order to test the flexibility and rigorousness of this typological approach. The data collection encompassed visual data (photographs, sketches), archival textual data (records, documents and architectural drawings), and subsequently enriched by experiential data (on site observations).

#### 4. Findings

Each of the 12 mosques was dissected according to aspects of morphology, technology and design articulation to allow the transformation of mosque architecture to be closely examined. Subsequently the history of architecture in Malaysia will contextualize the research from a Malaysian perspective by framing the discussion within the historical development and transformation of local architecture.

## 4.1 Morphology

Morphology describes the overall massing and volume of buildings, covering 2-dimensional and 3-dimensional geometry or structure, as well as the organisation of architectonic elements that contribute to the space and form of a building. Since a mosque is essentially a demarcated space orientated towards the Qibla, spatial organisation is an important component to include as it would affect the form in terms of size, volume, and roof selection. The spatial organisation of mosques are analysed based on the geometry of the floor plans, the overall scale and the layout of the interior spaces and architectural components. The study of geometry demonstrated how floor plans of the earliest traditional mosques are generally square or rectangular in shape and symmetrical in its layout as exemplified by the Tengkeru Mosque, Melaka. This was followed by unique variations during the British colonial period such as the experimentation with octagonal floor plans as seen in the Ubudiah Mosque, Perak. However, this experimentation raised issues of practicality such as the interruption of the *saf* (prayer row) by the introduction of brick walls as well as closely-spaced columns to support the heavy roofs, which was eventually resolved with new building technology. As floor plans became larger in scale with longer spanning and larger roof structures, the overall geometry of the main prayer halls still maintain its symmetry even as the overall mosque plans became more complex with the inclusion of additional functions and ceremonial spaces. This can be seen in the National Mosque, Kuala Lumpur as well as the Putra Mosque, Putrajaya which have multiple floors. The planning of mosques transformed from the basic multi-functional main prayer halls into complexes with clearly differentiated spaces and the inclusion of courtyards and arcades which were not typically found in traditional Malaysian mosques (Figure 2).

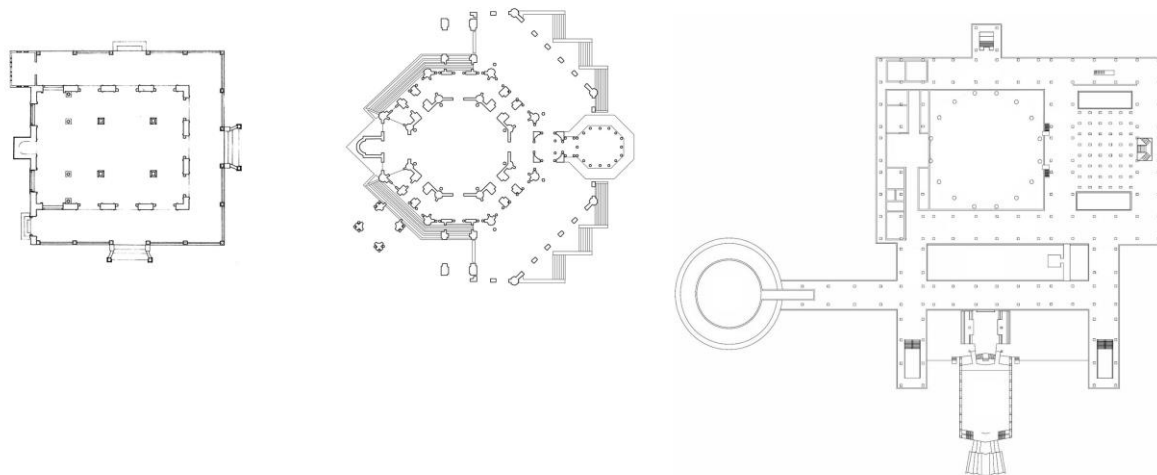


Figure 2: Plans of Tengkeru Mosque, Melaka; Ubudiah Mosque, Perak; and National Mosque, Kuala Lumpur, all depicted with different scales and with the *mihrab* aligned  
(Sources, left to right: UTM measured drawing 1981; author; Alice Sabrina Ismail)

From a Malaysian architectural typology context, roof form is particularly significant as the history and regional variations of traditional Malay architecture is closely bound to the different types of roof. Additionally, the visual and symbolic significance of roof and its proportions in relation to the façade makes it an invaluable component of a mosque's morphological characteristic. The roof form is subsequently analysed based on 3 main groups which is form, proportion, and structure. As an example, analysis of form could be centred on the pitch roof which is frequently associated with the multi-tiered pyramidal roof typical of traditional mosques in the Malay Archipelago, but also include hip roof and gable roof commonly thought to be derived from domestic traditional architecture. However, with the appearance of domes during British colonial period, the preference for dome has grown and persisted; roofs of existing traditional mosques were sometimes modified to incorporate domes on their apexes or in some cases even completely replaced with domes such as in the case of

Kapitan Keling Mosque, Penang. The transformation of domes could be mapped through various construction techniques such as the use of metal and wood in the original domes of the Kuala Lumpur Jamek Mosque, the reinforced concrete dome of the Mersing Jamek Mosque, to the composite dome construction of the Putra Mosque, Putrajaya. This also indicates the resonance of domes with the local Muslim culture. The study of roof form allowed the contemplation of related design issues such as the subservience of a mosque's floor plan to the roof form or whether the transformation of floor plans parallels that of roof forms.

## 4.2 Technology

Technology is defined as the application of craftsmanship and technical knowledge to construct a mosque and encompasses building materials and construction systems that give a mosque its overall form. The study of building materials is organised based on its main constituent components, namely organic and plant-based, stone and minerals, concrete and clay, metal, glass and plastics, and composite building materials. Research on organic and plant-based building materials such as timber would link the extensive use of hardwood timber in the Kampung Laut Mosque, Kelantan with the woven bamboo strip walls called *kelarai* used in the Ihsaniah Iskandariah Mosque, Perak, thus establishing the strong influence of available local materials on the construction methods used. Analysis of other material types such as bricks could focus on the Dutch colonial period which resulted in the rebuilding or extension of mosques using this material as seen in Tengkeru Mosque, Melaka or the use of corrugated zinc roof during the British colonial period as an example of the ready adoption and adaptation of local mosques to new building materials. Similar to the issues raised in the analysis of mosque morphology, it raises interesting viewpoints on the impact building materials had on mosque forms as well as how the desired building form dictate the selection and application of building materials. Eventually the combination of materials used can be studied and its implications systematically analysed.

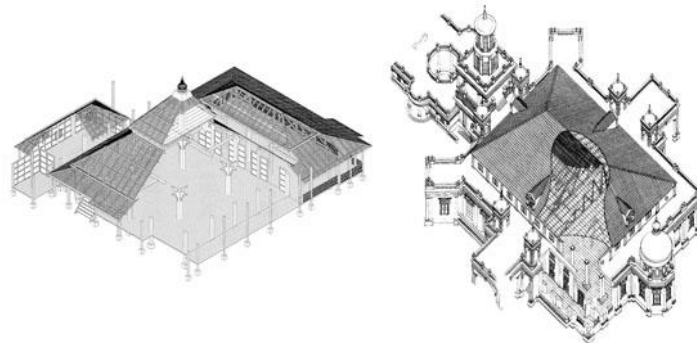


Figure 3: Examples of technological transformation as seen through the axonometric drawings of Kampung Laut Mosque, Kelantan and Sultan Ibrahim Jamek Mosque, Johor (Sources, left to right: UM measured drawing 2009, UTM measured drawing 1999)

Construction methods are analysed based on specific parts of a building such as the floor, wall and roof construction system. This approach enables its transformation to be mapped irrespective of the architectural styles adopted and shedding light on the technological achievement of that particular period. The construction of roofs and their specific requirements of scale and forms would reveal pragmatic yet technically sound approach to timber construction found in the multi-tiered pyramidal roof of the Kampung Laut Mosque, Kelantan, to the long-span hip roof of the Sultan Ibrahim Jamek Mosque, Johor built using steel and timber components, or the reinforced concrete folded plate roof of the National Mosque built in the Modernist style popular at that time (Figure 3). Construction methods also brings to light the different levels of craftsmanship needed for each mosque, including new technical knowledge brought in by Indian and Chinese builders as well as by the British-educated architects and engineers working with the Public Works Department.



### 4.3 Design Articulation

Amongst the 3 characteristics discussed in this paper, design articulation is a particularly useful – though by no means the only – indicator of culture-specific design values. Design articulation is related to Muslim aesthetics formally expressed in mosques and goes beyond the pragmatic aspects of mosque architecture. The component of decorative language can be studied from elements of calligraphy, as well as floral and plant-based motifs, geometric motifs, and architectural motifs (Al-Faruqi & Al-Faruqi, 1986). Calligraphy is particularly intriguing since it has unique religious and symbolic connotation to the local Muslim population who in the majority do not speak Arabic language, but perhaps can appreciate it more in terms of its artistry compared to its embodied meaning. This treatment of calligraphy as an abstract motif could be seen in the calligraphy painted on the fully glazed Qibla wall of the Sultan Mizan Zainal Abidin Mosque, Putrajaya and the marble inlay calligraphy intertwined with dense floral and geometric motifs of the Putra Mosque, Putrajaya (Figure 4). In both cases the calligraphy literally seemed to disappear into the background and is treated like any other surface design elements. This consideration of visual impact is carried through in the study of the visual order found in mosques, as a way of comparing the different kinds of design articulations and how the arrangements and locations of these architectural elements could be interpreted. Due to the orientation of the *saf*, decorations tend to be more heavily focused on the Qibla wall to highlight the *mihrab* (prayer niche). In the case of the Pengkalan Kakap Mosque, Kedah, the absence of ornamentation except for selected architectural details highlights the arrangement of the interior space and the simple and humble forms of its architectural elements.

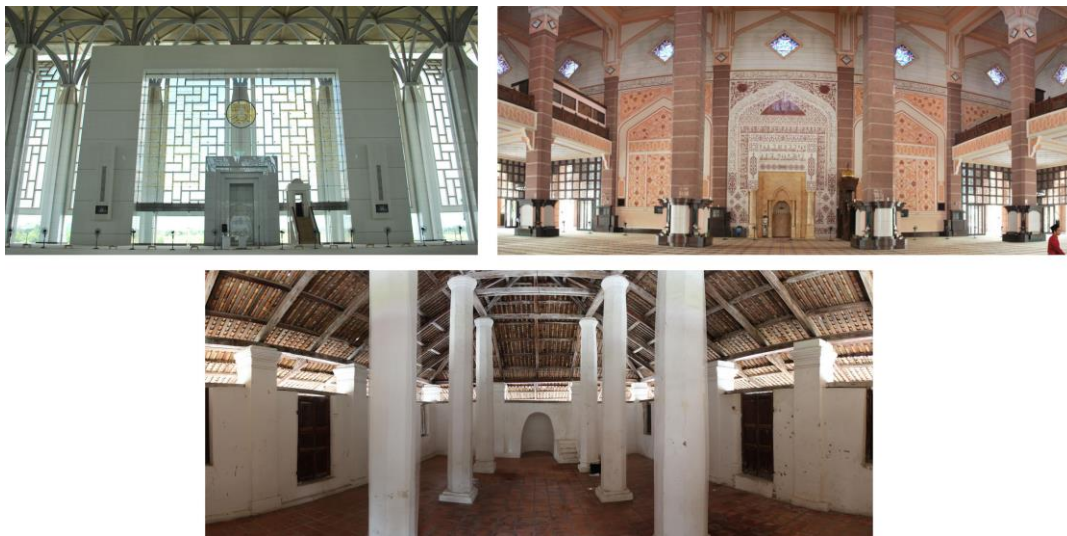


Figure 4: Design articulation as seen in the Sultan Mizan Zainal Abidin Mosque, Putrajaya; the Putra Mosque, Putrajaya; and the Pengkalan Kakap Mosque, Kedah (Source: Author)

### 5. Conclusion

Three observations can be made thus far regarding current historical approaches on mosque architecture of Malaysia. First is regarding ambiguously defined parameters and characteristics, which are particularly problematic if the intent is to convey accurate recollection of history. Some of the issues might be traced to differing translation arising from English, Arabic, and Malay nomenclature, as well as incomplete information due to lack of records and documentations which can lead to multiple interpretations. Others are more subtle, such as usage of the terms vernacular and traditional which are sometimes used interchangeably, or omissions of descriptive or contextual details as seen in the term colonial period which might potentially refer to Portuguese, Dutch or

British empires. The second observation is to do with the monolithic approach in analysing mosques as case studies. Rather than studying each building as a single undifferentiated entity, Malaysian mosques can be interpreted through its constituent components. Hence, instead of looking at plans and roofs as being inseparable architectural elements, each can be analysed through comparison with other similar or related elements. An advantage of this approach is that mosque variants that may not easily fit into any particular classifications can be included into the ongoing discourse on Malaysian architectural history based solely on their formal characteristics. The final observation is regarding the importance of holistic overview in understanding mosque architecture in Malaysia. The usefulness of classification needs to be seen beyond the constraints of the individual categories and more into their overall transformation over time as part of a larger historical system. A mosque should be appreciated as a culmination of prior decisions, ideas, and architectural precedents found at a local as well as a global scale. This perspective would locate Malaysian mosques as an important part of the historical narrative of Muslim architecture by recognising the shared characteristics as well the unique development of mosques existing in this region.

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