DESIGN FRAMEWORK FOR URBAN MOSQUE IN THE CITY OF KUALA LUMPUR: A QUALITATIVE APPROACH

Nayeem Asif, Nangkula Utaberta, Arman Sarram, Sumarni Ismail

Keywords

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Abstract

Thousands of years after the establishment of mosque as a place of worship, issues and problems regarding its continuous development, especially those stemming from complexity of modern living have created the need for urban planners and architects to reconsider its planning and design in regard with limited land availability, shortage of resources, accessibility and appropriate architectural expression. Thus the aim of this research is to find a proper definition for urban mosques in compact cities and point out the key considerations for the design of urban mosques. This research is conducted qualitatively through reporting on available design guidelines related to the current topic followed by a discussion on three mosques within the Malay Archipelago as the secondary data source. Consequently, three mosques within Kuala Lumpur, Malaysia were studied as a primary data source. The outcome of this research establishes a framework for possible design approach of urban mosque development as a basis for future mosques design in compact cities. The result can be utilized as a source of information for reference purpose as well as a possible guide on the effectiveness of urban mosque concepts, possible challenges in a compact city setting, vertical expansion, and sustainable development.

Nayeem Asif,
PhD Candidate, Faculty of Design and Architecture, Universiti Putra Malaysia, Serdang, 43300, Malaysia
Nangkula Utaberta
Assoc. Prof. Dr, Research Fellow, Halal Product Research Institute, Universiti Putra Malaysia.
Arman Sarram
Ph.D. Student, Limkokwing University of Creative Technology, Cyberjaya, Selangor, Malaysia
Sumarni Ismail
Lecturer, Faculty of Design and Architecture, Universiti Putra Malaysia, Serdang, 43300, Malaysia

*Corresponding Author's email address: nayeem.asif@gmail.com, nangkulautaberta@gmail.com

INTRODUCTION

The Mosque is a significant symbol to Muslims; it is interpreted to recreate divine presence on earth yet it is not built according to any divine pattern. The Qur'an in its divinity does not provide explicit rules as to what a mosque should look like, but major Islamic theological discourse outlines the vital elements of a mosque. Muslims in the past and even today have made use of local artisans and architects to create beautiful, magnificent mosques (Baharudin & Ismail, 2014).

There has been ample documentation on the historical evolution of mosque design throughout the history of Islam. The contextual differences regarding regional location, technological availability, cultural influence as well as political perspectives put a significant impact on the design of mosque (Hillenbrand, 2004; Ismail, 2008; Khan, 1990; M Rasdi & Utaberta, 2010; Elkhateeb et al., 2018; Tarabieh et al., 2018). However, compared to the references available on design documentation for early mosques until the 20th century, a guideline on mosque design for contemporary times are limited regarding available texts and research. Prominent works among this sector are design criteria for mosques and Islamic centers by Kahera (2017); design of mosque as community development center by Rasdi (1998); mosque architecture and formulation of design criteria by Imam (2000); design standard for mosque in various facilities by Mokhtar (2009); as well as some small handbooks for mosque design standards focusing on specific contexts (Department of Town and Country Planning, 2011; Imam, 2000; A. Kahera, Abdulmalik, & Anz, 2017; Mokhtar, 2009; Rasdi, 1998).

The rapid changes in contemporary societies call for fundamentally new spatial arrangements in every sphere of urban life. The growth of the modern cities as defined by the needs of the industrial period in their establishment period requires to be reformed in innovative ways resonating with the current way of life in urban areas (Seifert, 2009).

Malaysia as a Muslim majority nation has a diverse cultural and architectural style of mosque all over the country. The structure plan for Kuala Lumpur 2020 illustrates the future requirements for building new facilities among which there are 309 mosques and surau (DBKL, 2015). While the land constraints remain for the city of Kuala Lumpur, the need of the growing population cannot be overlooked. Current practice for planning and designing mosque in the compact urban settings, in particular within Kuala Lumpur, shows a tendency for horizontal progression of layout despite the issue of land insufficiency (Ahmad et al., 2015). Hence, for the context of designing an urban mosque, consideration should be given to the nature of the structure, the relationship between communities in compact cities and the institution of a mosque to ensure a structure that can accommodate the needs of the population. This study, therefore, attempts to evaluate modern urban mosque architecture in compact city setting to assess on the sensibility of its designs as well as address critical issues relative to its purpose and improvements for further optimal use.

LITERATURE REVIEW

Emerging challenges in designing urban mosque in compact cities

By modern times, the definition of a compact city is aimed at a sustainable society based on three principles- urban forms, spatial characteristics, and social functions. According to a more recent report of Organization for Economic Co-operation and Development on compact

city assessment, a compact city is defined based on three distinct characteristics which are: (1) dense and proximate development patterns; (2) urban areas linked by public transport systems; and (3) accessibility to local services and jobs (*Compact City Policies*, 2012).

The emergence of mosques in dense urban settings and the appropriate design approach for these mosques is a relatively new discussion. Ismail Kahera pointed out that mosque can be found in compact settings during the early days of American cities on the east coast (A. I. Kahera, 2010). The term compact in his statement was referring to the densely populated neighborhood with houses arranged horizontally. Meanwhile, today's compact cities are equipped with high-rise residential blocks with population density much higher than that of the traditional neighborhoods. Moreover, the vertical development also brings change in road network, accessibility, and land use pattern. All of these makes the scenario for today's urban mosque unique in manner. Current guidelines for planning and designing mosque lack adequate information on vertical development for mosque. Vertical development is not just merely stacking the functions on above another linked by stairways; instead, this is a sophisticated process which requires a carefully formulated framework (Abel, 2003).

A framework is a basic order underlying a system, concept, or text (Merriam-Webster, 2004) and in the context of this research, a design framework for urban mosque refers to the outline, or skeleton, of predefined factors affecting the design and serves as a guide for designing mosque in compact urban settings.

Table 1: Prominent literature on mosque design with indications of research gap concerning the current study (Source: Authors).

Sl. No.	Title	Area of discussion	Identified gap related to the current study
1	Design Criteria for Mosques and Islamic Centers (2017)	Guideline for urban mosque in Western context	The typology of urban mosque discussed does not consider a situation such as dense urban area, limited land, and vertical development
2	Guideline for the design of Mosques and Surau, Department of Town and Country Planning (2011)	Guideline for mosque in the Malaysian context	Generalized instruction which lacks specific discussion on an urban mosque in compact settings
3	Design standards for Muslim prayer facilities within public buildings (2009)	Focuses on special prayer facility	Prayer facilities within buildings are different in the genre than entire mosque building on a particular site.
4	Architectural Graphic Standards (2007)	Guideline for mosques in Western countries	Focuses on space requirements for mosques in Western context only
5	Neufert Architects' Data (2003)	Design criteria for mosque from historical perspective	Contemporary issues on mosque design are unavailable

This research attempts to bridge the gap on design framework for urban mosques. Previous studies which are closely related to the scope of this research have pointed out several factors to be considered for the analysis such as land use and vertical planning (Ahmad et al., 2015), contextual design (Al-Hathloul, 2004; Mohd Rasdi & Utaberta, 2007), and diversified activities and related facilities (Asif et al., 2015; Rasdi, 1998, 2010). In short, the factors to be observed primarily are context (in this case compact cities), capacity, facilities, and activities. The diagram below visually represents the factors to be considered in evaluating urban mosques.
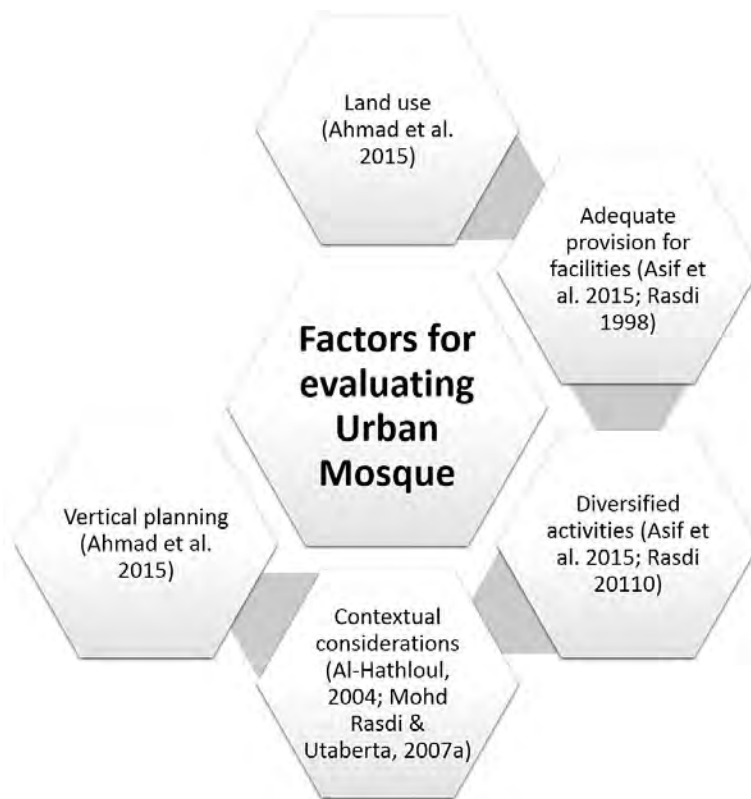
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Figure 1. Factors to be considered for evaluating urban mosques (Source: Authors).

METHODOLOGY

This study is qualitative describing the practices and lifeworld regarding the institution of a mosque in compact urban settings. The research is based on two levels of data- a) Secondary data and b) Primary data. The researcher conducted a descriptive analysis of secondary data collected from available written sources on three mosques outside Malaysia though within the Malay Archipelago which are presented in the case studies section.

Primary data are collected from three mosques within the city of Kuala Lumpur, Malaysia. Selection criteria are discussed in the sampling section. Semi-structured interviews and observations were adopted as the data collection method. Findings from the semi-structured interview are analyzed through content analysis supported by observational findings wherever needed. The overall process is illustrated in figure 2.

Sampling

Case selection for the study was based on the following characteristics: Type and size of the mosque; type of zone; the population density of the region; functionalities; spatial topology; and architectural features/designs. Kuala Lumpur, the federal capital for the government of Malaysia, has the largest population among Malaysian cities according to the population census of 2010 ("MALAYSIA: Administrative Division," 2010). For the ease of governance, the area is divided into 6 zones, and each zone has one masjid as *Pusat Pejabat* to observe the affairs of other mosques under them. The most densely populated zone in Kuala Lumpur

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is Zone 3 or City Center (135 people/hectare). Based on this characteristic, this study focuses only on zone 3 out of all 6 zones. According to the list of MAIWP, there are ten mosques and nine surau *jumat* within this zone (DBKL, 2015)

Out of these ten mosques, three mosques have been shortlisted for this particular research. Among the remaining seven mosques, respondents for semi-structured interview were not available, one of the mosques was under construction, and the rest is a special type of mosque with a historical value having single storied building blocks. Therefore, based on the surroundings, limitation of land and vertical approach of design Masjid Al-Imam Asy-Shafie, Masjid Jamek Kg. Baru and Masjid Jamek Pakistan have been selected.
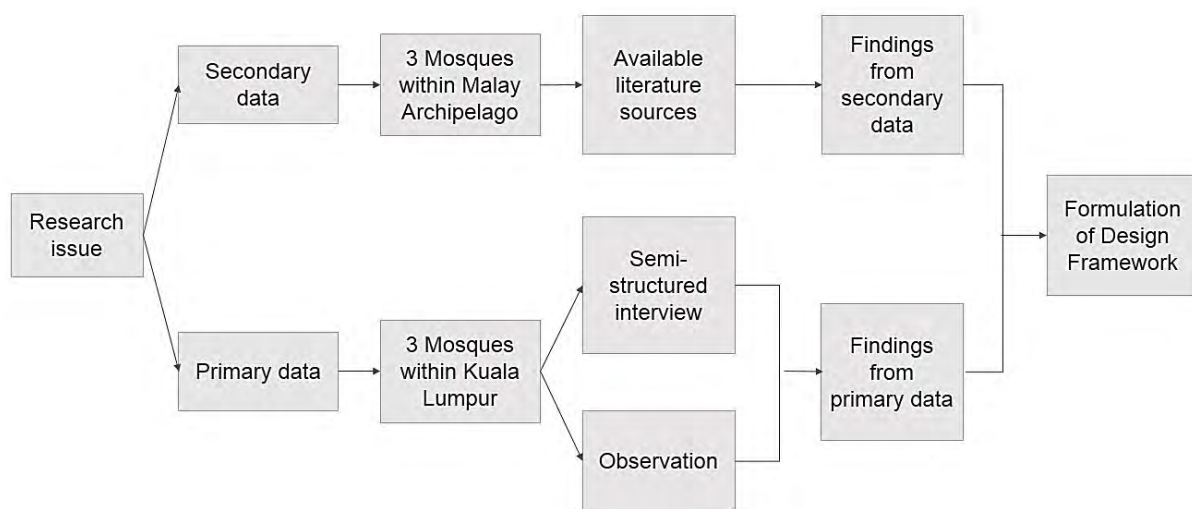

Figure 2. Summary of research design (Source: Authors).

Case studies

This section will present a brief discussion on selected mosques outside of Malaysia. As this research will focus on developing a framework for mosque in Malaysian context primarily, the selection of foreign mosques follows several criteria:

1. Mosque in similar context, regions close to Malaysia is chosen (i.e., Indonesia, Hong Kong, Singapore);
2. Among the selected regions, cities with high density of population are selected to ensure that the selected mosques are situated in compact urban settings;
3. Type and size of mosque and functionalities, spatial topology and architectural features/designs are considered to select cases.

Based on these criteria the selected mosques are (1) Istiqlal Mosque, Jakarta, (2) Kowloon Mosque & Islamic Centre, Hong Kong and (3) Masjid Al Islah Punggol, Singapore. It is to be noted that the scale of these mosques vary as well as their capacity, while the evaluation criteria focus primarily on the context, activities, facilities and land use. A brief introduction of the cases is presented below in table form.

Table 2: Comparative table for study cases (Source: Authors).

Name of the Mosque	Location	Capacity per Land Area* (Person/Sqm)	Facilities
Istiqlal Mosque (1978)	Jakarta, Indonesia	(200000/90000) 2.22	• Main prayer hall • Classrooms • Resting areas • Plaza (multipurpose space) • Landscape garden • Office • Madrasa
Kowloon Mosque & Islamic Centre (1984)	Hong Kong	(3500/25200) 0.14	• Main prayer hall • Clinic • Day-care center • Community Centre • A/V room • Market and food stall • Guest room • Staff dormitory • Kindergarten • Classroom • Library • Exhibition • Office
Masjid Al Islah (2015)	Punggol, Singapore	(4500/3700) 1.21	• Main prayer hall • Education center • Administrative center • Plaza • Classrooms

Discussion on the design consideration for study cases

Considering the design characteristics, Istiqlal mosque and Al-Islah mosque have more contemporary design style, and Kowloon mosque blends traditional elements with contemporary styles (Crossette, 1987; Ward, 2017). On the other hand, the Kowloon mosque, designed by architect I.M. Kadri, represents the unique identity of the Muslim community in Hong Kong. Among all these three cases, Al-Islah mosque has the most distinct design characteristics.

Apart from the religious programs and additional communal activities, the cases have one thing in common: all three mosques are used by the community as recreation parks with adequately designed landscape features.

One of the significant aspects noted from the discussion is the use of vertical spaces within these mosques. Unlike the traditional style of horizontal or spread out design, these mosques tend to be developed vertically to accommodate its functions within the settings of the compact neighborhood.

Figure 3. Kowloon Mosque representing traditional design character (Middle) while Al Islah Mosque has contemporary design character (Right) and Ishtiqlal Mosque represents a combination of traditional and modern design (Left) (Source: https://en.wikipedia.org/wiki/Istiqlal_Mosque,_Jakarta; http://mapio.net/pic/p-67191601/; https://www.beautifulmosque.com/Al-Islah-Mosque-in-Punggol-Singapore; Retrieved on 24 January 2017).
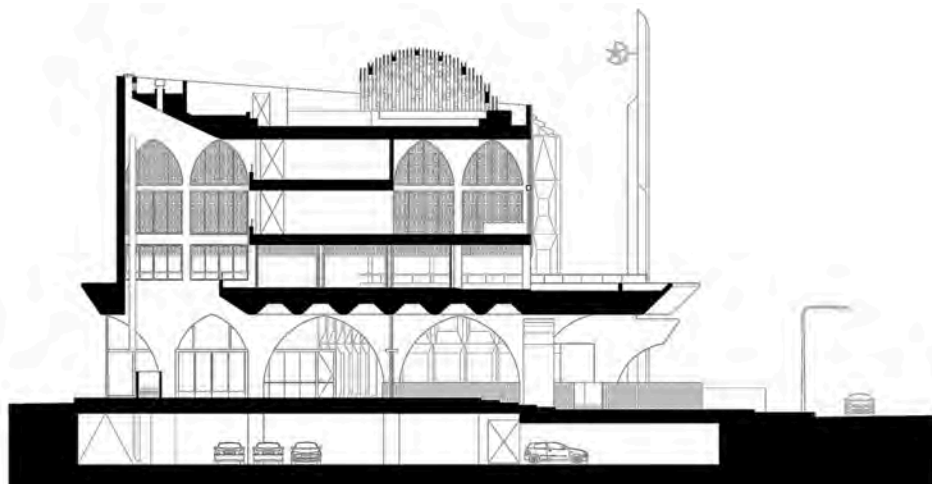

Figure 4. Vertical stacking of facilities in Al Islah Mosque (Source: Peterson, 2016).

Several aspects found to be unique for urban mosques in a compact setting compared to that of the traditional mosque and traditional design approach. They are noted below.

a) A mosque can be designed with more elaborate facilities despite having a lower capacity to accommodate people (Haroon, 1995).
b) While modern style mosques have better provision for effective functional arrangements, in the case of Kowloon mosque, it has blended traditional elements with contemporary style and yet has the most elaborate functional spaces (Ward, 2017).
c) The design language of mosque is required to be accepted by the community people. As for the case of Al-Islah mosque, the community people consider this mosque as a reflection of Islamic aspiration of Singapore (Asif & Utaberta, 2016; Peterson, 2016).
d) Open or semi-open spaces are recommended for mosques in high-density areas. These spaces can be either an adjacent public park (Istiqlal and Kowloon mosque) or plaza area at ground level or elevated plaza (Al-Islah Mosque) with adequate greenery (Peterson, 2016).

Ishtiqlal Mosque	Kowloon Mosque	Al Islah Mosque
• Out of harmony with regards to contextual design	• Elaborate facilities despite limited land and capacity • Traditional yet contextually accepted design character	• Innovative use of plaza area as a recreation space • Vertical landscaping to provide green spaces within compact settings • Successfully integrating the community with its activities

Figure 5. Key aspects emerged from the case studies (Source: Authors).

Vertical stacking of functions is present in all three cases. Instead of providing a large prayer hall with a high ceiling, the vertical space is used for accommodating the functions within the limited available land.

COMPARATIVE DISCUSSION BETWEEN PRIMARY AND SECONDARY DATA

This section will briefly analyze the findings collected for the three chosen samples and at the same time inference will be made with the outcome of early case studies.

Outlining a standard definition and design framework for an urban mosque in compact cities

The study gave information on the mosque's evolution, the rapidly growing challenges they face and how these mosques have so far addressed such issues. The role of the Mosque is composed of thoroughly institutionalized multiple functions and roles when Muslim society norms have undergone a few drastic changes to adapt to the modern age. Responsibilities of various nature such as socio-political, socio-economic, educational and religious are now intertwined, and mosque as an integral part of society is also responsible for its development, guidance, and administration.

In the compact city setting, Masjid Jamek Kg Baru's design and planning address the needs and requirement of urban communities living in dense areas as is evident in the interviewee's response. It presents the similar situation with Al-Islah mosque in Singapore mentioned in the previous section. Al-Islah mosque's design is also welcomed by the community as it fulfills their expectation from their mosque. Both Masjid Jamek Kg. Baru and Masjid Al-Islah are designed in a way that is different from the traditional symmetrical layout of mosque, and the design proves to be well accepted among the users according to the findings (refer to the figure below).
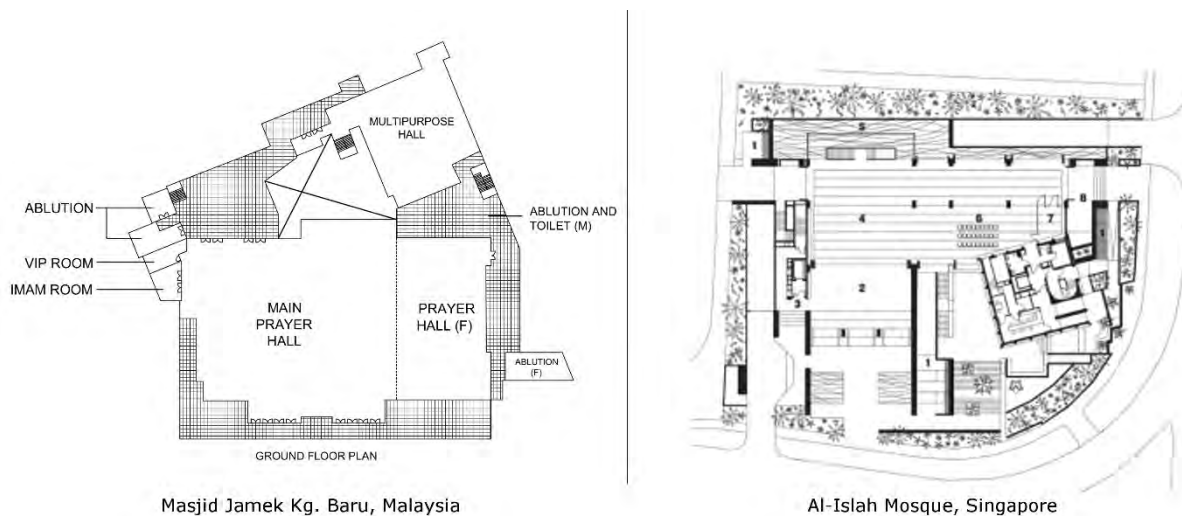
Figure 6. Contemporary layout of Masjid Kg. Baru & Masjid Al-Islah (Source:
https://www.archdaily.com/773123/; Authors, 2016).

The renovation strategy for Masjid Jamek Kg. Baru is successful in a way that it increases the capacity of the mosque as well as added facilities to the mosque complex to serve the needs of the community. Meanwhile the planning of Masjid Jamek Pakistan is not integrated with the requirements of the neighborhood, which causes an overflow of people on the street during Fridays and other occasions. This situation is certainly not expected for a compact city where the overflow of users on streets is a usual phenomenon. In contrast, the traditional horizontal design of Masjid Al Imam Asy-Syafei has the much lower capacity to accommodate people while having the largest land area. Moreover, the recorded activities are also fewer than the other two mosques in Masjid Al Imam Asy-Syafei.

Therefore, it can be concluded that the most efficient mosque regarding capacity, facilities, and land utilization is Masjid Jamek Kg Baru while Masjid Jamek Pakistan and Masjid Al Imam Asy-Syafei hold the latter positions respectively.

Considering the above, urban mosque in compact cities can be defined as: *an urban mosque within the settings of a compact city is the mosque which has maximized the land use by arranging adequate facilities serving the surrounding communities with required activities and programs, and fulfills the capacity requirement within its limited available land area.*

Apart from the definition of an urban mosque, factors needed to be considered for urban mosque as derived from the study above are summarized below:
   a) Standardization of facilities designed for urban mosques is crucial to ensure community involvement by providing different activity spaces;
   b) Vertical stacking of the functional spaces and creating a visual link among them;
   c) Use of design elements such as a ramp or lift to make the facility accessible to the elderly and disabled people;
   d) Flexibility in design and multiple uses of a single space to ensure maximization of the use of available facilities;
   e) Providing a plaza area as a setback for the mosque building, which could offer open space feelings within a dense urban setting. The plaza could be at road level like that of Masjid Jamek kg Baru or elevated like Al-Islah mosque at Singapore.

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f) If residential facilities are required for an urban mosque (like Masjid Jamek Pakistan) they are advised to be planned in the early stage of design to avoid making horizontal development.

Figure 7. Vertical spaces with physical access and visual connection (Upper: Al-Islah mosque, Lower: Masjid Kg. Baru) (Source: https://www.archdaily.com/773123/; Authors, 2016).

CONCLUSION

The results of this research have provided insights into the evolution of mosque and how it can be further improved to address modern challenges. Based on the evaluated mosques in this study, urban mosques are built and made to serve the fundamental purpose of mosque, however, because of the other essential needs of the community it also serves other purposes which demonstrates the flexibility of mosque in serving the community socially, economically and even politically. It shows the relevance of urban mosque where space constraint is an on-going issue. Furthermore, the examples of mosques both modern and old were able to demonstrate and retain functionality and aesthetic presentation while maximizing its space allotment.

Framework for planning and design of urban mosque	Facility spaces	Ensure provision for mandatory facilities
		Incorporate additional facilities based on community needs
	Vertical development	Adopt vertical design solutions for initial planning of mosque
		Make provision for vertical extension
	Visual connectivity	Spaces are recommended to be connected visually
		Visual connection gives better sense of integrity within vertically stacked spaces
	Accessibility	Provision for disable accessibility is a must in urban mosque
		Both horizontal and vertical accessibility has to be considered
	Flexibility	Flexible space design gives better option for multipurpose use of space
		With the changing needs of the community, flexible spaces can be reorganized to suit the purpose
	Open areas	As a community institution urban mosque is recommended to provide breathing spaces within the compact design
		Open ares can be plaza, courtyard, semi covered spaces, veranda and other transitional spaces among the specific functional areas.

Figure 8. Design framework for urban mosques in Kuala Lumpur (Source: Authors).

Addressing the fact that Kuala Lumpur Structure Plan 2020 proposes to build more than 300 mosques within the city, this study is highly significant to provide a guideline for developing urban mosque in the compact city of Kuala Lumpur. If the new mosques are appropriately planned considering all the key requirements of an urban mosque, it will ensure a better and more liveable environment for Kuala Lumpur as well as within the region of Malay Archipelago in the years to come.

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