



UNIVERSITI PUTRA MALAYSIA

***A SPACE MANAGEMENT MODEL FOR OPTIMIZING SPATIAL
PERFORMANCE OF MOSQUES IN KUALA LUMPUR, MALAYSIA***

NAYEEM ASIF

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PERFORMANCE OF MOSQUES IN KUALA LUMPUR, MALAYSIA**

By

NAYEEM ASIF

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

September 2018



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DEDICATION

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

A SPACE MANAGEMENT MODEL FOR OPTIMIZING SPATIAL PERFORMANCE OF MOSQUES IN KUALA LUMPUR, MALAYSIA

By

NAYEEM ASIF

September 2018

Chairman : Nangkula Utaberta, PhD
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Government expects the population in Greater Kuala Lumpur will grow from six million to 10 million by 2020 under the Economic Transformation Programme (ETP). The development of Malaysia is now guided by the national agenda and Vision 2020 that envisions Malaysia as a fully developed country economically, socially, politically and spiritually by the year 2020. Religious facility requirement for Vision 2020 states 309 new mosques and surau have to be established to fulfill the need of the growing population. While the land constraints remain for the city of Kuala Lumpur, the need of the growing population cannot be overlooked. This necessitates developing an innovative tool which can provide a layout for maximizing the space use within the limited boundary. This research studies the current space use patterns and formulates design framework for the mosque as a community center in the urban fabric of Kuala Lumpur. The method being used here is a combination of qualitative and quantitative approach. The sample consisted of 28 mosques in Kuala Lumpur distributed within 6 zones. The findings show that on an average only 38.48 % of the time the mosques are utilized with activities while only 5.76 % of its available spaces are occupied during the activities. As a result, the average space utilization rate of the mosques of Kuala Lumpur turns out to be extremely low, only 2.22 %, causing wastage of valuable resources and financial burden. Recommendations include proposal for increased activities and introducing flexible usage of the spaces as well as distribution of the functional spaces based on the requirement of the population. This study will give a huge impact on the development of the Muslim community in particular and the public in general through a model for space management. Further study may include in-depth analysis of spatial usage pattern of individual mosque for a longer period of time as well as include more typologies, i.e., surau to be analyzed.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**MODEL PENGURUSAN RUANG UNTUK MENINGKATKAN TAHAP
KECEKAPAN RUANGAN MASJID DI KUALA LUMPUR, MALAYSIA**

Oleh

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Kerajaan menjangkakan penduduk di Greater Kuala Lumpur akan berkembang dari enam juta hingga 10 juta pada tahun 2020 di bawah Program Transformasi Ekonomi (ETP). Pembangunan Malaysia kini dipandu oleh agenda negara dan Wawasan 2020 yang membayangkan Malaysia sebagai negara maju sepenuhnya dari segi ekonomi, sosial, politik dan rohani menjelang tahun 2020. Keperluan kemudahan agama untuk Wawasan 2020 menyatakan 309 masjid baru dan surau perlu diwujudkan untuk memenuhi keperluan penduduk yang semakin meningkat. Walaupun kekangan tanah kekal untuk bandar Kuala Lumpur, keperluan penduduk yang semakin meningkat tidak boleh diabaikan. Ini memerlukan pembangunan alat inovatif yang boleh menyediakan susun atur untuk memaksimumkan penggunaan ruang dalam sempadan yang terhad. Kajian ini mengkaji pola penggunaan ruang semasa dan merumuskan rangka kerja reka bentuk untuk masjid sebagai pusat komuniti di fabrik bandar Kuala Lumpur. Kaedah yang digunakan di sini adalah gabungan pendekatan kualitatif dan kuantitatif. Sampel terdiri daripada 28 masjid di Kuala Lumpur yang bertempat dalam 6 zon. Penemuan menunjukkan bahawa pada purata hanya 38.48 % masa masjid digunakan dengan kegiatan sementara hanya 5.76 % ruang yang tersedia diduduki semasa aktiviti tersebut. Akibatnya, purata kadar penggunaan ruang masjid Kuala Lumpur ternyata sangat rendah, hanya 2.22 %, menyebabkan pembaziran sumber yang berharga dan beban kewangan. Cadangan termasuk cadangan untuk meningkatkan aktiviti dan memperkenalkan penggunaan fleksibel ruang serta pengedaran ruang fungsional berdasarkan keperluan penduduk. Kajian ini akan memberi kesan besar kepada perkembangan masyarakat Islam khususnya dan orang awam secara amnya melalui model untuk pengurusan ruang. Kajian lanjut boleh merangkumi analisis mendalam pola penggunaan ruang masjid individu untuk jangka masa yang lebih lama serta termasuk lebih banyak tipologi iaitu surau untuk dianalisis.

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I certify that a Thesis Examination Committee has met on 3 September 2018 to conduct the final examination of Nayeem Asif on his thesis entitled "A Space Management Model for Optimizing Spatial Performance of Mosques in Kuala Lumpur, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

TN50	Transformasi Nasional 2050 (National transformation 2050)
GP-008A	Garis Panduan-008A (Guideline for mosque by JPBD)
ETP	Economic Transformation Programme
DBKL	Dewan Bandaraya Kuala Lumpur
MAIWP	Majlis Agama Islam Wilayah Persekutuan
JAWI	Jabatan Agama Islam Wilayah Persekutuan
JAKIM	Jabatan Kemajuan Islam Malaysia
JPBD	Department of Town and Country Planning Malaysia
JAIS	Jabatan Agama Islam Selangor
NAO	National Audit Office
SMG	Space Management Group
SUR	Space utilization rate
E	Control value
RA	Relative asymmetry
RRA	Real relative asymmetry
MD	Mean depth
PSM	Prayer space male
PSF	Prayer space female
PSX	Prayer space extended

CHAPTER 1

INTRODUCTION

1.1 Background of the study

The era of globalization and rapid urbanization is experiencing a steep growth in population throughout the world. The population of greater Kuala Lumpur is predicted to rise from six million to ten million within the year 2020. This growth will create the need for more infrastructure such as housing, public institutions, transportation networks and so on. Apparently, with the rapid increase in population, available land for new developments remains limited. This accentuates the need to build more innovatively in restricted footprint while maximizing the space utilization (Ellabban et al., 2014).

The development of Malaysia is currently guided by the national agenda and Vision 2020 that envisions Malaysia as a fully developed country economically, socially, politically and spiritually by the year 2020. In addition, TN50 or *Transformasi Nasional 2050* comes up with a target that envisions Malaysia among top 20 developed countries in future to come.

TN50 has mentioned some real challenge in light of the current world situation as reported by Datuk Asma Ismail (2017) who stated, “Taking a look at the world today, common patterns, for example, rapid urbanization and demographic shifts are playing important role that would have adverse effects on people, society, economics, and nations. In the meantime, the world is confronting unparalleled dangers that should be handled effectively and adequately. These include extreme weather events and data fraud that are among the top global risks in terms of likelihood as identified by The World Economic Forum’s Global Risks Perception Survey 2016. As indicated by the United Nations (UN), the total populace is believed to be grown up to 9.7 billion within 2050. Growing population and expanding businesses will cause a sharp ascent in worldwide interest for water, food, and energy, placing further pressure on the natural environment. Right around 70% of the worldwide populace is living in urban zones with about 90% of them packed in Asia and Africa. Given the quick urbanization rate, sustainable development challenges will be quite challenging in urban areas, especially in the lower-middle-income countries where the pace of urbanization is fastest. (D. A. Ismail, 2017)

Kuala Lumpur, being the premier city of the nation, must contribute strongly to the attainment of the ideal embodied within Vision 2020, its aspirations and go beyond 2020 towards fulfilling the aims of TN50. The development vision for Kuala Lumpur must, therefore, be consistent with, and reflect the underlying principles of long-term development plans while being appropriate to the City’s own particular role in the nation’s development (Academy of Science Malaysia, 2017; DBKL, 2015).

1.2 Problem statement

According to Asoka, Thuo, and Bunyasi (2013), the rapid population growth of cities is often associated with population demands that outdo the infrastructure and service capacity, thus leading to environmental degradation. Similarly, it also affects efficient management by the government, rising costs in building and maintenance and most importantly a far-reaching impact to future generations to come (Asoka et al., 2013).

This negative effect also remains for infrastructures which are vital to the community such as mosques. In a compact city setting, development must be considered in the context of a constrained situation which is (1) within the boundaries of its intended capacity, (2) the needs of the population, and (3) serving and sustaining the function of the infrastructure whilst preserving the traditional and /or aesthetic style natural to the structure.

Ethnically speaking, Kuala Lumpur is, more than any other cities in Malaysia, a true microcosm of the country, and it leads by example in the harmonious coexistence of its multi-ethnic and multi-religious society. In keeping with the status as the capital of a predominantly Muslim nation, the City does have a significant role to play as a religious center, both regionally and nationally, as evidenced by the presence of the National Mosque and the Centre for Islamic Studies. Kuala Lumpur's status in this regard will continue, as will the need to ensure that there are sufficient mosques and "surau" to serve the population of Kuala Lumpur as well as those from outside. Although there are mosques and "surau" in all strategic zones, they are not distributed evenly according to population distribution. Religious facility requirement for Vision 2020 states 309 new mosques and *surau* have to be established to fulfill the need of the growing population [Draft for Kuala Lumpur Structure Plan 2020] (CGG, 2015).

Reported by Utaberta (2009) from the interview of one of the leading Indonesian architect Adhi Moersid who said only 15 % of the total spaces of mosque in Jakarta, Indonesia is being utilized. It means 85 % of the total spaces of mosque are not being used for any sorts of activities (Utaberta, 2009). The scenario might be the same for the mosques in Malaysia also while it is yet to be investigated. Reports have been made by scholars in Malaysia that the mosques in Malaysia are merely being used for prayer only (Rasdi, 2010). The purpose of this research is to study the current space use patterns of the mosques in the urban fabric of Kuala Lumpur. 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. Moreover, according to prior research, on an average, the maintenance cost of mosques in Malaysia is RM 45.48 per sqm per year. The study only had taken into account the maintenance cost for mosque's roof (Mohd Yusof & Misnan, 2012). Following their calculation, the maintenance cost for the roofs of the newly planned 309 mosques in Kuala Lumpur will roughly be more than RM 1.02 billion per year. Therefore, considering the land insufficiency as well as the financial factor, assessing the performance of existing mosques and maximizing their use become a priority in the development scheme of Kuala Lumpur. The diagram below summarizes the problem statement based on the issues on hand:

DBKL, 2015; TN50, 2017	Asoka, Thou, Bunyasi, 2013	DBKL, 2015; Mohd Yusof, Misan. 2012	Utaberta, 2009; Rasdi, 2010
<ul style="list-style-type: none"> •Rapid Urbanization •Growing population in KL (10 million by year 2020) 	<ul style="list-style-type: none"> •New Infrastructures •Limited Land •Environmental Degradation 	<ul style="list-style-type: none"> •309 New Mosques in KL within 2020 •Land Insufficiency and Maintenance Cost more than 1.02bn per Year 	<ul style="list-style-type: none"> •Underutilization of mosques' spaces •Mosques being devoid of diversified activities

Diagram 1.1 : Summarization of problem statement

This necessitates developing an innovative tool which can provide guidance for maximizing the space use within the limited land provision. The tool will also guide the planners and designers to re-organize the layout of existing facilities so that the usability of existing structures increases. Mosque is expected to serve and enhance the relationship of the Muslim community while at the same time also strengthens the ties of Malaysia's multi-racial society as a whole. This framework and model is also expected to be a reference and prototype to be implemented at various mosques across the country.

Hence, for the discussion above, the problem statement for this research has been drawn as follows.

The adverse effects of rapid urbanization require that infrastructure development is guided by the actual need of the population. The proposal to set up 309 new mosques and *surau* in the vicinity of the city of Kuala Lumpur thus needs to be justified by ensuring that existing facilities are utilized properly. The lack of investigation in this regard thus necessitates assessing the spatial efficiency for the mosques of Kuala Lumpur in terms of usage and configuration so as to optimize their performance as well as maximize resource utilization.

1.3 Research questions

The main research question is drawn as follows:

How spatial usage and spatial configuration analysis can be utilized to develop an effective space management model for optimizing the performance of mosques in Kuala Lumpur, Malaysia

Sub RQ 1: What are the factors that affect the performance of mosques in urban area, especially mosques in Kuala Lumpur?

Sub RQ 2: How suitable is the existing guidelines for the planning and design of mosques in Malaysia in relation to the real scenario.

Sub RQ 3: How spatial analysis can be applied to evaluate mosques' performance by measuring spatial usage and spatial configuration of mosques in Kuala Lumpur to formulate an effective space management model?

1.4 Research objectives

Research Objectives are as follows:

1. To identify the factors that affect the performance of mosques in urban area, especially mosques in Kuala Lumpur.
2. To evaluate the applicability of existing guidelines for the planning and design of mosque in Malaysia.
3. To formulate space management model for urban mosques in Kuala Lumpur by measuring mosque's performance in terms of spatial usage and spatial configuration.

1.5 Purpose and significance of the study

By the year 2020 Malaysia aspires to become a self-sufficient industrialized nation encompassing all aspects of life, from economic prosperity, social well-being, world-class education, political stability, as well as psychological balance. One of the major challenges towards this vision is to ensure sustainable development of the infrastructure for fostering economic growth. Infrastructure development is linked with the rapid urbanization of Malaysian cities. It demands the planners, designers and policymakers to come up with innovative and viable strategies in order to guide and control the development progress towards the right direction.

In recent years, the concept of urban development has led to sustainable urban growth, in both micro and macro levels. The quality of life is directly related to the quality of the environment, and therefore space and its structures can change and transform the quality of life. It changes communication networks, social and economic development aspects of society and more importantly the influence the reaction of the population.

Religious buildings, including temples, churches, synagogues, and mosques have always been one of the integral components of the urban layout (Ayhan & Mert Cubukcu, 2010). The Mosque as a vital part of a Muslim majority area, therefore, helps support the change process. Its existences as part of urban landscape (1) improve quality of life and (2) fosters growth within the community in the social, moral and even economic sense (Ziari, 2003). Religious scholars emphasized the presence of the mosque as a condition for a society to fulfill its Islamic way of life in the city.

Malaysia as a country where Muslims are the majority, mosque has always been a vital element of its society. Throughout the country, there are numerous mosques fulfilling the religious needs of the Muslim community. Additionally, 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 in 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 (M. F. Bin Ahmad et al., 2015). Hence, for urban mosque, this study attempts to redirect the current trend of planning and designing mosque towards a more innovative approach which will be appropriate for the context of compact cities.

Few points are to be noted with regard to the significance of this research. The output of the research, i.e. the thesis will contribute to the sector stated as follows. There are prior researches in the field of planning and designing mosques, however, studying the properties, typology and design issues of urban mosques in compact cities is a fairly new topic. Contemporary practice of architecture provides a good number of example of mosque in compact settings around the globe, while a study on their performance in terms of functionality is yet to be done.

In particular, this study utilizes spatial utilization analysis and spatial configuration analysis for assessing and analyzing the subject under study. Previous researches of similar topic assess the layout of the mosque in terms of the theoretical framework. This study links the layout assessment with actual data on the functionality of the mosque, thus creating a relationship between theory and practice.

In summary, this study will give a huge impact on the development of the Muslim community in particular and the public in general through a model of space management. More effective and efficient community development functions are expected of the institution of the mosque which can be enhanced not only to serve the relationship of the Muslim community but also strengthens the ties of Malaysia's multiracial society as a whole.

1.6 Scope of the study

The study's primary focus is evaluating urban mosque in compact cities. This is viewed in terms primarily through functionality and space utilization of mosques located in the compact city of Kuala Lumpur in Malaysia. The scope is confined within the quantitative analysis of the activities and spatial provisions of urban mosque.

The selected urban mosque in this study is evaluated on parameters set against the backdrop of a compact city and therefore emphasized the importance of scale, functionality and space utilization. Factors to be observed in the selected mosques are activities of the mosque, physical space layout where the activities are accommodated and the relationship of the mosques' planning and design with its surrounding compact settings. It provides the fundamental background of mosque and its transition into urban enclaves specifically for the city of Kuala Lumpur.

1.7 Expected outcome of research

The expected outcome of this research will provide many insights into the evolution of mosque's design and how it can be further improved to address modern challenges. 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 planned properly considering all the key requirements of an urban mosque, it will ensure a better and more livable environment for Kuala Lumpur in the years to come.

In summary, the expected outcome of the research will be:

- a) Space management model for mosque by correlating the properties and applications of spatial analysis techniques.
- b) Recommendations on design framework for optimizing the space usage in Mosques of Kuala Lumpur.
- c) Suggestion on the improvement of guideline for planning and design of mosque especially in the urban context of Kuala Lumpur as well as other growing cities in Malaysia.

This research focuses on a particular city which is Kuala Lumpur, the most compact city in Malaysia. However, the needs and requirements of the communities in other cities which are less compact could vary from that of Kuala Lumpur. Also, qualitative study to determine actual use pattern and activity frequency of the mosques in Kuala Lumpur will give deeper understanding of the situation.

Therefore, it is recommended that further studies on this topic focusing on other Malaysian cities, both qualitative and quantitative, should be conducted for better understanding and more specific guideline for developing urban mosques in compact cities. Moreover, in-depth study on the urban mosques where Muslims are minority may add a different perspective to the topic of urban mosques in compact cities. This research and the other projected researches are aimed towards the greater benefit for the Muslims of the world by empowering mosques, the most significant institution of Islam.

1.8 Outline of the thesis

This thesis is written in six chapters. Each of the chapters is organized in different and sections and sub-sections. Chapter 1 gives the overview of entire thesis especially focusing on the background of this study, the issue in hand or problem statement, formulation of research questions and objectives based on preliminary literature review, research design and significance and limitation of the study. Chapter 2 provides elaborate discussion on available literature related to the issue of this study. It talks about urban cities and the challenges of 21st-century mosques to cope with the fast-changing lifestyle of the communities. Discussion on a possible way to meet this challenge by improving the functional performance of the mosque is presented. Useful techniques and their applications to assess the performance are also described with sufficient explanation. The chapter ends with a conceptual framework to guide this research in the appropriate

direction. Chapter 3 is the detail illustration of the methodology adopted by the study. It also states the theoretical proposition for this research which guided the selection of data collection method and analysis techniques. Chapter 4 is a simple description of the findings of this research. The chapter presented the findings in three major section according to the three different method of data collection. Chapter 4, however, is the discussion of findings, relating them to each other in a meaningful way to extract necessary information in light of the objectives of this study. Recommendation and the model of space management follow the initial discussion. Chapter 6 is the conclusion where entire research is summarized in brief with an indication of the limitations of this study and projection for further research.



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