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ADOPTION OF THE SYSTEMATIC FACILITIES MANAGEMENT APPROACH TO THE SUSTAINABLE PERFORMANCE OF MOSQUES

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ABSTRACT

Mosques play a vital role in the Islamic community. Philosophically, they have been developed not only as places of worship, but also to function as a centre for various aspects of Islamic community development. However, these days, with the increasing number of mosques being built, it has become a big challenge for the mosque authorities to maintain the role of the institution as the centre of the Islamic community. This paper explores previously unstudied issues related to the critical success factors (CSFs) of the facilities management (FM) of mosques. The final aim of the review is to develop a conceptual framework incorporating a systematic FM approach to the sustainable performance of mosques. It makes a comprehensive literature review of numerous published sources, such as journals, books, websites, magazines and unpublished theses, focusing on understanding of the concept of the FM of mosques, the concept of the CSF approach, the growing importance of FM, and its significant role in supporting the current functions of mosques. The proposed conceptual framework developed from the literature review will provide guidelines and understanding of how FM should be conceived, managed and integrated with other key management activities within the context of mosques in Malaysia. It will also provide understanding of the best practical approach to the FM of mosques. The paper contends that this approach is certain to contribute to an environment and society as prosperous as it was during the golden age of the Prophet Muhammad (peace be upon him) if the concepts outlined in the proposed frame work are adopted and adapted.

Keywords: Critical success factors; Facilities management; Mosque facilities; Sustainable performance

1. INTRODUCTION

Mosques are holy places of worship and should be honoured in the highest degree. Mosque facilities consist of all types of buildings and equipment for prayer and non-prayer purposes. The space layout of a mosque can be divided into two parts, namely internal and external space. The inner space includes the main prayer hall, a multipurpose hall, office, ablution area and toilet, while the external space comprises areas such as landscaping, roads and parking areas (Najafi & Sharif, 2014; Majid et al., 2015; Sapri et al., 2016). These facilities play a vital role in the realization of the roles of mosques by satisfying the physical and emotional needs of the users.

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They should be well maintained and must be in good working order, and be in functional accordance with the Qur'an and the Sunnah of the Prophet (peace be upon him). One of the most fundamental ways to pay ones obeisance to a holy place is to keep it clean, neat and well-maintained in every regard. However, the literature shows that certain issues have arisen related to the facilities management (FM) of mosques, particularly with regard to to uncontrolled infrastructure, hygiene, inappropriate design, non-strategic location, inadequate sanitary facilities, poor monitoring tools and utilization of conventional facilities management techniques (Awuzie and Isa, 2017; Sapri et al., 2016 ; Mahazan & Abdullah, 2013). Therefore, it has been established beyond any doubt that FM plays an important role in maintaining the role and functions of mosques. As such, continual study is necessary to further improve its effectiveness.

FM plays an important role in the success of the built environment of any organization. Successful FM leads to better and improved workplaces. Many organizations have reassessed the contributions of FM towards the profitability of their business objective (Baaki et al., 2016; Kamaruzzaman et al., 2017; Awuzie & Isa, 2017). On the other hand, negligence in FM, which is an important management constituent, will have a significant impact on organizational performance. Inefficient or malfunctioning facility equipment will result in poor quality services and dissatisfaction amongst customers and users (Asbollah et al., 2016; Sapri et al., 2016). The role of FM in the success of organizations is crucial, and there is a need for fundamental study of sustainable FM operations. However, a brief search of Malaysian FM-related literature in several international journals showed that little has been published on this area. Generally, the growth of FM in Malaysia is considered to have been very passive, with a lack of fundamental understanding of the FM field, so FM is not being practiced in an appropriate way (Kamaruzzaman et al., 2010). The literature related to FM study only centers on healthcare services, educational institutions, and commercial and office buildings. The study of FM focusing on places of worship, for instance mosques, is still at an embryonic stage. In attempting to fill this void, this study aims to further explore fundamental and unstudied issues related to the FM of mosques. In order to study its effectiveness, it is necessary to reach an understanding of its current practice. Subsequently, appropriate improvements in FM operation in order to achieve the desired performance can be proposed.

According to statistics from Indexmundi (2018), 61.3 percent of Malaysia's population is Muslim. Every year, the Malaysian government, through the Department of Islamic Development Malaysia (JAKIM), allocates appropriate funds to facilitate the development of the Muslim community in various fields and activities. Part of these funds are allocated to building new mosques and to the refurbishment of existing ones (JAKIM, 2018). This implies the importance of mosques from the Malaysian government perspective as centers for different aspects of Islamic community development. However, these days, with 6500 existing mosques and an increasing number of new mosques being built, it is becoming a big challenge to the mosque authorities to sustain the role of mosques as centers of the Islamic community. Significantly, these challenges necessitate a more effective system, particularly related to mosque facilities. Therefore, a fundamental study related to the FM of mosques is necessary in order to assist the authorities to make decisions about the critical success factors (CSFs) pertinent to the FM of mosque. CSFs are defined as a set of key ideas used to assist organizations to accomplish their strategic goals (Gates, 2010). They are a set of characteristics, conditions or variables, which are limited in number (usually ranging from three to eight), and which have a direct and serious impact on the effectiveness, efficiency and viability of an organization, program or project (Elmualim et al., 2010; Business Dictionary, 2018). The CSF constructs must be thoroughly considered and constantly followed by organizations in order for them to achieve their organizational goals (Elmualim et al., 2010; Gates, 2010). The idea of CSFs was first introduced in the 1960s and since then they have evolved and been implemented in different ways.

Mosques are very important places for the development of Islam and they have many particular functions (Sapri et al., 2016; Abdullah et al., 2017). In particular, a mosque provides a social service to the Muslim community with three specific major roles: as a place of worship; a center of Islamic education; and a center to foster intimate social relationships between the members of the Muslim community. Hence, mosques were developed not only for worship, but also to include all aspects of a Muslim's life. In conclusion, mosques have a function as a one- stop center for the community to carry out its daily activities. Nowadays, the number of mosques is growing rapidly worldwide, in proportion to the increasing Muslim population. It is estimated that there are approximately 3.6 million mosques around the world, which translates to around 500 Muslims for every mosque. Malaysia is one of the countries with a high Muslim population.

1.1. Overview of Facilities Management

According to Business Dictionary (2018), facilities are defined as permanent, semi-permanent, or temporary commercial or industrial property, such as a buildings, plant or structures, which are built, established or installed for the performance of one or more specific activities or functions. The International Facilities Management Association (IFMA, 2018) states that facilities management (FM) is a branch of science that incorporates multiple disciplines to ensure functionality of the built environment by integrating people, place, processes and technology. The development of FM started in the USA in the 1980s evolving from property management, services and maintenance into a more proactive and strategic function (Jones & Jowett, 2011). FM tasks are multi-disciplinary and cover a wide range of knowledge, activities and responsibilities. FM role is vital since every aspect of an organization's function is under the purview of FM (Patanapiradej, 2006; Kamaruzzaman et al., 2017).

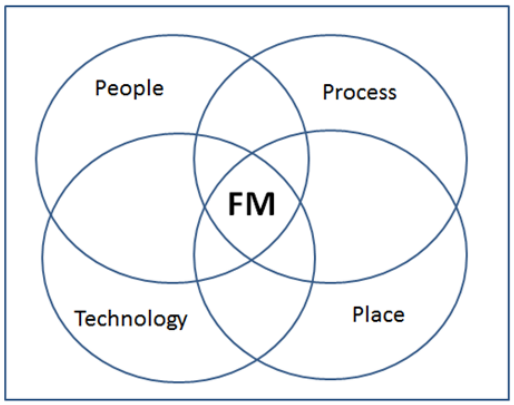

Figure 1 Facilities management concept (Source: IFMA, 2018)

FM plays an important role in the success of the working environment of any organization. Efficient and maintainable FM operations will assist organizations in achieving their business objectives. (Berawi et al., 2015; Asbollah et al., 2016; Sapri et al., 2016). The growth of FM in Malaysia is considered to have been very passive, with a lack of understanding of the FM field, and therefore it is not being practiced in an appropriate way (Kamaruzzaman et al., 2010; Baaki et al., 2016; Kamaruzzaman et al., 2017). The literature related to FM study only centers on the healthcare services, educational institutions, hotel and commercial buildings. Study focusing on religious buildings, for instance mosques, is still in its infancy. It cannot be disputed that the accessibility of information plays an invaluable role for local scholars as well as practitioners, in identifying and prioritizing the areas of concern in FM. In attempting to fill this void, this study aims to further explore the unstudied issues related to the FM of mosques. In order to gauge the effectiveness of FM operations in mosque, it is necessary to understand its current practice. Subsequently, appropriate improvements in FM operations in order to achieve the desired performance can be proposed (Sapri et al., 2016).

2. METHODS

The study aims to develop a conceptual framework incorporating a systematic FM approach to the sustainable performance of mosques. It conducts a comprehensive literature review of numerous published sources, such as journals, books, websites and unpublished theses, focusing on understanding of the concept of the FM of mosques, the concept of the CSFs approach, the growing importance of FM, and its significant role in supporting the current functions of mosques. Based on the results and findings from the literature review, a conceptual framework to manage the FM of mosques was derived. Both of deductive and inductive approach was used in developing the conceptual framework.

3. RESULTS AND DISCUSSION

3.1. Comparative Analysis of the Existing FM Framework: Absence of a Comprehensive FM Framework

A wide range of constructs related to the FM of mosques was studied, with a review of previous studies. Based on this review, four CSF constructs with the most significant impact on FM for mosques were identified, and were summarized based on the affinity diagram technique (Bakri, 2015). They involve four main elements: people, place, process and technology. Table 1 summarizes the CSF constructs derived from the literature and the subsequent sections provide a brief discussion of them.

It was observed that none of the studies provides complete coverage of the CSF constructs of FM for mosques, particularly in relation to technology, meaning they are not sufficiently comprehensive to be used as guidance for mosque authorities in improving FM activities in their respective mosques.

3.1.1. CSF element 1: people

Sapri et al. (2016) point out that it is important for mosque authorities to have a structured organizational chart with a clear mission and vision. They further elaborate that the characteristics of a mosque organization have a major influence on FM activities. Such characteristics should be revised periodically, since they can change under the influence of factors such as stakeholders, management and government policy. The structured organizational chart will not work without full commitment and leadership from the senior management of the mosque organization. Such commitment is a key factor, which must be carefully established as a foundation for any FM program. The major resources required to support the FM of mosques, particularly human, material and financial resources, are under the decisive role of management, thus their commitment is a prerequisite (Elmualim et al., 2010; Bakri, 2015). The importance of FM as a constituent of mosque management should be fully understood by management, who play a vital role in determining FM policies, objectives, strategies, allocation of resources and alignment with goals. The final aim of mosque FM is to help the mosque prosper by delivering a good quality service for user (worshipper) and customer (visitor) satisfaction. It is a collective responsibility of the various stakeholders of the mosque, consisting of both internal and external stakeholders. The internal stakeholders are mosque management, its working committees and worshippers, whereas the external stakeholders are visitors and government authorities (state or federal) (Baaki et al., 2016).

Table 1 Comparative analysis of the CSF elements emphasized by previous research

FM element	Critical Success Factor	Bhatia (2017)	Abdullah et al. (2017)	Suratkon et al. (2017)	Sapri et al. (2016)	Jaafar et al. (2013)	Mustafa et al. (2011)
People	Structured organization				✓	✓	
	Management commitment and leadership	✓			✓	✓	
	Allocation of resources	✓		✓		✓	
	Participation from stakeholders	✓		✓	✓	✓	
Place	Requirement to provide a conducive and safe environment	✓	✓		✓	✓	
	Design of mosque and compound			✓	✓	✓	
	Availability space for community gatherings			✓	✓	✓	
Process	Structured implementation approach	✓	✓			✓	✓
	Training & education	✓			✓	✓	✓
	Application of a systematic maintenance approach to facilities/equipment	✓	✓		✓	✓	✓
Technology	Cognitive computing	✓					
	Predictive maintenance	✓					
	Machine-to-machine interface	✓					
	Real-time monitoring and asset tracking, via RFID	✓					
	Energy management	✓					

3.1.2. CSF element 2: place

For mosques to be functional, their environment should be pleasant and welcoming for worshippers. Their architecture, decoration and aesthetics could influence people's relations with them, and their attachment to the setting. However, not only should the physical aspect of mosques be attractive, but they should also be capable of serving as places for community development. Therefore, mosques are integral to the development of the Islamic community, culture and civilization all over the world, including Malaysia (ITC, 2017). For this reason, mosques should be equipped with adequate and well-maintained facilities in order to support the execution of any planned activities. However, many cases have been reported regarding the mosque environment and maintenance issues that should be given serious attention in mosque FM. For instance, there was a case of lack of maintenance within a mosque building, and its roof unexpectedly collapsed (Sapri et al., 2016). Another case was the façade of a mosque. The façade is the key element of a building and it influences the comfort, safety and aesthetics of every mosque. Studies on mosques in Malaysia have highlighted that a lack of façade maintenance can have a serious financial impact on total maintenance costs.

3.1.3. CSF element 3: process

The life cycle of a mosque is similar to that of other buildings; they are all affected by defects and deterioration due to the wear and tear process (Mustafa et al., 2011). A systematic FM approach is needed to slowdown the deterioration process of mosques. Ignorance with regard to FM activity in mosques will result in widespread deterioration, which may lead to collapse. Issues in mosque maintenance are universal, and consideration of FM will encompass multiple

disciplines such as civil, mechanical and electrical (IFMA, 2018). Poor understanding of the concept of FM will lead to the attitude that the maintenance of civil work is less important than that of services in the buildings.

3.1.4. CSF element 4: technology

Buildings today are connected more than ever with the emergence of the fourth industrial revolution (IR 4.0) and its sub-elements, such the internet of things (IoT) and radio-frequency identification (RFID) technology (Setiawan & Asvial, 2016; Poespawati & Rifki, 2016; Liao et al., 2017). Nowadays, it is not uncommon to control temperature, lighting and other mechanical components automatically or remotely (Shrouf et al., 2014; Liao et al., 2017). IoT technology makes FM tasks easier, particularly in controlling and monitoring facilities. Through the IoT, it is possible to access data about everything, from temperature to equipment effectiveness, in real time remotely, thus reducing the time spent on repairs and regular maintenance tasks. Every aspect of an FM program can benefit from the IoT (Setiawan & Asvial, 2016; Liao et al., 2017). In the mosque environment, there is a growing demand for IoT technology to improve energy management and public safety (Al-Mohammed, 2017). Through this type of digital technology, the mosque authorities will be able to strategize in order to improve electricity and water wastage. For example, lighting and heating-ventilation-air-conditioning (HVAC) systems can be automated and designed to operate in operation-mode during business hours, and then automatically power down during off-hours. Besides, sensor systems using RFID can be employed to detect the level of occupancy in the mosque building and dim (or turn off) lights and turn down the HVAC system (Poespawati & Rifki, 2016; Al-Mohammed, 2017).

3.2. Development of the Research Framework

The final step in the review was aimed at developing the conceptual framework of a systematic FM approach towards the sustainable performance of mosques. The basis for this development was the work of previous researchers (Bakri, 2015; Dachyar et al., 2015). Four CSF constructs were identified to have the most significant impact on mosque FM and embedded as the main components in framework, as shown in Figure 2. These four constructs were combined based on Leavitt's Diamond, also known as Leavitt's System Model, as introduced by Harold Leavitt in 1972. This is one of the famous critical success factor models used in change management.

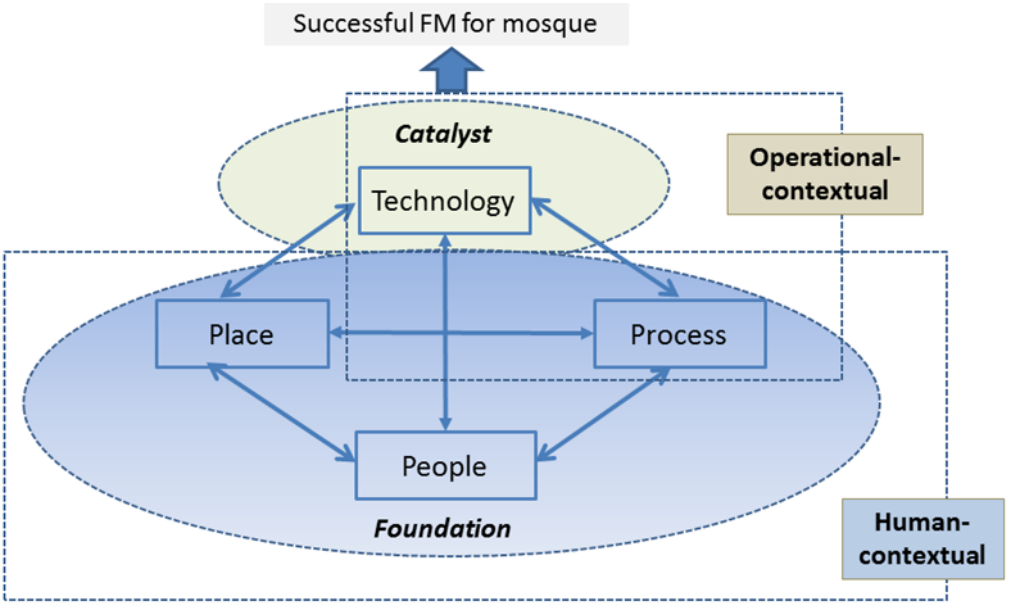

Figure 2 Conceptual framework for mosque FM

The conceptual framework for mosque FM outlines four interconnections and interdependent CSFs to support the objective: people, process, place and technology. These were further classified as two CSF groups. The first of these refers to the foundation of the organization, while the second refers to the catalyst for the mosque to achieve its FM mission. The foundation tasks of mosques are aimed at managing the mosque itself and providing a service to worshippers. 'People' are those responsible for managing and carrying out the FM tasks for the mosques. 'Process' is the workflow, communications and decision making by the 'people'. For mosques to be functional, their environment should be pleasant and welcoming for worshippers. The architecture, decoration and aesthetics of the mosque could influence worshippers' relation with it. 'Technology' refers to the application of the latest and most advanced tools and techniques in managing mosque FM. There is a growing demand for the application of digital technology to improve the FM in the mosque environment, in line with the emergence of IR4.0 and its sub-elements, such as the IoT and RFID. The concept of the "smart mosque" achieved through digital technology would significantly improve FM tasks in controlling and monitoring the facilities. Through the IoT and RFID technology, it would be possible to access data about everything related to the FM of mosques, such as HVAC equipment effectiveness and the level of occupancy of people in the mosque (particularly related to peak times and any crowding issues). As a further advance in improving the FM of mosques, real-time video surveillance with sophisticated recognition and analytics capabilities could also be used.

The foundation of this conceptual framework reflects the fundamental role of top management in managing the issues related to human and operational contextual factors in mosque FM. The human contextual factors require distinct consideration of each particular phase of the process. Improvement in mosque FM requires a radical change in the mindset of the 'people' within the mosque institution. Such tasks are challenging and represent a gradual effort. Sufficient and effective training programs for the 'people' would develop competency, skills and knowledge of world-class FM practice. Effective communication is vital in the FM process, since there are important interactions between the various stakeholders within and outside the mosque institution. Emphasis on the operational contextual factors would be the next stage after the human contextual factors have been relaxed. In order to ensure the success of mosque FM, the 'process' should be realistic, with strategic planning and a structured implementation approach. These would include activities such as establishment of the institution's vision and mission in relation to the FM program; assessment of the internal strengths, weaknesses, external opportunities and threats in achieving the goals of the program; development of a necessary action plan; allocation of appropriate resources; deployment of the tasks in pursuit of the goals; performance reporting; and making the necessary adjustments towards continual improvement. Appropriate monitoring of performance and evaluation of the progress of the FM would enable mosque management or authorities to review the achievements and further improve any setbacks in the FM program.

4. CONCLUSION

The literature review provided an overview of the CSFs for an effective FM approach in mosques. Managing mosques is regarded as one of the main devotional tasks of Muslims to Allah (the Almighty). It does not refer to the facilities and assets themselves. FM is an integral part of the overall management of mosques. Therefore, mosque FM should be efficient and systematic in order to serve the main purpose for which the mosque was built. Efficient and effective mosque FM is vital in supporting various religious and community activities. In addition, the advances in science and technology necessitate mosque management to adopt up-to-date facilities management techniques. From the economics perspective, efficient mosque FM will also include various tangible and intangible values, such as improving cost-effectiveness through the

optimization of electrical and water usage; quick action and fast decision making through systematic data monitoring; and improving safety, environmental and hygienic issues through systematic FM procedures. These will improve the quality of delivery and services to worshippers and have a positive impact on the prosperity of the mosque. A systematic FM approach to managing mosque facilities is still in its infancy. It has been discovered that no dedicated study has been made to assess FM in mosques. Therefore, there is an urgent need to study the FM approaches being adopted in mosques. The proposed new conceptual framework from the case study will provide guidelines and understanding on how FM should be conceived, managed and integrated with other key management activities within the context of mosques in Malaysia. It will also provide a clear and holistic understanding of the best practice approach to mosque FM.

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