# An Investigation of Facilities Management Implementation Process for Malaysian State Mosque

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**Abstract**

The mosque has been a focal point of Islam since its inception, serving as a place of worship, a centre of education, economic pursuits, communal services, and spirituality. However, due to a variety of causes, the scope of mosque functions has been constrained as the world has developed rapidly. In summary, congregational capacity and facilities relating to hygiene, safety, and space utilisation are among the problems being closely examined in Malaysia. Based on the problems, the subject of mosque management's competencies that need to be improved in order to become more professional arises. Reviews of literature suggested that facilities management (FM) approach has the potential to be incorporated in the management of mosque. The purpose of this study is to examine the implementation of FM process in mosque in supporting the achievement of mosque's functions. A quantitative approach was adopted in this study. The implementation of FM process from 12 state mosques in Peninsular Malaysia were investigated using questionnaire survey which distributed among the mosque management that manage mosque facilities. Descriptive statistics were used to analyse the questionnaire survey data with Statistical Package for the Social Sciences (SPSS) software. Results from the questionnaire survey revealed that, 50 per cent of the mosque has implemented most of the FM process model elements whereas other mosque still need further improvement to ensure the standards of FM process model is achieved. The results indicated that there is potential for improvement in mosque that possesses low position in implementing elements of FM process model that includes FM formulation strategy, requirement analysis of services, FM solutions development, FM solutions implementation and monitoring service provision. The finding could assist the top management level of the mosque in strategising the implementation action plan of mosque facilities management.

*Keywords*: Facilities management (FM) process, FM mosque, mosque management, mosque building, Malaysia

## ⊙1.0 INTRODUCTION

Facilities management (FM) emerged over the past decade in response to a turbulent change in the business environment. Pressure for rationalisation of business to reduce costs and improve flexibility has led to innovative approaches to managing facilities that support the business (Alexander, 1992; Baaki et al., 2019; Kamaruzzaman et al., 2018). Furthermore, the requirement of corporate strategies to create competitive advantage for the organisation's core business, customer responsiveness and the continual improvement of quality demand a complete rethinking of all processes and restructuring on an unprecedented scale (Atkin & Brooks, 2009; Koukiasa, 2011; Mazanec & Bartosova, 2018). Therefore, at a time of fundamental change in the public, private and nonprofit organisations, the recognition of the role of FM in business performance has gradually grown (Mazanec & Bartosova, 2018).

Mosque institution is classified as one of the nonprofit organization has been a focal point of Islam since its inception, serving as places of prayer, educational institutions, commercial endeavours, communal services, and spiritual centres. However, due to a variety of causes, the scope of mosque duties has become constrained as the world has progressed. In short, congregational capacity as well as amenities relating to sanitation, safety, and space utilisation have become issues in Malaysia that are being closely examined. In light of the problems, the subject of mosque management's competencies that need to be improved in order to become more professional arises. Therefore, the purpose of this paper is to reveal the potential of FM approach to be implemented within the mosque management context.

Moreover, review of literature shows that research on FM has been widely discussed in various case studies such as in higher education institutions, health care services, commercial buildings and office buildings. However, studies focusing on religious buildings such as mosque is still lacking (Muin, 2017; Sapri et al., 2016). This is not surprising as information on the importance of FM in supporting non-profit organisations to achieve their core business objectives appears to be limited (Kamaruzzaman et al., 2018). Thus, there is a research gap, as no study has been conducted on the implementation of FM process for mosque institutions. Hence, this research assesses FM process that been implemented by the mosque. The research findings will assist relevant parties to optimize FM approach for enhance the performance of mosque in future.

## ○2.0  LITERATURE REVIEW

### 2.1  Overview of Facilities Management

FM is a subset of general management and thus, it can support and make a positive contribution to organisational success (Amaratunga & Baldry, 2000). This picture of FM functions underlies Becker's (1990) verdict: "FM is responsible for coordinating all efforts related to planning, designing and managing buildings and their systems, equipment and furniture to enhance the organisation's ability to compete successfully in a rapidly changing world" (see Tay and Ooi, 2001, p. 358). Yet, poor FM could negatively impact an organisation such as failure to support the functioning of an organisation, not contributing to the organisation's mission, being cost inefficiencies, inadequacy and unavailability of the facility for future needs (Lavy et al., 2010; Nota et al., 2021).

The main objectives of FM could be categorised into two: supporting and sustaining the operations as well as activities performed by organisations together with their employees and managing support services and the environment within which work is carried out. This categorisation is reinforced by Chotipanich (2004) when he stresses that FM's key function is to integrate and manage support services as well as all available facilities of an organisation, to provide the needed support for the organisation's core business in both short term and long term.

From an overall view, FM can be defined as a multi-disciplinary process for carrying out the support services of organisations towards the achievement of core objective; and that the potential impact of FM on an organisation's success may be highly significant. An effective FM approach provides the needed support to an organisation's mission for the realisation of future facility requirements, greater cost efficiency and the ability to anticipate consequences of current management decisions. Therefore, organisations have to begin managing facilities proactively and creatively with commitment and a broader vision if they want to realise significant benefits from their enormous investment in facilities (Amaratunga, 2001; Nota et al., 2021; Pathirage et al., 2008).

As Chotipanich (2004) points out, FM as a management function plays a vital role in an organisation which could lead to partial failure or success of the organisation's business. This vital role entails providing supportive function through coordination of physical resources, workplace, and support service to the process of work and users. It should be noted that FM is essential to ensure that the primary activities of an organisation operate smoothly without disruption.

According to Nutt (2004), poor execution of the management of facility resources and support services would negatively impact an organisation's core business. For instance, outdated facilities and poor services could be detrimental to organisation and employees by constraining work performance, reducing productivity and damaging an organisation's image. Therefore, strategic FM would be required, though it seems clear that many practitioners operate at the operational level within their respective organisations (Grimshaw, 1999). In other words, FM should be at the heart of organisational development to increase the adaptability of changing business needs (Hamid, 2009).

### 2.2  Potential of Facilities Management Approach in Mosque Organisation

Organisations rely on their facilities and support services in unique ways (Atkin & Brooks, 2009; Chotipanich, 2004; Nota et al., 2021). Although the organisations may be in the same business sector, their requirement of facilities and FM function could differ (Chotipanich, 2004; Schindler, 1998). This situation may be attributed to the difference in cultural as well as business objective and the nature of the organisation (Chotipanich, 2004; Potkány et al., 2021).

According to Sapri et al. (2016), facilities is one of the important key drives that supported the functions of the mosque to build a conducive environment for the user. It also portrays the culture, identity and historical value to the Muslim community around the area. Furthermore, some of the mosques had been modernized with unique structure and become the hallmarks of the great Islamic civilization (Sapri et al., 2014). The attractiveness and design of the mosque become the material factor that expedites the attraction to visit the mosque (Najafi & Shariff, 2014). This has shown that an effective FM approach needs to be introduced to protect and sustain the billion ringgit that has been spending to build the mosque.

Decisions concerning the FM approach to be aligned with mosque management should be strategic decisions (Sapri et al., 2016). This should be based on insight into the contribution that facilities could make toward mosque organisational success such as creating a working environment of high-quality conditions that is supportive to the mosque's critical objectives (Rahman et al., 2015). Facilities provided must support the business and processes according to the needs of the mosque. This would lead to quality services and enhance mosque performances through quality managed facilities (Sapri et al., 2014, 2016).

As Hamid (2009) postulates, for FM to be adopted in the decision-making processes of an organisation, FM must be involved at the strategic level. To achieve this strategic level of involvement, a clear FM process should be developed to assist FM practices in the organisation. Developing the FM process requires understanding the needs of the organisation. This understanding is crucial for effective FM and could be measured using a value for money criteria via business processes (Atkin & Brooks, 2009; Potkány et al., 2021).

Furthermore, it should be noted that FM importance in an organisation could be realised when the organisation has a clearly defined management process (Potkány et al., 2021). Such an organisation could potentially improve its decision-making, stakeholder management, its organisational coordination and continuous improvement as well as being consistent in the delivery of its business goals (Hamid, 2009). Therefore, FM needs to find a way to retain its relevance and gain influence and position within the organisation to help transform the organisation (Alexander, 2008). This could be achieved through mapping of processes which could provide insight into their status as well as identifying opportunities to develop them and create plans for improvements (Hamid, 2009).

## 2.3  Application of FM Process to Mosque Management

FM is part of the management discipline. The British Institute of Facilities Management (BIFM) defines FM as the amalgamation of organisational processes to sustain and evolve the agreed services which facilitate and augment the efficacy of its essential activities. Based on this definition, FM could be classified as a process-based approach.

According to Barrett (2000), the FM process in an organisation could be improved by establishing a clear linkage between the strategies of FM and the core business of the organisation. Establishing such a linkage could create the assurance that FM would continuously deliver appropriate operational support needed by the organisation's core business; it would lead to improvements in the organisation's strategic context (Barrett, 2000). Furthermore, it is argued that the function of carrying out maintenance of buildings and coordinating the processes involved in planning and managing new as well as continuous physical projects in addition to changing use patterns are all within the remits of FM.

In the management literature, the term 'process' frequently defined as a set of related activities. In addition, Barrett and Baldry (2003) define the process as "a series of steps and decisions involved in the way work is completed". It is a series of action taken to produce specified results by logically bringing together the needed resources such as materials, equipment people, energy, and procedures. Thus, numerous studies have attempted to explain the application of FM processes and their relationship to an organisation.

From the review of literature, several studies have revealed that it is significant to develop the FM process model in an organisation (Atkin & Björk, 2007; Hamid, 2009; Sigg, 2008). These researchers stress that the FM process should be developed strategically to ensure integrated awareness regarding the necessity of improving organisation's assets and facilities is established through proper decision making and organisational framework. Therefore, the need to applied FM processes and their important relationship to mosque performance become the aims of this study to propose a suitable model to be adopted in mosque organisation.

In addition, a survey of the literature suggests that task-oriented or functional thinking in FM appears to be obsolete, with how work is done or process thinking appearing to be the way forward for FM implementation in organisations. Task-oriented thinking may lead to people resisting tasks that do not produce a tangible outcome in the short term. As a result, many facilities managers now consider process thinking to be an effective technique for optimising FM in an organization's business process. However, there have been few studies on process thinking in the context of FM. Hence, in order to assist FM practice in the organisation, a clear FM procedure should be designed. As a result, it is critical to do research that focuses on the FM process in order to examine the possibilities of the FM method in the context of mosque institutions.
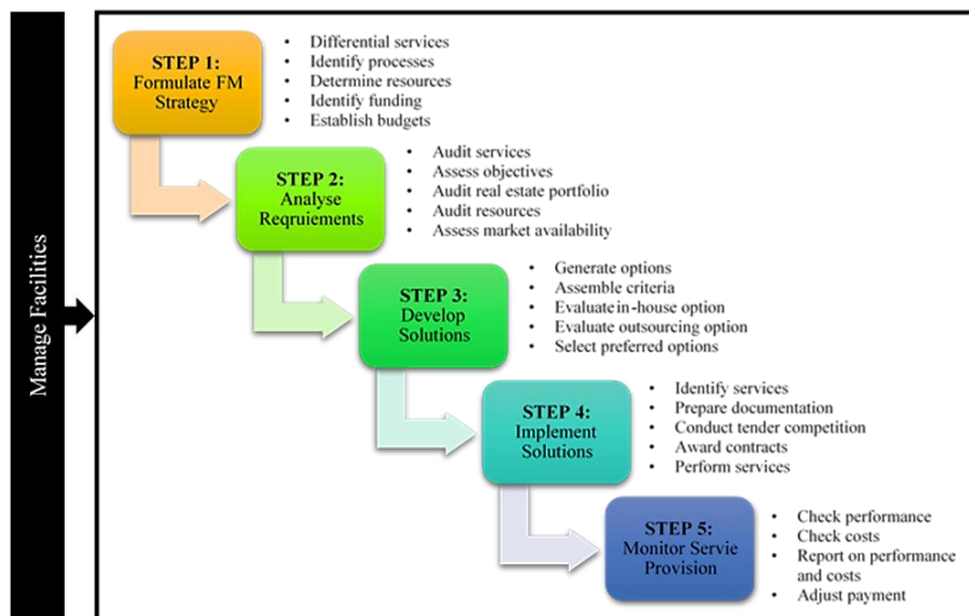
## 2.4  Approach of FM Process Model

From the foregoing discussion, it could be concluded that the FM process is an important ingredient for an organisation to enhance its performance. There are various studies had proposed the model of the FM process to be adopted in an organization. Yet, in the context of this study, the FM process model developed by Atkin and Björk (2007) appears to be appropriate to be adapted for this study. This is due to its flexibility to be adopted in any organisation which focuses more on strategic view. A top-down approach helps to propose an idea for the active involvement of top management in ensuring the effective FM in the management of the mosque.

Furthermore, this study is posited within the management process domain involving the application of FM process research. As proposed by Atkin and Björk (2007), the model is a 'fit for purpose' process model in which it focuses on the client's perspective. Moreover, it allows the contribution of current practices to the achievement of the best value and customer satisfaction to be examined. In this regard, the adaptation of the FM process model by Atkin and Björk (2007) to examine the mosque implementation of the FM process is relevant. Therefore, each process proposed by Atkin and Björk (2007) is vital to be understood to promote a more strategic approach to FM in supporting mosque function effectively and efficiently.

Based on the FM process model by Atkin and Björk (2007), the development of the FM process involves input, process, output, control and mechanism. It involves inputs in which it functions to transform the process into outputs. In the model, inputs represent facilities schedule as well as the business needs of the organisation while process concerns the subject 'managing facilities'; and the achievement of the best value and customer satisfaction represents outputs. Furthermore, other components of the model which are controls and mechanisms respectively represent financial limits, productivity and quality; human resources of facilities managers, senior management and service providers.

According to Atkin and Björk (2007), the FM process has been decomposed into two layers. The first layer is an initial decomposition of the FM process that consists of five key stages: Stage 1 – Formulate FM strategy, Stage 2 – Analysis requirements, Stage 3 – Develop Solutions, Stage 4 – Implement Solutions and Stage 5 – Monitor service provisions. Meanwhile, the second layer is the decomposition of the key stages that consists of various activities. The whole FM process proposed by Atkin and Björk (2007) can be illustrated in Figure 1.

**Figure 1** FM process model
(Source: Adapted from Atkin and Brooks, 2009)

## ⭕ 3.0 METHODS

This study embarks on a quantitative study. Therefore, the quantitative approach for data collection and data analysis will be used to build this study's breadth of outcomes.

### 3.1 The Questionnaire Survey

The objective of this study is to determine the elements of the FM process implemented in the mosque in which it purposefully investigates the mosque implementation of an FM process model. To achieve the objective, thus, a questionnaire survey is selected as the best method to conduct data collection. According to Creswell (2003), a questionnaire survey provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population. Selecting the best method for collecting surveys requires weighing several factors such as the complexity of questions, resources available or the project schedule (Frechtling, 2010).

The questionnaire was designed based on the FM process model developed by Atkin and Björk (2007) taken from the literature. This model used as the groundwork to survey by developing the questions according to the processes proposed in the model. Close-ended questions were used to get a higher response rate and contribute to efficient time in the data collection process. The development of the questionnaire was divided into two parts. The first part of the questionnaire focused on the respondents' background including their current job position, years of experience in managing mosque facilities and level of education. The second part of the questionnaire focused on the respondents' answer (yes/no) whether their mosque has implemented the elements of the FM process model.

In the context of this study, reason for using 2-point scale (yes/no) is based on several aspects. Firstly, 2-point response is relevant as it helps to have rigid response from the respondents where it helps to reduce an 'easy-out' response from the respondents as well as preclude from uncertainty response. In addition, Alwin (2007) suggested that the inclusion of a mid-point leads to lower reliability for shorter responses scale that has fewer items. Thus, there is no issue to used 2-points, 3-, 4-, or 100 points responses since it is proved rating scale have no substantial increase reliability aspect. Moreover, the main focus of this study is to have an insight on the mosque implementation of FM process. Data collection for this study is not intended to test the causal or relationship. Thus, reliability and validity of the questionnaire is not the priority.

A total of 26 questions were developed based on the selected FM process model by Atkin and Björk (2007). The design of the questions referred to the element and sub-elements of the FM process model and was divided into five key steps. It consists of:

a.    Step 1 - Formulating FM Strategy - six (6) elements
b.    Step 2 - Analysis Requirement - five (5) elements
c.    Step 3 - Developing Solutions - five (5) elements
d.    Step 4 - Implementing Solutions - six (6) elements
e.    Step 5 - Monitoring Service Provision - four (4) elements

### 3.2 Data Sampling

In analysing the data, descriptive analysis was adopted as the analytical approach using Statistical Package for the Social Science (SPSS) version 21 software. The frequency analysis was performed to identify the mosque implementation on the 26 elements that have been

identified from the FM process model developed by Atkin and Björk (2007). Additionally, the crosstab analysis was performed to determine the relationship between state mosque and the elements of the FM process model.

Cross tabulation displays a summary of the distribution of two or more variables. It demonstrates the frequency distribution of how one variable relates to one or more other variables. In this study, the cross-tabulation analysis is conducted helps to have a comparison among the state mosque in Peninsular Malaysia that most implemented the elements from the FM process model. This analysis is important as it provides an overview regarding the current practice of mosque in managing the facilities. It is hoped that the results from this analysis could indicate which of the twelve state mosques has the potential to reach the standard of the FM process model.

While entering the data into SPSS software, letters and numbers were used as the code to represent the statements. The letter represents the key steps of the FM process model, while the number refers to the sequence of statements that represents the sub-elements of each key steps of the FM process model. For example, A1 represent the first statement under the 'Step 1 – Formulate FM strategy'. The code was created to facilitate the process during data analysis in SPSS and interpretation when presenting the findings. The summary code of the questionnaire is shown in Table 1.

**Table 1** List of FM process model elements and its code to represent the statement of respondents in SPSS

| Facilities Management Process Model (FMPM) | | Code |
|---|---|---|
| **Step 1** | **Formulate FM Strategy** | |
| Sub-Elements | Identify the needs of user | **A1** |
| | Differentiate between core service and non-core service | **A2** |
| | Identify and establish process for meeting the needs of user and organisation | **A3** |
| | Determine resources required for providing services, whether obtained internally or externally | **A4** |
| | Identify the source of funds to provide service | **A5** |
| | Establish budget, either short or long term to provide service | **A6** |
| **Step 2** | **Analysis Requirement** | |
| Sub-Elements | Review or audit the services | **B1** |
| | Assess organisational expectation and objective | **B2** |
| | Review or audit the portfolio | **B3** |
| | Review or audit the resources | **B4** |
| | Assess market availability | **B5** |
| **Step 3** | **Developing Solutions** | |
| Sub-Elements | Generate options whether to in-house, outsource or mixed method in providing service | **C1** |
| | Assemble criteria of in-house and outsource option | **C2** |
| | Evaluate in-house and outsource option | **C3** |
| | Select in-house option to provide service | **C4** |
| | Select outsource option to provide service | **C5** |
| **Step 4** | **Implement Solutions** | |
| Sub-Elements | Review existing provision in order to identify services required by considering productivity and quality targets | **D1** |
| | Prepare documentation of service specification | **D2** |
| | Prepare documentation of service level agreement | **D3** |
| | Prepare documentation of condition of contract | **D4** |
| | Conduct tender competition | **D5** |
| | Award contracts | **D6** |
| **Step 5** | **Monitor Service Provisions** | |
| Sub-Elements | Check facilities and service performance | **E1** |
| | Check cost by considering productivity and quality targets | **E2** |
| | Prepare report on facilities and service performance | **E3** |
| | Adjust payment by considering financial limits | **E4** |

## ⭕4.0  RESULTS AND DISCUSSION

### 4.1  Implementation of Mosque FM Process

This section presents the results from the analysis of the implementation of the FM process in the mosque. The FM process composes of key steps where the steps are translated into elements with sub-elements totalling 26 items. The results obtained from these steps are discussed in turn.

### 4.1.1 Step 1: Formulating FM Strategy

Table 2 represents the elements of Step 1 - FM process that has been implemented in the mosque. Step 1, which entails Formulate the FM strategy involves six sub-elements that required the respondents to answer based on their knowledge and experience in managing mosque facilities. These elements include: identify the needs of the user (A1), differentiate services (A2), identify and establish process (A3), determine resources (A4), identify the source of funds (A5) and establish a budget (A6).

As can be seen, except for identifying the needs of the user, all the elements considered in formulating the FM strategy was found to be implemented by the study participants. The overwhelming majority of the respondents (83.3%) do not identify the needs of users and the organisation (A1), while only 16.7% of the respondents stated that they do identify the needs of users during their practices.

Meanwhile, a significant percentage (91.7%) of respondents indicated that they differentiate between core service and non-core service (A2) during the formulation of FM strategy with only 8.3% not differentiating between core and non-core services. Furthermore, the majority of the respondents (75.0%) were found to identify and establish a process for meeting the needs of user and organisation (A3), as well as determine resources required for providing services (A4) while all the respondents were found to identify the source of funds to provide the needed services (A5) with about 67% establishing budget (A6) in formulating FM strategy.

**Table 2** Analysis of elements considered in formulating FM strategy

| Item | N | | Frequency | | Percentage (%) | |
|------|-------|---------|-----|-----|-------|------|
|      | Valid | Missing | Yes | No  | Yes   | No   |
| **A1** | 12 | 0 | 2  | 10 | 16.7  | 83.3 |
| **A2** | 12 | 0 | 11 | 1  | 91.7  | 8.3  |
| **A3** | 12 | 0 | 9  | 3  | 75.0  | 25.0 |
| **A4** | 12 | 0 | 9  | 3  | 75.0  | 25.0 |
| **A5** | 12 | 0 | 12 | -  | 100.0 | -    |
| **A6** | 12 | 0 | 8  | 4  | 66.7  | 33.3 |

### 4.1.2 Step 2: Analysis Requirement

The Analysis of Requirements step consists of five sub-elements that required responses from the respondents of the study. These sub-elements include: review or audit the services (B1), assess organisation's expectation and objective (B2), review or audit the portfolio (B3), review or audit the resources (B4) and assess market availability (B5). Table 3 shows the result of the analysis of the elements considered during step 2 of the implementation of the FM process.

As Table 3 shows, except for assessing market availability, all the elements under Analysis of Requirements we found to be implemented by the majority of the respondents of the study. While all respondents stated that they do assess organisational expectation and objective (B2), about 83% of the respondents indicated that they undertake to review or auditing of their portfolio (B3). Similarly, 67% indicated they undertake to review or audit of the service (B1), 58.3% carrying out review or audit of resources (B4) with only 16.7% assessing market availability (B5).

**Table 3** Analysis of elements considered in the analysis of requirements

| Item | N | | Frequency | | Percentage | |
|------|-------|---------|-----|-----|-------|------|
|      | Valid | Missing | Yes | No  | Yes   | No   |
| **B1** | 12 | 0 | 8  | 4  | 66.7  | 33.3 |
| **B2** | 12 | 0 | 12 | -  | 100.0 | -    |
| **B3** | 12 | 0 | 10 | 2  | 83.3  | 16.7 |
| **B4** | 12 | 0 | 7  | 5  | 58.3  | 41.7 |
| **B5** | 12 | 0 | 2  | 10 | 16.7  | 83.3 |

### 4.1.3 Step 3: Developing Solutions

Five sub-elements are involved in this step that is, developing solutions, to which the respondents responded and were analysed. These five sub-elements include: generate options (in-house, outsource or mixed-method) (C1), assemble criteria of in-house and outsource option (C2), evaluate in-house and outsource option (C3), the select in-house option to provide service (C4) and select outsource option to provide service (C5).

Table 4 presents the results from the analysis of the elements considered in developing FM solutions as the third step in implementing the FM process in the mosque facilities management. As can be seen, selecting outsource option to provide service (C5) is the major activity to implemented by the majority of the respondents (75%) whereas evaluating in-house and outsource option (C3) are least performed, by 75% of the respondents. Also, generating options of in-house, outsource or mixed-method (C1) and assembling criteria for in-house and outsource option (C2) were each performed by about 58% of the respondents with 50% selecting in-house option to provide the needed service (4).

**Table 4** Analysis of elements considered in developing solutions

| Item | N | | Frequency | | Percentage | |
|---|---|---|---|---|---|---|
| | Valid | Missing | Yes | No | Yes | No |
| C1 | 12 | 0 | 7 | 5 | 58.3 | 41.7 |
| C2 | 12 | 0 | 7 | 5 | 58.3 | 41.7 |
| C3 | 12 | 0 | 3 | 9 | 25.0 | 75.0 |
| C4 | 12 | 0 | 6 | 6 | 50.0 | 50.0 |
| C5 | 12 | 0 | 9 | 3 | 75.0 | 25.0 |

### 4.1.4 Step 4: Implementing Solutions

The step of implementing developed solutions involves six sub-elements which were analysed. These sub-elements include: review existing provision (D1), prepare documentation of service specification (D2), prepare documentation of service level agreement (D3), prepare documentation of contract condition (D4), conduct tender competition (D5) and award contracts (D6). The results of these analyses are presented in Table 5. The results show that only the element of reviewing existing provision to identify services (D1) are implemented by the majority of the respondents (about 58%). The remaining elements were implemented by only 25% or less, of the respondents with none involving in the award of contracts (D6). Indeed, only about 8% of the respondents prepare service level agreement (D3) or conduct tender competition (D5).

**Table 5** Analysis elements involved in implementing solutions

| Item | N | | Frequency | | Percentage | |
|---|---|---|---|---|---|---|
| | Valid | Missing | Yes | No | Yes | No |
| D1 | 12 | 0 | 7 | 5 | 58.3 | 41.7 |
| D2 | 12 | 0 | 3 | 9 | 25 0 | 75.0 |
| D3 | 12 | 0 | 1 | 11 | 8.3 | 91.7 |
| D4 | 12 | 0 | 2 | 10 | 16.7 | 83.3 |
| D5 | 12 | 0 | 1 | 11 | 8.3 | 91.7 |
| D6 | 12 | 0 | - | 12 | - | 100.0 |

### 4.1.5 Step 5: Monitoring Service Provision

The step of monitoring service provision involves consideration of four elements that required the respondent to answer based on their knowledge and experience in managing mosque facilities. The elements include: check performance (E1), check cost (E2), prepare a report on performance and cost (E3) and adjust payment (E4). Table 6 presents the results of the analysis of data obtained for the implementation of the elements that constitute the monitoring service provision. The results show that all respondents (100.0%) do check performance (E1). Also, the majority of the respondents (58.3%) check cost (E2) where a minority of about 42% each carry out preparation of a report on performance and cost (E3), and adjustment of payment (E4).

**Table 6** Analysis elements involved in monitoring service provision

| Item | N | | Frequency | | Percentage | |
|---|---|---|---|---|---|---|
| | Valid | Missing | Yes | No | Yes | No |
| E1 | 12 | 0 | 12 | - | 100.0 | - |
| E2 | 12 | 0 | 7 | 5 | 58.3 | 41.7 |
| E3 | 12 | 0 | 5 | 7 | 41.7 | 58.3 |
| E4 | 12 | 0 | 5 | 7 | 41.7 | 58.3 |

### 4.2 Cross Tabulation Analysis

The cross-tabulation analysis regarding the state mosques in Peninsular Malaysia and the sub-elements for each key step of implementing the FM process. The analysis was used to make a comparison among the state mosques on the sub-elements implemented by them. The analysis results are aimed to identify the level of mosque implementation of the FM process. The results of this analysis provide an overview of the implementation of the twelve state mosques. It is hoped that the results from this analysis could indicate which of the twelve state mosques has the potential to reach the standard of the FM process. Letters and numbers were used as the code to represent the lists of state mosques (refer to Table 7).

**Table 7** Code for each state mosques in Peninsular Malaysia

| State | Code |
|---|---|
| Johor | M1 |
| Melaka | M2 |
| Negeri Sembilan | M3 |
| Selangor | M4 |
| Wilayah Persekutuan Kuala Lumpur | M5 |
| Perak | M6 |
| Pulau Pinang | M7 |
| Kedah | M8 |
| Perlis | M9 |
| Kelantan | M10 |
| Terengganu | M11 |
| Pahang | M12 |

### 4.2.1 Cross-tab of Formulating FM Strategy by State Mosque

Table 8 presents the results of cross-tab analysis between the lists of state mosques and the elements of the FM process implemented by the state mosques during the formulation of the FM strategy. As can be seen, the majority of the mosques implemented more than half of all the elements involved in the formulation of the FM strategy. For example, it is observed that two of the state mosques, namely M5 and M10 have implemented all the elements while adding five state mosques, coded M2, M4, M7, M11 and M12 have implemented five of these elements each with two mosques, that is, M3 and M8, implementing four elements each. However, one mosque, M6, implemented only one of the elements.

**Table 8** Cross-tab analysis of state mosque by elements of formulating FM strategy

| Sub-Elements | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 |  |  |  |  | 1 |  |  |  |  | 1 |  |  | 2 |
| A2 | 1 | 1 | 1 | 1 | 1 |  | 1 | 1 | 1 | 1 | 1 | 1 | 11 |
| A3 |  | 1 | 1 | 1 | 1 |  | 1 | 1 |  | 1 | 1 | 1 | 9 |
| A4 |  | 1 | 1 | 1 | 1 |  | 1 | 1 |  | 1 | 1 | 1 | 9 |
| A5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 |
| A6 | 1 | 1 |  | 1 | 1 |  | 1 |  |  | 1 | 1 | 1 | 8 |
| **Total** | 3 | 5 | 4 | 5 | 6 | 1 | 5 | 4 | 2 | 6 | 5 | 5 | 51 |

### 4.2.2 Cross-tab of Analysis of Requirements by State Mosque

The result of cross-tab analysis Analysis of Requirements and State Mosque is presented in Table 9. As shown by the table, the greater majority of the mosques implemented more than half of the elements involved in the Analysis of Requirements of the FM process. These mosques include M11 which implemented all the five elements; M2, M3, M4, M5 and M7 which implemented four of the elements; and M1, M9 and M10 which implemented three elements. However, one mosque, M8, was found to have implemented only one out of five elements that are considered in the Analysis of Requirements.

The literature review suggests that the Analysis of Requirements aims to establish a thorough understanding of the present state of the organisation's real estate and its approach to FM. This understanding would stimulate new and innovative approaches to providing high-quality service. Except for assessing the market availability (B5), all the elements are implemented by most of the state mosques. This situation may be due to fact that most of the state mosques are not exposed to the assessment of the market availability while conducting the requirement analysis as a result of the difficulties involved in cultural changes in fulfilling the needs and expectation of the user or customer of the service.

**Table 9** Cross-tab analysis of state mosque by elements of analysis of requirements

| Sub-Elements | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B1 |  | 1 | 1 | 1 | 1 |  | 1 |  | 1 |  | 1 | 1 | 8 |
| B2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 |
| B3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |  | 1 | 1 | 1 |  | 10 |
| B4 |  | 1 | 1 | 1 | 1 |  | 1 |  |  | 1 | 1 |  | 7 |
| B5 | 1 |  |  |  |  |  |  |  |  |  | 1 |  | 2 |
| **Total** | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 1 | 3 | 3 | 5 | 2 | 39 |

### 4.2.3 Cross-tab of Developing Options by State Mosque

The results of the cross-tabulation analysis between elements involved in developing solutions and state mosques are presented in Table 10. As indicated in Table 10, there are only two state mosques that have implemented all the elements for Step 3 – develop solutions. These two state mosques include M5 and M10. This followed by M4 with four elements. M2, M3, M7 and M11 have implemented three out of five elements, whereas M1, M6, M9 and M12 only with one element. However, M8 is the only state mosque that implemented two elements for this stage.

Based on the findings, most of the state mosques have generated their operation mode to deliver non-core services, whether in-house, outsource or mixed-method (C1). The operation mode was selected based on the criteria assembled (C2) by the state mosques. However, most of the state mosque have not involved in evaluating the criteria whether to in-house or outsource (C3). The evaluation and selection of the options will depend on the consideration of the Jabatan Agama Islam Negeri (JAIN) as the responsible body to make the decision and approve the budget.

The findings also indicate that most of the state mosques prefer to outsource their non-core activities since it is the best desirable choice. Yet, this method still has weaknesses to be considered. Overall, M10 becomes the only state mosque that was really into the process at this stage. It shows the management of M10 has a positive environment as it involves everyone in the organisation in making decisions.

**Table 10** Cross-tab analysis of state mosque by elements of developing solutions

| Sub-Elements | List of State Mosques | | | | | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | |
| C1 | | 1 | 1 | 1 | 1 | | 1 | | | 1 | 1 | | 7 |
| C2 | | 1 | 1 | 1 | 1 | | 1 | | | 1 | 1 | | 7 |
| C3 | | | | 1 | 1 | | | | | 1 | | | 3 |
| C4 | 1 | | | | | | 1 | 1 | 1 | 1 | | | 6 |
| C5 | | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | 1 | 9 |
| Total | 1 | 3 | 3 | 4 | 4 | 1 | 4 | 2 | 1 | 5 | 3 | 1 | 32 |

### 4.2.4 Cross-tab of Implementing Solutions by State Mosques

Table 11 shows the result of cross-tabulation analysis between elements involved in implementing solutions and state mosques. The finding indicates that almost all the state mosques do not implement the elements that are considered necessary during the implementation of solutions. Indeed, only two of the mosques, M5 and M4 were found to implement four of the six whilst five mosques implemented none of the elements. The rest of the mosque, except M3, implemented only one element.

These findings could be attributed to the fact that, as suggested by most of the state mosques facilities managers who participated in this study, they are not made to be involved in the implementation of solutions. This situation has come about because of the absence of the existence of special unit at the top of the state mosques' organisational structure. Accordingly, the processes of preparing documentation of service specification, service level agreement and contract condition; and conducting the tender competition and awarding contracts are beyond the jurisdiction of the state mosques.

These processes are normally conducted by the senior management at Jabatan Agama Islam Negeri (JAIN). However, as stated above, few state mosques have direct involvement in the implementation of the elements. The involvement of these two state mosques would offer opportunities to the management of the mosque to express their opinions in decision making.

**Table 11** Cross-tab analysis of state mosques by elements of implementing solutions

| Sub-Elements | List of State Mosques | | | | | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | |
| D1 | | | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | | 7 |
| D2 | | | 1 | 1 | 1 | | | | | | | | 3 |
| D3 | | | | | 1 | | | | | | | | 1 |
| D4 | | | | 1 | 1 | | | | | | | | 2 |
| D5 | | | | 1 | | | | | | | | | 1 |
| D6 | | | | | | | | | | | | | 0 |
| Total | 0 | 0 | 2 | 4 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 14 |

### 4.2.5 Cross-tab of Monitoring Service Provision by State Mosques

The results of the cross-tabulation between state mosques and monitoring of service provisions are presented in Table 12. These results clearly show that half of the mosques implement the elements involved in monitoring the provision of services. These mosques comprise M4, M5, M10 and M11 which implement all four elements, and M3 and M9 which implement 3 elements each. However, the remaining mosques implement only one element each.

Furthermore, it could be seen that the state mosques mainly focus on monitoring activities by checking the performance of the facilities and services delivered. This implies that the managers of the state mosques are aware of the necessity to ensure the facilities and services achieve the designated quality standards.

**Table 12** Crosstab analysis of state mosques by monitoring service provisions

| Sub-Elements | List of State Mosques | | | | | | | | | | | | Total |
| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 |
| E2 | | | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | 7 |
| E3 | | | 1 | 1 | 1 | | | | | | 1 | 1 | 5 |
| E4 | | | | 1 | 1 | | | | 1 | 1 | 1 | | 5 |
| Total | 1 | 1 | 3 | 4 | 4 | 1 | 2 | 1 | 3 | 4 | 4 | 1 | 29 |

From the foregoing discussions, the total elements of the FM process implemented by each state mosque were computed. This computation led to the identification of several elements of the FM process that are mostly implemented in the states mosques. These elements and their sub-elements are summarised in Figure 2.
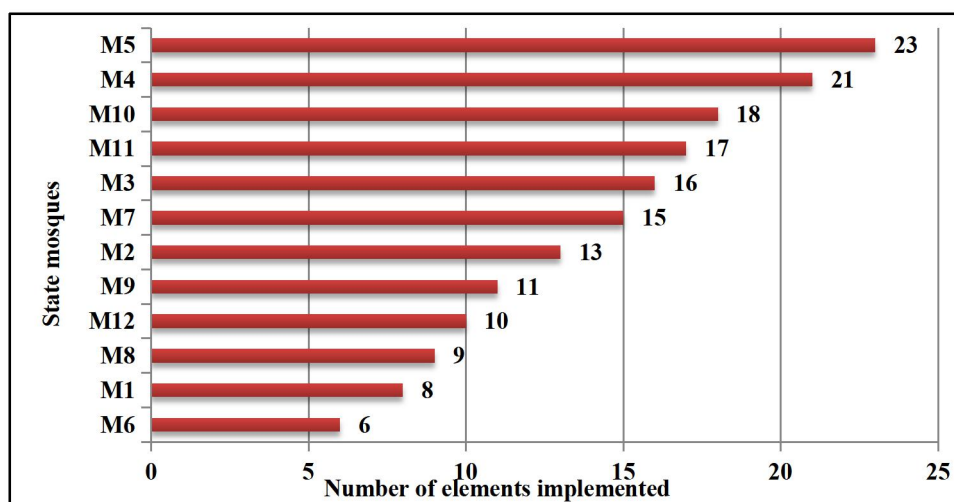


**Figure 2** Ranking of state mosque in the implementation of FM process

Figure 2 presents the finding in the form of ranking of the state mosques concerning these elements. In all, a total of 26 sub-elements of the FM process were measured among the twelve mosques. As can be seen, seven mosques implemented a minimum of 13 elements, constituting more than 50% of the total elements with the only mosque implementing the highest number of elements, that is, 23 out of 26 elements.

On the other hand, the mosque that implemented the least number of elements implemented only 6 elements of the total. It could be argued that much is needed to be done to achieve a higher level of implementation of the FM process in the management of state mosques in Peninsular Malaysia. In other words, the analysis results provide an insight regarding the strengths and weaknesses of the state mosque implementation of the elements of the FM process. Thus, it is necessary to map the strengths and weaknesses of state mosques in managing the facilities. This could help the management of state mosques in developing a well-planned strategy to support its core business. Based on the viewpoint relayed by Amaratunga et al. (2002), a planned strategy entails a process of logical thinking and rational control. This strategy is seen as the traditional approach by which organization makes sense of the future based on the past experience. On the other hand, the management of the state mosque should consider the emergent strategy. According to Chotipanich (2004), this kind of strategy is an ad-hoc solution, designed for a specific problem or task which is not intended to be adapted for other purposes. As a result, both strategies must be considered at an early stage, whereby extensive planning and involvement by FM practitioners will aid in delivering strategic relevance.

## ⊙5.0  CONCLUSION

Study in FM that related to the mosque is still at its infancy; yet to receive a comprehensive view among researchers. This paper contributes to bridging the research gap by proposing the adoption of the FM approach into mosque management. It is claimed in the literature that facilities management strategy contributes towards organisational success. The present work discovers that 50 per cent of the state mosques have implemented most of the elements of the FM process.

However, the remaining 50 per cent needs further improvement to ensure that a high standard of FM process is achieved. The results provide a general view regarding the implementation of the FM process in mosques, indicating the existence of potentials for improvement towards the effective and efficient achievement of the functions of state mosque. Accordingly, these results could assist the top management level of the mosque in considering the lower position of state mosque to improve the FM process. Therefore, the outcome indicates a root for another research drawing the attention of study in FM to the mosque. In this way, FM could directly be integrated into mosque management as a way to holistically uplift the functions of the mosque. By way of implication, this study has contributed to the development of theory in terms of case study in FM.

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