



PLANNING MALAYSIA:

Journal of the Malaysian Institute of Planners

VOLUME 24 ISSUE 5 (2026), Page 681 – 698

**INTEGRATING COMMITTEE MEMBERS' PERSPECTIVES INTO
PERFORMANCE-BASED MAINTENANCE PLANNING:
EVALUATING SERVICE QUALITY AND SAFETY AND HEALTH
FOR MASJID KARIAH IN KELANTAN, MALAYSIA**

**Azhar Yusof¹, Mohamad Ridzuan Yahya²,
Faridah Ismail³, Siti Fatimah Hashim⁴**

*^{1,2,3,4}College of Built Environment,
UNIVERSITI TEKNOLOGI MARA*

Abstract

This study investigates the integration of committee members' perspectives into performance-based maintenance planning, focusing on service quality and safety and health aspects in Masjid Kariah across 10 districts in Kelantan, Malaysia. Through a structured questionnaire survey involving 354 committee members from 59 mosques, the research examines reported practices and assessments of three maintenance strategies. Planned Corrective Maintenance (PCM) accounted for 66.1% of recorded strategy categories. Planned Preventive Maintenance (PPM) received the highest mean ratings across all nine indicators. Exploratory Friedman comparisons of mosque-level mean ratings identified overall differences among strategy ratings for every indicator (Holm-adjusted permutation $p < 0.001$; Kendall's $W = 0.903-1.000$). An additional mosque-level chi-square test found no statistically significant association between maintenance frequency and recorded strategy category ($p = 0.765$). The findings highlight committee members' priorities for service delivery, equipment inspections and cleanliness. These assessments represent management perceptions and do not establish the operational effectiveness of individual maintenance strategies.

Keywords: Performance-Based Maintenance, Service Quality, Safety and Health, Committee Perspectives, Masjid Kariah

¹ Corresponding author. Email: azharbinyusof@gmail.com

INTRODUCTION

The maintenance of religious facilities, particularly mosques, plays a vital role in preserving their functionality, safety and service quality (Zaini & Mizal Azzmi, 2023). In Malaysia, Masjid Kariah serves as community hubs, providing not only a place for worship but also a space for various social and educational activities (Au-Yong et al., 2017). As these facilities age and face increasing demands, ensuring their upkeep through effective maintenance planning becomes imperative. The performance-based approach has emerged as a key framework, prioritizing measurable outcomes such as reliability, safety, and user satisfaction (Swanson, 2001; Tsang, 2002). Maintenance concept development provides a framework for relating strategy choices to facility requirements (Waeyenbergh & Pintelon, 2002). Examining mosque committee members' perspectives adds an organisational view of the priorities guiding these choices.

Kelantan offers a context for examining maintenance practices in Masjid Kariah. Research on mosque design failures demonstrates the importance of considering facility-specific requirements in maintenance management (Khalid et al., 2024). This study incorporates the insights of committee members, who possess firsthand knowledge of the operational and maintenance challenges faced by their respective mosques. Their administrative responsibilities provide access to maintenance decisions and arrangements, although their views do not necessarily represent the experiences of all mosque users.

The objective of this study is to evaluate committee members' perceptions of performance-based maintenance strategies for Masjid Kariah in Kelantan, emphasizing service quality, safety, and health. By integrating committee members' perspectives, this study aims to provide actionable recommendations for enhancing maintenance practices. The study employs a quantitative methodology, analyzing data from 354 committee members across 59 mosques. Its contribution lies in examining service quality and safety and health assessments together within a religious-facility maintenance context. The analysis distinguishes recorded maintenance categories from respondents' evaluations of Planned Preventive Maintenance (PPM), Planned Corrective Maintenance (PCM) and Unplanned Maintenance (UM).

LITERATURE REVIEW

Performance-based maintenance planning is a structured approach that focuses on achieving specific outcomes, such as reliability, safety, and operational efficiency. Tsang (2002) examines the strategic alignment of maintenance with organisational goals, while Swanson (2001) considers the relationship between maintenance strategies and performance. In the context of religious institutions, PPM's emphasis on regular inspections and systematic interventions aligns well

with the operational requirements of mosques. However, strategy selection also involves responding to defects and operational constraints. Waeyenbergh & Pintelon (2002) provide a framework for developing maintenance concepts that connects these decisions to organisational and technical requirements. This supports examining preventive, corrective and unplanned maintenance within a common assessment framework.

The integration of stakeholder perspectives is increasingly recognized as a critical factor in maintenance planning. Au-Yong et al. (2017) highlight that engaging key stakeholders enhances service quality and fosters a sense of ownership. This participatory approach is particularly relevant for community facilities like Masjid Kariah, where the involvement of committee members can bridge the gap between centralized policies and localized needs. Zaini and Mizal Azzmi (2023) further note that committee members provide an organisational perspective because their responsibilities involve administration, resource allocation and maintenance decisions. Their assessments can identify management priorities, while mosque users and maintenance personnel can provide complementary evidence on service experiences and technical performance.

Maintenance planning involves coordinating preventive activities, corrective work and responses to unexpected defects. A maintenance concept therefore requires consideration of organisational objectives and technical requirements rather than reliance on a single strategy in all circumstances (Waeyenbergh & Pintelon, 2002). For mosque facilities, research on design failures illustrates the relevance of building-specific conditions to maintenance management (Khalid et al., 2024). These considerations support examining committee members' assessments of different strategies, while distinguishing perceived service performance from independently measured costs, defects and safety outcomes.

This study builds on these insights by examining the application of performance-based maintenance planning in the specific context of Masjid Kariah in Kelantan. By incorporating the perspectives of committee members, it seeks to identify maintenance priorities reflected in service quality and safety and health assessments. The research considers preventive, corrective and unplanned maintenance through a common set of indicators. These assessments provide evidence on management perceptions without directly establishing the operational effectiveness of the strategies.

Service quality provides a complementary perspective by examining how maintenance services are perceived. Parasuraman et al. (1988) developed SERVQUAL around five dimensions: reliability, assurance, tangibles, empathy and responsiveness. Reliability concerns dependable and accurate service delivery; assurance relates to the knowledge and courtesy of personnel and their

ability to inspire confidence; tangibles concern physical facilities, equipment, and personnel; empathy involves individualised attention; and responsiveness concerns willingness to help and provide prompt service. These dimensions provide the conceptual basis for the service quality indicators adapted in this study. Within the mosque maintenance context, the indicators address scheduled service delivery, perceived efficiency, maintenance service provision, attention to complaints and assistance from maintenance personnel.

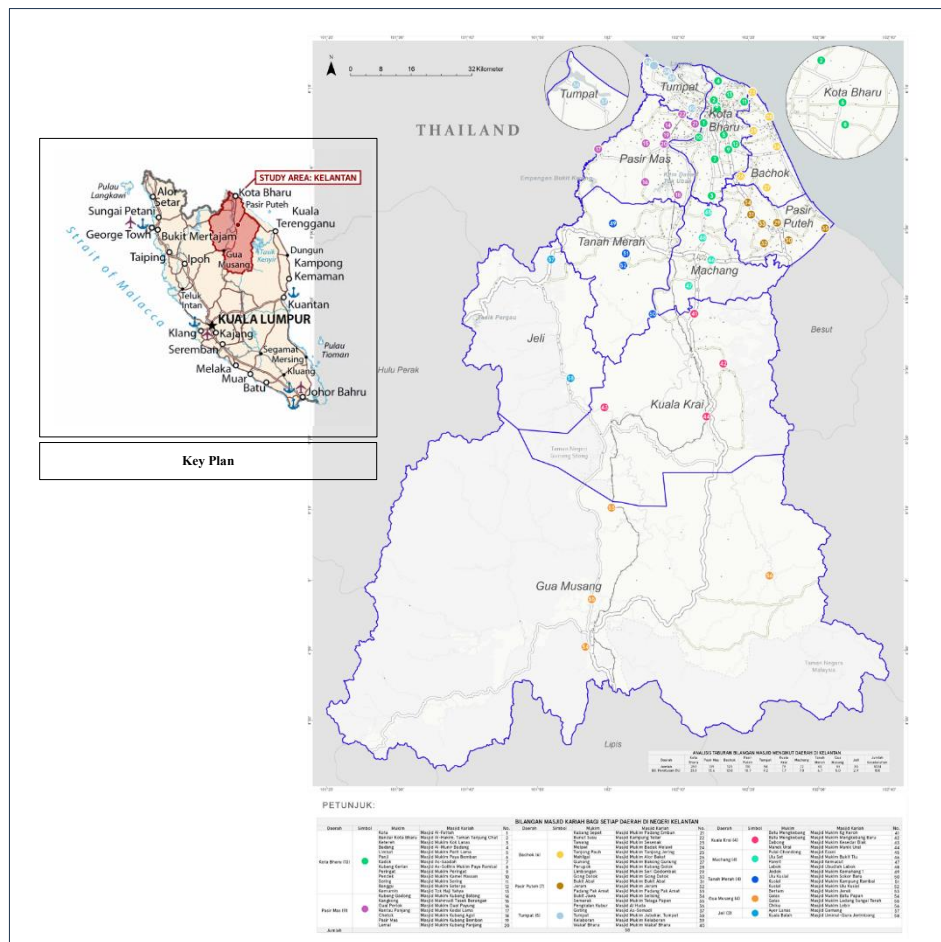
Safety and health extend maintenance evaluation beyond service delivery to the conditions supporting safe and suitable facility use. Research on design failures in mosque facilities illustrates the relevance of building-specific issues to maintenance management (Khalid et al., 2024). In the present study, safety indicators concern perceived protection from falls and trips and the regular inspection of equipment systems. Health indicators address perceptions of building-related health conditions and cleanliness. Considering these dimensions alongside service quality enables maintenance priorities to encompass both service provision and the mosque environment. Nevertheless, these indicators capture respondents' assessments rather than independently verified safety or health outcomes. Their interpretation therefore requires a distinction between perceived maintenance performance and evidence obtained through physical inspections, environmental measurements, or incident records.

RESEARCH METHODOLOGY

This study employed a quantitative questionnaire survey to examine committee members' perceptions of maintenance strategies in relation to service quality and safety and health in Masjid Kariah, Kelantan, Malaysia. The survey formed part of a wider study on mosque maintenance planning. This study focused on reported maintenance practices, the association between maintenance frequency and recorded strategy category, and respondents' evaluations of Planned Preventive Maintenance (PPM), Planned Corrective Maintenance (PCM) and Unplanned Maintenance (UM). The study covered 59 Masjid Kariah across 10 districts: Kota Bharu, Pasir Puteh, Jeli, Machang, Gua Musang, Tanah Merah, Pasir Mas, Tumpat, Kuala Krai and Bachok. Figure 1 shows the geographical distribution of the 59 selected Masjid Kariah across the ten districts of Kelantan. The sample comprised 13 mosques in Kota Bharu, nine in Pasir Mas, seven in Pasir Puteh, six in Bachok, five each in Tumpat and Kuala Krai, four each in Machang, Tanah Merah and Gua Musang, and two in Jeli.

A multistage sampling approach was adopted. The sampling frame comprised 584 Masjid Kariah, from which approximately 10% were selected within each district, resulting in 59 participating mosques. Six committee members represented each mosque: the chairman or nazir, deputy chairman or deputy nazir, development committee representative, secretary, deputy secretary

and treasurer. These positions were selected for their involvement in mosque administration and maintenance-related decisions. The final dataset comprised 354 respondents. Individual committee members constituted the unit of analysis for descriptive perception ratings, while mosques constituted the units for the additional inferential analyses.



The structured questionnaire collected information on mosque characteristics, respondents' positions, maintenance practices, and assessments of the three maintenance strategies. Service quality was assessed through five indicators adapted from the dimensions of reliability, assurance, tangibles,

empathy, and responsiveness proposed by Parasuraman et al. (1988). Safety and health were assessed through four indicators covering protection from falls and trips, equipment inspections, building-related health conditions, and cleanliness. Respondents evaluated each strategy irrespective of the maintenance category recorded for their mosque. Following the thesis questionnaire, service quality items used a five-point satisfaction scale, safety items used a five-point perceived-safety scale, and health items used a five-point agreement scale. Higher scores indicated more favourable assessments.

Descriptive analysis comprised frequencies, percentages, cross-tabulations, and mean scores. Frequencies and percentages summarised respondent characteristics and reported maintenance practices, while cross-tabulations described strategy categories by district and maintenance frequency. Mean scores summarised respondents' evaluations of the three strategies across the service quality and safety and health indicators. All 354 respondents had complete responses for these indicators. Counts in respondent-based tables were distinguished from counts of separate mosques.

Pearson's chi-square test of independence was used to examine the association between reported maintenance frequency and recorded maintenance strategy category. Before analysis, the six respondents within each mosque were checked for agreement on both variables. As their responses were consistent, one record per mosque was retained, yielding 59 mosque-level observations and avoiding repeated counting of the same facility. The resulting contingency table comprised three frequency categories; monthly, every three months, and every six months and two strategy categories, PCM and UM. Categories with no observations were excluded. Statistical significance was assessed at the 0.05 level, and Cramér's V was calculated to describe the strength of association.

Additional exploratory Friedman tests compared respondents' evaluations of PPM, PCM and UM for each of the nine indicators. The six committee responses within each mosque were averaged separately for each indicator and strategy, yielding three paired ratings for each of 59 mosques. This approach retained the paired structure of the evaluations while avoiding treating committee members within the same mosque as independent observations. Friedman statistics were corrected for ties, and permutation p-values were calculated using 99,999 within-mosque permutations of strategy labels. Holm adjustment controlled for multiple testing across the nine indicators at the .05 level. Kendall's W was calculated to describe consistency in strategy rankings. No pairwise significance tests were conducted.

Ethical approval was obtained from the Universiti Teknologi MARA Research Ethics Committee under reference REC/12/2021 (MR/936), dated 14 December 2021. Participants were informed of the research purpose, and the questionnaire included an agreement to participate. Participation was voluntary,

respondents could withdraw without providing a reason, and their information was treated confidentially.

The findings are subject to several methodological limitations that define the scope of their interpretation. Restricting participation to committee members privileged management perspectives, leaving the service experiences of mosque users and the technical assessments of maintenance contractors and officers unrepresented. Consequently, favourable strategy ratings reflect committee judgements and cannot independently substantiate improvements in service delivery, safety or health outcomes. Self-reported assessments were also susceptible to social desirability and variation in respondents' interpretations of maintenance performance, potentially affecting the comparability of ratings. The cross-sectional design precluded establishing temporal order or attributing observed differences to the effects of particular maintenance strategies. Aggregating responses into mosque-level means avoided treating members of the same committee as independent observations in the exploratory comparisons, but obscured variation within each mosque; these averages therefore do not establish consensus among committee members.

RESEARCH FINDINGS

Table 1 highlights that all 354 respondents in the 59 Masjid Kariah reported employment on a contractual basis. Each of the six committee positions accounted for 59 respondents (16.7%). These data describe reported service status and role distribution; contractual status alone does not establish commitment, accountability or maintenance performance. The positions comprised the chairman or nazir, deputy chairman or deputy nazir, development committee representative, secretary, deputy secretary, and treasurer. Equal representation across these positions reflected the sampling design, which included six designated committee members from each mosque. Their involvement in administration and maintenance-related decisions provided a basis for examining management perspectives on maintenance planning. Au-Yong et al. (2017) identified a positive association between stakeholder involvement and maintenance management effectiveness, highlighting the relevance of participation by managers, maintenance personnel, users and service providers. Within the present study, committee responses therefore provide one organisational perspective within this broader stakeholder context. The absence of permanent or voluntary appointments among the sampled respondents does not establish the absence of volunteers or other personnel in wider mosque operations.

Table 1: Positions Held at the Masjid Kariah

No.	Positions held at the Kariah Mosque	Serving as			
		Permanent	Voluntary	Contract	Others
1.	Chairman/ Nazir	0	0	59	0
2.	Deputy Chairman/ Deputy Nazir	0	0	59	0
3.	Exco for Development	0	0	59	0
4.	Secretary	0	0	59	0
5.	Deputy Secretary	0	0	59	0
6.	Treasurer	0	0	59	0
Total		0	0	354	0

Source: Researcher (2026)

Table 2 shows that all 354 respondents from the 59 Masjid Kariah classified their respective mosques as government-owned, with no private, waqf or other ownership categories recorded. Kota Bharu contributed the largest number of respondents (78), while Jeli contributed the fewest (12). These frequencies represent respondent reports rather than counts of separate mosques, and the differences between districts reflect their representation in the sample. The uniform ownership classification provides an institutional context for interpreting the reported maintenance arrangements. However, it does not establish equivalent funding, consistent management procedures or comparable maintenance outcomes across the participating mosques. In a study of public facilities managed by Malaysian local authorities, Mong et al. (2019) identified maintenance management barriers and cost-related challenges, highlighting the relevance of operational conditions to maintenance delivery. This provides a broader context for distinguishing institutional ownership from the resources and practices through which facilities are maintained. For the present sample, assessing these relationships would require additional evidence on budget allocation, maintenance responsibilities and implementation at each mosque.

Table 2: Districts by Ownership Type

No.	District	Ownership Type			
		Government	Private	Waqaf	Others
1.	Kota Bharu	78	0	0	0
2.	Pasir Puteh	42	0	0	0
3.	Jeli	12	0	0	0
4.	Machang	24	0	0	0
5.	Gua Musang	24	0	0	0
6.	Tanah Merah	24	0	0	0
7.	Pasir Mas	54	0	0	0
8.	Tumpat	30	0	0	0
9.	Kuala Krai	30	0	0	0
10.	Bachok	36	0	0	0
Total		354	0	0	0

Source: Researcher (2026)

Table 3 shows that mosques reported as more than 15 years old accounted for 330 respondents (93.2%). 18 respondents (5.1%) reported mosque ages of 6–10 years, while six (1.7%) reported ages of 11–15 years. No respondents reported mosques aged 1–5 years. These frequencies represent respondent reports rather than counts of separate mosques. The predominance of older buildings provides a context for examining maintenance requirements, although building age alone does not establish deterioration, structural deficiencies or inadequate maintenance. Khalid et al. (2024) examined mosque facilities in Perak Tengah and identified design and construction-related defects with implications for maintenance management. These findings highlight the relevance of building-specific conditions when interpreting the maintenance needs of mosque facilities. Accordingly, the age profile in the present study provides background information for maintenance planning, while priorities for inspection and repair require evidence on actual building conditions and maintenance history. The small proportion of newer mosques describes the composition of the sample and does not establish a shortage of facilities or demand for additional construction.

Table 3: Districts by Age of Masjid Kariah

No.	District	Age of Masjid Kariah (Years)				Total
		1-5	6-10	11-15	>15	
1.	Kota Bharu	0	6	0	72	78
2.	Pasir Puteh	0	0	0	42	42
3.	Jeli	0	0	0	12	12
4.	Machang	0	6	0	18	24
5.	Gua Musang	0	0	0	24	24
6.	Tanah Merah	0	0	6	18	24
7.	Pasir Mas	0	6	0	48	54
8.	Tumpat	0	0	0	30	30
9.	Kuala Krai	0	0	0	30	30
10.	Bachok	0	0	0	36	36
Total		0	18	6	330	354

Source: Researcher (2026)

Table 4 presents the distribution of recorded maintenance strategy categories by district, based on reports from 354 committee members representing 59 Masjid Kariah. PCM accounted for 234 responses (66.1%), while UM accounted for 120 (33.9%). No responses were classified as PPM or other strategies in the selected categorical variable. PCM was more frequently reported than UM in nine districts, while Machang recorded equal frequencies for both categories. These district-level patterns were described using frequencies without inferential testing. The predominance of PCM reflects the recorded strategy

classification and does not establish the absence of preventive activities or the effectiveness of the maintenance arrangements.

Table 4: Recorded maintenance strategy categories by district

No.	District	Planned Preventive Maintenance (PPM), n	Planned Corrective Maintenance (PCM), n	Unplanned Maintenance (UM), n	Others, n	Total, n
1	Kota Bharu	0	54	24	0	78
2	Pasir Puteh	0	24	18	0	42
3	Jeli	0	12	0	0	12
4	Machang	0	12	12	0	24
5	Gua Musang	0	18	6	0	24
6	Tanah Merah	0	18	6	0	24
7	Pasir Mas	0	36	18	0	54
8	Tumpat	0	18	12	0	30
9	Kuala Krai	0	18	12	0	30
10	Bachok	0	24	12	0	36
Total		0	234	120	0	354
Note: Counts represent respondent reports, with six committee members per mosque. Zero counts for PPM indicate that no responses were assigned to this category in the selected categorical variable; they do not establish the absence of preventive maintenance activities.						

Source: Researcher (2026)

For Table 5, each mosque was counted once after confirming within-mosque consistency for frequency and strategy category. Monthly maintenance was reported for 25 mosques (42.4%), followed by every six months (23; 39.0%) and every three months (11; 18.6%). Frequency described maintenance activity generally and did not establish that individual unplanned interventions followed fixed schedules. PCM accounted for 39 mosques (66.1%), while UM accounted for 20 (33.9%). No mosque was classified as PPM in the categorical variable used for this analysis; this does not establish the absence of preventive maintenance activities. Pearson's chi-square test did not identify a statistically significant association between maintenance frequency and recorded strategy category, χ^2 (2, N = 59) = 0.537, $p = 0.765$. Cramér's V (.095) indicated a small observed association. These results describe the distribution of recorded strategy categories across maintenance frequencies and do not establish the effectiveness of individual strategies.

Table 5: Association between maintenance frequency and recorded maintenance strategy category

No.	Maintenance Frequency	Types of Maintenance Strategy used			Total, n (%)
		Planned Preventive Maintenance (PPM), n	Planned Corrective Maintenance (PCM), n	Unplanned Maintenance (UM), n	
1.	Monthly	0	17	8	25 (42.4)
2.	Every Three Months	0	8	3	11 (18.6)
3.	Every Six months	0	14	9	23 (39.0)
Total		0	39	20	59 (100.0)
Notes: n = 59 mosques. Percentages in the total column are based on all 59 mosques. PPM = planned preventive maintenance; PCM = planned corrective maintenance; UM = unplanned maintenance. PPM is displayed for completeness but excluded from the chi-square calculation because its recorded frequency is zero. Pearson's $\chi^2(2) = 0.537$, $p = 0.765$; Cramér's $V = 0.095$. One of six expected cell counts was below five; the minimum was 3.73.					

Source: Researcher (2026)

Table 6 presents committee members' ratings of various maintenance strategies on Service Quality at Masjid Kariah, using a 5-point satisfaction scale. Planned preventive maintenance received the highest mean scores across all dimensions of service quality, with mean scores ranging from 4.46 to 4.52. This reflects strong satisfaction among committee members regarding its reliability, assurance, tangibility, empathy, and responsiveness. PCM mean scores ranged from 2.64 to 2.96. In contrast, unplanned maintenance received lower mean scores, with means ranging from 1.91 to 2.17. All 354 respondents evaluated each strategy, irrespective of the maintenance category recorded for their mosque. Swanson (2001) supports these findings, noting that reactive maintenance often results in higher costs and lower performance due to unplanned downtime. Similarly, Waeyenbergh & Pintelon (2002) emphasize the role of a well-developed maintenance framework in enhancing overall service quality and operational efficiency. The emphasis on planned preventive maintenance aligns with best practices in facility management, advocating for proactive strategies that enhance service quality and operational performance (Pintelon & Parodi-Herz, 2008).

Table 6: Service Quality Indicators

No.	Dimension of Service Quality	Mean Score
1. Reliability: <i>You are satisfied that the strategy below is able to perform the service according to the schedule</i>		
1a.	Planned Preventive Maintenance	4.46
1b.	Planned Corrective Maintenance	2.73
1c.	Unplanned Maintenance	2.17
2. Assurance: <i>You are satisfied that the strategy below can guarantee the maintenance service is done efficiently</i>		
2a.	Planned Preventive Maintenance	4.52
2b.	Planned Corrective Maintenance	2.96
2c.	Unplanned Maintenance	2.02
3. Tangible: <i>You are satisfied that the strategy below allows the maintenance staff to provide a good maintenance service</i>		
3a.	Planned Preventive Maintenance	4.50
3b.	Planned Corrective Maintenance	2.78
3c.	Unplanned Maintenance	1.91
4. Empathy: <i>You are satisfied that the strategy below allows the maintenance staff to pay special attention to the complaints received</i>		
4a.	Planned Preventive Maintenance	4.48
4b.	Planned Corrective Maintenance	2.64
4c.	Unplanned Maintenance	1.92
5. Responsiveness: <i>You are satisfied that the strategy below allows the maintenance staff to be able to help provide maintenance services to this mosque</i>		
5a.	Planned Preventive Maintenance	4.49
5b.	Planned Corrective Maintenance	2.70
5c.	Unplanned Maintenance	2.15
Notes: Mean scores were based on a five-point Likert scale (1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, and 5 = Very Satisfied).		

Source: Researcher (2026)

Table 7 presents committee members' ratings of maintenance strategies across safety and health indicators at Masjid Kariah. For safety, PPM received the highest mean ratings for perceived protection from falls and trips (4.50) and regular equipment inspections (4.49), followed by PCM (2.65 and 2.75, respectively) and UM (2.10 and 1.94). For health, PPM also received the highest ratings for perceived protection from sick building syndrome (4.46) and cleanliness (4.53). The corresponding ratings were 2.77 and 2.79 for PCM, and 2.02 and 1.35 for UM. Cleanliness displayed the largest descriptive difference between PPM and UM, indicating a particularly pronounced contrast in

committee assessments. Al-Turki et al. (2014) discussed the relationship between maintenance and safe and healthy working environments in manufacturing facilities, providing a broader conceptual context for considering safety and health within maintenance planning. In the present study, the consistently higher PPM ratings reflect favourable committee perceptions. The ratings do not measure accident occurrence, environmental conditions or diagnosed building-related illness. These findings identify safety and health priorities for maintenance planning, while assessment of operational effectiveness requires complementary evidence from inspections, incident records and environmental measurements.

Table 7: Safety and Health Indicators

No.	Dimension of Safety and Health	Mean Score
<i>1. Safety:</i>		
<i>a. The strategy below ensures that this maintenance provides safety from accidents due to falling, and tripping</i>		
1a.1	Planned Preventive Maintenance	4.50
1a.2	Planned Corrective Maintenance	2.65
1a.3	Unplanned Maintenance	2.10
<i>b. The strategy below regularly inspects the equipment system of the Masjid Kariah to ensure the safety of users</i>		
1b.1	Planned Preventive Maintenance	4.49
1b.2	Planned Corrective Maintenance	2.75
1b.3	Unplanned Maintenance	1.94
<i>2. Health:</i>		
<i>a. You agree that the strategy below ensures that this mosque is free from sick building syndrome</i>		
2a.1	Planned Preventive Maintenance	4.46
2a.2	Planned Corrective Maintenance	2.77
2a.3	Unplanned Maintenance	2.02
<i>b. You agree that the strategy below ensures the cleanliness of the maintained area</i>		
2b.1	Planned Preventive Maintenance	4.53
2b.2	Planned Corrective Maintenance	2.79
2b.3	Unplanned Maintenance	1.35
Note. Mean scores are based on responses from 354 committee members. Safety items used a five-point perceived-safety scale, while health items used a five-point agreement scale. Higher scores indicated more favourable assessments.		

Source: Researcher (2026)

Table 8 presents exploratory Friedman comparisons of PPM, PCM and UM ratings across nine service quality and safety and health indicators. Statistically significant overall differences among the three strategy ratings were identified for every indicator following Holm adjustment of permutation p-values (all adjusted $p < 0.001$). Kendall's W ranged from 0.903 to 1.000, indicating strong consistency in strategy rankings across the 59 mosques. Together with the

descriptive means in Tables 6 and 7, these findings indicate that committee members consistently rated PPM more favourably. For cleanliness, $W = 1.000$ reflected identical strategy ordering across mosques, with PPM ranked above PCM and UM. The omnibus tests establish overall differences in ratings but do not identify statistically significant individual pairwise comparisons or demonstrate the operational effectiveness of particular strategies.

Table 8: Exploratory Friedman comparisons of maintenance strategy ratings at mosque level

Indicator	Friedman Q	Adjusted p-value	Kendall's W
Service quality			
Reliability	106.496	< 0.001	0.903
Assurance	115.111	< 0.001	0.976
Tangibility	116.034	< 0.001	0.983
Empathy	115.566	< 0.001	0.979
Responsiveness	113.265	< 0.001	0.960
Safety and health			
Protection from falls and trips	113.426	< 0.001	0.961
Regular equipment inspections	116.558	< 0.001	0.988
Perceived protection from sick building syndrome	112.592	< 0.001	0.954
Cleanliness	118.000	< 0.001	1.000
Notes: $n = 59$ mosques; $df = 2$ for each test. Each mosque contributed three paired strategy ratings, calculated by averaging its six committee members' responses for each indicator and strategy. Friedman statistics were corrected for ties. Permutation p-values were calculated using 99,999 within-mosque permutations and adjusted across nine tests using Holm's procedure. Kendall's W represents consistency in strategy rankings. $W = 1.000$ indicates identical strategy ordering across mosques, not identical scores or perfect maintenance performance.			

Source: Researcher (2026)

DISCUSSION

The findings indicate that committee members evaluated PPM more favourably than PCM and UM across service quality and safety and health indicators. This pattern is consistent with the emphasis on proactive maintenance and organisational performance discussed by Swanson (2001) and Tsang (2002). The exploratory Friedman analyses extend the descriptive findings by identifying overall differences in mosque-level strategy ratings across all nine indicators. Strong Kendall's W values indicate consistent ranking patterns, but do not quantify improvements in maintenance outcomes.

The service quality findings show that committee members' evaluations extended beyond task completion to how services were delivered. PPM received favourable assessments for scheduled services, perceived efficiency, attention to complaints, and assistance from maintenance personnel. These concerns correspond to the dimensions developed by Parasuraman et al. (1988). The

comparatively low empathy rating for PCM identifies complaint handling as a potential planning priority. However, the ratings do not establish whether concerns arose from staffing constraints, funding, communication difficulties or delays, as these explanations were not tested.

The recorded strategy distribution was dominated by PCM, despite the favourable perception ratings for PPM. This contrast separates recorded practice categories from assessments of perceived performance and provides a basis for examining the incorporation of preventive activities into existing arrangements, without assuming their complete absence. Waeyenbergh and Pintelon (2002) emphasise systematic maintenance concept development, supporting coordination of inspections, corrective work and responses to unexpected defects. The reasons for the recorded distribution remain questions for further investigation.

Safety and health ratings also favoured PPM, with cleanliness displaying the widest descriptive separation between PPM and UM. All 59 mosque-level averages ranked cleanliness in the same order, PPM above PCM above UM. Equipment inspections and protection from falls and trips connect maintenance planning with everyday facility use. Research by Khalid et al. (2024) on mosque design failures demonstrates the relevance of building-specific issues to maintenance management. These ratings indicate committee members' perceived safety, health and cleanliness priorities but do not represent independently measured facility conditions.

At mosque level, the association between maintenance frequency and recorded strategy category was not statistically significant ($p = 0.765$), with a weak observed association (Cramér's $V = 0.095$). This addresses a different question from the significant strategy-rating comparisons. It does not establish equivalence between PCM and UM or demonstrate that frequency is unimportant. Broad frequency categories do not describe task scope, asset condition or response timeliness. Maintenance planning benefits from considering frequency alongside inspection records and service outcomes.

The study contributes a committee-level perspective by integrating service quality and safety and health assessments within religious-facility maintenance planning. Complaint handling, equipment inspections and cleanliness emerged as practical priorities. However, the findings represent management perceptions rather than independently verified maintenance outcomes, and the exploratory omnibus tests do not establish pairwise differences or causal effectiveness. Future studies should incorporate mosque users, maintenance personnel, physical inspections and operational records to evaluate whether these perceptions correspond with actual facility performance.

CONCLUSION AND RECOMMENDATION

This study examined assessments from 354 committee members representing 59 Masjid Kariah across ten districts in Kelantan. PPM received the highest descriptive ratings across all nine service quality and safety and health indicators, while PCM predominated in the recorded strategy distribution. Exploratory Friedman tests demonstrated consistent differences in committee members' ratings of the three strategies after adjustment for multiple testing. The chi-square analysis found no significant association between maintenance frequency and recorded strategy category. The findings identify complaint handling, equipment inspections and cleanliness as priority areas for maintenance review. Committees can use these priorities to strengthen inspection schedules, maintenance records and responses to reported defects. Differences between districts were not examined inferentially and should therefore be investigated in future research.

To address these challenges, the following recommendations are proposed:

- a) **Develop a Coordinated Maintenance Plan:** Committees can incorporate preventive tasks into routine maintenance plans, document defects and repair completion, and establish clear responsibilities for inspections and complaint handling. Staff training can focus on inspection procedures, maintenance records and responses to reported defects. The effects of these arrangements on service continuity and repair performance require evaluation during implementation.
- b) **Strengthen Maintenance Records:** Committees can maintain records of inspections, reported defects, repair completion and recurring complaints to support maintenance scheduling and follow-up. The suitability of digital tools can be assessed against staffing capacity, available resources and record-keeping needs before adoption.
- c) **Promote Inclusive and Participatory Planning:** Establishing regular feedback mechanisms, such as community surveys and stakeholder meetings, can provide valuable insights into user satisfaction and emerging challenges. Feedback from mosque users and maintenance personnel can complement committee assessments and help identify priorities that are not fully represented by management perspectives.
- d) **Strengthen Technical Collaboration:** Committees can seek technical input from relevant agencies and maintenance practitioners when reviewing inspection priorities, recurring defects and repair requirements. The scope of collaboration can be matched to identified facility needs and available resources. Any effects on maintenance performance require subsequent evaluation.

- e) **Examine Variation Across Districts:** Future research can investigate whether maintenance arrangements and stakeholder assessments vary across districts using a sampling and analytical design suited to such comparisons. Combining questionnaire responses with inspections and operational records can help explain any observed variation.

The study contributes to maintenance planning literature by integrating committee assessments of service quality and safety and health in Malaysian religious facilities. Future work can combine management and user perspectives with inspections and operational records to examine correspondence between perceived and measured performance. Independently collected data and longitudinal evaluation can assess whether changes in maintenance arrangements are accompanied by improvements in service delivery, safety and cleanliness.

REFERENCES

- Al-Turki, U. M., Ayar, T., Yilbas, B. S., & Sahin, A. Z. (2014). *Integrated maintenance planning in manufacturing systems*. Springer. <https://doi.org/10.1007/978-3-319-06290-7>
- Au-Yong, C. P., Ali, A.-S., Ahmad, F., & Chua, S. J. L. (2017). Influences of key stakeholders' involvement in maintenance management. *Property Management*, 35(2), 217–231. <https://doi.org/10.1108/PM-01-2016-0004>
- Khalid, M. K. A., Ahmad Zawawi, Z., Ahmad, N. A., Zahari, N. F., & Hashim, H. (2024). Evaluating the impact of design failure on the Perak Tengah District mosque, Perak, Malaysia. *Planning Malaysia*, 22(6), 207–221. <https://doi.org/10.21837/pm.v22i34.1624>
- Mong, S. G., Mohamed, S. F., & Misnan, M. S. (2019). Current issues and barriers of maintenance management practices for public facilities in Malaysia. *International Journal of Engineering and Advanced Technology*, 8(5C), 119–125. <https://doi.org/10.35940/ijeat.E1017.0585C19>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12–40.
- Pintelon, L., & Parodi-Herz, A. (2008). Maintenance: An evolutionary perspective. In K. A. H. Kobbacy & D. N. P. Murthy (Eds.), *Complex system maintenance handbook* (pp. 21–48). Springer. https://doi.org/10.1007/978-1-84800-011-7_2
- Swanson, L. (2001). Linking maintenance strategies to performance. *International Journal of Production Economics*, 70(3), 237–244. [https://doi.org/10.1016/S0925-5273\(00\)00067-0](https://doi.org/10.1016/S0925-5273(00)00067-0)
- Tsang, A. H. C. (2002). Strategic dimensions of maintenance management. *Journal of Quality in Maintenance Engineering*, 8(1), 7–39. <https://doi.org/10.1108/13552510210420577>
- Waeyenbergh, G., & Pintelon, L. (2002). A framework for maintenance

Azhar Yusof, Mohamad Ridzuan Yahya, Faridah Ismail, Siti Fatimah Hashim
INTEGRATING COMMITTEE MEMBERS' PERSPECTIVES INTO PERFORMANCE-BASED
MAINTENANCE PLANNING: EVALUATING SERVICE QUALITY AND SAFETY AND HEALTH FOR
MASJID KARIAH IN KELANTAN, MALAYSIA

concept development. *International Journal of Production Economics*, 77(3), 299–313.
[https://doi.org/10.1016/S0925-5273\(01\)00156-6](https://doi.org/10.1016/S0925-5273(01)00156-6)

Zaini, M., & Mizal Azzmi, N. (2023). A study on maintenance management at mosques. *e-Proceeding 6th Undergraduate Seminar on Built Environment and Technology (USBET) 2023*, 1338–1347.
<https://ir.uitm.edu.my/id/eprint/97293/>

Received: 26th Jan 2026. Accepted: 7th August 2026