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ENVIRONMENT**

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A FRAMEWORK OF BEST PRACTICES FOR IMPROVING MAINTENANCE MANAGEMENT FOR BUILDING FACILITY (CASE STUDY: UITM SERI ISKANDAR)

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ABSTRACT

A building exists to serve the user's space requirement. The essence of maintenance is, therefore, to maximize the service life of a building, by delaying deterioration, decay, and failure. Building maintenance management is a complex and multi-faceted thought process that involves planning, directing, controlling, and organizing resources for the sustenance of the building's functional performance. The purpose of this paper is to propose an alternative maintenance management model for university buildings. Although this research is specifically proposed for university buildings, however, many public and private sector institutions face similar maintenance management problems. Therefore, this research has broader applications. This research emerged from the need for an alternative building maintenance management system that reflects current thinking on the efficient and effective use of maintenance resources. This research used a quantitative research method that included survey distribution and collection. The 15 questions about best practices for improving maintenance management for building facility were created as surveys and separated into three sections. Data was collected with high confidence from a sample size of 50 respondents. The implementation of best practices to improve maintenance management statistics was assessed using the IBM SPSS Statistics software version 28. According to the survey results, the majority of respondents who in-house and outsource in maintenance department believe that there are various more methods that may be implemented to improve maintenance management in Univerisiti Teknologi MARA (UiTM) Seri Iskandar.

Keywords: *building maintenance management, university buildings*

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INTRODUCTION

The life cycle of a university building begins with design and continues through construction, operation, and demolition. The operation phase comprises employing the building for academic activities such as classrooms, laboratories, workshops, and any other academic activity relevant to an institution. During the operation phase, a building requires several maintenance tasks as it develops various flaws or is harmed by the user. As a result, effective building maintenance is a critical issue that university administration must consider (Lateef et al, 2020). Nonetheless, despite the fact that university buildings require upkeep, particularly during the operational phase, some university administrations are unable to meet the requirement. Some current colleges may not adhere to tight maintenance schedules, exposing their facilities to faults that accelerate the decay of various building parts, necessitating the construction of new structures and/or the demolition of old facilities. Although the development of new buildings helps to update educational facilities and give a higher level of education, the priority should be to preserve old buildings to guarantee the present settings are conducive and appropriate for learning. Furthermore, demolition is frequently a technical or economic consideration. As a result, it necessitates greater financial assistance than simply sustaining the old structure (Prescilla, 2019).

According to (Prescilla, 2019), while regular building maintenance is capable of identifying numerous flaws on time and aids in the reduction of maintenance costs. However, if it is ignored, it may result in expensive maintenance costs in the future. Defects or damages on a building occur over time as the building is exposed to all types of weather changes such as rain, sun, wind, and other natural events that affect the various parts of the building, particularly the exterior, followed by the interior in the long run, affecting the satisfaction of the building's users and thus defeating the purpose of the building.

Hence, as state by (Prescilla, 2019), in real life, 'ad hoc' maintenance procedures are frequently used, and if the building is thought to be capable of weathering the many elements that may limit its service life, maintenance is usually delayed or postponed. However, delaying, or postponing building maintenance increases the risk to the user and the building itself. Furthermore, unlike other institutions, a university's major purpose is to provide a stimulating and favourable atmosphere to support teaching, learning, and academic activities, therefore its buildings are intended to be unique and diversified, necessitating more care. However, without buildings or poor upkeep of existing university buildings and facilities, the essential aims of a university would not be met. As a result, proper knowledge of the need for building upkeep, particularly among universities, is critical to being addressed in depth (Prescilla, 2019).

Since a result of the foregoing, effective university building maintenance should be conducted on a continual basis, and the necessity of building maintenance should be understood in depth, as building increases yearly, with faults and damage occurring from time to time. Maintenance techniques should be carefully chosen in order to

reduce or limit building maintenance costs while maximizing performance. It is critical to guarantee that university buildings are effectively managed and maintained so that they can sustain the building's lifestyle while also maintaining the value of the country's asset for a long time (Prescilla, 2019). Although the effectiveness of the building maintenance system contributes to the institution's profitability, many stakeholders are unaware of this. Thus, in order for university buildings to serve their responsibilities and provide long-term service, they must be in good condition, which can be achieved by employing appropriate building maintenance procedures.

LITERATURE REVIEW

Building maintenance management is the coordination of maintenance activities aimed at maintaining, repairing, and improving buildings and its connected systems in order to offer a safe, habitable, comfortable, and functional environment at a low cost. It includes all duties that make a room "livable" and guarantees that essential building systems such as electrical, plumbing, fire protection, and HVAC are functioning properly. Building maintenance management also involves the structure of a building, which includes the floors, walls, ceilings, roofs, and fittings. Furthermore, building upkeep may involve painting, cleaning, landscaping, and groundskeeping on the structure's exterior (Wilke, 2023).

Building maintenance refers to activities performed to retain and restore the functionality of residential and commercial properties. It includes tasks such as cleaning, landscaping, and electrical system maintenance. It aims to preserve a safe, functional, and comfortable environment for tenants always (Campbell, 2022). Maintenance management is an ordered procedure for controlling the maintenance resources and activities required to keep assets in good operating order or repair them to that standard. While this definition of maintenance management may be seen as merely "fixing things," it would be an oversimplification.

The Importance of Building Maintenance Management

Management of building maintenance is essential for monetary stability, risk reduction, and operational effectiveness. Regular maintenance is prioritised over urgent repairs since it is less expensive and also makes the environment for occupants safer and more dependable. Property owners can secure the long-term viability and functionality of their structures while minimising potential liabilities and unforeseen financial obligations by carefully planning their budgets and adopting a proactive approach (Chaplin, 2018).

Benefits of Building Maintenance Management

Numerous advantages of building maintenance management contribute to the general health and effectiveness of buildings and services. First of all, it makes sure

that assets are preserved, extending the life of buildings and reducing the need for pricey repairs or replacements. Regular maintenance and inspections improve security and safety by removing risks and potential mishaps, protecting residents and guests. By establishing a cosy and attractive environment, building maintenance management also promotes occupant satisfaction, increasing productivity and happiness. Additionally, it encourages energy efficiency through system optimisation and utility cost reduction, which is in line with sustainable practises. Achieving compliance with rules and codes reduces legal risks and ensures that industry standards are followed. Additionally, the systematic approach to maintenance enables better resource allocation and planning, making it simpler to prepare for planned maintenance and preventative actions. In the end, building maintenance management is essential for maximising asset value, reducing hazards, and establishing a welcoming, secure, and affordable environment for all parties involved (Christiansen, 2022).

Significant In Building Management in Malaysian Universities

According to Zulkharnain (2018), the university has a variety of educational facilities available to students, who are the customers, and faculty, who are the operators. It will encompass not only physical development such as building and infrastructure, but also transit, lodging, and other services. The administration of the university serves as a supplier, aiming to provide a better educational environment in order to produce quality graduates. As a result, those facilities must be maintained and enhanced at all times in order to satisfy clients. All businesses and organizations value property. The cost of the asset itself, as well as the costs of acquiring, managing, and operating it, should place it high on the priority list of property managers. This applies to all organizations, including universities, to identify certain goals shared by most building maintenance organizations, and this evidence suggests the need for a balanced scorecard approach that adequately reflects the building maintenance organizations' characteristics, goals, and critical success factors. The organization's vision and objectives were discovered to be to provide distinctive service combined with value for money, to respond quickly to changes in customer needs, to achieve continually improving services, to develop skills of all employees, and finally to recognize their performance through opportunities for advancement (Zulkharnain, 2018).

Improvement Maintenance Management in Universities

Maintenance teams, facility managers, administrators, and other stakeholders must work together to implement these improvements in a methodical and comprehensive manner. Universities may improve their maintenance management procedures and create a comfortable and effective environment for students, teachers, and staff by concentrating on preventive maintenance, data-driven decision making, training, and sustainability (Lateef, 2015).

RESEARCH METHODOLOGY

This research is to achieve objective to develop framework of maintenance management best practices for building facility in UiTM Seri Iskandar. In this chapter also state the process of selecting research methodology, research design, method of data collection, method of sampling, instrument of research and analysis of data.

Stage One (1):

At this step, the starting phase will identify the research challenges and the current issue of the research. The issues will support the reasons for this research. In terms of review sessions and literature readings, several publications, journals, books, and studies from prior works were reviewed. In this scenario, the problem statement is summarized. The themes of the study's aim, objectives, and questions will then be carried out.

Stage Two (2):

At this step, the themes of the study's goal, objectives, and questions are established. Several questions arise in accordance with the study's aims that must be addressed in the study's findings. At the same time, the study's significance was determined. Finally, data collection tools were created. The case study will be chosen in accordance with the research investigation.

Stage Three (3):

The quantitative survey approach is used for data collection and data analysis. Data was gathered through the dissemination of questionnaires using media platforms such as Email and WhatsApp groups, with simple and intelligible questions. The questionnaire will be distributed to 30 people which is inhouse and outsource department, and end users.

Stage Four (4):

Following data collection, the data will be properly tested and analyzed. IBM SPSS Statistics version 28 will be used to analyze the data. In addition, conclusions are offered, as well as some suggestions for further research. This research will determine the level of satisfaction of both buildings' occupants in the end.

RESEARCH SCOPE AND LIMITATION

This study is carried out to determine the current practices employed by universities (Malaysia) especially in UiTM Seri Iskandar, Perak in the maintenance of their

buildings as well as looking into the factors that affect the cost for maintaining buildings in university. In another section, practices that are considered to be the best in the maintenance of buildings in universities in Malaysia will be identified. Therefore, the focus of this research is Malaysian universities. However, literature will focus on all public universities in the world. The researcher has limited time for carrying out this study and therefore it is difficult for all buildings in Malaysian universities to be researched.

ANALYSIS AND FINDINGS

Table 1: Respondents' Background

NO.	ITEM	RESPONDENTS		
1.	Gender	Male – 27 (81.8%)	Female – 6 (18.2%)	-
2.	Race	Malay – 28 (84.8%)	Chinese – 5 (15.2%)	-
3.	Age	21 – 30 16 respondents (48.5%)	31 – 40 11 respondents (33.3%)	41 – 50 6 respondents (18.2%)
4.	Occupation	Inhouse – 16 (48.5%)	Outsource – 17 (51.5%)	-
5.	Occupation Status	Fulltime – 30 (90.9%)	Parttime – 3 (9.1%)	-

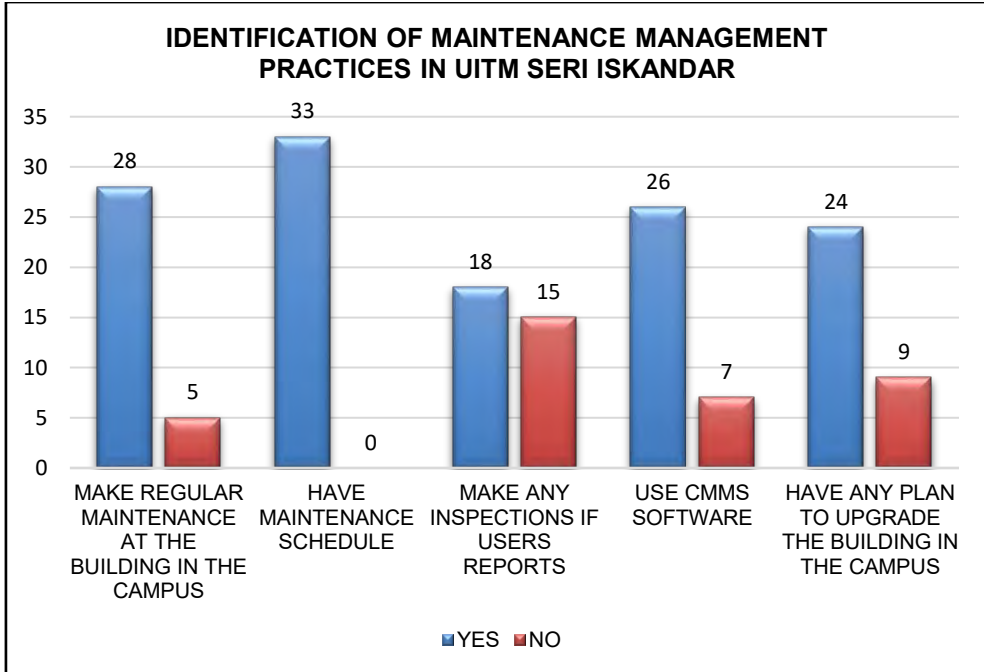


Figure 1: Identification of Maintenance Management Practices in UiTM Seri Iskandar

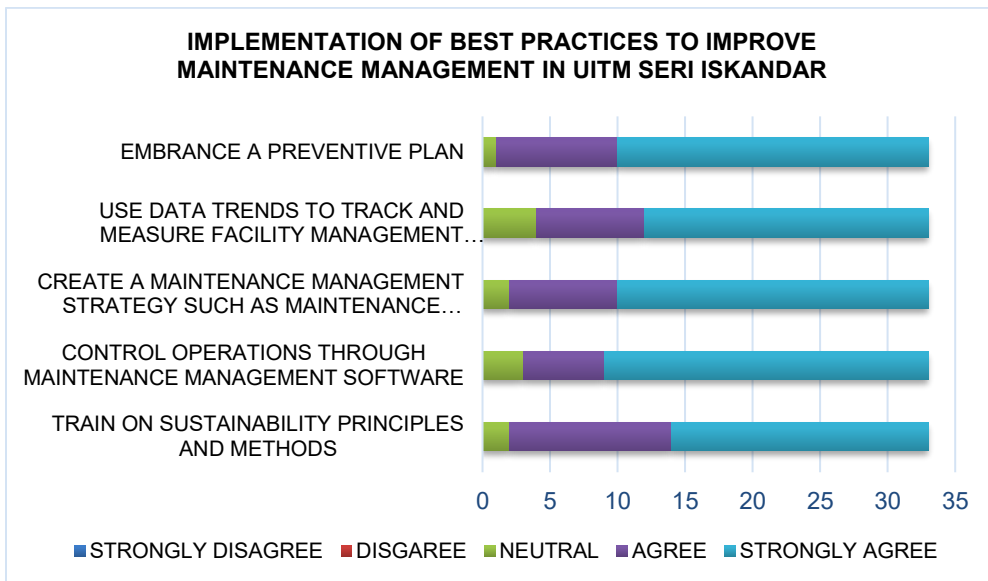


Figure 2: Implementation of Best Practices to Improve Maintenance Management in UiTM Seri Iskandar

Table 2: Overall Result for Mean Score in Section C

NO.	ITEM	MEAN SCORE	SATISFACTION LEVEL
1.	Embrace a preventive plan.	4.67	Strongly Agree
2.	Use data trends to track and measure facility management processes and performance.	4.52	Strongly Agree
3.	Create a maintenance management strategy such as maintenance schedule, corrective maintenance and condition-based maintenance.	4.64	Strongly Agree
4.	Control operations through maintenance management software	4.64	Strongly Agree
5.	Train on sustainability principles and methods.	4.52	Strongly Agree
AVERAGE MEAN RESULT		4.98	Strongly Agree

DISCUSSION

The results and findings of the research were carried out using quantitative data collecting for this chapter. The questionnaire was distributed to the UiTM Seri Iskandar maintenance department (both in-house and outsourced). The questionnaire has been distributed, and responses can be submitted via Google Forms. This method is simple to distribute, faster than an interviewing session, and may be shared with a point of fingers to save time.

The respondent's background needs to be filled in from the first section, section A, as it is easier to do a data analysis on the gender, race, age, occupation, and occupation status. These data acquired facilitate the process of writing this chapter of results and findings. Aside from that, the respondents' backgrounds reflect the ration of the answers they have picked.

Section B of the questionnaire shows identification of maintenance management practices in UiTM Seri Iskandar. The responses to the questions in this section are either yes or no. The goal of the questions in this section is to examine the practises utilised at UiTM Seri Iskandar to preserve the campus's buildings. With the facts acquired in this portion, this paper can move on to the following section of the question, portion C.

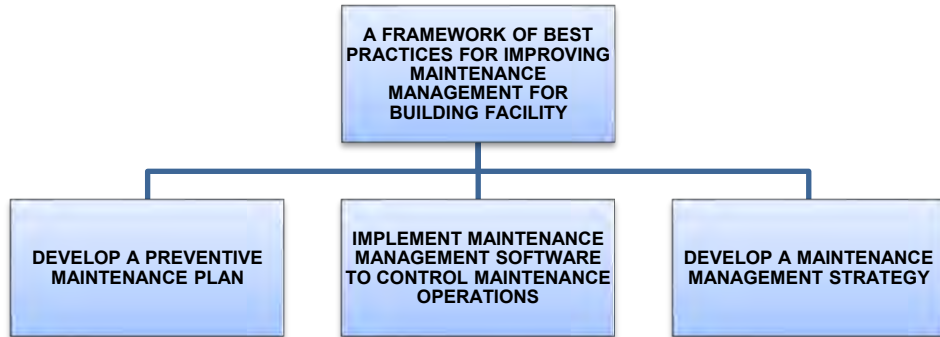
The final section, Section C, will design a framework of implementation of best practices to improve maintenance management in UiTM Seri Iskandar. This part will also determine whether the idea of improvement is acceptable. Respondents will play an essential part in this section since it will decide whether to make maintenance development on campus ensure and for establishing with advances in technologies.

CONCLUSION

This research study's purpose and data are derived from a literature review, previous research, and surveys (questionnaire). This study will most likely concentrate on the maintenance management practises applied at UiTM Seri Iskandar. Furthermore, the study's research aims contributed to the achievement of the research questions. Following the research, several recommendations can be properly considered and used as a reference for future research objectives.

The primary goal is to discover best practises in building maintenance management at UiTM Seri Iskandar. It was accomplished using data obtained from the literature and a questionnaire survey. Maintenance management on campus performs regular maintenance and follows a maintenance schedule. It is critical to ensure that the buildings on campus are in good condition and perform properly. However, there are some slackness or deficiencies that they did not make any inspection if users report, did not use software to record the data of the maintenance work and do not have any plan to upgrade the building in the campus. According to the data from the questionnaire survey, maintenance management at UiTM Seri Iskandar is performing well in terms of job sequence, however there are some concerns in some areas.

RECOMMENDATIONS



Studies will provide useful information regarding future assessments a framework of best practices for improving maintenance management for building facility in universities. More research is needed to better understand the identification of practices used in the universities as well as the implementation of new system or suggestions.

The article should also emphasize the literature review, conduct interview survey and observation on case study and distribute questionnaire to gain more detail information and achieve more accurate results. When utilising the questionnaire approach, there will be evidence for each element that needs to be taken into account in the research. Additionally, the researcher will have detailed information from the interview and can conduct a Q&A session, which will produce outstanding findings.

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