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**A FRAMEWORK FOR BUILDING USER ORIENTED
MAINTENANCE MANAGEMENT FOR NATIONAL
RELIGIOUS SECONDARY SCHOOLS.**

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Abstract - The area of building maintenance creates an opportunity for scholar, practitioner, building owner, stake holder, end user and others to participate in various study to establish issues and solution to the problem concerning building maintenance. Building maintenance is not only limited to restore the physical of the building and its facilities but also contribute to improve the existing environment of building user. The paper highlights the significance of building maintenance for National Religious Secondary school to take into consideration building-user as one of the main factors in maintenance management frameworks. The proposed framework is developed through unstructured interview with relevant stakeholders that involved in school maintenance with integration of building user and service quality. The objective is to investigate the nature of maintenance management for National Religious Secondary school. A pilot survey was conducted to obtain some overview on the current condition and practice of maintenance management for national religious secondary school in Perak one of the states in Malaysia. Some secondary data were provided by the national religious secondary school maintenance department. The maintenance data were analyzed with reference to the location, building elements and frequency of reported defects that were recorded in a year. The collected building maintenance data show that issues on building maintenance still occur that is equivalent with the age of the school buildings. It indicates that the proposed integration of building user in maintenance management framework will improve the service rendered by the operator and satisfy the building user.

Keywords - Maintenance Management, Performance Measurement, Maintenance Performance, Building user

1 INTRODUCTION

Malaysia has achieved great progress in education on many areas inclusive of increasing access to pre-school education, primary and secondary education, as well as expanding opportunities to pursue at tertiary education level. The history of Malaysia national education can be seen from the early days of British occupation and it continues after Malaysia achieved its independence in year 1957. The interest of the ruling government to eliminate illiteracy after independent can be seen from the First Malaysia Plan (1966 to 1970). It is reported that:

“The Education Committee Report of 1956 laid the foundation for a system of education which would be national in character and which would give every child a place in primary school” (Economic Planning Unit, 1965 p.164-165).

The efforts to excel in education is a continuous effort that can be seen in every decades starting from 70's, 80's, 90's and year 2000. Generally in 70's, education system in Malaysia focussed to consolidate the education system to achieve its national development.

While in 80's, the ministry was given the responsibility to lay foundation to uplift bumiputera access to tertiary education where quite a number of Majlis Amanah Rakyat (MARA) junior science college was built in the same decade. People's Trust Council, commonly abbreviated as MARA was established in 90's. The ministry has encouraged the private sector's involvement and also to reduce the

gap between rural and urban schools. In year 2000, the ministry focussed to promote technical and vocational educational training (TVET) to meet industrial demand and also to give an option for students whether to pursue in academic or TVET (Economic Planning Unit, 1965-2016). Since then, Malaysia has embarked to improve human capital by way of strengthening the education system starting from pre-school, primary school, secondary school and tertiary education.

The tireless effort of the government to promote access to quality education can be seen in year 2006 to 2010. For instance, the Ministry of Education spent more than RM20 billion on infrastructure development. The total sum was used for the proposed development of 400 new schools, with expansion of Information and Communications Technology (ICT) infrastructure, and also upgraded the maintenance of existing facilities (Malaysia Education Blue Print, 2013-2025 Ministry of Education, 2013).

In addition, the launching of Malaysia Education Blue Print in year 2013 has set the new paradigm of the whole education system in Malaysia. The blue print was developed with three (3) clear objectives, firstly understanding the current performance and challenges, secondly establishing a clear vision and aspiration and thirdly outlining a comprehensive transformation programmed for the system, including key changes to the Ministry. The effort to uplift the standard of education, has seen the government of Malaysia allocated priority budget to Ministry of Education (MOE) amount to RM41.3 billion in 2016 budget. In Malaysia besides the provision of main stream education system, the government also has supported the religious education to meet demands from the majority of Muslim community. In Malaysia, the Islamic religious education can be classified into two categories, known as informal education and formal education. The informal education includes the pondok school and the quranic school. The formal religious education known as Madrasah (Taib, 1973). In 70's the religious schools was not well accepted by the Muslim community due to lack of facilities and education system. The evolution of the Islamic religious education in Malaysia is further enhanced when the government is taking over 11 State Religious schools in year 1977 (Temrin & Ali, 2017).

The rising demand for religious school in Malaysia can be seen with the total number of national religious secondary schools stands at 58 numbers of schools throughout Malaysia. The same has been reported by Malaysia Education Blue Print (2013-2025 MOE, *Ch3 p.23*, 2013), where growing percentage of students are also registered for religious schools. It shows that the trend for religious schools has gradually increased and well accepted by the majority of Muslim community in Malaysia. In order to expand the religious education pathway the Ministry has put some plans to increase up to 77 numbers of new Sekolah Menengah Kebangsaan Agama (SMKAs') by 2025 (Malaysia Education Blue Print 2013-2025 MOE, *Ch7 p.14*, 2013)

2 OVERVIEW ON SCHOOL MAINTENANCE MANAGEMENT

Building maintenance as defined by Seeley (1976) is “work undertaken in order to keep, restore or improve every part of a building, its services and surrounds, to a currently accepted standard, and to sustain the utility and value of the building. The same definition could be extended to the school maintenance in Malaysia. The school maintenance programmed constitutes three important aspects: organization, inspection and maintenance planning. Firstly is to establish a good organisation structure and – be able to identify personal in-charge complete with their responsibilities. Secondly is to conduct regular building inspection to overall of building's elements and components. It is paramount to have good record on school building conditions. The final one is to have maintenance planning, to ensure that school building can be functioned towards intended purpose. (Elghaffar, 2007; Xaba, 2012)

The effective school maintenance will not only ensure that the physical building can be functioned to serve its intended purpose but also provides good environment for teaching and learning. In addition, efficient school maintenance will eventually secure capital investment and contribute to improve on health and safety aspects. The above will give positive impact on the educational performance of the school children (Ibrahim, Osman, Bachok, & Zin, 2016; Ropi & Tabassi, 2014; U.S. Department of Education, 2003). Generally in Malaysia the standard of maintenance management in every school is inclusive of

national religious schools. These schools do still require room for improvement. It is also concurred by C.Y.Yong (2015), Ropi and Tabassi (2014), Zainal Abidin Akasah et al. (2009), where most of the schools in Malaysia are still lacking in performing maintenance management and unable to achieve satisfactory level due to low awareness on the importance of maintenance practices. It shows that even though the same issue has been discussed by previous scholars pertaining to the school maintenance management, there are still issue to be discussed by future researcher. It is further explained by Ali, Keong, Zakaria, Zolkafli, and Akashah (2013), the growing importance of maintenance sector, poor maintenance performance and the lack of research in this area that provide impetus for this study. The issues are getting worse due to poor maintenance staffing level and also insufficient knowledge of maintenance for those who assigned to perform maintenance management practice at schools (Lavy & Bilbo, 2009; Ropi & Tabassi, 2014). The same challenges faced by schools in Malaysia.

In Malaysia, one of the main reasons why most of the building having poor maintenance is due to lack of preventive measures (Peng Au-Yong, Shah Ali, & Ahmad, 2014). In addition, improper attitude put on maintenance has led to deterioration of building fabrics and facilities. The benefits of practicing preventive maintenance is further described by Lazim, Taib, Lamsali, Saleh, and Subramaniam (2016), where it will diminish potential disruption of facilities from occurring in daily operation. The researchers and scholars are echoing the significance of preventive maintenance. However, stakeholders and masses are prone towards ad-hoc maintenance, where repairing works will take place once disruption occurred.

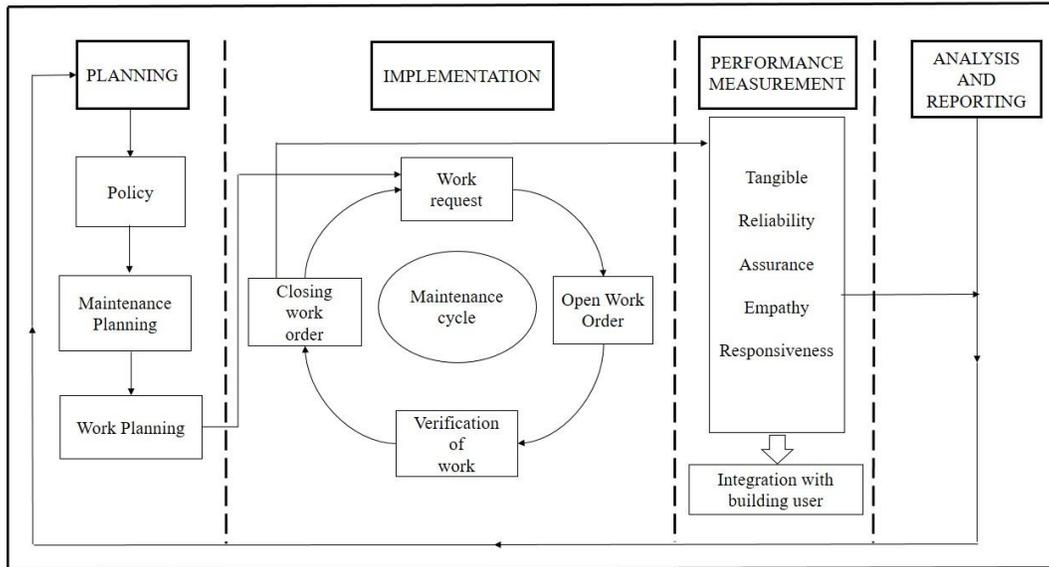
However in Malaysia scenario, according to Zulkarnain, Zawawi, Rahman, and Mustafa (2011), ad-hoc maintenance is still practiced by many, where in some cases the building is left unrepaired until complaints received before any repairing works. The research by Yong and Zailan Sulieman (2015) has discovered that unplanned maintenance is the preferred choice by District Education Office, since planned maintenance requires higher overhead cost. Recent evidence suggests that approach of planned maintenance is preferred by Ropi and Tabassi (2014) because reduction in repairing cost compared to unplanned maintenance. However, the practiced of school maintenance is still lacking particularly that involves the community and building user oriented maintenance services.

3 PERFORMANCE MEASUREMENT REVIEW

According to Ghalayini, Noble, and Crowe (1996), the literature pertaining to performance measurement has evolved into two phases. The first phase started in late 1880's, where during that time performance only be measured for something tangible or financial measures. The capability to minimise cost of production and at the same time increase profit was be treated as a good performance. However in 1980's and above, the evolution of knowledge lead by scholars and practitioners have changed the traditional financial measures and began to value the intangible or non-financial measures as a second phase of performance measurement. It could be seen by the introduction of balance score card (BSC) in year 1992 that has streamlined the criteria to be measured by every organization (Kaplan, Robert S.eNorton, 1996). Measurement of maintenance performance is an assessment that helps to identify the strengths and weaknesses of the maintenance activities. In addition, the result of performance measurement indicates the effectiveness of the existing strategy. Consequently, the management team is able to plan and make appropriate decision for future maintenance strategy.

The building user oriented maintenance services (BUOMS), can be classified as maintenance management service quality where pending evaluation by property owner or building user which covers service quality expectation versus performance (Kazemi, Ehsani, Abdi, & Bighami, 2013). Thus, this research will incorporate the flow of school maintenance management coupled with BUOMS performance measurement.

Table 1 The School Maintenance Performance Measurement Framework with integration of building user.



(Sources: Researcher's - building users oriented maintenance framework)

The above framework describes the relation between four (4) maintenance stages beginning with Planning, Implementation, Performance measurement, Analysis and reporting.

At planning stage, the maintenance policy is important in rendering the fundamental of any maintenance organization. It is further explained by Al-Turki (2011), where maintenance itself constitute around 30% of the total running cost of manufacturing and construction businesses. The maintenance planning could be done at strategic and tactical level. Strategic level concerns on the existence of the business and tactical refers to the way how business is conducted.

While at implementation stage, the efficient maintenance management must achieve sustainable interrelation between business strategy, maintenance policy, financial management and good maintenance implementation (Sodangi, Khamdi, Idrus, Hammad, & AhmedUmar, 2014). In his research Au-Yong (2013) argued that the efficient maintenance implementation can be described as producing minimal waste, expense, downtime, failure and complaint. The scholars have concluded that implementation is where the policy is interpreted and applied on the ground to achieve good maintenance cycle as well as the best maintenance implementation.

The second last stage is Performance measurement. Maintenance performance measurement can be considered as assessment that eventually be able to appraise the outcomes of the maintenance activities. The findings will be analyzed to continually improve the maintenance policies and maintenance performance as well (Maletič, Maletič, & Gomišček, 2012). The variables used inclusive of Tangible, Reliability, Assurance, Empathy and Responsiveness.

Table 2 The main variable for occupant's satisfaction.

Tangible	Physical facilities, equipment and appearance of personnel
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers and provide prompt service
Assurance	Knowledge and courtesy of employees and their ability to inspire trust and confidence.
Empathy	Caring, individualized attention the firm provides its customers.

(Sources: Parasuraman, Zeithaml, & Berry, 1988)

The final stage in the maintenance performance measurement framework is analysis and reporting. The maintenance report and analysis is imperative as a document and record to attain the real scenario of maintenance management in certain organization (Au-Yong, 2013). The maintenance report consists of complaint from the users, maintenance expenditure and technical report. The same variables will be utilized to measure maintenance performance for the school.

4 SIGNIFICANCE OF BUILDING USERS' SATISFACTION

Building users are the people who “use/occupy the building; they are not experts in managing it but have knowledge and opinions about its performance in relation to their own objectives. (Pemsel, S., Widen, K. and Hansson, 2010). The roles of end user in strengthening maintenance management is also mentioned by Myeda, Kamaruzzaman, and Pitt (2011). They assert that maintenance managers should value the important roles of end users in evaluating the performance of maintenance services with a great attention given on their needs and requirements. The root causes of the problem is the lack of an understanding of the maintenance management process for heritage building among school administrators as such it hinders the schools from designing a good maintenance programme for their schools (Akasah, A Z. A., 2012).

There are several studies that revealed integration between principals, representatives from parent teacher associations, students, and school community should be responsible for setting up the school maintenance program in order to prolong the life expectancy of school buildings, its furniture and equipment (Akasah, Shamsuddin, Rahman, & Alias, 2008; Elghaffar & Assistant, 2007). In year 2013, Lai and Lai pointed out that satisfaction of every stakeholders in particular the building user must be valued because they experience the maintenance contractors' service quality and the finished works. In the final part of his thesis, Mansor (2014) informed there has been an increasing amount of literature that promote community as accountable in providing conducive learning environment on the availability of the school maintenance and facilities. Thus, promoting the concept of schools and communities in strengthening relationship for mutual benefit is considered important.

Some researchers conducted survey in the form of post-occupancy evaluation (POE) to identify real issues and also end-users' preferences for facilities and services (Hebert & Chaney, 2012). Thus, this will measure the end-users' perception towards facilities and services provided in the building. It is important before steps are taken to improve existing facilities and services in the building.

The efforts to provide access for end user to jointly contribute during the design stage is much appreciated. This is based on their experiences and also because they are the one who are going to use the completed building and its facilities. The idea to strengthen the involvement of end users in Building Life Cycle is reiterated by Pemsel, S., Widen, K. and Hansson (2010), where participation of end-users in the circle of design process up to occupancy offered not only benefits, but also disadvantages. Scholars have pointed out that on social and cultural barriers are the two great challenges to understand end users' real needs. The service quality rendered to the building user is the main factor that perform satisfaction and create background of end-user's perceived value and at the nature of quality (Lepkova, 2012).

5 METHODOLOGY

At the very outset, existing procedures have been analysed in relation to types of maintenance, time to respond to maintenance request, annual maintenance budget and level of satisfaction towards maintenance works done. The researchers discovered the issues and problems on maintenance practices for school buildings by examining secondary data from journals. In addition, the researchers derived the objectives to be used as a guide for the research. The case studies were selected for preliminary survey based on the age of the school buildings, The selected schools is in operation for more than 20 years. The boarding religious school under Ministry of Education, Malaysia. Every similar type of schools having academic buildings, hostels, surau, hall and sports facilities. This is the pilot study to identify the real

issues and problem that hovering maintenance practices for religious schools. The findings will be used as a foundation before further research to be carried out for other schools through-out Malaysia. The study employed two methods to collect the required primary and secondary data for analysis, i.e. by interview and document analysis.

This was mostly because the study needed to know the maintenance practices that were adopted in the schools. Other than that, the visual inspections of the school buildings assisted in conducting a better analysis and provided some evidence to support the results of the study. The visual inspections were carried out without any specific instrument and there were certain limitations as there were some places that were out of bounds to the researchers.

6 CONCLUSION

Insufficient budget allocation is one of the challenges that contribute for lack of maintenance for the school. As a result most of the building defects may occur continuously and unpredictable. School building of more than 30 years is prone to have defects. Even though maintenance for national religious boarding school is led by technical personnel, building user still has problem when dealing with maintenance works. Some of the maintenance works are being carried out repetitively thus, they create disturbance to the building user. As such building users face problems in dealing with their routine works due to improper maintenance management implementation at their school. One of the significance of maintenance management is it can affect occupants' satisfaction on building performance where it can offer the occupants a positive environment which consequently will contribute to the productive and healthy life style.

The maintenance performance measurement will depend solely on occupant's satisfaction. The variables could be grouped as follow: tangible, reliability, assurance, empathy and responsiveness. The research will reinforce the understanding and the needs to deliver services to achieve the building users' satisfaction.

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