

## **Comparative Study on The Effectiveness of Building Maintenance Scheduling Between Two Multipurpose Hall Buildings**

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**Abstract:** Buildings maintenance is very important for the building and building occupants. Maintenance is a service to make sure the performance of the building in good condition throughout its design life. It is very much needed so we can have very good environment that can help us do our work peacefully. Occupants demand to have priority in terms of comfort of ability to use and utilise the facilities and services as it must be fit for purpose of the user. Work productivity of workers may be demotivated and interrupted due to poor building facilities conditions. In order to prevent that, we have to make sure the building maintenance scheduling are well prepared and followed. This study is about comparative study on the effectiveness of building maintenance scheduling between two multipurpose hall buildings. The objectives of the case study are to investigate the procedure of building maintenance scheduling for the buildings, compare the maintenance scheduling approach between the two multipurpose hall buildings and suggest the best method to practice in the development of building maintenance. This investigation will be carried out through field study and interview from both building. At the end of this study, the data for analysis from the interview have been gathered and it shows that both building are using the same maintenance approaches. Discussion has been explained to provide the comparison for the effectiveness of building maintenance scheduling for both building. Both buildings had made improvement in the building to overcome the building defects and increase the building performance. The buildings have been properly maintain in order to keep it well perform. Some recommendations have been suggested for the future used in having effective building maintenance scheduling. The results from this study are the effectiveness of building maintenance scheduling for both multipurpose buildings have been properly studied and investigated.

**Keywords:** Building, Maintenance Scheduling, Multipurpose Hall

## 1. Introduction

Buildings are one of the important especially for society because they serve several societal needs. It gives us shelter from the outside environment. Buildings also provide us with the facilities that we need to help us do our work easily. All buildings have to be well maintained to keep it functioning throughout their life cycle.

The main aim of maintenance is to protect a building at its preliminary stage and to retain the value of investments in the property [1]. In reality, maintenance works are not given the attention it should have. Buildings will be weary, decaying and dirty as time goes by; but with high quality maintenance management we can prolong the life-span of structure, provide building services and keep the building performance at its ultimate level [2]. Structures as stated do not only refer to buildings. Other structures such as bridges, roads, harbours, drainages, and any kind of engineering structures are also included. Maintenance of these structures may differ in various ways, but all of it must be carried out in a strategic and systematic way.

Building maintenance is the main activity or work in the building management because it keeps the building well perform whether the building are large, small, simple or complex. The building maintenance play important role for the operation process of the building. After for a long time, building maintenance will become an invaluable process to retain the quality of the building. This is because the building has defects that cannot be maintained. By not having an effective maintenance management, it well affects the building performances and also the financial cost of maintenance. The performance and operation of the building are also affected by other factors. Some of the factors are age of the building and building surrounding.

Effectiveness of building maintenance is the important factor to make sure the building operation was functioning to achieve the occupant's needs. It also to maintain the building environment by achieving zero defects in the building operation. Maintenance in building can help to reduce the disturbance or interruption during doing our jobs. The effectiveness of building maintenance can help to increase the revenues by increasing the equipment performance. The quality and cost has big impact for the building maintenance and has to be understood. If we fail to do an effective building maintenance, it can give a bed performance and images of the building.

### 1.1 Problem Statement

Buildings with bad maintenance scheduling can lead to structural failure and waste of money. As we all know, maintenance is very important and needed for all sectors of structure. Even if with the highly cost for maintenance it is very necessary to study about the maintenance problem so that an effective maintenance scheduling can be carried out. There are three main problems in maintenance which is inadequate financial, bad management, and poor building design.

The first problem is cost of financial management. Financial cost controlling for maintenance is a difficult obstacle in building maintenance. There are very less attention has been given on building maintenance budget and it is very rare to see research carried out on the subject of maintenance expenditure, funding or financial budget of maintenance work [3]. The cost for the construction will be the problem and issue for the building maintenance if the building is repeatedly having deterioration. The second problem is improper management. Building management usually involves the participation of a manager who, faced with a number of problems and issues, has to make decisions which require vast knowledge, analytical skills as well as speed and self-discipline [4]. The building management need to have functional team of effective managers and employees to keep the maintenance works organise. All the records and data need to be kept and categorize so it will be easy track. Effective building maintenance scheduling will not be carried out without the workers effort. The third problem is imperfect building design. The degradation incurred by aging of the building can not only lead to excessive repair costs, but also affect its usability and resident safety negatively [5].

We have to know the material used for the building construction. Building projects want to make the building look attractive but as the building ages, these building will deteriorate. The types of capacity or facility of the building would cause different type of maintenance requires. This study is important so we can overcome all these kind of problem with an effective building maintenance scheduling.

## 1.2 Study Objectives

The objectives of this study are to investigate the procedure of building maintenance scheduling for both multipurpose hall buildings, compare the maintenance scheduling approach between the two multipurpose hall buildings and suggest the best practice in the development of building maintenance for multipurpose hall buildings.

## 2. Methodology

This study approach will be conducted by using suitable methods to do the observation that is performing a field study at the selected study places and doing an interview with the people in charge of the maintenance and people who work there. These study approaches will be done to gain data and information for the purpose of this study.

### 2.1 Location of Study

The first multipurpose hall building is *Dewan Orang Ramai Yong Peng*. It is located at Jalan Labis, Yong Peng, Johor. The second multipurpose hall building is *Dewan Orang Ramai Parit Yaani*. It is located at Kampung Parit Banyumas, Yong Peng, Johor. The information and data for maintenance work of the buildings will be taken manually at the location with the permission of the district Council that is Majlis Daerah Yong Peng (MDYP).

### 2.2 Interview Method

Interview is the most common format of data collection in qualitative research. Interview questions are usually open-ended questions so that in-depth information will be collected. The one-to-one interview helps gather information or data directly from a respondent. It is a qualitative research method and depends on the knowledge and experience for interviewing to frame and asks relevant questions one after the other to collect meaningful insights from the interview. For these interviews, the target respondents are the workers or people who in charge of the maintenance work for both of the building. They will ask about the effectiveness of the maintenance work and the organization for the building maintenance work scheduling.

Before the interviews, suitable dates will be agreed on and the purpose of the interview is made clear to the respondents although the researcher was in touch with the respondents prior to the interview. Besides, the interviews, there will be a series of follow-ups for further clarifications that can be through telephone conversations and e-mail. These interviews can last from 30 minutes up to a few hours.

## 3. Results and Discussions

From the interview, many questions had been asked based on the objectives of this study. These structured questions will help in analysing the data and information for this study.

### 3.1 Procedure of Building Maintenance Scheduling

The procedure of the building maintenance scheduling for both of the buildings had been analyse based on the interview that had been done. Both buildings use many type of approaches for their maintenance work such as scheduled maintenance, preventive maintenance, and corrective maintenance. These approaches are used to maintain the performance and the cleanliness for both of the building. For scheduled maintenance, there are 3 types schedule that they used.

Firstly, they used everyday inspection. There is one janitor for each of the building who works under MDYP that will do inspection on the buildings. This janitor's job are keeping the buildings clean everyday while doing inspection and checking on the facilities and condition of the buildings. Their work hours are from 8 a.m. to 5 p.m.

The second one is yearly maintenance. Once a year the authorities from Valuation and Property Management Department from MDYP will do inspection on the multipurpose hall buildings. They will investigate the problem that the buildings are having. The budget that been provided for the yearly maintenance are RM40000. These budgets are divided by two. The first RM20000 are for mechanical and electrical problems like the lamp, fan and audio system. The other RM20000 are for civil problems like the condition of the building, cracking and painting on the wall.

The third one is once in five years maintenance. The maintenance usually takes place for a bigger or major problem for the buildings. These included in the work for renovation of the buildings. Renovation works are applied to the building if there are any facilities or equipment that needed to be upgrade or renovate. The budgets for the maintenance are RM100000 because it will be used for many bigger kinds of maintenance work.

### 3.2 Comparison of Maintenance Scheduling Approach

There are some comparisons that can be made between the maintenance approaches between the two multipurpose buildings. The maintenance approaches for both of the buildings are the same but *Dewan Orang Ramai Yong Peng* needed more maintenance work than *Dewan Orang Ramai Parit Yaani*. This is because *Dewan Orang Ramai Yong Peng* is more used than the other building.

Other than that, *Dewan Orang Ramai Yong Peng* needs more maintenance because it is an old building. It was built in the 1980's but *Dewan Orang Ramai Parit Yaani* was built in the 1990's. Many defects occur when the building is very old such as cracking because of the lifespan of the building. Because of this, many cost or budget will be used for repairing or fixing the problem.

The maintenance works are usually more focus on *Dewan Orang Ramai Yong Peng* because it is near the MDYP. This is because the quality and the performance of the buildings will represent the image of building management of MDYP. The maintenance works needed to be done perfectly so it will represent the good image of MDYP in building management and people will have more trust to use it.

### 3.3 Maintenance Development Improvement

Improvement on the building had been done so that the building will have better performance and quality. One of the improvements is changing the type of roof. On the previous year, the buildings are using asbestos roof. This material can causes problem to the building and health. It is brittle and breaks easily. This problem will leads leaking problem on the roof. When it's raining, the water can pass through the crack from the broken asbestos roof and causing leakage in the building. Repair and maintenance work for the asbestos roof will be done but it will cause health problem to the workers who repairing it such as lung cancer. Asbestos also plays an important role in lung cancer carcinogenesis [6]. So, to prevent from having these problems, they change the roof to a metal deck roof. This material is very good in durability and safety. It can sustain heavy wind and rain and not burn into flame during wildfire. This improvement is good for the future maintenance work.

Other than that is changing the colour of the building paint to a new one. These buildings have been built very long. After a while, the paint of the buildings will start to peel. The corrosion on the buildings will affect the painting. By painting the building with new paint, it can cover up the cracking, corrosion and peeling from the buildings old painting. It also can make the buildings more

attractive and clean with the new painting. These will make the user feel comfortable when using the buildings.

#### **4. Conclusion**

The procedure of building maintenance scheduling for both buildings have been investigated. The buildings are using the same preventive maintenance, scheduled maintenance and corrective maintenance which suitable and proper types of maintenance for the building maintenance work. The budget costs provided for the maintenance work procedure have been identified.

The maintenance scheduling approach between the two multipurpose hall buildings have been compared. The amount of maintenance work are usually depends on the age of the building and the usage of the buildings. Multipurpose hall building of Yong Peng needed more maintenance work because the building is very old than the others buildings and also being used for many events because of the strategic place of the building.

Improvements and recommendations have been made to increase the performance for both of the buildings and reduce the cost of future maintenance work. Both building have used a new technology or equipment like changing the roof to a new type of roof to prevent from future defects conclusion should summarize the main findings of the study, and restate the key points inferred from trends observed and discussed regarding the data. Some suggestions should be included to encourage the continuation of the current research.

#### **5. Recommendations**

Regarding this study, some recommendation can take into account in order to improve the building maintenance scheduling for both multipurpose hall building.

For multipurpose hall building of Yong Peng, we need to replace it by proposing a new building to be built somewhere more suitable in that town. This is because the building is very old, have factors affecting the building defects and cost many maintenance works. So to prevent this from happening and saving the future maintenance cost, new building for multipurpose hall building Yong Peng should be built.

Build a kiosk at both multipurpose building. Kiosk is a small vendor's stall. This kiosk should provide the needs for the building user like selling food and water. This is because usually everyday people will use the building for badminton activities. With this kiosk, we can provide them the supply by selling them food and water. They do not have to bring anything. This can prevent form any waste from user and also gain income from the kiosk.

Improve the facilities and equipment to a brand new technology. As an example is switching from fan to air conditioner. By doing this, the user will feel more comfortable especially during an events like wedding and seminar. This also can attract many other people to use the building for events. With many events, the income cost from the renting will increase too.

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