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Building Condition Assessment Imperative and Process

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Abstract

Building is a major physical asset within every facility. Facilities management (FM) deals with the management of built assets such as building in order to deliver the best service to the users. However, building condition does not stand longer in a good performance as it starts deteriorate once completed and been used. Therefore, the paper offers a literature review of the defining the condition assessment for building, the need and the process in the context of FM.

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1. Introduction

According to Douglas (1996), building is a major physical asset within every facility. There are three primary functions of a building which is related to space, as a shelter from weather; and provides safety and privacy to the users or occupiers. However, the evolution of building walks along with time. A building nowadays has played many roles in order to support human activity. The roles are rapidly changing as our activities had changed. Recently, many of our daily activities always happen within a building. A building now is a learning centre; also a place for communicate and socialize; or as our

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workplace and even much more (Don Prowler, 2007). In a short word, today, the role of a building to support our life activity is unlimited.

However, not only roles but the actual performance of the buildings may declined due to external and internal factor; whereas external factors mostly comes from weathers while the internal comes from maintenance take place in the building . Moreover, the factors of wear and tear or even user abuse may contribute to the same concern (Douglas, 1996). Building may become worn-out and requires maintenance after 5 years as it expected to be long last for about 60 years (Olanrewaju, 2011). Consciously, the maintenance is needed for all buildings that had been start used ever since the deterioration process begins once the building completed (Arditi, 1999). So, it is not surprised if many expenses spent on maintenance and replacement of building component each year by the owners as an assurance of well perform of their building for long term.

2. Building Performance

Gibson (1982) indicates that, in simple words, building performance is related with the ability of a building or building product. It has been used a long time before and only look at the needs of a users and the achievement that had been target for the business process. It seems a process from beginning to verify the requirement and fitness of a building purpose, asset or facility, or a building product, or a service. It is clear that, building performance can be bring to a close as something that can be achieved by a building through it use as a physical resource of facility management that has been targeted to the business process.

Closely to FM, based on Syahrul Nizam Kamaruzzaman (2010) statement, FM is engages with a range of disciplines and services also the development, organization, and management particularly the buildings and their systems, fittings and furnishing. All of these have been put along into the overall target to support the strategic objectives of an organization. The words of “buildings, their system, fittings and furnishing” as mentioned above are closely related to the elements found within a building that need to be managed under FM to assist the organization to achieve their business goal. Same goes with building performance; as also been mentioned before, it is a process that need to be encounter with requirement and fitness of a building purpose, asset or facility, or a building product, or a service.

So, building performance and facilities management are tied together. The difference is performance of a building more relates with the ability of a building to fulfill its true function and user requirement then connecting it into business process. While FM is likely more concern to integrate all the building matters into the organization without overlook into the business goal. Similar to FM, the function and ability plays by a building is matched with FM goal which is to deliver the best service for the owner and user; same as. It is very excellent for a building to remain functional to building users as FM can assist to give the best service relates to building matters for the users and owners.

3. Condition Assessment and Building Performance

Building performance and condition assessment could not be separated as condition of a building is the typical way to measure the building performance (Abbott, 2007). The ability of a building can be viewed roughly by the physical of the building. That is the reason why condition of a building becoming the measurement marker for building performance. It has been connected as it is the perfect way of measuring the building performance. Not only that, it does helps to show the needed existing maintenance program that would be put onto the building in order to keep the building in the original states especially

for the components. But, it has to be compared with the full economic function when it first been completed; or given with effective maintenance.

This process of comparing the function and the state of the component is one way of benchmarking. Mainly, the mean of “benchmarking” is carry out by assessing the condition of the building fittings, component, furnishing and the physical of the building itself. Then, follows with choosing the between the deferred maintenance, required maintenance or repair programs. The choice had been made has to be list in as the action needed to be taken in order to enhance the building performance. Obviously, condition is the building performance measurements but not meant for preparation of the maintenance budget by the FM managers.

Figure 1:

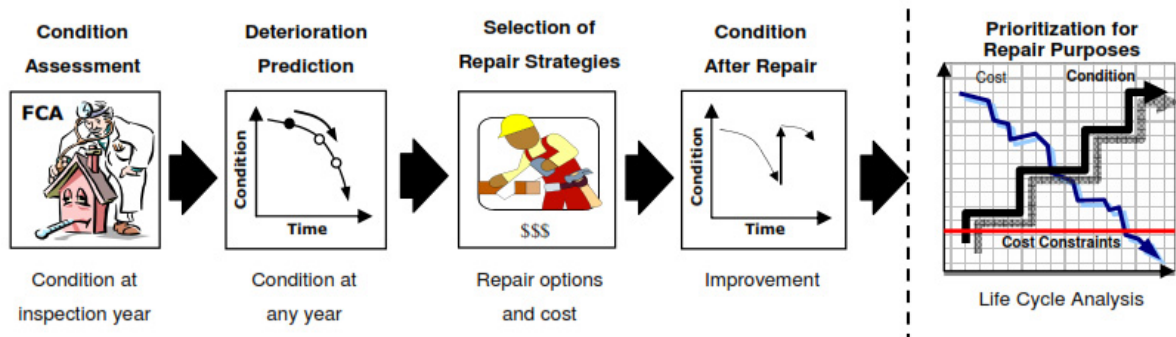


Fig. 1. Main Functions of an Asset Management System (Ahluwalia, 2008).

Based on Ahluwalia (2008) study of her literature, condition assessment is one of the main functions of Asset Management. It is a first step in the maintenance process. Figure 1 above shows the “*Main Functions of an Asset Management System*”. It shows that condition assessment did assist in the next step of selecting or prediction the maintenance and repair strategies that suits with the components, fittings or even the physical condition of the building that had been assessed. The condition after repairing needs to be review to seek out the result of improvement. From here, the cost will be calculated based on what had been repaired and assessed. Therefore, condition assessment did have connection with building performance. It helps a lot on what is exactly needed in maintenance repair strategies and also in forecasting the maintenance cost for the future planning in maintenance program. Thus, the building performance will be enhanced if the maintenance cost and program can be predicted in case if there will be the same deterioration happens in future.

4. Condition Assessment: The Imperative

Condition assessment as mentioned before, is the basis for measuring the building performance. At the same time also agreed by National Centre for Education Statistics or NCES (2003b), condition assessment is used for as for find out the level of preventive maintenance needed for a building’s systems and components. It also known as condition survey; is a tool to evaluate the technical performance which involves the properties to support the durable maintenance. Meanwhile, as mentioned by Rugless (1993), the definition of condition assessment is a process of evaluate the assets owned by organization with the aim for determine the best maintenance needed to support their activities and service. So, a measurement of building performance involve the process of evaluating the asset to find out what maintenance is needed for what type of asset that had been evaluated. However, Abbot (2007) stated that, mostly, it value

was seldom fully used and been undervalued and supposedly it should be a basis for maintenance decision making process. He stressed out that, condition assessment is a best tool towards creating sustainable asset management.

Not only design and appearance of a building, the building condition also gives impact to the users. There are positive relationship between building condition and student performance. Students are likely to perform better so do the staffs; if they are in the building with the best condition (Earthman, 2002). The building with lack of maintenance and repair will be labelled in unsatisfactory state by their building users even it's a new building. Because building are in high standard if it can be fully function as a building with good maintenance and repair. Student's achievement is higher in the school that is in good condition. The staff or teacher work's performance may also directly influenced by the building condition. This obviously shows that it is imperative to conduct the condition assessment throughout of a building in order to keep in good physical shape all the way through its life span.

5. Condition Assessment: The Process

Condition assessment is a process of predicting the maintenance strategies and repairs needed for existing components, fittings and physical of the building. It also useful in order to rank the amount of repair and cost needed. It requires some of process to make it useful to assist in decision making of maintenance future planning. Ahluwalia (2008) stated that there are about four main steps involves in condition assessment as shown in the Figure 2 below.

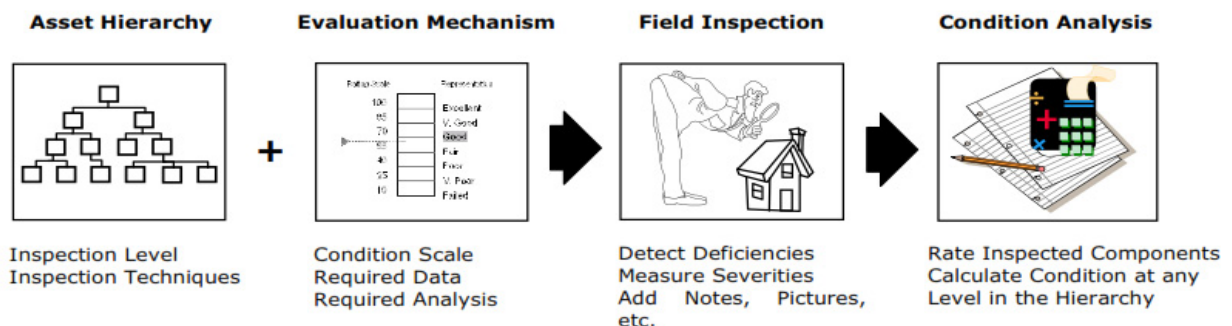


Fig. 2. Main Steps In the Condition Assessment Process (Ahluwalia, 2008)

The steps are starts with inspection after categorizing all the assets own by the organization. The purpose to conduct the Asset Hierarchy is to categorize the components in the building because a building usually been divided into many systems and fittings also this hierarchy will help in order to determine the inspection level. While the inspection technique also will be determined after knowing what level of inspection needed. Next step, the scale of condition will be used as the evaluation mechanism. In this step, the data collected from scaling the condition will be used as data then will be analyzed. The third steps requiring the field inspection in order to detect defects and measuring the severities on the components and structure, fittings and physical of the building. Lastly, the inspected condition will be rated and calculated based on level of inspection and asset hierarchy. However, not only Ahluwalia (2008) does have mention the process, but also Straub, (2002) in the different way but still yet look alike. The similarity is founded in the process of detecting defects except, Straub did put more attention only on detecting defects. His model of condition process is simpler than Ahluwalia. Figure 3 below shows the Condition Assessment Process by Straub (2002).

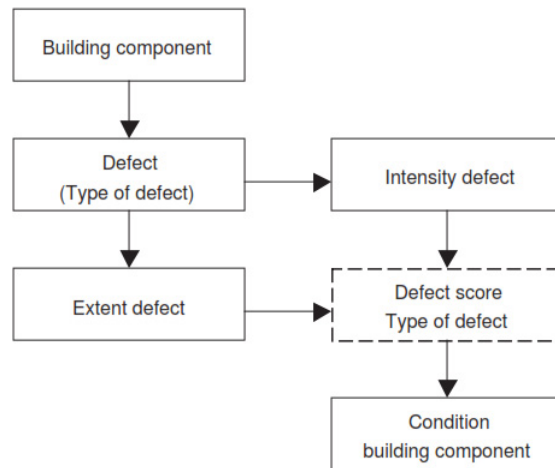


Fig. 3. Condition Assessment Process (Straub, 2002)

Straub starts the process with identifying the type of defect. There are three type of defect which is minor, serious and critical. The critical defect is more threaten that other two and slowly damaging the building components. This process of identify and classify the type of defect will be follows by looking at the intensity and extent of the defect. The intensity of the defect entails with the degradation process. Image of the defect will be a useful tool for this purpose. Meanwhile, the extent of defect is more likely on rating the defect. The result will come with the percentage e.g. 0–50 per cent and 450 or refers to official international standards, e.g. ISO4628 Paint and varnishes. After all of these done, the result will ends up with the condition marks and defect scores as the last of process in building condition assessment.

In order to facilitate in condition assessment process, both researcher, Ahluwalia and Straub did mention that inspector are needed during the inspection field. Both of them also mention about review and recoding image are needed in inspection as the visual inspection. Ahluwalia (2008) also mentioned the suitability of visual inspection suits with the nature of building. However, human visualization is limited. They can not quantify all possible defects. Past research have come with many attempt overcome the limitations by human inspector. Thus, in condition assessment process, the visual inspection does help a lot but there is a need of visual guidance database as been stressed out by Ahluwalia (2008) in order to create the ideal condition assessment.

6. Conclusion

Building performance represent the ability of a building and condition assessment is needed since it has to be the basic of performance measurement. Meanwhile, condition assessments represent one of the main functions of asset management. Besides that, there are positive relationship between building condition and user performance. By assessing the building condition, the decision making on maintenance plan and strategies will be easier. In order to assessing the building condition it requires a few of step and process however there is problem in visual inspection. This paper highlighted only on the building performance connection with building condition assessment, the need and the process of condition assessment. Thus, in the future, there is a need to explore the implementation of condition assessment

which has to be improved from time to time in order to enhance the building performance. So, FM will serve the best service to building user when the performance and the condition of building are in the best and high use.

References

- Abbott, G.R, Mc Duling, J.J, Dr, Parsons, S. And Schoeman, J.C (2007). Building Condition Assessment: A Performance Evaluation Tool towards Sustainable Management. CIB Building Congress 2007.
- Ad Straub, (2002)," "Using a condition-dependent approach to maintenance to control costs and performances", Journal of Facilities Management, Vol. 1 Iss: 4 pp. 380 - 395
- Ahluwalia (2008). A Framework for Efficient Condition Assessment of the Building Infrastructure. University of Waterloo. Doctor of Philosophy in Civil Engineering
- Arditi, D. and Nawakorawit, M. (1999). Issues In Building Maintenance: Property Managers ‘perspective. Journal Of Architectural Engineering / December 1999.
- Douglas, J. (1996). “Building performance and its relevance to facilities management”. Facilities. Volume 14. Numbers ¾. March/ april 1996. Pp.23-32. MCB University Press. ISSN 0263-2772.
- Earthman, Glen I. (2002). “School Facility Conditions and Student Academic Achievement”. Los Angeles, CA: UCLA’s Institute for Democracy, Education, & Access (IDEA).
- Gibson, E. J. (1982). Working with the Performance Approach in Building. CIB Report Publication 64. Rotterdam, The Netherlands. CIB (International Council for Research and Innovation in Building and Construction).
- National Centre for Education Statistics (NCES July 2003 b). Facilities Information Management: A Guide for State and Local Education, U.S. Department of Education, NCES 2003-400, U.S.A.
- Olanrewaju, A. (2011). *Behavioral issues in maintenance of university buildings*. Macmillan Publishers Ltd. 1479–1110 Journal of Retail & Leisure Property Vol. 9, 5, 415–428.
- Rugless, J. (1993). Condition Assessment Surveys, Facilities Engineering Journal, 21(3). 11-13.
- Syahrul Nizam Kamaruzzaman(2009).*Development of facilities management in Malaysia*. Journal of Facilities Management. Vol. 8 No. 1, 2010. pp. 75-81. Emerald Group Publishing Limited. 1472-5967