BARRIERS FOR PRACTICING BIM IN FACILITIES MANAGEMENT IN INDONESIA

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Specially dedicated to all mighty ALLAH who gave me skill of learning and strength to memorize, my parents and my wife who always remember me in their prayers.

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ABSTRACT

Facilities management is now widely practiced in Asia. It has been practiced in Europe, America and other continents many years earlier. It has helped many organizations in their business. It deals with vast amount of data which changes over time. The data was always used to adopt to changing business environment. Therefore the need for the medium to capture, manage and use the various data regarding building and facilities. There are many softwares which are very useful for professions and for facilities management. Building Information Modelling is one of the most suitable. BIM has been practiced in FM. However, it is not widely used in FM industry including Indonesia. Therefore this study was conducted to identify the barriers of BIM is active and wide use in Indonesia. Perceptions of the facilities managers were seek, through survey questionnaire, to identify the barriers. The survey showed the respondents agreed that there are barriers due to insufficient knowledge and lack of training institutes that have hindered the wider and active use of BIM in FM industry in Indonesia.

ABSTRAK

Pengurusan Fasiliti sedang diamatikan secara meluas di Asia. Ia telah diamalkan di Eropah, Amerika benua-benua lain sebelum ini. FM telah membantu banyak organisasi di dalam perniagaan mereka. Ia melibatkan banyak data yang berubah melalui masa. Data- data berkenaan digunakan untuk disesuaikan dengan persekitaran perniagaan yang berubah. Oleh itu, perlunya media untuk mengumpul, mengurus dan mengguna berbagai data berkaitan bangunan dan fasiliti. Model maklumat bangunan BIM adalah salah satu yang sesuai. BIM telah menjadi amalan .Ia tidak digunakan dengan meluas di dalam industri FM termasuk di Indonesia. Oleh itu, kajian ini telah dilaksanakan untuk halangan-halangan kepada amalannya yang giat dan meluas di Indonesia. Persepsi Pengurus Fasiliti telah didapatkan melalui soal selidik untuk mengenalpasti halangan-halangannya. Kaji selidik menunjukkan responden telah bersetuju terdapatnya halangan-halangan akibat kekurangan pengetahuan dan kurangnya institusi latihan yang telah menghindarkan amalan BIM secara giat dan meluas dibanding dalam industri FM.

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CHAPTER 1

INTRODUCTION TO RESEARCH

1.1 Introduction

A great responsibility goes to facilities managers of every building to conserve energy efficiently (NIBS, 2007). Similar to construction, facilities also consume 40% of the world's energy and 65.2% of the total United States electric consumption (NBIM part 1, 2007). Carbon emitted from facilities make up 40% of the total carbon emission in the atmosphere. This renders a great impact on the environmental equation (NBIM part 1,2009) .

Architecture, engineering, construction, owners, and operators (AECOO), are the components of a building life cycle. All these components cater the needs of different stake holders and demand a lot of coordination. They also require careful communication to ensure effective process coordination (Zhang et al., 2013).

Facilities managers are the professionals who need to identify and understand failure cause-effect patterns in order to prepare preventive maintenance plans. This is not an easy job due to the complex interaction between different building parts and their operational conditions.

Generally, decisions on maintenance-related works are dependent on different types of accumulated historical data such as inspection records, design drawings and sensing data, etc. Most of the time, the periodical maintenance data is text-based that makes deriving information to be time-consuming and less effective.

Most of the time, historical data is not available on some parts. This complicates the task of preventive planning. Storing historical data on the changes of facilities gives benefits to facilities managers particularly in making maintenance decisions.

Advanced FM-related information systems such as the Computerized Maintenance Management Systems (CMMS), Maximo (Maximo, 2011) and FM: Interact (FM Systems,2011) are specially designed for handling repair orders, asset inventory and procurement management. However, these systems lack the vital functions to analyze the collected data in order to determine failure patterns.

To share information on drawing, facilities, inventory, and the coordination throughout the life cycle of a building, a newly developed concept / mechanism called Building Information Modelling (BIM) is now in industry. The definitive and correct definition for BIM is stated by the National Building Modeling Standard Committee of the National Institute of Building Sciences (2011) as:

" . . . an improved planning, design, construction, operation, and maintenance process using a standardized machine-readable information model for each facility, new or old, which contains all appropriate information created or gathered about that facility in a format usable by all throughout its life cycle." Such a process integrates the physical and functional characteristics of a facility in a digital representation (NBIMS version 1,2011)."

The above definition explains that BIM promotes improved processes of planning to design, from design to construction, and the operation and maintenance of facilities. This inevitably leads to the need of a standard software that has the ability to provide information on every process aforementioned.

Unlike in the past where the facilities managers were handed over with files of CMMS owner's manuals, BIM gives the same critical information within the drawing itself. The facilities managers no longer need to take out information from files. As mentioned by Reddy (2011), with BIM, any information about equipment from the drawing is just one-click away. The facilities managers can click on any fixture or equipment to obtain information on a product, the life cycle of the product, replacement cost, warranties, maintenance checks, installation and repair procedures, and even place order for a replacement online (Jordani, 2010).

Joyce (2012) reported that Augmented Reality (AR) in smart phones and tablet devices such as iPhone and iPad has made it easy to obtain complete information about a building component by just pointing the component in the device. Thus, BIM has played a vital role in a building's life cycle.

1.2 Problem Statement

The use of BIM in construction projects is growing rapidly. McGraw-Hill Construction (2010) surveyed hundreds of civil engineers, building owners, architects, structural and MEP engineers, general contractors, construction managers and trade contractors in the United States, who have been using BIM. 62% of the survey subjects indicated that they will be using BIM in over 30% of their projects in 2009.

Expertise in BIM leads to greater understanding of BIM advantages. The value of using BIM is approaching 82%. Experts believe that BIM has a very affirmative impact on their company's productivity and around 44% of BIM experts are now regularly tracking the BIM return-on-investment (McGraw-Hill Construction, 2008).

Interoperability is becoming increasingly vital within the construction industry as it will change the quality and productivity of a project. BIM technology has been made in order to solve this problem. However, the adoption of BIM is still slow in the Malaysian construction industry. Furthermore, there are still some barriers in the implementation of BIM. As Datuk Seri Prof Judin Abdul Karim said "It is not a problem of information knowledge and on the usage of ICT; it is always about the cost." Although there is enough need for using ICT, the cost of investment restricts companies from adopting the newer technology. Bigger companies can afford ICT investment while most of the smaller companies find its adoption financially unviable (Star, 2009). So, this research will highlight the barriers of implementing BIM in the industry.

Nowadays, the construction industry in Malaysia is facing bigger challenges from the community to increase their ratio of output, quality and value. This is because the construction industry in Malaysia has been seen as the most complex industry (Zahrizan et al., 2012) due to cost overrun, the production of low quality product, delays, intensive labor, as well as the use of old technology. These issues occur due to the complexities in the construction process and the involvement of various parties in the construction industry. Information exchanged among the stakeholders mostly involves a lot of documents and drawings (Zahrizan et al., 2012). This practice creates errors because of the large quantity of documents and drawings that are mostly in paper-based format and are not properly managed. Having the wrong information in the construction process could hinder the productivity of projects as information is perhaps the most important construction "material".

Therefore, there is a need for managing the information properly to ensure all parties in the construction projects receive the right information. The utilization of Building Information Modelling (BIM) is one of the platforms to meet this objective. (Zahrizan et al., 2012).

In reality BIM is not implemented in the construction industry due to the lack of awareness (Rohena, 2011). Some industry units have their own indigenes solutions with more or less similar features. However, due to the lack of quality, these tools are financially not benefiting as much. In these cases a lot of problems arise due to the use of out-dated technology equipment /tools and software (Rohena, 2011).

The construction industry will not be able to improve due to the lack of awareness on the need for BIM. Without BIM work becomes slow and inefficient, causing low quality and material loss. Important to note is that in many countries in Europe, BIM proved to be very successful and gave a lot of benefit in their work (Katz, Gerald I., et al. 2010).

We need to study the barriers for the implementation of BIM so that it will be widely accepted and successfully implemented. Only when there are institutes and universities having the latest knowledge on new technology, and also raise awareness of the government on its importance can the nation benefit from an economic boost (Williams, 2013).

One obstacle in BIM is it requires highly experienced and skilled professionals. Thus, software companies will continue to invest in human resources and educate the market in South East Asia, especially Indonesia

According to the Computer Integrated Construction Research Group (2009), there are 25 uses of BIM for consideration in a project life cycle. As Eastman et al. (2008) summarized based on the ten case studies, the BIM implementation varies from one place to another and no single project has yet realized all or even a majority of BIM potential benefits. Firms are also apprehensive about workflows and the rate of progress change due to the bringing of BIM. However in practice, it disrupts only inefficient workflows, pushing them to follow better design processes with more informed decision making (Autodesk, 2007).

1.3 Research Objectives

The research objectives are as follows:

i. To identify the barriers in practicing Building Information Modeling (BIM) for Facilities Management.

ii. To rank the barriers in practicing Building Information Modeling (BIM) for facilities management in Indonesia.

1.4 Scope of Research

The research focuses on the practices of BIM in facilities management for Indonesian facilities management professionals working in FM companies.

1.5 Significance of Research

The study will add valuable knowledge in different facets of academic and professional prospective. The study will have a good pool of statistical data and will show the factors that hinder the implementation of BIM in facilities management in Indonesia. This will also be very much beneficial for the industry where they will realize the importance and hindrance of BIM in the facilities management industry.

1.6 Research Methodology

The following chart illustrates the research methodology:

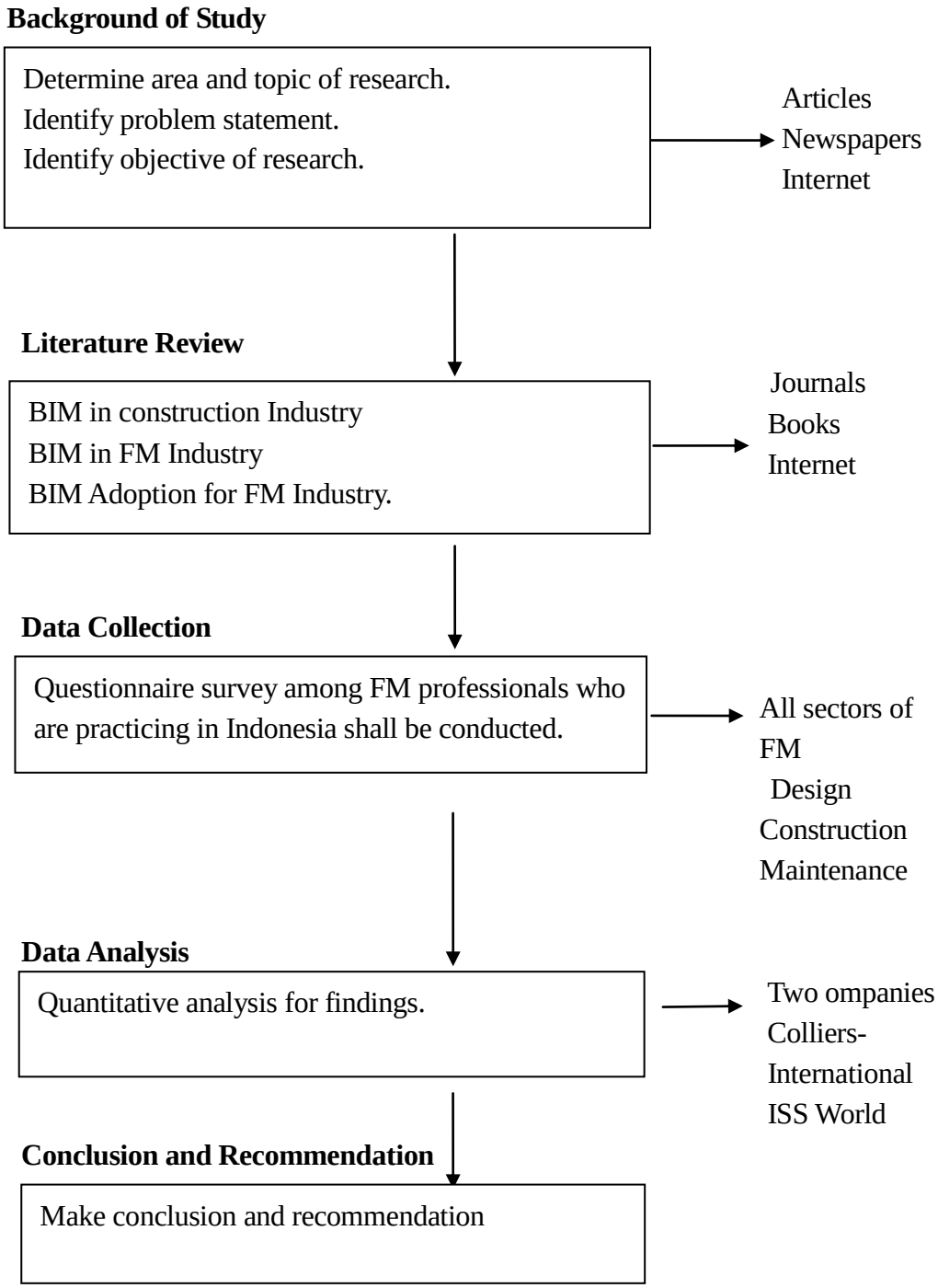

Figure 1.1: This figure Shows Research Methodology

1.7 Summary

This chapter has identified the issues and research objectives. The issues tell us more about the different problems faced due to lack of knowledge about BIM implementation. The research objectives will add value for the future researchers to get knowledge on BIM in facilities management companies in Indonesia. The research methodology of the project is presented which will act as the milestone for completing the project.

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