

THE IMPLEMENTATION OF BUILDING INFORMATION
MODELING IN MALAYSIAN CONSTRUCTION INDUSTRY

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DEDICATION

This project report is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

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In preparing this project report, I was in contact with many people, researchers, academicians, and practitioners. They have contributed towards my understanding and thoughts. In particular, I wish to express my sincere appreciation to my project report supervisor, PM Dr. Mohamad Ibrahim Bin Mohamad, for guidance, advices and motivation. Without his continued support and interest, this project report would not have been the same as presented here.

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ABSTRACT

Building Information Modeling (BIM) is a new approach of construction design. It does not only facilitate the digital representation for designs but also provides all the necessary information for any project before it is constructed. Despite these advantages, the adoption of BIM in Malaysian construction is very low. Therefore, this study has been conducted to assess the current status of BIM implementation in Malaysian construction industry. This study investigated potential benefits together with barriers to implementations of BIM and proposing effective strategies for enhancing the BIM implementation in construction industry. The methodologies adopted for this study included literature review, interview with industry experts and questionnaire surveys. Findings of the study revealed that the rate of BIM implementation in construction industry is very low. Main functions of BIM are energy optimization of the building, functional simulations and model-based cost estimation (5D). Potential benefits of BIM are improving the management and operation, enhance work coordination and improve design quality. Major barriers to low level of BIM implementation are lack of demand from clients, lack of the financial ability for the small firms and lack of the awareness of BIM by stakeholders. Provision of trial software, training of construction staff and introducing of BIM in university curriculum are very effective strategies in enhancing the implementation of BIM.

ABSTRAK

Pemodelan Maklumat Bangunan (Building Information Modeling (BIM)) merupakan sebuah pendekatan baru dalam reka bentuk pembinaan. Ia bukan sahaja memudahkan pembentangan secara digital untuk reka bentuk tetapi juga menyediakan semua maklumat yang diperlukan untuk setiap projek sebelum dibina. Walaupun dengan kelebihan ini, penggunaan BIM dalam pembinaan di Malaysia masih pada tahap yang rendah. Oleh itu, kajian ini dijalankan untuk mengetahui kedudukan semasa pelaksanaan BIM dalam industri pembinaan di Malaysia. Kajian ini menyelidik kebaikan yang berpotensi dan juga halangan dalam pelaksanaan BIM dan mencadangkan strategi yang berkesan untuk meningkatkan pelaksanaan BIM dalam industri pembinaan. Metodologi yang digunakan untuk kajian ini termasuklah kajian literatur, temubual dengan pakar-pakar industri dan pengedaran borang soal selidik. Hasil kajian menunjukkan bahawa kadar penggunaan BIM dalam industri pembinaan sangat rendah. Kegunaan utama BIM adalah untuk penyelarasan tenaga bangunan, penggunaan simulasi dan penganggaran kos berdasarkan model (5D). Manfaat yang diperoleh daripada penggunaan BIM adalah meningkatkan pengurusan dan operasi, meningkatkan koordinasi kerja dan meningkatkan kualiti reka bentuk. Halangan utama terhadap pelaksanaan BIM yang rendah disebabkan oleh kekurangan permintaan daripada pengguna, kekurangan kewangan bagi firma kecil dan kurangnya kesedaran terhadap BIM oleh pengguna. Diantara strategi yang dapat mempromosi aplikasi BIM adalah dengan menyediakan peruntukan perisian percubaan, memberi latihan kepada pekerja pembinaan dan memperkenalkan BIM dalam kurikulum universiti.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Building Information Modeling (BIM) is infrequently utilized in Malaysian construction industry. It is a new evolving approach to design and construction phase which encourages with a virtual representation of the entire lifecycle of project. BIM is the process and preparation of stimulated design and construction throughout the building process. It is not only just called as BIM software but a 3D building design which systematizes and visualizes all information data of the building before the actual construction is built. BIM has been confirmed a useful method in construction industry which has empowered practitioners in reducing uncertainties and accomplishing effective completion of a project.

BIM can be functional on each phase of construction process from design until operation stage. Unfortunately, the adoption of BIM is consider as very slow caused by the human itself and technical issues, known as internal and external issues. Internal challenge is related to human itself and expense generally to learn a new tools and techniques of the BIM software. While external barriers caused by lack of trust between the among of the disciplines and the new software applications. The implication hindrance, although perhaps are not entirely familiar by the industry yet, since most of the company have no experience and no understanding of the use of shared BIM software. The successful adoption of BIM in construction, it is very important to recognized and understand challenges to adopt BIM and develop strategies to monitor these challenges.

1.2 Problem Statement

BIM has been adopted in many developed countries for their construction projects where the countries are presently at stage 2 (model-based collaboration) while Malaysia is still slinking on pre-BIM stage. Thus, the effort on BIM must be given to expand the efficiency of production and quality in construction industry. Moreover, the adoption of BIM in

Malaysian construction industry along these lines lies between level 0 (CAD-based) and level 1 (object-based collaboration) because of the lack of knowledge and understanding of BIM as well as the low concern level by the disciplines in construction projects (Zahrizan et al, 2013). This is for the circumstances that the low utilization from the top management of project such as developers, whom are viewed as the main actor on the implementation of BIM, to comprehend the advantage achieved by BIM and the organization have to plan in order to get arranged for adoption the BIM in term of preparing the demand for BIM projects (Azhar et al, 2012).

The construction industry has a generally low increment of efficiency when compared with other industry. The advancement of BIM has proceeded for a long time but the implementation rate is still slow, although BIM has been presented by various method for addressing this issue. There is presently a many research evolving theory on why, concentrating on various boundaries constraining the value of BIM or restraining the ability to implement BIM in construction projects. How these diverse theories connected is however unorganized documented. There is a require to create the understanding of how these challenges link and in what method they can be connected. There is also unclear compromise of which actor that should drive the improvement and implementation of BIM in order to address this low productivity rate issues.

1.3 Aim and Objectives

This study analyses the implementation of Building Information Modeling (BIM) in the Malaysian Construction Industry. The purpose of the study is to develop the understanding of the implementation process regarding BIM in construction project. Thus, this research aimed to achieve the following objectives:

- i) To identify the main functions of Building Information Modeling system.
- ii) To determine the potential benefits of Building Information Modeling application in construction.
- iii) To investigate major challenges toward the effort to apply Building Information Modeling in Malaysian construction industry.

1.4 Scope of Study

The scope of this study is solely covering on design and build project in Malaysia which have been implement and using

BIM. Thus, all information relating to the adoption of BIM in design and construction stage were achieved from developer, consultants and contractors. This study proposed to come out the data from those participated using BIM in managing projects. This is vital in order to achieve their understanding and involvement in monitoring projects using BIM. Furthermore, the data and information also important to determine the current BIM practices and useful to identify the issues linked with a BIM adoption in Malaysian construction projects.

1.5 Significance of Study

This study is expected to contribute to the construction industry including the designer, consultants and contractors on the importance to adopt BIM to support the design and construction stage. This study to raise the awareness of the limitation in the BIM implementation in Malaysia. BIM has many advantages for the industry. However, there are many barriers that prevent its wide adoption. Therefore, this study analyzes these issues and suggests how to improve BIM implementation.

1.6 Brief Methodology

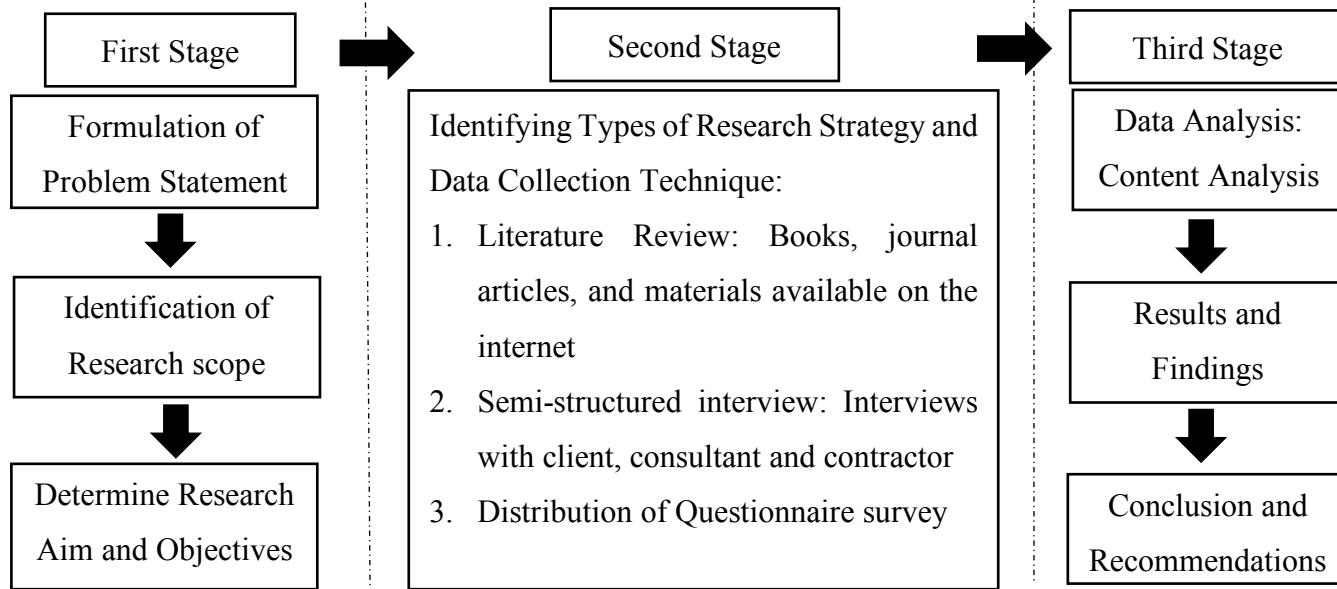


Figure 1.1 The Methodology Process

1.7 Research Organization

The study consists of Six (6) main chapters. The chapters are as follows:

(i) Chapter 1 : Introduction

This chapter is the outline description of problem statement, aim and objectives of the study, scope of the study, significance of study, brief methodology and the project organization.

(ii) Chapter 2: Literature Review

Chapter 2 presents the literature reviews on construction industry and BIM. This chapter discusses on definitions of BIM; application of BIM in construction; concepts and main functions; potential benefits and challenges to implement BIM.

(iii) Chapter 3: Research Methodology

Chapter 3 outlines the research methodology of this study. In this chapter, the method such as literature review, interview and questionnaire survey are used to achieve all objectives of research are discussed in details.

(iv) Chapter 4: Results and Analysis

This chapter presents analysis on Building Information Modeling in construction industry. The data presented are based on the outcome of the statistical analysis such as frequencies and mean index while the content analysis shows the summary from the interviews.

(v) Chapter 5: Discussion

This chapter consist of findings from literature review, questionnaire survey and interviews with industry experts. In addition, this chapter focused on current BIM practices in construction project among all parties. The development of BIM implementation in construction process are discussed, include main functions BIM implementation, potential benefits of BIM implementation and challenges of BIM implementation in construction.

(vi) Chapter 6: Conclusion and Recommendations

This chapter outlines the conclusion for this study. Recommendation on contribution and potential direction for future works also being concluded in this chapter.

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