

**6th UNDERGRADUATE
SEMINAR ON BUILT
ENVIRONMENT
AND TECHNOLOGY
(USBET) 2023**

**SUSTAINABLE BUILT
ENVIRONMENT**

25 - 27 SEPTEMBER 2023

E-PROCEEDING

USBET 2023



e-Proceeding

**6th UNDERGRADUATE
SEMINAR ON BUILT
ENVIRONMENT
AND TECHNOLOGY
(USBET) 2023
SUSTAINABLE BUILT
ENVIRONMENT**

Published by,

Department Of Built Environment Studies And Technology
Faculty Of Architecture, Planning & Surveying
Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus
usbet.fspuperak@gmail.com

Copyright @ 2023

Department Of Built Environment Studies And Technology
Faculty Of Architecture, Planning & Surveying
Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus

This work is subject to copyright. All rights are reserved by the Publisher. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system without permission in writing from the copyright owners.

eISSN 2821-3076



02 October 2023 | Perak, Malaysia
Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus

EDITORIAL BOARD

Editors-in-Chief

SR. NORAZURA MIZAL AZZMI (BS)

NADIRA AHZAHAR (BS)

Editors

TS. ZURAIHANA AHMAD ZAWAWI (BS)

SR. NAZHATULZALKIS JAMALUDIN (BS)

SR. SITI ZUBAIDAH HASHIM (BS)

NURHIDAYAH SAMSUL RIZAL (BS)

SR DR. NURUL FADZILA ZAHARI (BS)

NUR FADHILAH BAHARDIN (BS)

SR TS. DR. ALIA ABDULLAH SALLEH (BS)

SR TS. DR. SURIANI NGAH WAHAB (BS)

SR TS. DR. HASNAN HASHIM (BS)

SR NOORAZLINA KAMARUZZAMAN (BS)

SR MARIATY MOHD BAHARI (BS)

SR AIDA AFFINA ABDUL GHANI (BS)

DR. NOR DIANA AZIZ (BS)

SR AMIR FASHA MAT ISA (BS)

SR DR. NOR AMIN MOHD RADZUAN (BS)

PROF. MADYA SR DR. MOHD FADZIL YASSIN (BS)

SR TS. KHAIRUL AMRI RAMLY (BS)

SR. MOHD ASRUL HASIN (BS)

SR TS. MOHD KHAZLI ASWAD KHALID (BS)

SR MOHD DZULKARNAEN SUDIRMAN (BS)

SR DR. IRWAN MOHAMAD ALI (BS)

SR DR. MOHAMMAD HASZIRUL MOHD HASHIM (BS)

DR NURHASYIMAH BT AHMAD ZAMRI (BCT)

DR. PUTERI YULIANA SAMSUDIN (TP)

Editors-in-Chief

6th Undergraduate Seminar on Built Environment and Technology 2023

- E- Proceedings-

Organized by,

College of Built Environment (KAB) UiTM Perak Branch



THE IMPLEMENTATION OF BUILDING INFORMATION MODELLING (BIM) IN MALAYSIAN CONSTRUCTION INDUSTRY

Muhammad Azzat Mohd Noor¹, Nor Amin Mohd Radzuan^{1*}

¹Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus, 32610, Seri Iskandar, Perak, Malaysia

muhammadaizzat77@gmail.com, *noram185@uitm.edu.my

ABSTRACT

Building Information Modelling (BIM) implementation has received a lot of attention in the Malaysian construction industry. BIM is a digital tool that allows for collaborative work, communication, and data management throughout the project lifecycle. This study explores the current state of BIM adoption in Malaysia, its benefits, challenges, and potential implementation strategies. The research identifies the importance of BIM through a comprehensive review of literature and a questionnaire with industry professionals. The findings emphasise the importance of industry-wide awareness campaigns promoting the benefits of BIM, as well as the implementation of training programmes and workshops aimed at improving BIM knowledge and skills among construction professionals. Furthermore, the study emphasises the importance of government support for BIM adoption through policies, incentives, and regulations. By embracing BIM and implementing the recommended strategies, the Malaysian construction industry can unlock its full potential for increased efficiency, cost savings, and quality improvement.

Keywords: Building Information Modelling (BIM), construction industry, benefits of BIM, challenges of BIM, strategies

© 2023 USBET, JABT, UiTM Perak Branch, All rights reserved

INTRODUCTION

Building Information Model (BIM) in construction design is regarded as an alternative approach for design which makes it easy to present digital designs which contains all the necessary information about the proposed project before it is constructed (Azhar, 2015). In Malaysia, the Director of Public Works Department (PWD) in 2009 urged construction companies to adopt ICT to improve productivity and efficiency (Building Smart Malaysia, 2015).

Building Information Modeling or Building Information Management is abbreviated as BIM. BIM is a process involving the development of digital representations of physical and functional characteristics of places that is supported by various tools, technologies, and contracts. BIMs are computer files that can be extracted, exchanged, or networked to support decision-making about a built asset, often but not always in proprietary formats and containing proprietary data. Individuals, businesses, and government agencies use BIM software to plan, design, build, operate, and maintain buildings and various physical infrastructures such as water, refuse, electricity, gas, communication utilities, roads, railways, bridges, ports, and tunnels. It is a highly collaborative process that enables architects, engineers, real estate developers, contractors, manufacturers, and other construction professionals to plan, design, and build a structure or building within a single 3D model. (Lorek, 2022) It can also include building operation and management using data that building or structure owners have access to which is the Building Information Management. This data enables governments, municipalities, and property managers to make informed decisions based on model information even after the building is built.

LITERATURE REVIEW

BIM is an innovative design tool which has changed a lot in the construction industry such as project procurement, execution, and facility management. This shows that BIM can be said to be the future of construction industry. According to Bryde and Broquetas (2017), BIM is a suitable tool for management of construction projects, as such, project managers should take advantage of it in managing their projects.

Cost And Time Control

Controlling costs and time in construction projects has been one of the most important priorities in the industry since its beginning. Cost and time management are critical components of any building project. An efficient cost and time management and control strategy for construction projects is critical in reducing the risk of cost overruns and project delays. Construction projects are becoming more complex as

more stakeholders from many professions are involved (Tahir et al., 2022). Cost and time management are indispensable aspects of construction projects. With the adoption of effective strategies and the involvement of various stakeholders, construction firms can successfully mitigate risks and achieve desired project outcomes. The industry's continuous pursuit of innovation and research will further enhance efficiency and overall success in cost and time management.

Government Initiatives

Building Information Modeling (BIM) is becoming more used in the construction sector for creating data-rich models of buildings and structures. The Public Works Department (PWD) introduced BIM to the Malaysian building industry in 2007. Since then, the Malaysian government has taken steps to encourage the use of BIM in construction projects (Mohd et al., 2015).

BIM development in the AEC industry is consistent with the vision stated in the Construction Industry Master Plan (CIMP), which is to transform Malaysia into a world-class construction industry that is innovative and knowledgeable about global solutions (CREAM, 2019). Furthermore, construction stakeholders see BIM as a potential solution to present concerns such as cost, quality, and completion time (CREAM, 2019). PWD, Building Industry Development Board (CIDB), Multimedia Super Corridor (MSC), and the Construction Research Institute of Malaysia are some government entities that have encouraged the use of BIM in Malaysian construction projects (CREAM) (Mohd et al., 2015).

Awareness

The Malaysian government has encouraged the deployment of BIM in the construction industry in order to facilitate the achievement of the CIDB Master Plan vision as well as the nation's 2020 vision through an increase in key performance indicators (KPIs) and productivity (Mohd et al., 2015). Currently, the Malaysian construction industry faces significant challenges in meeting community expectations for increased productivity, quality, and value (Mohd et al., 2015). As a result, the Malaysian construction industry's best construction practises programme model includes information technology (IT) programmes and tools (Mohd et al., 2015). The government has made many attempts to promote BIM, including roundtable discussions with construction players, forums, and seminars, as well as giving the most up-to-date information through a portal.

Design and Quality

In the Architectural, Engineering, and Construction (AEC) sector, Building Information Modelling (BIM) has become a widely used and well-liked technology. The widespread acceptance of BIM has been greatly aided by the expanding use of information technology. BIM has consequently developed into an essential tool for

many parties involved in construction projects, such as architects, engineers, contractors, and facility managers. (Dombouya et al., 2016).

METHODOLOGY

In a research study, the research methodology plays a crucial role, and selecting the appropriate method is vital. The research aims to clarify the study's method, data collection, analysis, and the rationale behind the chosen case study. The research design outlines the structure and methods used, including data collection, research questions, and data sources. It allows the researcher to determine the necessary tools and techniques for the study. In this case, the research design follows a quantitative approach to analyze numerical data easily. This approach involves evaluating percentages, intervals, or ratios and using analytical tools like graphs or diagrams for optimal results. The study focuses on gathering information about the factors influencing the implementation of Building Information Modelling (BIM) in Malaysia. A questionnaire survey will be distributed among at least 50 respondents who are applying BIM. The limitation for this research is lack of previous studies in the research area and data collection implementation.

FINDING AND ANALYSIS

The results and analysis of a study that used a questionnaire as its main technique of data collecting are presented in this chapter. The study's goal was to learn more about how Building Information Modelling (BIM) is being used in Malaysia's building sector. The goal of this research project was to obtain insightful information and comprehend the correlations between key variables by using a quantitative method and surveying a varied sample of respondents.



Figure 1 : Perceived Influences of Cost and Time Control on BIM Implementation In The Malaysian Construction Industry

The data collected from the respondents provides valuable insights into their perceptions regarding the influence of cost and time control items on the implementation of Building Information Modeling (BIM) in the Malaysian construction industry.

Overall, the data reveals that a majority of respondents perceive cost management, time management, minimizing delays, and reliable modeling software as important factors influencing the implementation of BIM in the Malaysian construction industry. These findings provide valuable insights for industry professionals seeking to enhance the effectiveness and efficiency of BIM adoption in construction projects

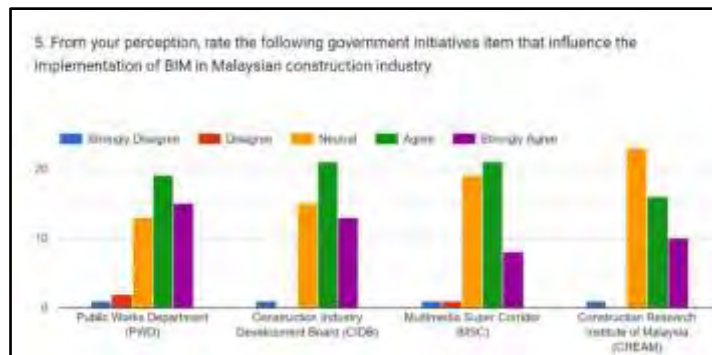


Figure 2 : Perceived Influences of Government Initiatives on BIM Implementation In The Malaysian Construction Industry

The presented data focuses on respondents' perceptions and ratings of various government initiatives influencing the implementation of Building Information Modelling (BIM) in the Malaysian construction industry. These findings shed light on the respondents' perceptions of the influence of government initiatives on BIM implementation in the Malaysian construction industry. It appears that the Public Work Department (PWD), Multimedia Super Corridor (MSC), Construction Industry Development Board (CIDB), and Construction Research Institute of Malaysia (CREAM) are recognized as relevant entities in driving the adoption and success of BIM within the industry.

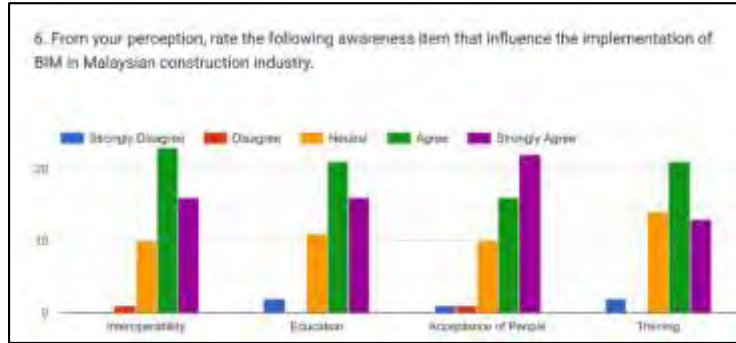


Figure 3 : Perceived Influence of Awareness Initiatives on BIM Implementation In The Malaysian Construction Industry

The data presented highlights the respondents' perceptions and ratings of various awareness initiatives that influence the implementation of Building Information Modeling (BIM) in the Malaysian construction industry. These results provide insight into how the respondents see the impact of initiatives like interoperability, education, human acceptance, and training on BIM implementation in the Malaysian construction sector. The information reveals that, with different levels of agreement and disagreement among the respondents, these awareness campaigns are acknowledged as critical elements in encouraging effective BIM deployment.

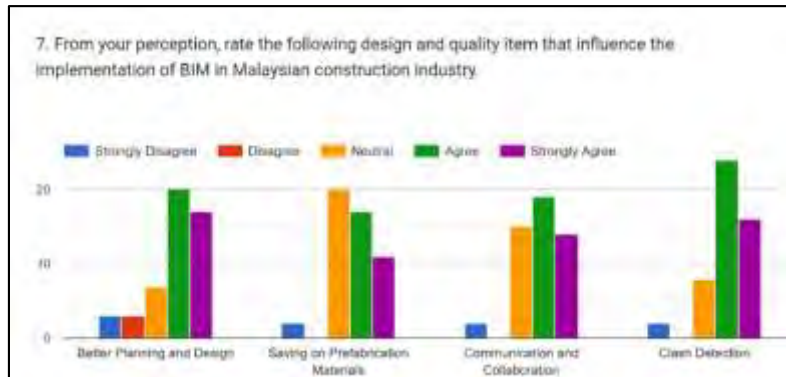


Figure 4 : Perceived Influence of Design and Quality Factors on BIM Implementation In The Malaysian Construction Industry

The data presented reflects the perceptions of respondents regarding the influence of various design and quality factors on the implementation of Building Information Modeling (BIM) in the Malaysian construction industry. These findings provide valuable insights into the perceived influence of design and quality factors on BIM implementation in the Malaysian construction industry. The data indicates that better

planning and design, saving on prefabrication materials, communication and collaboration, and clash detection are considered important elements in driving successful BIM implementation. These insights can inform industry professionals in adopting strategies that prioritize these factors to enhance the effectiveness of BIM implementation in the Malaysian construction industry.

CONCLUSION

The research suggests several recommendations to boost BIM adoption in the Malaysian construction industry. First, promoting the benefits of BIM through industry-wide awareness campaigns and educational initiatives, collaborating with associations, government bodies, and professional organizations. Second, implementing training programs and workshops to enhance BIM knowledge among construction professionals. These programs can improve project coordination, reduce errors, and increase productivity. Collaborating with industry associations and educational institutions can ensure alignment with industry needs. These efforts will lead to improved project coordination, reduced errors, enhanced productivity, and a more sustainable construction industry in Malaysia.

Throughout this research, we have explored the importance of BIM and its benefits, including improved project coordination, reduced errors and rework, enhanced productivity, and support for sustainable practices. However, it is evident that further efforts are needed to accelerate the adoption of BIM across the industry.

ACKNOWLEDGEMENT

First and foremost, I want to thank Allah SWT for blessing me with the ability to complete this research from beginning to end. I would also like to thank UITM Seri Iskandar, who guided and supported me throughout this research journey. I want to extend my thanks to the construction professionals who contributed to this research by sharing their knowledge and participating in discussions. Their contributions have enriched the study's findings and recommendations.

REFERENCES

Azhar, S. (2015). 'Building Information Modeling (BIM): Trends, Benefits, Risks and Challenges for the AEC Industry', *ASCE Journal of Leadership and Management in Engineering*, 11(3), 241-252.

Building Smart Malaysia. (2015). mybuildingsmart.org.my.

Bryde, D., M. Broquetas, and J.M. Volm. (2017). The project benefits of building information modelling (BIM). *International Journal of Project Management*, 31(7): p. 971-980.

Construction Research Institute of Malaysia (CREAM). (2019). Issues and Challenges in Implementing Building Information Modeling (BIM) by SME's in the Construction Industry. <https://www.cidb.gov.my/cidbv3/images/pdf/announcement/BIM/bim%20seminar%20%20workshop%20for%20malaysia%20construction%20industry.pdf>

Doumbouya, L., Gao, G., & Guan, C. (2016). Adoption of the Building Information Modeling (BIM) for Construction Project Effectiveness: The Review of BIM Benefits. *American Journal of Civil Engineering and Architecture*, 4(3), 74–79. <https://doi.org/10.12691/ajcea-4-3-1>

Lorek, S. (2022, April 6). What is BIM (building information modeling). What is BIM? | Building Information Modeling | Levels of BIM. <https://constructible.trimble.com/construction-industry/what-is-bim-building-information-modeling>

M. Tahir, A.N, Haron, N.A, Alias, I.B, Mohammed and D.L, Baba. (2022, December 24). FUTMinna Institutional Repository: Improving Cost and Time Control in Construction using Building Information Model (BIM): A Review. <http://repository.futminna.edu.ng:8080/jspui/handle/123456789/15968>

Mohd, S., & Brahim, J. (2015). Application of Building Information Modeling (BIM) in the Malaysian Construction Industry: A Story of the First Government Project. *Applied Mechanics and Materials*, 773–774, 943–948. <https://doi.org/10.4028/www.scientific.net/amm.773-774.943>

S. Rahim, F. A. A. Nifa, and M. N. M. Nawi. (2015). "Integrated Project Delivery (IPD) in Malaysian Construction Industry Dealing with Waste Issue," *Advances in Environmental Biology*, 9 (4). pp. 35-38. ISSN 1995 – 0756

Surat kami : 700-KPK (PRP.UP.1/20/1)

Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
Universiti Teknologi MARA
Cawangan Perak



Tuan,

**PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK
MELALUI REPOSITORI INSTITUSI UiTM (IR)**

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

nar

Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR