



الجامعة
UNIVERSITI
TEKNOLOGI
MARA



QS COLLOQUIUM 2020

SERIES XII PROCEEDING OCT 2020 - FEB 2021

BACHELOR OF QUANTITY SURVEYING (HONS.)
Department of Built Environment Studies & Technology,
Universiti Teknologi MARA Perak

QS COLLOQUIUM 2020 SERIES XII

UNIVERSITI TEKNOLOGI MARA (UiTM) PERAK BRANCH
OCTOBER 2020 - FEBRUARY 2021

Perpustakaan Negara Malaysia

Editors

Sr Dr. Kartina Alauddin
Sr Puteri Sidrotul Nabihah Saarani
Noor Anisah Abdullah @ Dolah
Nur Fatihah Mohamed Yusof



Centre of Studies for Quantity Surveying
Department of Built Environment Studies & Technology
Universiti Teknologi MARA (UiTM) Perak Branch
Seri Iskandar Campus, Perak, MALAYSIA

ISBN: 978-967-19692-0-5

Copyright @ QS Colloquium Series XII

All right reserved. No part of this publication may be produced, stored in a retrieval system, or transmitted in any form or by means electronics, mechanical, photocopying, recording or otherwise, without prior permission in writing form the publisher.

WORK CULTURE OF BUILDING INFORMATION MODELING (BIM) IN THE MALAYSIAN CONSTRUCTION INDUSTRY

Abdul Muhaimin Zakaria¹ and Syed Ahmad Qusoiri Syed Abdul Karim²

¹ ²Centre of Studies for Quantity Surveying, Department of Built Environment Studies & Technology, Universiti Teknologi MARA, Perak Branch, Seri Iskandar, 32610, Perak Malaysia.
*muhaminzakaria96@gmail.com*¹, *syeda896@perak.uitm.edu.my*²

Abstract

The work culture in the BIM has an influence on the communication and process growth of the project of the technical team members. It is clear that the building industry will benefit from the incorporation of BIM and the work culture among the parties in order to enhance current fragmented working methods, solve the overwhelming problems and potentially give the industry potential solutions and benefits may infer from the literature review and secondary case studies that work culture can reinforce partnerships between the participating parties in the use of the BIM in the building industry, and also improve products across the industry. Researchers, practitioners, general contractors, and construction industries should use the results of the study to concentrate their real intentions and energy on the big questions required to give the involvement in active BIM projects a good impact on working culture or the state of behaviour. Therefore, this research aims to observe the effect of work culture on the success of BIM projects in Malaysia. The objectives of this research are (i) To observe BIM work culture among parties involve in BIM projects, (ii) To explore the issues of information sharing in BIM work culture and (iii) To relate the extent of information sharing towards the success of BIM projects. as this research method using qualitative approach due to the Covid-19 Pandemic issue, as the author need to change from using quantitative approach. The questionnaire distributed into 3 categories respondents; Quantity Surveyor, Architect and Engineer at Perak. In analysing data will be interpret into SPSS by using percentage and frequency mode. The findings of this research, the work culture in the manner of cultural behavioural by implement BIM in the construction industry.

Keywords: *Building Information Modelling, Work Culture, Information Sharing, Behavioural, Success of BIM*

1.0 INTRODUCTION

BIM advances the modernization of the professional partnership among architecture, engineering, quantity surveyors and construction (AEC). Abdul Ghafar, M., et al (2013) however claimed that the influence of human and cultural factors can be allowed to BIM visualisation applications. This desktop study explores the cultural, behavioural and work culture of application of BIM in Malaysia's construction sector. It can be established through the project in the early stages and the closure as difficulties, factors, behaviour and culture. The results are expected to know the working culture and attitudes of the construction players or the quickly evolving country members such as Malaysia, in order to allow effective partnerships with their colleagues. BIM has gained in popularity in Malaysia over the last 5 years due to its cost-efficiency and time saving benefits and the growing exchange of information between the involved parties. During the project's life cycle, the BIM is specified as the functional digital representation of a facility by accumulating information to inform the stakeholders in decisions Zainon, N., Mohammad Rahim, F. A. and Salleh, H. (2016).

1.1 Problem Statement

Information sharing cannot be established because lack of leadership in the management of collaboration, Che Ibrahim, C.K.I., et al (2018). Leaders of the are one of the importance role in any industry, it could serve as models capable to coordinate of diverse viewpoints by sharing the information in the article Gil-Garcia, J. R. and Sayogo, D. S. (2016).

Relationships among the project participants need more collaboration to create virtual information sharing more productive (Liu, et al., 2017). Wei et al. (2012) emphasizes further the behavioural factors of employer and employee information sharing may affect their behaviours and thoughts on the exchange of information.

The issue regarding inter-operability between IT/ICT technologies improves in AEC, where the streamlined data visualization between team members often previously inhibited it. In order to minimise repetitive information transformation, Interoperability is essential.

Discontinuous memberships in any firm of construction industry during the construction process became an issue. Ibrahim, R. and Paulson, B.C. (2008) claimed that the additional training and compilation of available

data by the other team and databases developer are difficult for young staff members. Each team member's different culture and various workflows will lead to the lack of expertise, resulting in poor decision-making.

1.2 Research Questions

- i. What are the work Cultures in using BIM in the construction industry?
- ii. What are the expected main issues in work culture on using BIM in Malaysia?
- iii. What are the problems on using BIM to the construction industry agaisnt work culture in sharing information in Malaysia?

1.3 Research Aim

The aim of this research is to observe the effect of work culture on the success of BIM projects in Malaysia.

1.4 Research Objectives

- i. To observe BIM work culture among parties involve in BIM projects.
- ii. To explore the issues of information sharing in BIM work culture.
- iii. To relate the extent of information sharing towards the success of BIM projects.

1.5 Scope of Research

This study will focus on the information to the players in the construction industry at Perak area. Data will be collect by using questionnaire survey distributed to experienced 5 to more than 15 years which are QS, Architect and Engineer in construction industry by implement BIM in their projects.

2.0 LITERATURE REVIEW

2.1 Issues Work Culture on Using BIM in Construction Industry

Kouch, M.A., Illicainen, K. Perala, S. (2018), the construction industry immediately lacks willingness to change. Work cultures are very weak through information sharing. The usefulness of BIM in improving information sharing has been acknowledged in the construction industry. The objectives related to the work and behavioural factor have yet to attract the attention of Cheng, J. H., et al (2013).

2.2 The Effect of Budget in Using BIM Towards The Work Culture

Mirawati, N., Othman, S.N., and Mohamed Ismail, R. (2015) noted that poor collaboration between the players is due to lack of communication and lack of trust between the building players and the client. The suffering collaborative issues arising from this era of the advancement of the construction industry have resulted in a negative impact, noted Mirawati, N., Othman, S.N., and Mohamed Ismail, R. (2015).

2.3 Challenges in Using BIM Against Work Culture Information Sharing

The very nature of BIM is incompatible with the traditional procurement method, since it calls for early integration of construction knowledge from all disciplines. Integrated design building organisations are therefore expected to benefit the most. New contractual arrangements to facilitate integrated work formats need to be developed, Kamari, A., Makowski, P., and Kirkegaard, H. P. (2019).

2.4 Real Time Progress on Using BIM in Construction Project

De Wet, W., Koekemoer, E., and Nel, J.A. (2015) in their articles, employees often use their ICT at work as a convenient excuse to avoid face-to-face communication. It is clear that it is easier for someone to talk face to face than for the listener to question directly at the same time.

2.5 BIM for Participants Player in Construction Industry

In a managed workplace climate, more tools and options are available to work more accurately, and are less expensive in a short time. The precise design and field accuracy are important for prefabrication. However, the BIM Team must ensure that the software used by the manufacturers is interoperable.

2.6 Work Culture in Using BIM n Information Sharing

One of the most major factors in the management of their ventures is the incompetence of various architects, entrepreneurs and consultants. The developers declined to disclose and conceal the true facts about the project from the other parties involved. The risk management plan is critical for determining the threats that could

arise at the earlier project proposed and the other parties would assess the risk situation that may be faced with options that would be suitable for embracing, mitigating, preventing, moving or sharing the risk. Then all planning work could be identified through project planning and used for effective project monitoring.

3.0 METHODOLOGY

The study carried out desktop studies to investigate the behaviour and work culture of construction members of BIM in Malaysia. Data obtained through questionnaires and literature reviews. The literature review will also be performed to collect knowledge on the effects of the work culture on the use of BIM. All data will be generated by books, journal articles, international conferences and information on the related websites. Essential questionnaires were made with the construction players: Quantity Surveyor, Engineer and Architect. All of them were completely involved and experienced in the construction project by implementing BIM with at least 5 years of experience. The data collected from the questionnaire distributed will be analysed by utilizing framework analysis approach and SPSS (percentage and Frequency). A framework will be prepared based on the outcomes obtained from literature review and questionnaires. All response data would be stored and transcribed to the details analysis.

3.1 Theoretical Framework

Information sharing is the first factor to implement the work culture in using BIM execution plans for the project. It has different impact due to the requirement of the client that public projects more insist compared to private projects for the construction industry. As the second element, the information sharing is the independence variable (IV) in enhancing the success of BIM projects as the dependence variables (DV). As the data has been collected between the information sharing and the success of BIM, it will participate with the external variables along with the research could be determine. Another issue on behalf of the study will be collected to observe another issue that could be enhanced in the correlation study.

4.0 DATA ANALYSIS AND DISCUSSION

BIM projects in Perak state. In order to get the data clarification, the questionnaire is prepared and given to Quantity Surveyor, Architect and Engineer in Perak. A random sample of 90 respondents were sent by E-mail and Googleform. All information gathered from the respondents were analysed using SPSS Version 20 as the instrument to analyse the data. The data is analysed by using correlation and descriptive analysis. The correlation analysis is used to analyse the strength and significant relationship between the work culture on information sharing and success of BIM projects. The frequency and percentage is used to analyse the data and the score is ranked accordingly.

4.1 The Work Culture on Using BIM in The Construction Industry

4.1.1 Factor Affecting Cost of the Construction Project

Table 1 shows the factor that affects the cost of the construction project. The first factor is Communication. This issue has arisen for those who have a different culture of communication. The Trust Issue; the requirement of the company may be defaulted in providing information to other participants. Political gains; in Malaysia politics, some of the construction will be delay or stop when changing the politics head. Collaboration teamwork issues; rules on data exchange must be complied with and that agreement must be reached. Legal changes to documentation ownership; increasing the BIM used in projects would allow industry practitioners to address these issues. Changes in practises and use of information; nature of BIM is incompatible with the traditional procurement method, it calls for early integration of construction knowledge from all disciplines. implementation issues; Graduating the existing CAD environment to the BIM system requires more than just software acquisition, training and hardware upgrades.

Table 1: Factor Affecting The Cost of the Construction Project

| | | Communication | Trust Issue | Politic Gains | Collaboration Teamwork Issues | Legal Changes to Documentation Ownership | Changes in Practises and Use of Information | Implementation Issues |
|-------------------|------------|---------------|-------------|---------------|-------------------------------|--|---|-----------------------|
| Strongly Agree | Frequency | 63 | 64 | 39 | 28 | 29 | 33 | 35 |
| | Percentage | 67.70% | 68.80% | 41.90% | 30.10% | 31.20% | 35.50% | 37.60% |
| Agree | Frequency | 27 | 26 | 43 | 39 | 53 | 52 | 49 |
| | Percentage | 29.00% | 28.00% | 46.20% | 41.90% | 57.00% | 55.90% | 52.70% |
| Neutral | Frequency | 3 | 3 | 11 | 25 | 11 | 8 | 9 |
| | Percentage | 3.20% | 3.20% | 11.80% | 26.90% | 11.80% | 8.60% | 9.70% |
| Disagree | Frequency | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Percentage | 0.00% | 0.00% | 0.00% | 1.10% | 0.00% | 0.00% | 0.00% |
| Strongly Disagree | Frequency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Percentage | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |

4.2 Exploration of the Issues Work Culture on Using BIM in the Construction Industry

4.2.1 Behavioural Factors Could Affect Information Sharing in BIM projects.

Table 2 show the results of the questionnaire survey on the seven behavioural factors influencing successful information sharing. majority of the participants were strongly agreed and agreed to all of those elements. For the first factor, Trust, was the importance and truthfulness in dealing with others. Reciprocity; easily get help from the others in future. Accountability; they assumed as Engineer, Architecture or Quantity Surveyor to share information to the other project members. Communication; as it enhanced comprehension of a task through contact between colleagues and participants. Culture; normally the project team members were sitting together and discussing project progress.

Table 2: Behavioural Factors Could Affect Information Sharing in BIM Projects

| | | Trust | Leadership | Reciprocity | Accountability | Communication | Culture | Commitment |
|-------------------|------------|-------|------------|-------------|----------------|---------------|---------|------------|
| Strongly Agree | Frequency | 67 | 75 | 60 | 73 | 72 | 74 | 73 |
| | Percentage | 72.0% | 80.6% | 64.5% | 78.5% | 77.4% | 79.6% | 78.5% |
| Agree | Frequency | 25 | 18 | 29 | 19 | 19 | 19 | 18 |
| | Percentage | 26.9% | 19.4% | 31.2% | 20.4% | 20.4% | 20.4% | 19.4% |
| Neutral | Frequency | 1 | 0 | 4 | 1 | 2 | 0 | 2 |
| | Percentage | 1.1% | 0.0% | 4.3% | 1.1% | 2.2% | 0.0% | 2.2% |
| Disagree | Frequency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Percentage | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Strongly Disagree | Frequency | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Percentage | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

4.3 Relation The Extent of Information Sharing Towards the Success of BIM Projects

Table 3 shows, the challenges by implementing BIM in the Malaysian construction industry. The results shown that most of the partipants were strongly agreed and agreed to the challenges of work culture in implementing BIM in the Malaysian construction industry. Perception of BIM somehow some of the project participants still not clear in determined the use and output of the BIM itself. Second, not all of the construction players clearly not have sufficient amount to set up the company with the model because in order to use the model needs to have large amount of cost. Training, roles and responsibility were agreed as the commitment of someone to be clearly know the use and applying the work into the BIM project.

Table 3: Challenges In Implementing BIM In The Malaysian Construction Industry In Regard To Work Culture Of Information Sharing

| | | Perception of BIM | Interoperability | Cost | Fundamental Difference Between Project and Life-Cycle Management | Contractual and Legal Frameworks | Training, Roles and Responsibility |
|-------------------|------------|-------------------|------------------|-------|--|----------------------------------|------------------------------------|
| Strongly Agree | Frequency | 22 | 34 | 79 | 31 | 34 | 36 |
| | Percentage | 23.7% | 36.6% | 84.9% | 33.3% | 36.6% | 38.7% |
| Agree | Frequency | 54 | 52 | 12 | 54 | 52 | 47 |
| | Percentage | 58.1% | 55.9% | 12.9% | 58.1% | 55.9% | 50.5% |
| Neutral | Frequency | 17 | 7 | 2 | 8 | 7 | 10 |
| | Percentage | 18.3% | 7.5% | 2.2% | 8.6% | 7.5% | 10.8% |
| Disagree | Frequency | 0 | 0 | 0 | 0 | 0 | 0 |
| | Percentage | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Strongly Disagree | Frequency | 0 | 0 | 0 | 0 | 0 | 0 |
| | Percentage | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

5.0 CONCLUSION

The review of the data analysis shows that the cultural activities of the Malaysian building industry have been identified where the culture of BIM is accepted. There is a lot of research into how the working community can be made available by partnering with BIM. This theoretical knowledge was discussed in the second and third chapters of this paper. However, based on the observation of the current culture, the three (3) respondents who: Architect, Engineer and Quantity Surveyor in Perak, it is clear that the work culture used by BIM in the construction industry in Malaysia is likely to be environmental culture.

6.0 REFERENCES

- Abdul Ghafar, M. and Ibrahim, R. (2018) The Malaysian AEC Professionals Work Culture Could Improve Organizational Team Productivity during Industrialized Project Delivery. *Journal of Social Sciences and Humanities*; 26(3), (pp. 2021-2035).
- Bataw, A., Richard, K., and Lou, E. (2016) *The Issues and Considerations Associated with BIM Integration*. School of Mechanical, Aerospace and Civil Engineering, University of Manchester, United Kingdom.
- Che Ibrahim, C.K.I., et al (2018) *Exploring Behavioural Factors for Information Sharing in BIM Projects in the Malaysian Construction Industry*, Built Environment Projects and Asset Management, (pp. 5-8).
- Cheng, J.H., Chen, S.W. and Chen, F.Y.(2013) *Exploring How Inter-Organizational Relational Benefits Affect Information Sharing In Supply Chains*, Information Technology and Management, Vol. 14 No.4, (pp. 283-294).
- De Wet, W., Koekemoer, E., and Nel, J.A., (2015) AOSIS: Exploring the Impact of Information and Communication Technology on Employees' Work and Personal Lives. *SA Journal of Industrial Psychology*, ISSN: (online) 2071-0763, (pp. 1-11).
- Ibrahim, F.S. and Esa, M. (2018). Malaysian Construction Research Journal (MCRJ), *International Conference on Applied Science and Technology (ICAST) 2017*, Special Issue, Vol.3, No.1, (pp.13-14).
- Mirawati, N., Othman, S.N., and Mohamed Ismail, R. (2015). Supplier-contractor partnering impact on construction performance: A study on Malaysian construction industry. *Journal of Economic Business and Management*.
- Kamari, A., Makowski, P., and Kirkegaard, H. P. (2019) BIM-Adoption within Small and Medium Enterprises (SMEs): An existing BIM-Gap in the Building Sector. Conference, Conference: 36th CIB W78 2019

Conference: ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO) At: Northumbria University, Newcastle, United Kingdom.