

CONSTRUCTION  
INDUSTRY DEVELOPMENT  
BOARD MALAYSIA  
CIDB

---



---

MALAYSIA BUILDING INFORMATION  
MODELLING REPORT

2016

CIDB TECHNICAL REPORT PUBLICATION NO 1217





CONSTRUCTION  
INDUSTRY DEVELOPMENT  
BOARD MALAYSIA  
CIDB

---

MALAYSIA BUILDING INFORMATION  
MODELLING REPORT

2016

CIDB TECHNICAL REPORT PUBLICATION NO 1217

# Copyright

Published in 2017 by

LEMBAGA PEMBANGUNAN INDUSTRI  
PEMBINAAN MALAYSIA  
Tingkat 23, Sunway Putra Tower,  
No 100, Jalan Putra,  
50350 Kuala Lumpur, MALAYSIA

Malaysia BIM Report 2016

CIDB Malaysia

ISBN 978-967-0997-08-7

Copyright ©2017 by Construction Industry Development Board Malaysia (CIDB)

All right reserved. No part of the reports may be printed or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing form the publisher.





# CONTENTS

**II**

**LIST OF FIGURES  
LIST OF TABLES**

**IV**

**FOREWORD**

**V**

**EXECUTIVE SUMMARY**

**02**

**A GLIMPSE AT BIM IN THE MALAYSIAN  
CONSTRUCTION INDUSTRY**

**05**

**BIM SURVEY : FINDINGS  
AND SUMMARY**

INTRODUCTION .....	06
RESPONDENT OVERVIEW .....	07
BIM KNOWLEDGE.....	09
BIM IN ORGANISATION.....	13
BIM ADOPTION IN MALAYSIA .....	17

**32**

**FUTURE USE OF BIM**

**33**

**REFERENCES**

**37**

**SPECIAL THANKS  
EDITORIAL TEAM**



## LIST OF FIGURE

<b>Figure 01.</b>	Respondents by region .....	7
<b>Figure 02.</b>	Respondents by organization.....	7
<b>Figure 03.</b>	Profile of respondents by profession.....	8
<b>Figure 04.</b>	Working experience of respondents.....	8
<b>Figure 05.</b>	Respondent with knowledge of BIM.....	9
<b>Figure 06.</b>	Industry Awareness of BIM in CITP.....	11
<b>Figure 07.</b>	Industry Feedback on government mandating BIM usage.....	11
<b>Figure 08.</b>	BIM used for government projects in Malaysia.....	12
<b>Figure 09.</b>	Sources of information on BIM.....	13
<b>Figure 10.</b>	Awareness on BIM in the construction industry.....	15
<b>Figure 11.</b>	BIM readiness in the construction industry.....	16
<b>Figure 12.</b>	Respondents with experience in BIM.....	17
<b>Figure 13.</b>	Respondents with working experience in BIM.....	17
<b>Figure 14.</b>	Adoption of BIM by region.....	18
<b>Figure 15.</b>	Adoption of BIM by profession.....	18
<b>Figure 16.</b>	Size of organizations that adopt BIM.....	19
<b>Figure 17.</b>	Respondents interested in establishing or using BIM within the organization.....	23
<b>Figure 18.</b>	Respondents trusting BIM to provide benefits to their organization.....	23
<b>Figure 19.</b>	Utilization of BIM during construction planning and monitoring.....	28
<b>Figure 20.</b>	Visualization of a building using BIM.....	29
<b>Figure 21.</b>	BIM collaborative environment.....	29
<b>Figure 22.</b>	Future use of BIM in Malaysia.....	33
<b>Figure 23.</b>	The adequacy of resources for implementation of BIM.....	33

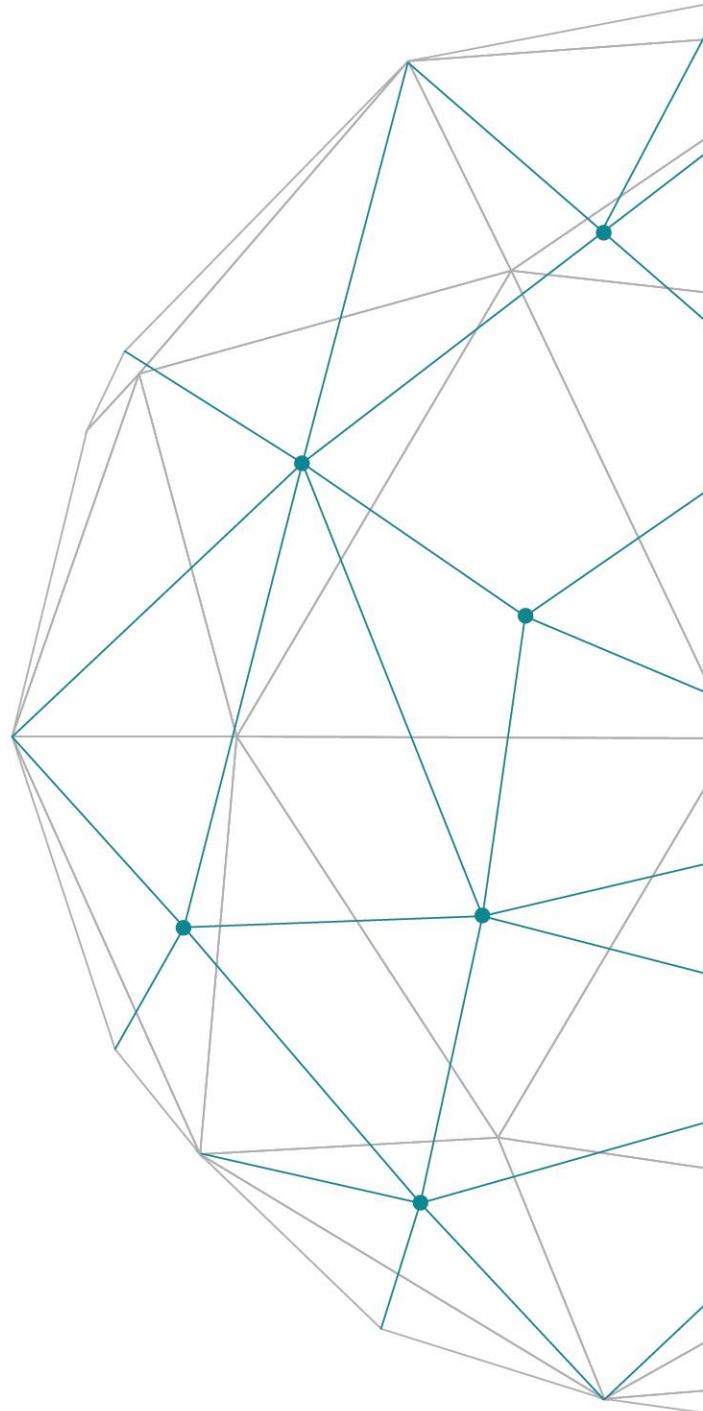
## LIST OF TABLE

<b>Table 1.</b>	Challenges to the implementation of BIM.....	20
<b>Table 2.</b>	Identified challenges from the technology perspective.....	21
<b>Table 3.</b>	Identified challenges from the people's perspective.....	22
<b>Table 4.</b>	Identified challenges from the process perspective.....	25
<b>Table 5.</b>	Expected benefits of implementing BIM.....	27



## ACKNOWLEDGEMENT

This survey was sponsored by the Construction Industry Development Board (CIDB) Malaysia and managed by the Construction Research Institute of Malaysia. We are grateful to the following organizations for their support in facilitating and the circulation of this survey to their registered members.



CIDB Malaysia Chief Executive  
Dato' Ir Ahmad 'Asri Abdul Hamid



## FOREWORD

The Malaysia Building Information Modelling (BIM) Report 2016 is published to assess the current extent of BIM adoption in Malaysia. This report is the first to be published on the status of BIM adoption and will serve as baseline to determine its progress in Malaysia.

The Construction Industry Transformation Programme (CITP) 2016 – 2020 has outlined BIM as an emerging technology that will tremendously enhance the level of productivity in the construction. By 2020, construction industry players that are engaged in government projects worth more than 100 million will be required to achieve a minimum of 40% implementation rate of Stage 2 BIM maturity. To steer the construction industry players toward this target, assessing the status of BIM adoption in Malaysia is necessary to ensure that the development of strategy can be used as an overarching framework for the implementation scheme.

At CIDB, we are determined to ensure easier and more affordable access to BIM, so that industry players will gain the full benefit of the technology which will catapult the overall productivity of the industry to the next level.





## EXECUTIVE SUMMARY

This survey measures the level of Building Information Modelling (BIM) adoption and serves as a critical baseline for the transition into BIM adoption within the Malaysian construction industry. The findings from this survey indicate a widespread awareness of BIM among the Malaysian construction industry, and 84% of the responses are willing to adopt the implementation of BIM. Although we have the observed extensive awareness and willingness of the industry to change for BIM, the percentage of BIM adopters (17%) is extremely low. Thus, this result leads to the low adoption rate of BIM in Malaysia. The considerably low rate of BIM uptake in Malaysia underscores the significance of the **diffusion of BIM** within the construction organization to understand the barriers and drivers of BIM adoption.

Readiness is determined by the tendency of an organization to adopt BIM. Readiness mainly depends on contexts, situations, and individuals involved in the implementation. The **readiness levels** of BIM among the players in the Malaysian construction industry are still low based on the following findings of the survey:

- 41% of the organization lack clear policies that support the implementation of BIM,
- 72% of the organization lack allocations for any financial incentive for using BIM,
- 64% percent of the organization failed to invest in BIM training, and
- 67% percent of the organization failed to invest in BIM hardware and software.

The ability to understand the challenges of adopting BIM is considered a foundation to predict the adoption process because such capability provides constructive strategies to mitigate the challenges. In this survey, several challenges that hinder the adoption of BIM in Malaysia are as follows:

- high cost of technology,
- high training cost,
- lack of BIM knowledge,
- high cost of software; and
- Insufficient BIM trainings.

Given the future use of BIM in Malaysia, 95% of the respondents are interested to establish or use BIM within their organization. A total of 96% of the respondents believe that BIM will provide benefits to their organization. In this context, the future use of BIM in the construction industry is expected to expand. The demographic profiling revealed that 39.3% of organizations will adopt BIM within 3 years, 37.5% within 5 years, and 18.6% within 1 year.

However, the limited resources to assist the BIM implementation will adversely affect the implementation pace in Malaysia. That is, if a well-planned and properly implemented strategy of BIM adoption is in place, then such adoption can be achieved within a short period.



# A GLIMPSE AT BIM IN THE MALAYSIAN CONSTRUCTION INDUSTRY







## A GLIMPSE AT BIM IN THE MALAYSIAN CONSTRUCTION INDUSTRY

***The Malaysian construction industry has been identified as a significant sector that drives the Malaysian economy. Under the Eleventh Malaysia Plan (11<sup>th</sup> MP), transforming the construction industry is a component of the focus areas that have been identified as key drivers to accelerate the momentum of economic growth. The Ministry of Works (MoW) and the Construction Industry Development Board (CIDB) Malaysia has spearheaded the development of the Construction Industry Transformation Programme (CITP) 2016–2020 to empower and strengthen the construction industry as outlined in the thrusts of the 11<sup>th</sup> MP. CITP aims to transform the construction industry through four strategic thrusts, namely, Quality, Safety and Professionalism; Environmental Sustainability; Productivity; and Internationalization.***

Despite being part of a crucial sector, the construction industry was reported as among the industries with the lowest economic productivity levels (Malaysia Productivity Corporation, 2016). This report indicated that the ineffectiveness and low productivity of the construction industry are partially caused by the limited adoption of new technologies and practices. Accordingly, embracing new technology and modern construction, such as information and communications technology (ICT), as the future direction will drive the industry toward an improved performance and continued global competitiveness.

Building Information Modelling (BIM) is recognized as advanced ICT with the potential to transform the construction industry by enhancing efficiency, productivity, and quality.

CIDB Malaysia has proactively initiated the promotion and support of the adoption of BIM in the construction industry. As a prelude to the implementation of BIM in Malaysia, CIDB has organized several awareness programs, seminars, and workshops within the industry players to facilitate the adoption of BIM.

CITP encourages the adoption of productivity-enhancing IT construction, such as BIM, which will transform the industry into new methods of design, construction, and maintenance of buildings and infrastructure. CITP aims to transform the Malaysian construction industry with the implementation of Stage 2 BIM maturity by 2020, in which a minimum of 40% implementation rate of public projects valued at RM 100 million and above shall implement the corresponding approaches and processes (CIDB Malaysia, 2015).

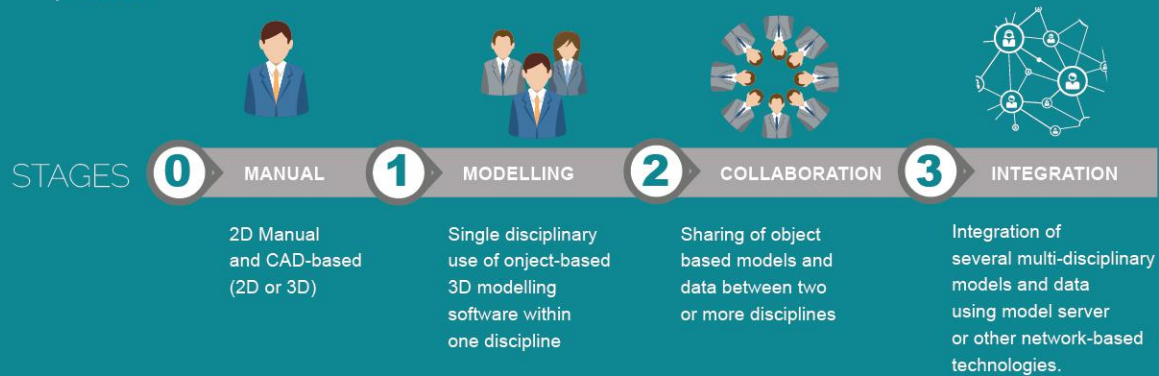




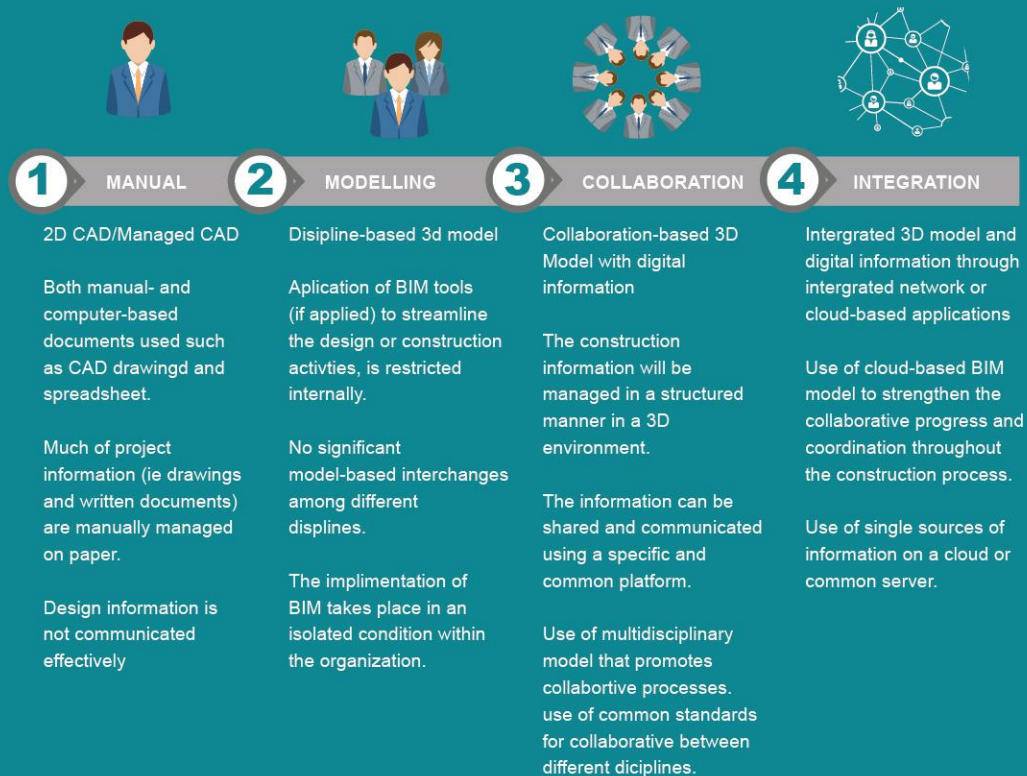
## QUICK INFO

### BIM Stage in Malaysia

The BIM process evolves in few stages where each stage is identified by the level of information collaboration. The type and process to collaborate the information will determine the maturity of BIM process.



### BUSINESS MODEL





# BIM SURVEY : FINDINGS AND SUMMARY







## INTRODUCTION

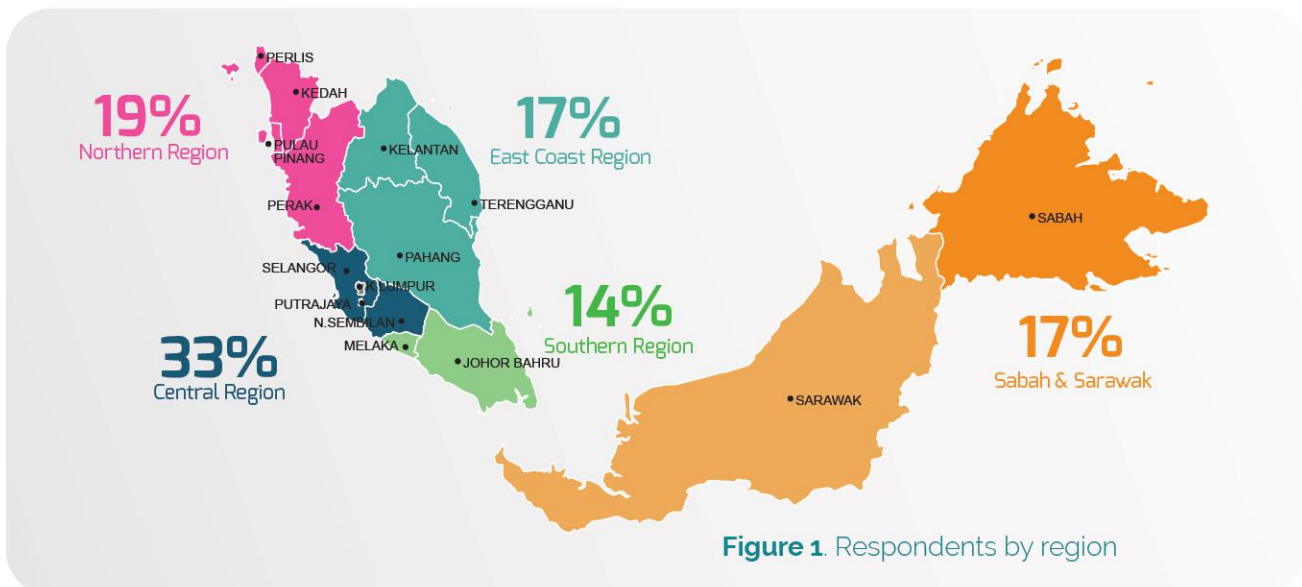
This study is the first national report published by CIDB Malaysia to gauge the level of BIM adoption in the Malaysian construction industry. This report provides an intriguing but interesting insights and research findings into the adoption of BIM within the Malaysian construction industry. The 2016 survey serves as baseline to provide a critical reference point to assess the changes and effects that are crucial in determining the progress of BIM in Malaysia.

This survey was conducted in 2016 among the construction industry players in Malaysia. The data collection process lasted four months (from August 2016 to December 2016) and **generated a sample of 570 responses**. The methods used for data collection included online survey, interviews (by telephone and in-person), conferences, and seminars. The target groups of respondents comprised stakeholders in the construction industry (i.e., architects, engineers, surveyors, contractors, developers, and government officials, among others). The responses reflected the process of BIM progress in Malaysia and the necessity of dispassionate reporting of the actual conditions.

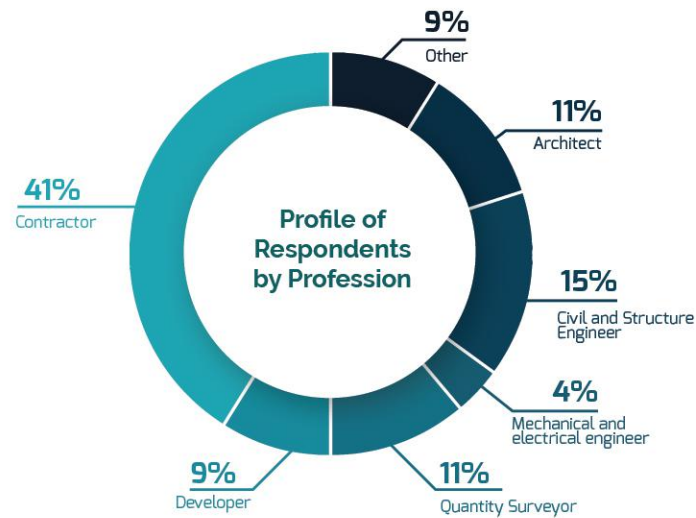


## RESPONDENT OVERVIEW

**Figure 1** shows the population of the respondents in each region in Malaysia. The regional breakdown of participation in the survey generally originated from the central (33%), northern (19%), east coast (17%), Sabah and Sarawak (17%), and southern (14%) regions. **Figure 2** illustrates the organization type for each response collected for this survey. Overall, 49% of the total population are from small organizations (3–19 individuals), 25% from small to medium organizations (20–50 people), 13% from medium to large organizations (50–200 people), and 13% from large organizations (over 200 people). This survey indicates that the responses comprise various types of organizations that have provided insights into BIM from different perspectives. A breakdown of responses shows that the contractor is the largest group of respondents at 41%. **Figure 3** shows that the other significant groups of respondents comprise civil and structure engineers (15%), architects (11%), quantity surveyors (11%), developers (9%), and mechanical and electrical engineers (4%). Another type of response is received from 9% of the population, including building surveyors, land surveyors, academicians, technologists, management consultants, planners, project managers, manufacturers, suppliers, and builders.

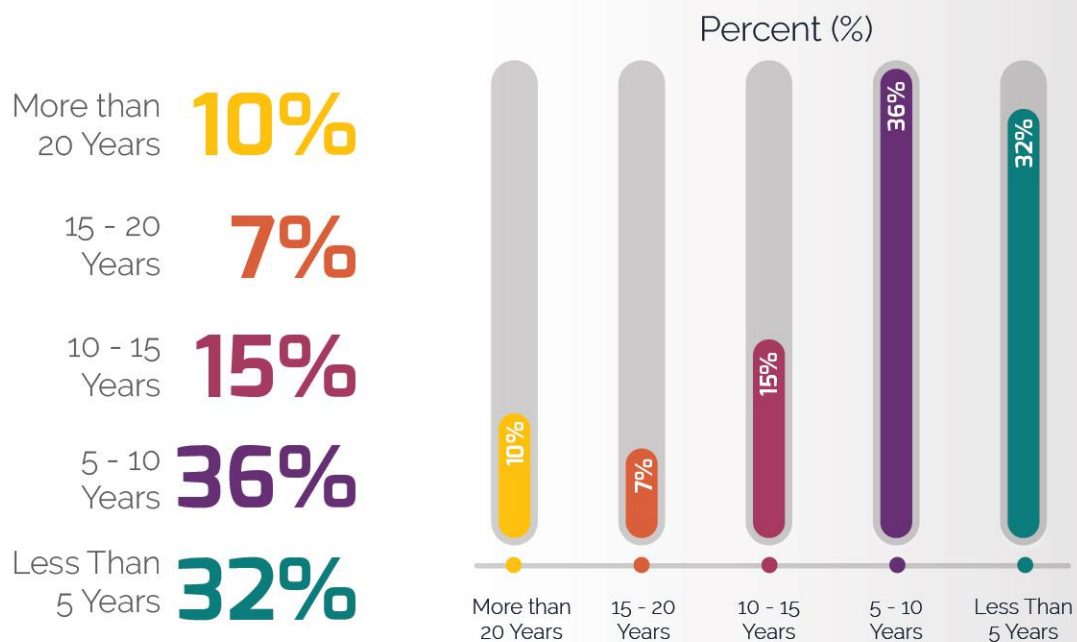


**Figure 2. Respondents by organization**



**Figure 3.** Profile of respondents by profession

Over 68% participation rate was received with at least 5 years of working experience in the construction sector (**Figure 4**). Approximately 32% of the respondents have over 10 years of experience. The number of years of working experience is important to ensure that the collected data are valid and represent actual scenario in the construction industry.



**Figure 4.** Working experience of respondents

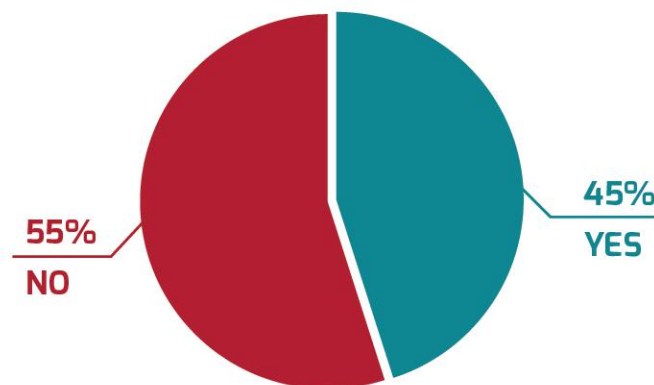


## BIM KNOWLEDGE

### Knowledge on BIM

BIM in Malaysia is a remarkable paradigm that has recently transformed the global construction and is gradually improving and changing the industry. In this report, **45% of the total respondents have knowledge of BIM, whereas 55% claimed that they lack knowledge of this paradigm.** As part of the national agenda, BIM is expected to increase productivity in the construction industry.

To realize this effort, the government through its agencies, such as the Public Works Department (JKR), CIDB, and other professional bodies, has been aggressively promoting BIM through a various events. **A series of BIM awareness programs were organized by CIDB since 2014. Awareness programs, such as BIM Day and Nationwide BIM Road Tour, are part of CIDB initiatives to enhance the awareness of the construction industry and understanding of BIM.** This initiative has been created and is expected to increase BIM awareness among the construction industry players in Malaysia.



**Figure 5.** Respondent that know about BIM



## QUICK INFO



## CIDB BIM ROAD TOUR 2017

### Jelajah BIM & IBS 2017

- April 18, 2017:  
Perdana Hotel, Kota Bharu, KELANTAN
- July 27, 2017:  
Grand Borneo Hotel, Kota Kinabalu, SABAH
- September 7, 2017:  
Mega Hotel, Miri, SARAWAK
- October 11, 2017:  
Thistle Hotel, Johor Bahru, JOHOR
- November 14, 2017:  
Weil Resource Hotel, Ipoh, PERAK

**Book your place NOW!!!**

Registration and further inquiries:

**Call:** 03- 4047 8000/ 1300 88 2432 (CIDB Careline)

**Email:** [rosli.ismail@cidb.gov.my](mailto:rosli.ismail@cidb.gov.my)

**Web:** [www.bimcenter.com.my](http://www.bimcenter.com.my)





## Awareness on BIM in CITP

To increase the productivity of the construction industry, the Malaysian government shows an unfaltering commitment to apply BIM in construction as opposed to traditional construction methods. BIM under the 11th Malaysia Plan is considered technology and modern construction methods that will enhance the efficiency of the implementation of construction projects. CITP calls for the adoption and utilization of modern construction methods and technologies, such as BIM, to address productivity challenges in the industry. This call to action is aligned with the national agenda.

**From the 45% of the respondents with knowledge of BIM, 74% are aware that BIM is a component of the national agenda under CITP.** Meanwhile, CITP recommends a minimum of 40% implementation rate of BIM Stage 2 for public projects above RM 100 million. This target shows the government's level of commitment to implement BIM in the Malaysian construction industry within a few years. For the respondents with knowledge of BIM, over **91% agree on the government initiative to mandate the use of BIM in the construction industry**. Clear government directions with strategic approaches in supporting the industry players will ensure the potential achievement of BIM adoption within a short period.

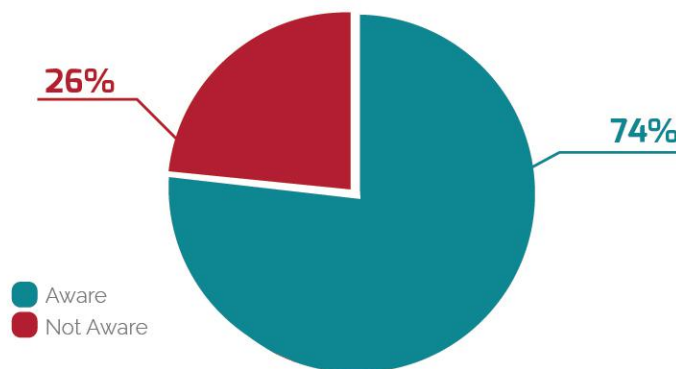


Figure 6. Industry awareness of BIM in CITP

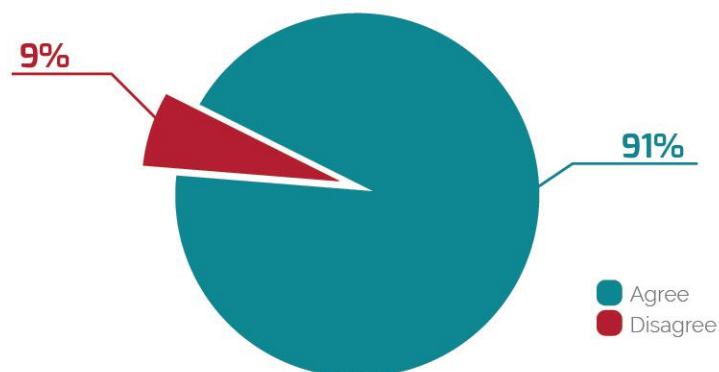


Figure 7. Industry feedback on Government mandating BIM usage



## QUICK INFO

### Government initiative towards Building Information Modelling (BIM)

The use of technology and modern construction methods such as BIM were crucial in improving the efficiency of construction project implementation. Under the Eleventh Malaysia Plan (11th MP), increasing technology adoption and modernising construction methods are parts of government strategy to increase productivity in the construction sector. The use of information and communication technology (ICT) will be enhanced by providing platform to use BIM on a pay-per-use basis (Economic Planning Unit Malaysia, 2015).

### Highlights – Government project using BIM

BIM was used in such projects as the National Cancer Institute in Putrajaya (**Figure 8 (a)**), which is the first government project that used this technology, and the construction of the administration complex of the Malaysian Anti-Corruption Commission in Shah Alam (**Figure 8 (b)**) (Economic Planning Unit Malaysia, 2015).



(a)



(b)

Source: Public Work Department Malaysia

**Figure 8.** BIM used for government projects in Malaysia



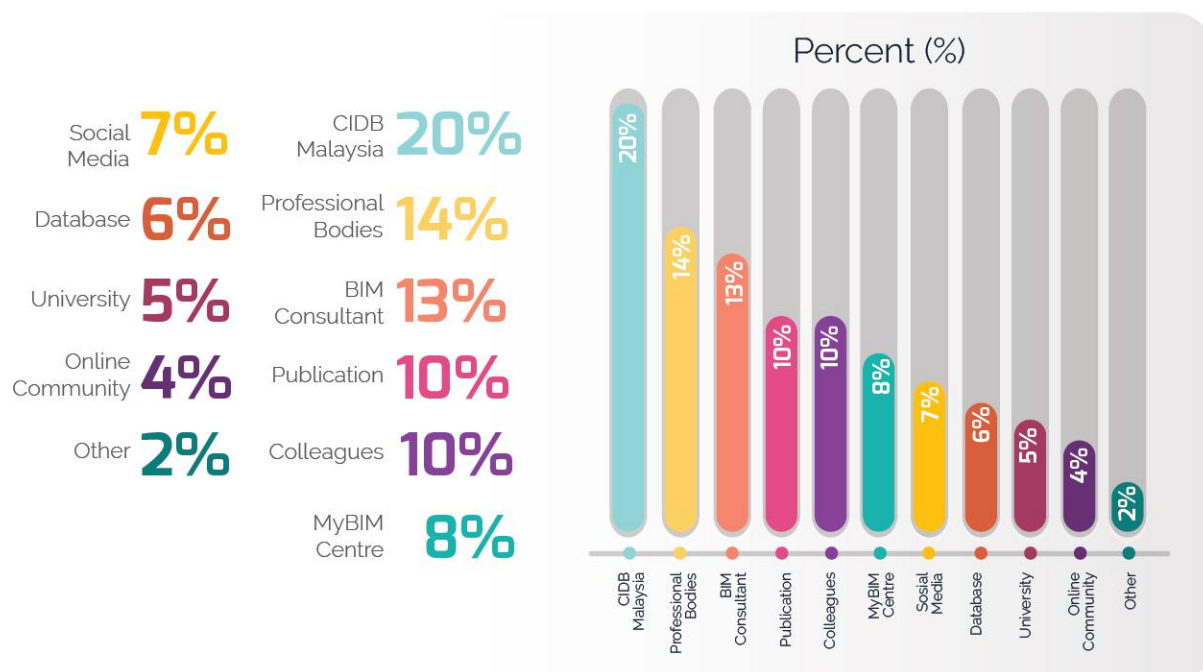


## BIM IN ORGANIZATION

This survey is designed to determine the relational contributions of factors that affect the adoption of BIM in organization, namely, BIM awareness and readiness. To ensure the reliability of data, **further analysis will be performed based on 45% of the respondents** with knowledge of BIM. The respondents from this group were selected to ensure that the survey data collected represent the current implementation and perspective of BIM in Malaysia.

## Information on BIM

Effective platforms of resources should be made available to enhance the awareness of BIM in the Malaysian construction industry. Dissemination of information, programs, and activities through shared resources should be reliable, user friendly, accessible, and up-to-date. When these resources function effectively, they can become powerful tools to increase the awareness level of BIM among the industry players. **Figure 9** shows that CIDB Malaysia was reported as a platform used by most people to obtain information on BIM followed by professional bodies (14%), BIM consultants (13%), publications (10%), colleagues (10%), and MyBIM Centre (8%).



**Figure 9.** Sources of information on BIM



## QUICK INFO



The vision of CIDB's National BIM Centre or myBIM is to become the premiere national **One –Stop – Centre** facilitating the implementation of Building Information Modeling in Malaysia via various initiatives parallel to the aspirations of **Eleventh Malaysia Plan (11<sup>th</sup> MP)** and **Construction Industry Transformation Program (CITP) 2016 – 2020**.

To Achieve this, myBIM Centre is committed to develop and nurture BIM and related technology proficiency in Malaysian Construction Industry.

myBIM Centre's non – exhaustive collaborative efforts together with the industry include:

- To foster general awareness and understanding among industry stakeholders' in BIM and other construction technologies.
- To provide high quality, affordable BIM education program for all.
- Together with the industry in providing access to BIM education training programs for all.
- To establish links and collaborate in a concerted effort with the education sector, government agencies and all practitioners of the construction industry in the effort to promote proficiency and excellence in BIM implementation.
- To research, facilitate and promote the means of better project and organizational management by improving communication, coordination, productivity, delivery time and quality throughout the whole construction life cycle.
- To ease the initial challenges of BIM implementation by providing affordable, pay – per – use solutions and infrastructure.
- To provide general and technical guidance on BIM implementation and the way for career distinction in construction industry.



## BIM Awareness

Awareness of BIM must arise through organizations at an early stage for the rapid adoption of BIM in Malaysia. Despite the 55% of the respondents confirming to have attended BIM seminars or programs, the survey indicated that over half of the respondents (65%) show that their organizations failed to provide staff members with trainings on BIM tools and workflows. The organizations that provide trainings for their staff members will develop a set of knowledge and skills that is crucial for the implementation of BIM due to the processes and technological changes within the organizations. This finding indicates that the required knowledge on BIM is still minimal despite the awareness on BIM of the respondents from this group.

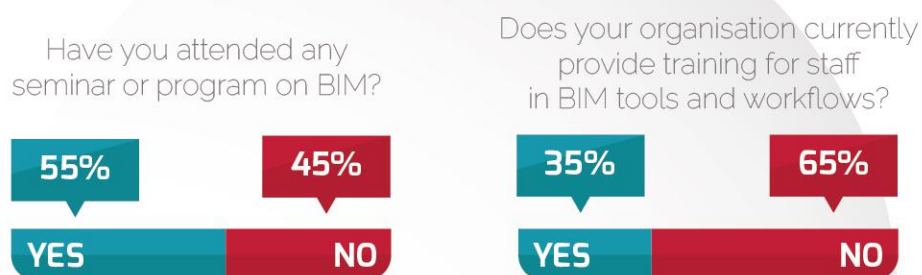


Figure 10. Awareness on BIM in the construction industry

## BIM Readiness

Organizational readiness will determine the tendency of an organization to adopt BIM. Readiness can be expressed as the level of preparation, potential to participate, or capability to innovate (Succar & Kassem, 2015). A total of **59% of the organizations were observed to have clear policies** that support the implementation of BIM. However, the policy is unsuccessful due to the ineffective policy formulation and absence of a designated policy driver. A structured policy intervention with the appropriate approach is vital to drive BIM within their organization.

To date, no tangible and quantifiable case study reports are available in Malaysia to prove the benefits. Moreover, the industry still faces difficulties in understanding the benefits that they could obtain from the implementation of BIM. The Malaysia Productivity Corporation (MPC) reported that many construction organizations were unprepared to invest in new technologies and human resource trainings on a large-scale basis because they were uncertain of the immediate future growth (Malaysia Productivity Corporation, 2012). Thereafter, this finding may lead to the unwillingness of organizations to invest in and develop capability in BIM. This finding was proven by this survey, where over **60% of the responses failed to allocate any financial incentives or support** to use BIM, invest in BIM trainings, and invest in BIM hardware and software.



The implementation of BIM is considered an organizational innovation that requires change to the values and cultures of organizations. Changes across organizational scales will involve a considerably high degree of difficulties because such transformation requires change in management and the possibility of resistance by individuals to embrace change. The risks and uncertainties of adopting BIM have led to the suggestions to require a general dissatisfaction with the status quo by employees who must change (i.e., readiness to change), vision of the future, and well-managed change process. The result of this survey indicates that 84% of the respondents are willing to change for the implementation of BIM. However, the changes can only be successful when the adoption strategy is effectively planned and implemented.

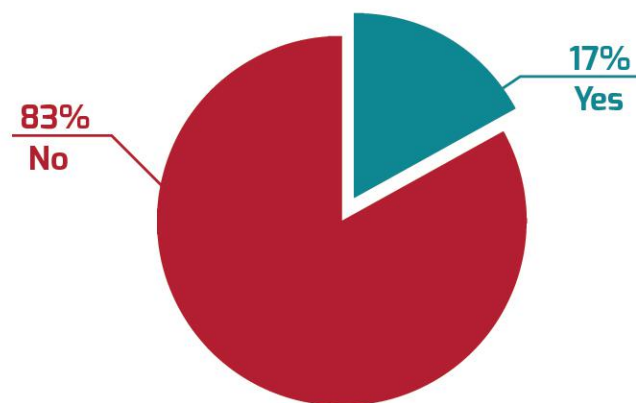


Figure 11. BIM readiness in the construction industry

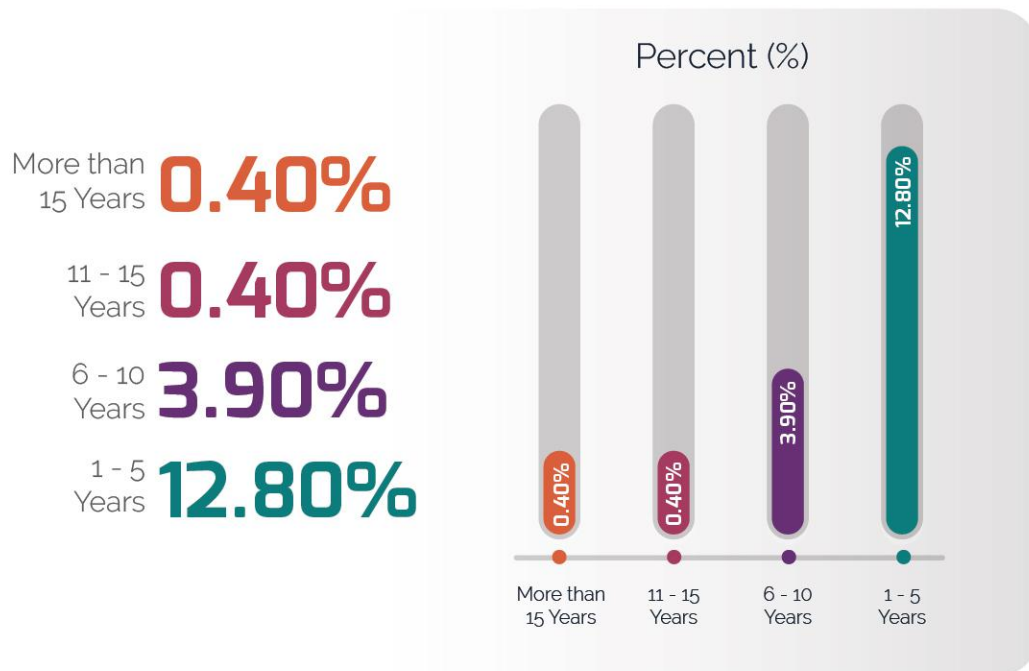
# BIM ADOPTION IN MALAYSIA

## Introduction

In-depth analysis that focuses on 45% of the respondents with knowledge of BIM shows that only **17% of the respondents have experience using BIM**, whereas 83% lack experience (see **Figure 12**). Of the 17% respondents with experience in BIM, 12.8% have 1 to 5 years of experience, 3.9% with 6 to 10 years, and 0.8% with over 10 years. Therefore, measuring the understanding of BIM among construction organizations is quite possible given that such understanding is still at the embracing stage. Accordingly, the **diffusion of BIM** within the construction organizations is a significant factor to understand the barriers and drivers of adopting BIM.



**Figure 12.** Respondents with experience in BIM



**Figure 13.** Respondents with working experience in BIM





## BIM Adoption Rate

BIM in Malaysia is generally **adopted in the central region** (i.e., Kuala Lumpur, Selangor, and Negeri Sembilan) of Malaysia with 78% of the population. This result is contributed by the rapid development and large-scale projects currently underway in this region.

Among industry professionals who adopted BIM, **architects are the leading adopters of BIM in Malaysia at 42%** and followed by engineers at 21%. This result highlights that BIM is mainly used among professionals at the design stage, thereby further showing that the current BIM practice in Malaysia is only predominantly focusing on the interests of architects and designers. This survey also determined that contractors (13%) and quantity surveyors (12%) have begun applying BIM. Small and large organizations at 29% were the optimum sizes of organization that adopt BIM.

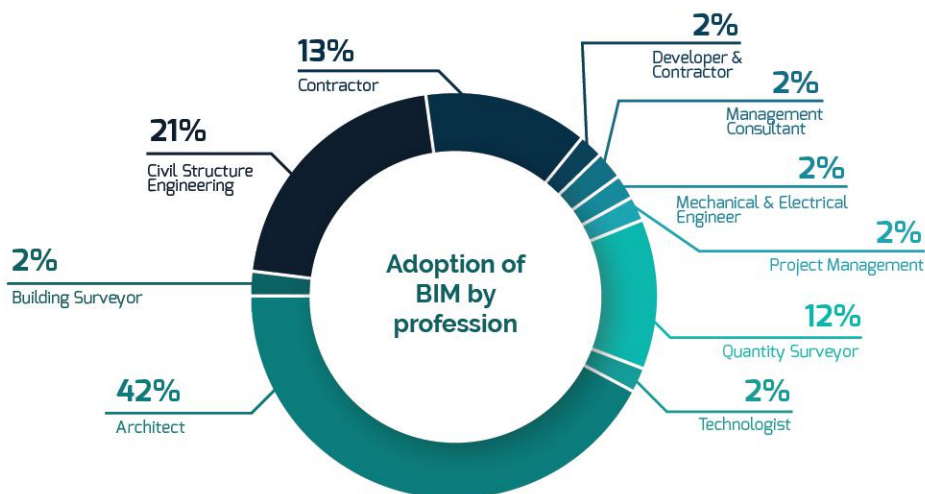
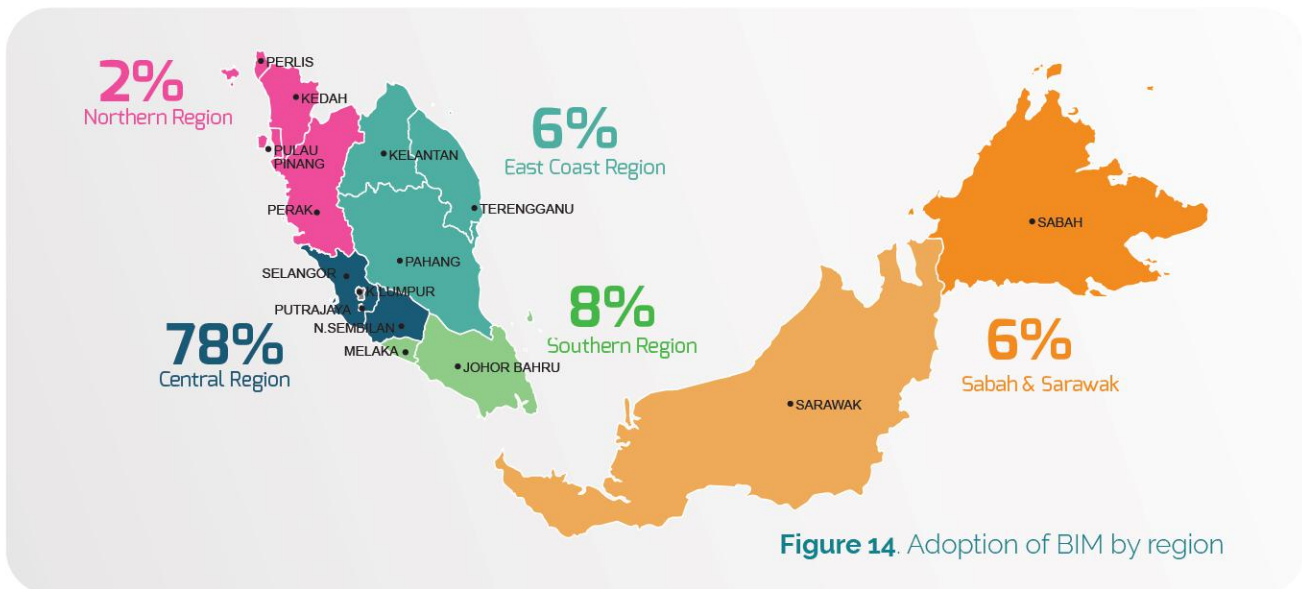


Figure 15. Adoption of BIM by profession





**Figure 16.** Size of organizations that adopt BIM

## QUICK INFO

The following data are identified based on organizations with experience in using BIM in Malaysia. Considering the organizations with experience in implementing BIM, the individuals in their organizations can be considered people with BIM capability (skills and knowledge).

The results are based on the initial assessment of the organizations that have been implementing BIM.

Number of BIM Managers: 7

Number of BIM Coordinators: 25

Number of BIM Modelers: 74



## Challenges to the implementation of BIM

This survey was designed to determine the challenges that impede the adoption of BIM in Malaysia. Moreover, understanding the challenges of adopting BIM is considered a foundation to acknowledge the hindrance of BIM adoption in Malaysia. This finding enables policy-makers to develop constructive strategies to mitigate the challenges.

**Table 1** presents several challenges that surround the adoption of BIM in Malaysia. The results show that high cost of technology, **high training cost, lack of knowledge on BIM, high cost of software, and insufficient availability of BIM trainings** are the critical challenges that hinder the adoption of BIM in Malaysia. To articulate the strategic BIM adoption, the challenges are divided into three categories, namely, **people, process, and technology**.

**Table 1.** Challenges to the implementation of BIM

Factor	Rank	Category
<b>High cost of technology</b>	<b>1</b>	<b>Technology</b>
<b>High training cost</b>	<b>2</b>	<b>Technology</b>
<b>Lack of knowledge on BIM</b>	<b>3</b>	<b>People</b>
<b>High cost of software</b>	<b>4</b>	<b>Technology</b>
<b>Insufficient availability of BIM trainings</b>	<b>5</b>	<b>People</b>
Lack of time for experimentation and implementation in fast-paced projects	6	Process
Lack of references to assist in implementing BIM	7	Process
Lack of awareness of BIM benefits	8	People
Lack of time to implement	9	Process
Lack of competency among team members in using BIM	10	People
Existing hardware incapable of running basic BIM software	11	Technology
Reluctance to initiate new workflows for the implementation of BIM	12	People
Lack of direction of BIM in the industry	13	Process
Inadequate familiarity with the use of BIM	14	Process
No BIM requirement/ mandate exists in the industry	15	Process
BIM software is complicated to use	16	Technology
Resistance to change for new technology	17	People
Assumption that conventional methods are better than new processes	18	Process

*Note: Factor challenges of BIM implementation rank (Technology-Mean: 3.80, People- Mean: 3.63, Process- Mean 3.47)*





## i. Challenges for technology

Although BIM is expected to provide benefits to the construction industry, its implementation will require initial investment. The cost of implementation was recognized as one of the barriers to BIM implementation. Cost is a subjective issue because it depends on external factors, such as regulations imposed by the government or clients. The perceived sources of high cost, such as technology, training, and software, were deemed factors that hinder the implementation of BIM within construction organizations. The initial transition phase toward BIM requires organizations to invest, although it requires consideration against the benefits potentially offered by BIM.

**Table 2.** Identified challenges from the technology perspective

Factor	Rank
High cost of technology	1
High training cost	2
High cost of software	3
Existing hardware incapable of running basic BIM software	4
BIM software is complicated to use	5

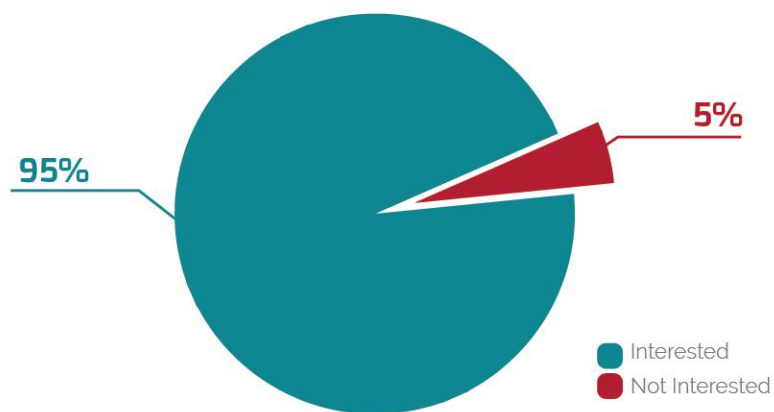
## ii. Challenges for people

This survey has suggested that many organizations in Malaysia are becoming increasingly aware and interested in adopting BIM. **Figure 17** shows that **95% of the respondents are interested** in establishing or using BIM within their organizations. However, the lack of knowledge on BIM, insufficient BIM trainings, and lack of awareness of BIM benefits have influenced the rate of implementation in an organization.

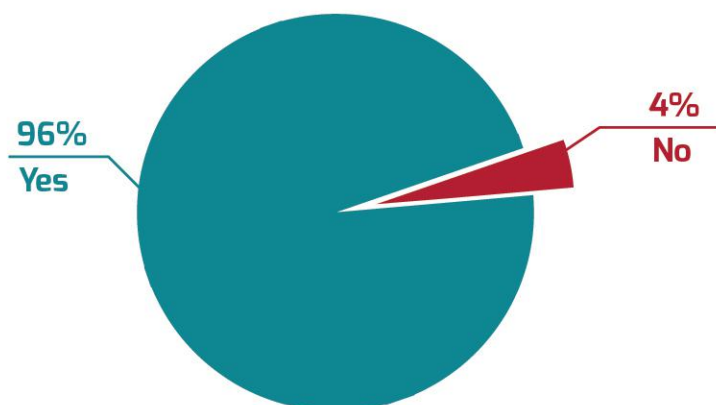
The limited number of BIM professionals who are competent and capable of implementing BIM, which is regarded as resistance based on the “human factor,” are the other factors that limit the adoption of BIM in an organization. This phenomenon occurs when the industry is unequipped with a set of BIM knowledge. At present, CIDB through the MyBIM Centre is actively providing trainings and short courses to prepare the industry for the implementation of BIM. Even though a majority of the respondents believe that BIM will provide benefits to their organizations (see **Figure 18**), no substantial proof is documented on how BIM can be beneficial to the organization. Most organizations are still uncertain of the practical benefits and possibilities that BIM could offer to improve their productivity.

**Table 3.** Identified challenges from the people's perspective

Factor	Rank
<b>Lack of knowledge on BIM</b>	<b>1</b>
<b>Insufficient BIM trainings</b>	<b>2</b>
<b>Lack of awareness of BIM benefits</b>	<b>3</b>
Lack of competency among team members in using BIM	4
Reluctance to initiate new workflows for the implementation of BIM	5
Resistance to change for new technology	6



**Figure 17.** Respondents interested in establishing or using BIM within the organization.



**Figure 18.** Respondents trusting BIM to provide benefits to their organization.



## QUICK INFO

### BIM Training and Courses

myBIM Centre offers BIM software and proficiency training programs. These courses cover the **three stages of continuous learning** related to BIM, namely, **Introduction** for beginners, **Intermediate**, and **Advanced Learning**.

#### a) Affordable BIM Training

- Revit Architecture Essential
- Revit Architecture Advance
- Revit Structure Essential
- Revit Structure Advance
- Revit MEP Essential
- Revit MEP Advance
- Autodesk Navisworks

#### b) BIM Training

- BIM Concept and Theory
- Fundamental Architectural Modelling for BIM
- Fundamental Structural Modelling for BIM
- Fundamental Coordination of BIM
- BIM Manager Essential
- BIM Manager Advance

For further information on trainings and courses on BIM, kindly visit

Web: [www.bimcenter.com.my](http://www.bimcenter.com.my)

Facebook: <https://www.facebook.com/LetsTalkAboutBIM>





### iii. Challenges for process

An organization's readiness to change has also become a turning point for the implementation of BIM in Malaysia. BIM requires a revolutionary shift in the work processes and technology within the organization. Accordingly, these organizations must adjust and align their business operations to maintain the pace of their transition process. A total of **84% of the respondents are willing to change** for the implementation of BIM. However, such changes involve substantial difficulties related to the cultures that support the innovation culture within the organization.

During the transformation phase, organizations should develop the capability of people with a set of skills and knowledge of BIM. However, adopting BIM also involves a steep learning curve to the organization. This survey determined that the lack of time for experimentation and implementation in a fast-paced project is another factor that hinders the implementation of BIM. Most organizations are concerned that the learning curve in adopting BIM could affect their respective businesses. In addition, the lack of references to assist in implementing BIM tends to extend the period of the learning curve. The availability of references will empower organizations with sources of information that will aid them during the learning process.

**Table 4.** Identified challenges from the process perspective

Factor	Rank
<b>Lack of time for experimentation and implementation in fast-paced projects</b>	<b>1</b>
<b>Lack of references to assist in implementing BIM</b>	<b>2</b>
<b>Lack of time to implement</b>	<b>3</b>
Lack of direction of the BIM in industry	4
Our organization is inadequately unfamiliar with BIM usage	5
No BIM requirement/ mandate exists in the industry	6
Assumption that conventional methods are better than new processes	7





## QUICK INFO

# BIM Guide Book

The BIM Guide was formulated as a fundamental approach for the implementation of BIM in Malaysia. This guide enables construction industry players to improve productivity by adopting high usage of technology and modern practices to reduce construction time and redundancy of construction works. This goal is consistent with the goal of CITP to raise productivity levels across the industry. The BIM Guide provides directives, references, and process guidelines to construction players at both organizational and project levels. This guide will be published in three booklets, namely, BIM AWARENESS, BIM READINESS, and BIM ADOPTION.

### a) BIM AWARENESS

Book 1 aims to acknowledge and promote the understanding and implementation of BIM in the Malaysian construction industry, which is still in its early stages. With a strong understanding of BIM, construction players can expect sound awareness on the implementation of BIM in Malaysia. This book will further explain the rationale and process by which BIM will boost productivity-enhancing technology and practices that will be eventually rewarded with substantially high earnings.

### b) BIM READINESS

Book 2 elaborates that BIM is a methodology to develop, manage, and use construction information in the form of a digital model. This digital model can be developed as early as the feasibility stage (preconstruction), managed during the design stages, and used throughout the operation and maintenance stages. This process will strengthen and streamline collaboration among consultants, contractors, and all stakeholders.

### c) BIM ADOPTION

Book 3 explains that BIM will enable information to be transmitted seamlessly from one process, personnel, or even organization to another. Limited time is required to understand the design intent at each phase. Information is available and easily accessed within the digital model, thereby optimizing resources and maximizing the productivity of all relevant parties.







## Expected benefits from the implementation of BIM

This survey further intends to discover the expected benefits from implementing BIM by the construction organizations. The leading expected benefits of the implementation of BIM for construction organizations include improved project understanding, improved construction planning and monitoring, improved coordination between client-consultant-contractor, improved visualization of the project, 3D/4D clash detections, and improved collaborations among project team members. **Table 5** presents the other expected benefits of implementing BIM.

**Table 5.** Expected benefits of implementing BIM

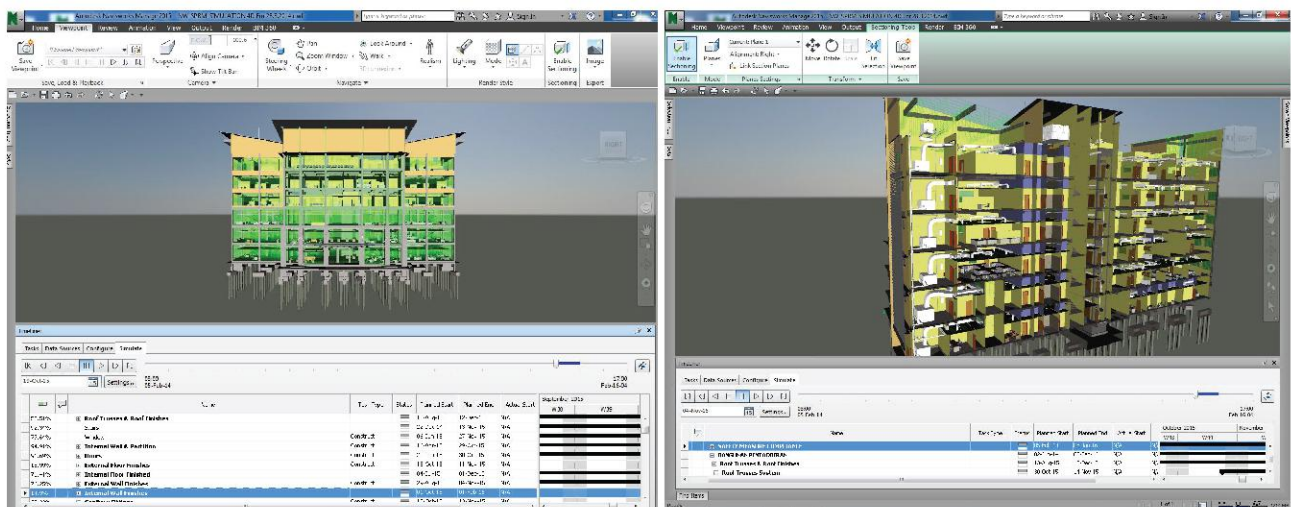
Factor	Rank
<b>Improve project understanding</b>	<b>1</b>
<b>Improve construction planning and monitoring</b>	<b>2</b>
<b>Improve coordination between client-consultant-contractor</b>	<b>3</b>
<b>Improve visualization of the project</b>	<b>4</b>
<b>3D/4D clash detections</b>	<b>4</b>
<b>Improve collaboration among project team members</b>	<b>5</b>
Decision-making tools	6
Transparency of design for all stakeholders	6
Greater predictability of project	7
Increase in organization's competitive advantage	7
Better quality control of project	8
Increased productivity of construction project	9
Promotion of early decision making	10
Provision of cost information for early decision making	10
Reduction of RFI during the construction process	11
Implications of different design options and concepts	12
Increase in project turnover	13
Ability to reduce the overall project duration	14
Improvement of regulatory approval	15
Dispute avoidance	16



BIM is a collaborative process that provides significant information to **improve project understanding** at the early stage. This process aids the project team to visually understand the process of constructing a building and provide an improved feedback on their requirements for the project. BIM also enables the owners and all players involved to entirely conceptualize a building before the construction begins, thereby acquiring an improved understanding of the design intent.

Given that all project teams are gathered during the conceptualization phase, the constructability of the project can be effectively managed to **improve the construction planning and monitoring**. BIM produces accurate and detailed building models with a set of information that will improve construction planning and monitoring. Construction planning involves the scheduling and sequencing of the model to coordinate the virtual construction in time and space. The use of BIM during planning will enhance site utilization, space coordination, and product information (see **Figure 19**).

For example, an integrated model enables the project team to utilize simulation to support construction planning and assess the effect of the proposed design features on the construction schedule and workflow. The information indirectly provides valuable information and assists project teams in making the best decision.



Source: Public Work Department Malaysia

**Figure 19.** Utilization of BIM during construction planning and monitoring

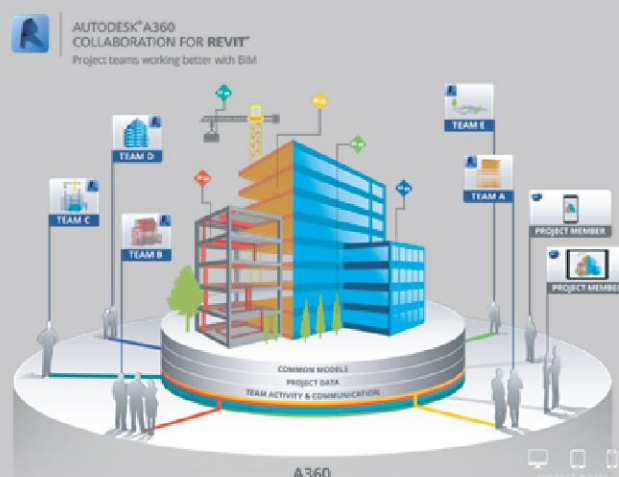


BIM creates effective communication given that it is a coordination-based and integrated system in a single virtual representation, thereby **enhancing the coordination of client–consultant–contractor**. **BIM is an advantageous visualization tool** and provides three-dimensional virtual representation of a building. Visualization offers an improved project understanding of the building's possible appearance (see **Figure 20**). This process aids in eliminating misunderstandings and miscommunications that originate from the visualizations of BIM. Moreover, BIM results in significant time saving and cost efficiency if **3D/4D clash detections** are implemented before the construction stage. A substantial collaborative approach among project teams using a singled shared model can improve the constructability of the project. Collaboration will enable a centralized access to models by project teams in all disciplines.



Source: Public Work Department Malaysia

**Figure 20.** Visualization of a building using BIM



Source: [http://inthe fold.autodesk.com/in\\_the\\_fold/aec/page/3/](http://inthe fold.autodesk.com/in_the_fold/aec/page/3/)

**Figure 21.** BIM collaborative environment





# FUTURE USE OF BIM





## FUTURE USE OF BIM

The demographic profiling revealed that 39.3% of organizations will adopt BIM within 3 years, 37.5% within 5 years, and 18.6% within 1 year. Only 4.6% are disinterested to implement BIM. A cumulative total of 57.9% of organizations are expected to adopt BIM by 2018. This finding highlights the crucial role of structured strategies to ensure that the 57.9% would be certainly prepared to adopt BIM within three years.

At present, the industry lacks adequate resources to assist the implementation of BIM within its organizations (see **Figure 23**). The data from the survey suggest that **organizations will be ready for evaluation of the adoption in the third year**. If the figure of BIM adopters presented here becomes a reality, then BIM as used by construction organizations will become the norm. Consequently, the implementation of BIM will support the maturity process of this process.

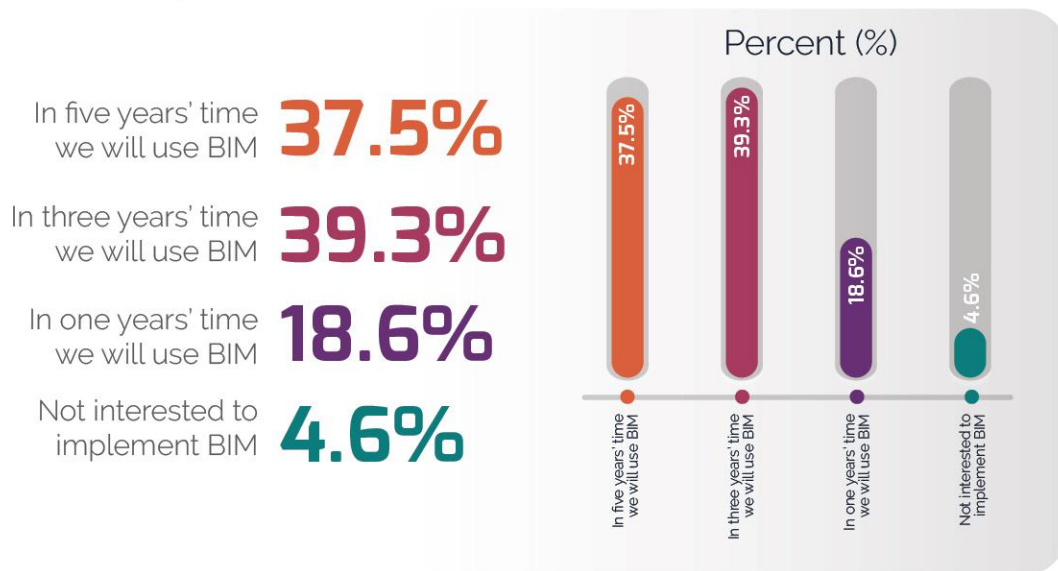


Figure 22. Future use of BIM in Malaysia



Figure 23. The adequacy of resources for implementation of BIM





## REFERENCE

- Abbasnejad, B., Nepal, M., & Drogemuller, R. (2016). Key Enablers for Effective Management of BIM Implementation in Construction Firms. *Proceedings of the CIB World Building Congress 2016 - Creating Built Environments of New Opportunities*, 1, 622–634.
- Ali, M., Haron, T., & Marshall-ponting, A. (2014). Exploring the Barriers and Driving Factors in Implementing Building Information Modelling ( BIM ) in the Malaysian Construction Industry : A Preliminary Study, 75(1), 1–10.
- CIDB Malaysia. (2015). Construction Industry Transformation Programme 2016-2020. <http://doi.org/10.1007/s13398-014-0173-7.2>
- Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2011). BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. Building (Vol. 2). <http://doi.org/10.1002/9780470261309>
- Economic Planning Unit Malaysia. (2015). Eleventh Malaysia Plan 2016-2020 Anchoring Growth on People.
- Malaysia Productivity Corporation. (2012). Productivity Report 2011/2012 (Vol. 19). <http://doi.org/10.1017/CBO9781107415324.004>
- Malaysia Productivity Corporation. (2016). Productivity Report 2015/2016.
- Peansupap, V., & Walker, D. H. T. (2004). Strategic Adoption of Information and Communication Technology ( Ict ): Case Studies of Construction Contractors, 2(September), 1–3.
- Succar, B., & Kassem, M. (2015). Automation in Construction Macro-BIM adoption : Conceptual structures. *Automation in Construction*, 57, 64–79. <http://doi.org/10.1016/j.autcon.2015.04.018>



## SPECIAL THANKS

We wish to extend our sincere appreciation to the following individuals who participated in the completion of this: Sr. Nur Waheeda Bt Ismail, Jabatan Kerja Raya Malaysia; Ir. Ahmad Ridzuan Bin Abu Bakar, Jabatan Kerja Raya Malaysia; Ir. Mohd Faiz Bin Shapiai, Jabatan Kerja Raya Malaysia; Mohamad Hassan Zakaria, Brunfield Construction Sdn Bhd; Chung Soo Kiong, Sunway Construction Sdn Bhd; Jeremy Loh Tze Wei, Sunway Construction Sdn Bhd; Muhaimi Tusiman, YTL Construction; Zulkarnain B. Hasan, Sime Darby Property Berhad; Sr. Sharifah Noraini Noreen Syed Ibrahim, Royal Institution Surveyor Malaysia; Abdul Halim Hussein, IJM Construction Sdn Bhd; Isrin Ismail, BIM Asia Sdn Bhd; Ainaa Yusoff, BIM Asia Sdn Bhd and Suffian Shahabuddin, Six Design Office Sdn Bhd.

Special thanks also goes to Dr. Bilal Succar; Dr. Che Wan Fadhil Che Wan Putra; Dr. Afifuddin Husairi; Harni Rohaida Haron and Muhamad Razif Abdullah for assisting us and providing important inputs for this report.

## EDITORIAL TEAM

Datuk Ir. Elias Ismail  
Ir. Dr. Zuhairi Abd. Hamid  
Ir. Noraini Bahri  
Ahmad Farrin Mokhtar  
Ahmad Farhan Roslan  
Maria Zura Mohd. Zain  
Mohd. Khairolden Ghani  
Nurulhuda Mat Kilau  
Natasha Dzulkalnine  
Jasni Ismail  
Mazieana Che Amat  
Rofizlan Ahmad  
Sharifuddin Umar





[www.cidb.gov.my](http://www.cidb.gov.my)

CONSTRUCTION  
INDUSTRY DEVELOPMENT  
BOARD MALAYSIA  
CIDB

