

**STRATEGIES** for  
**BIM** Implementation  
in the  
**CONSTRUCTION INDUSTRY**



# STRATEGIES for **BIM** Implementation in the **CONSTRUCTION INDUSTRY**

Edited by  
Nur Emma Mustaffa  
Aimi Sara Ismail



[www.penerbit.utm.my](http://www.penerbit.utm.my)

2024

First Edition 2024  
© NUR EMMA MUSTAFFA & AIMI SARA ISMAIL 2024

Hak cipta terpelihara. Tiada dibenarkan mengeluarkan ulang mana-mana bahagian artikel, ilustrasi, dan isi kandungan buku ini dalam apa jua bentuk dan cara apa jua sama ada dengan cara elektronik, fotokopi, mekanikal, atau cara lain sebelum mendapat izin bertulis daripada Timbalan Naib Canselor (Penyelidikan & Inovasi), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor Darul Ta'zim, Malaysia. Perundingan tertakluk kepada perkiraan royalti atau honorarium.

*All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying, recording, or any information storage and retrieval system, without permission in writing from Deputy Vice-Chancellor (Research & Innovation), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor Darul Ta'zim, Malaysia. Negotiation is subject to royalty or honorarium estimation.*

Editor: **NUR EMMA MUSTAFFA & AIMI SARA ISMAIL**  
Editor Penyelaras/*Acquisition Editor*: **RASYIQAH ABDUL RANI**  
Pereka Kulit /*Cover Designer*: **NORIZAN YAACOB**

Diatur huruf oleh /*Typeset by*:  
**NUR EMMA MUSTAFFA & AIMI SARA ISMAIL**  
*Faculty of Built Environment and Surveying*  
UNIVERSITI TEKNOLOGI MALAYSIA  
81310 UTM Johor Bahru  
Johor Darul Ta'zim, MALAYSIA

Diterbitkan di Malaysia oleh/  
*Published in Malaysia by*:  
**PENERBIT UTM PRESS**  
UNIVERSITI TEKNOLOGI MALAYSIA  
81310 UTM Johor Bahru  
Johor Darul Ta'zim, MALAYSIA  
(PENERBIT UTM ahli MAJLIS  
PENERBITAN ILMIAH MALAYSIA –  
MAPIM dan MABOPA  
dengan no. keahlian 9101)

Dicetak di Malaysia oleh/  
*Printed in Malaysia by*:  
**JASAMAX ENTERPRISE**  
No.16, Jalan Kebudayaan 2,  
Taman Universiti,  
81310 Skudai Johor,  
MALAYSIA



Cataloguing-in-Publication Data  
Perpustakaan Negara Malaysia  
A catalogue record for this book is available from the  
National Library of Malaysia  
ISBN 978-983-52-2096-8

# CONTENTS

<i>Contributors</i>	<i>vii</i>
<i>Preface</i>	<i>ix</i>
<b>CHAPTER 1 INTRODUCTION TO BIM: IMPLEMENTATION STRATEGIES IN THE CONSTRUCTION INDUSTRY</b>	<b>1</b>
<i>Aimi Sara Ismail and Nur Emma Mustaffa</i>	
<b>CHAPTER 2 BIM EXECUTION PLAN PROCESS IN PUBLIC PROJECTS</b>	<b>21</b>
<i>Nur Emma Mustaffa, Fatin Natashya Nor Azam, Hamizah Liyana Tajul Ariffin, and Nursyahirah Aliya Mohamad Misdon</i>	
<b>CHAPTER 3 BIM IMPLEMENTATION IN HERITAGE BUILDINGS</b>	<b>35</b>
<i>Muhammad Hadi Mustafa, Khairusy Syakirin Has- Yun Hashim, and Maisarah Ali</i>	
<b>CHAPTER 4 4D BIM IN CONSTRUCTION SAFETY MANAGEMENT</b>	<b>51</b>
<i>Nafisah Abdul Rahiman, Kerk Yee Wen, Kherun Nita Ali, and Shamsulhadi Bandi</i>	

<b>CHAPTER 5</b>	<b>BIM IMPLEMENTATION IN HANDLING DESIGN CHANGES</b>	<b>75</b>
	<i>Farah Azwanee Aminuddin, Aina Qistina Khazli, Aimi Sara Ismail, and Nurshikin Mohd Shukery</i>	
<b>CHAPTER 6</b>	<b>CONTRACTUAL ISSUES IN BIM INTERNATIONAL CONTRACT</b>	<b>93</b>
	<i>Nur Emma Mustaffa, Mohamad Shaiful Hisham Zulhizam, Norhazren Izatie Mohd, and Naqiyatul Amirah Mohd Said</i>	
<b>CHAPTER 7</b>	<b>BIM IN QUANTITY SURVEYING PROFESSION</b>	<b>125</b>
	<i>Fuziah Ismail, Ann Jillian Pohan, Ahmad Faiz Azizi Ahmad Fauzi, and Siti Nurhuda Abd Wahid</i>	
<b>INDEX</b>		<b>141</b>

# CONTRIBUTORS

- Ahmad Faiz Azizi Ahmad Fauzi** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Aimi Sara Ismail** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Aina Qistina Khazli** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Ann Jillian Pohan** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Farah Azwanee Aminuddin** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Fatin Natashya Nor Azam** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Fuziah Ismail** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Hamizah Liyana Tajul Ariffin** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Kerk Yee Wen** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Khairusy Syakirin Has-Yun Hashim** *Kulliyah of Architecture & Environmenta Design, International Islamic University Malaysia, Selangor*
- Kherun Nita Ali** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Maisarah Ali** *Kulliyah of Engineering, International Islamic University Malaysia, Selangor*
- Mohamad Shaiful Hisham Zulhizam** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*
- Muhammad Hadi Mustafa** *Faculty of Built Environment, Universiti Malaya, Kuala Lumpur*
- Nafisah Abdul Rahiman** *Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru*

**Naqiyatul Amirah Mohd Said** *Faculty of Built Environment and Surveying,  
Universiti Teknologi Malaysia, Johor Bahru*

**Norhazren Izatie Mohd** *Faculty of Built Environment and Surveying, Universiti  
Teknologi Malaysia, Johor Bahru*

**Nur Emma Mustaffa** *Faculty of Built Environment and Surveying, Universiti  
Teknologi Malaysia, Johor Bahru*

**Nurshikin Mohamad Shukery** *Faculty of Built Environment and Surveying,  
Universiti Teknologi Malaysia, Johor Bahru*

**Nursyahirah Aliya Mohamad Misdon** *Faculty of Built Environment and  
Surveying, Universiti Teknologi Malaysia, Johor Bahru*

**Shamsulhadi Bandi** *Faculty of Built Environment and Surveying, Universiti  
Teknologi Malaysia, Johor Bahru*

**Siti Nurhuda Abd Wahid** *Faculty of Built Environment and Surveying, Universiti  
Teknologi Malaysia, Johor Bahru*



# PREFACE

Building information modelling (BIM) is regarded as a solution to the unprecedented problems in the construction industry. Its implementation is considered a daunting task due to the lack of understanding amongst the construction players on the potential benefits that BIM can offer. Nonetheless, the growing acceptance of BIM globally and Malaysia is an acknowledgement that the industry has fundamentally changed.

This book is a sequel to the first book published in 2022 entitled *BIM: Issues in Malaysian Construction Practices*. While the first book provides an invaluable insight related to the potentiality of BIM adoption in Malaysia and focuses on various aspects related to it, this book offers a different spectrum. It endeavours to present the current practices of BIM whilst at the same time benefiting the readers highlighting how BIM has been applied and indirectly highlighting the strategies to be adopted for BIM implementation.

Seven chapters in this book focuses on different aspects of BIM encompassing areas amongst others contractual aspects of BIM, heritage BIM, safety and BIM, design changes in BIM and documentation in BIM. These are some of the embodiments of the holistic nature of BIM.

This book targets a diverse audience including construction practitioners, academicians, students, BIM practitioners, heritage conversationists, safety managers, and construction legal professionals. Construction practitioners such as project managers, architects, engineers, contractors, and quantity surveyors will discover practical insights and strategies for implementing BIM in their projects. Academicians and students will benefit from the theoretical knowledge

and case studies provided. BIM practitioners could enhance their expertise through the detailed discussions on BIM implementation and BIM execution plans (BEP). Heritage conservationists will appreciate the focus on BIM's role in preserving historical buildings, while safety managers will find valuable information on integrating 4D BIM for safety management. Construction legal professionals will benefit from the comparative analysis of international BIM contracts, shedding light on pertinent legal issues and contractual approaches.

The authors would like to thank their research team and the people who have been involved throughout the process of data collection. Sincere gratitude is also extended to the publisher for their kind interest and efforts in ensuring the publication of this book. It is hope, through this book, readers will find a great interest to understand BIM better and embrace it.

**Nur Emma Mustaffa**

**Aimi Sara Ismail**

Universiti Teknologi Malaysia

**2024**