Digital Turn in Malaysian Quantity Surveying Practices:
Big Data Analytics Pathway for Forward Thinking Professionals

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Abstract: This book is written for Quantity Surveyors who recognise the need to evolve from conventional cost and measurement roles towards data driven strategic roles, yet remain unsure how to begin within the Malaysian construction landscape. Digital Turn in Malaysian Quantity Surveying Practices presents an in-depth exploration of how Big Data Analytics is redefining professional roles, competencies, and value. Blending local policy, industry practice, and case-based insight, it guides readers from cost analytics to digital data governance, empowering Quantity Surveyors as strategic decision makers.

Keywords: Quantity Surveyors, conventional cost, construction landscape, data.

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NORHAZREN IZATIE MOHD
AMALINA AZMI

DIGITAL MALAYSIAN QUANTITY SURVEYING PRACTICES

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Digital Turn in Malaysian Quantity Surveying Practices.indd 5 2/20/2026 8:16:24 AM

TABLE OF CONTENTS

LIST OF AUTHORS		v
LIST OF ABBREVIATIONS		xiii
FOREWORD		xv
PREFACE		xvii
CHAPTER 1		
DRIVING DIGITAL TRANSFORMATION IN THE QUANTITY SURVEYING PROFESSION		1
1.1	Big Data Analytics and Digital Transformation	1
1.2	The Case for Change: Quantity Surveying Profession at the Crossroads	1
1.2.1	Global Trends in Quantity Surveying Roles	8
1.2.2	Quantity Surveying in Malaysia: The Shift Proactive Advisory	8
1.3	The Crossroads Ahead	9
CHAPTER 2		
THE BIG DATA ANALYTICS ANATOMY- CONCEPTS AND RELEVANCE TO QUANTITY SURVEYORS		13

Digital Turn in Malaysian Quantity Surveying Practices.indd 7 2/20/2026 8:16:24 AM

2.1 Characterizing Construction Big Data 13
2.1.1 The 3Vs Foundational Nature of Data 13
2.1.2 The 5Vs Strategic Use of Data 14
2.1.3 The 7Vs Data Complexity in Practice 15
2.2 Characteristics of Data in The Construction Sector 17
2.2.1 Structured Data 17
2.2.2 Semi-Structured Data 18
2.2.3 Unstructured Data 18
2.3 Misconception of Big Data Analytics, Data Analytics and Artificial Intelligence 18
2.3.1 Big Data Analytics as Raw Asset 19
2.3.2 Data Analytics as Transformation Engine 20
2.3.3 Artificial Intelligence as Optimization Layer 22
2.4 Sources of Big Data Analytics in The Construction Sector 25
2.5 Big Data Analytics Application Across Industries 28
2.5.1 Retail and E-Commerce Industry 29
2.5.2 Healthcare Industry 29
2.5.3 Legal Services Industry 30
2.6 Big Data to the QS Profession 31
2.5.1 Retail and E-Commerce Industry 32
2.5.2 Healthcare Industry 33
2.7 Summary 34

CHAPTER 3

BIG DATA ANALYTICS POTENTIAL- THE CASE OF THE MALAYSIAN QUANTITY SURVEYING PROFESSION 35

Digital Turn in Malaysian Quantity Surveying Practices.indd 8 2/20/2026 8:16:24 AM

3.1 Introduction 35
3.2 The Data Ecosystem 36
3.2.1 Optimized Data Access 36
3.2.2 National Cost Data Establishment 46
3.3 Data Driven Decision Making 46
3.3.1 Cost Control Decision Making 47
3.3.2 Project Management Decision Making 50
3.3.3 Development Management Decision Making 50
3.4 Professional Service Diversification 53
3.4.1 Data Monetization 53
3.4.2 Geographical Service Diversification 54
3.4.3 Strategic Policy Establishment 55
3.5 Summary 56

CHAPTER 4

ATTRIBUTES OF BIG DATA ANALYTICS SUCCESS IN THE MALAYSIAN QUANTITY SURVEYING PROFESSION 59
4.1 Introduction 59
4.2 Data 60
4.2.1 Data Sourcing 61
4.2.2 Data Quality 61
4.2.3 Data Privacy 62
4.3 People 63
4.3.1 Technical Skills 63
4.3.2 Technological Skills 64
4.3.3 Statistical Skills 65
4.3.4 Big Data Analytics Skills 65

Digital Turn in Malaysian Quantity Surveying Practices.indd 9 2/20/2026 8:16:24 AM

4.4 Technology 65
4.4.1 Data Platform 67
4.4.2 Artificial Intelligence 67
4.4.3 Building Infromation Modelling 68
4.5 Financial Investment 68
4.6 Power 69
4.6.1 Power Influence 69
4.6.2 Power Involvement 70
4.6.3 Power Boundary 71
4.7 Collaboration 71
4.7.1 Skills Collaboration 72
4.7.2 Data Analytics Model Collaboration 74
4.8 Summary 75

CHAPTER 5
THEORETICAL FRAMING OF THE BIG DATA ANALYTICS PHENOMENON IN THE MALAYSIAN QUANTITY SURVEYING PROFESSION 77
5.1 Paradigm Model as Underpinning Theory for Big Data Analytics Phenomenon 77
5.2 Technology-Organization-Environment Framework Theoretical Extension 79
5.3 5G Innovation Model as Theoretical Granulation Basis 80
5.4 Summary 81

Digital Turn in Malaysian Quantity Surveying Practices.indd 10 2/20/2026 8:16:25 AM

CHAPTER 6

STRATEGIC BIG DATA ANALYTICS FRAMEWORK FOR QUANTITY SURVEYING IN MALAYSIA 83

6.1 Introduction 83

6.2 The Big Data Analytics Framework for QS Profession 84

6.2.1 Creating Big Data Analytics Phase 85

6.2.2 Big Data Analytics Buy-In Phase 88

6.2.3 Revolutionizing through Big Data Analytics Phase 91

6.2.4 Collaboration 95

6.3 Summary 96

CHAPTER 7

REFLECTIONS AND FUTURE DIRECTIONS IN BIG DATA ANALYTICS 97

7.1 Summary of Key Insights 97

7.2 Implication for QS Professional Practice 98

7.3 Agenda for Governing Bodies 100

7.4 Lessons Learned 102

BIBLIOGRAPHY 105

BIOGRAPHY 119

INDEX 125

Digital Turn in Malaysian Quantity Surveying Practices.indd 11 2/20/2026 8:16:25 AM

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
BIM	Building Information Modelling
CIDB	Construction Industry Development Board
DBKL	Dewan Bandaraya Kuala Lumpur
GFA	Gross Floor Area
IEM	Institution of Engineers Malaysia
IoT	Internet of Things
JKR	Jabatan Kerja Raya (Public Work Department)
KeTTHA	Kementerian Tenaga Teknologi Hijau Dan Air
KRI	Khazanah Research Institute
LLM	Lembaga Lebuhraya Malaysia
MBAM	Master Builders Association Malaysia
MITI	Ministry of International Trade and Industry
MS1184:2014	Malaysian Standard 1184:2014
MyCeSMM	Malaysian Civil Engineering Standard Method of Measurement
N3C	National Construction Cost
NAPIC	National Property Information Centre
RIBA	Royal Institute of British Architects Plan of Work

Digital Turn in Malaysian Quantity Surveying Practices.indd 13 2/20/2026 8:16:25 AM

REHDA	Real Estate and Housing Developer Association
RISM	Royal Institution of Surveyors Malaysia
SSM	Standard Method of Measurement
UBBL	Uniform Building by Law

Digital Turn in Malaysian Quantity Surveying Practices.indd 14 2/20/2026 8:16:25 AM

FOREWORD

The Malaysian construction industry is at a pivotal juncture. Rapid digital transformation is reshaping how projects are planned, managed, and delivered. Quantity Surveying (QS) profession is not exempt from this digital shift. Recognized as the custodian of cost and value, QS role must now evolve into one that leverages data for real-time insights, strategic foresight, and broader industry leadership.

Digital Turn in Malaysian Quantity Surveying Practices: Big Data Analytics Pathways for Forward Thinking Professionals, arrives at precisely the right moment. While national initiatives such as the National Construction Policy 2030 call for digital innovation, QS practices still find themselves constrained by legacy tools, fragmented information, and reactive decision approaches. The profession is aware of the need for transformation, but often lacks a clear pathway.

This book draws on case-based insights, practitioner experiences, and policy alignment, to provide a grounded yet forward looking perspective on how big data analytics can empower QS professionals. It demonstrates how data can strengthen data as an asset for QS professionals, data driven decision making uptake and innovative agenda to expand QS roles and services beyond conventional boundaries.

More than an academic contribution, this book is a call to action: for Quantity Surveyors to embrace the digital turn and claim

Digital Turn in Malaysian Quantity Surveying Practices.indd 15 2/20/2026 8:16:25 AM

their rightful place as strategic leaders in the built environment. It provides clarity, practicality, and vision. It presents a resource for QS professionals, policymakers, academics, and students who share the ambition of creating a more data driven, resilient, and innovative construction industry in Malaysia.

Digital Turn in Malaysian Quantity Surveying Practices.indd 16 2/20/2026 8:16:25 AM

PREFACE

This book is deeply personal to me, not just for its academic value, but because it captures the questions that shaped my thinking, guided my teaching, and inspired numerous collaborative explorations with peers, students, and industry partners. As someone trained in Quantity Surveying but drawn to the evolving world of data, I often found myself standing at the intersection between believing traditional and practicing transformative.

Over the years, my research has been anchored in one key belief: That Quantity Surveyors are capable of much more than measurement and cost documentation. With the right digital mindset and data capabilities, we can be the forefront of strategic decision making in the built environment. Yet, I have also seen how the profession struggles to keep pace with change. Not due to lack of ability, but due to a lack of guidance, tools, and confidence in navigating the digital turn.

This book, Digital Turn in Malaysian Quantity Surveying Practices: Big Data Analytics Pathways for Forward Thinking Professionals, is my attempt to fill that gap. It is written for those who know the profession must evolve, but are unsure how. It draws from my own work in Big Data Analytics, my involvement in industry focused research, and my commitment to shaping digitally literate, forward thinking professionals especially in Malaysia,

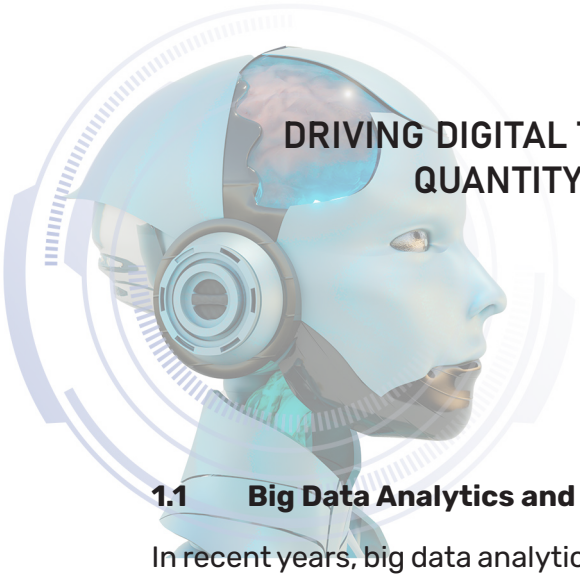
Digital Turn in Malaysian Quantity Surveying Practices.indd 17 2/20/2026 8:16:26 AM

where our construction landscape is vibrant, complex, and full of potential.

Here, you will find a blend of theory, policy, practice, and case based insight. The book walks through not only what Big Data means for Quantity Surveying, but how we can begin to reimagine our roles within it. From cost prediction to data governance, and from national policy alignment to industry implications, I've tried to keep the discussion contextual and hopefully, empowering.

This journey has been made possible by the many individuals and institutions who believe in pushing boundaries. I am grateful to colleagues, reviewers, mentors, and students who kept this conversation alive with questions, critiques, and encouragement. I hope this book not only informs, but also inspires. May it encourage Quantity Surveyors; Especially those in transition to reclaim their place in a data driven future, not as observers, but as key decision makers.

Digital Turn in Malaysian Quantity Surveying Practices.indd 18 2/20/2026 8:16:26 AM



CHAPTER 1

DRIVING DIGITAL TRANSFORMATION IN THE QUANTITY SURVEYING PROFESSION

1.1 Big Data Analytics and Digital Transformation

In recent years, big data analytics has evolved from a conceptual buzzword into a foundational enabler of digital transformation across industries. Characterized by the volume, variety, and velocity of data generated, Big Data Analytics (BDA) now plays a pivotal role in reshaping how organizations operate, innovate, and create value. Within the construction industry, this transformation is gaining urgency, driven by the advancement of digital technologies such as Building Information Modeling (BIM), Internet of Things (IoT), drones, sensors, and cloud computing (Elia et al., 2022; Ismail, Bandi & Maaz, 2018). These technologies are generating a massive influx of construction related data that, when properly harnessed, can support advanced analytics, improve project performance, and drive strategic decision making.

Big data analytics is one of the top 10 disruptive technologies in construction, alongside automation, 3D printing, and digital twins (see Figure 1.1). It enables smarter forecasting, faster risk detection, and greater transparency, allowing construction stakeholders to move from reactive management to proactive, data informed decisions (Li *et al*., 2023.; Ngo et al., 2020; Bilal *et al*., 2016).

In Malaysia, BDA gained formal recognition as a national economic priority. The National Construction Policy (NCP) 2030

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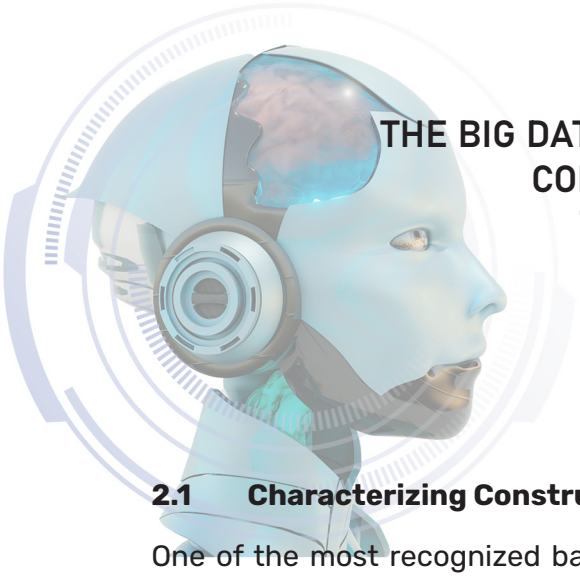

CHAPTER 2

THE BIG DATA ANALYTICS ANATOMY – CONCEPTS AND RELEVANCE TO QUANTITY SURVEYORS

2.1 Characterizing Construction Big Data

One of the most recognized bases for understanding big data analytics is the use of "V" characteristics of construction data. These Vs offer a simplified yet structured way to define the complexity of data in the modern digital era. The use of V foundations emerged as a response to the inadequacy of traditional data management tools in handling new data forms and functions. As data continues to evolve in its speed, size, source, and significance, the number of Vs used in literature has expanded from 3Vs to 5Vs and eventually 7Vs to further encapsulate emerging dimensions of big data analytics characteristics.

2.1.1 The 3Vs Foundational Nature of Data

The original 3V big data definition introduced by Doug Laney in 2001 and later popularized by analysts and researchers (Laney, 2001). 3V data characteristics includes:

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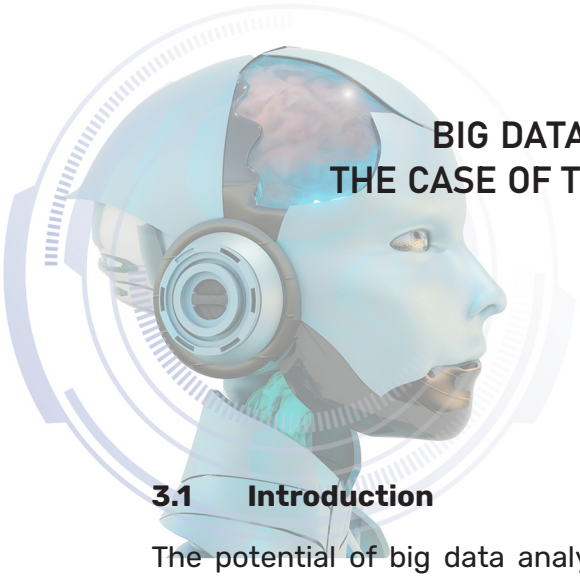

CHAPTER 3

BIG DATA ANALYTICS POTENTIAL – THE CASE OF THE MALAYSIAN QUANTITY SURVEYING PROFESSION

3.1 Introduction

The potential of big data analytics in the Quantity Surveying profession extends across three domains: The data ecosystem, Data driven decision making, and Professional service diversification. Strengthening the data ecosystem through centralized platforms, automated environments, and visualization tools addresses longstanding issues of fragmented, inconsistent, and biased cost information while laying the foundation for a national cost data standard. Building on this, data driven decision making transforms QS practice from traditional cost reporting into proactive roles in cost control, project management, and strategic planning, supported by advanced analytics to generate timely and reliable insights. Further to this, professional service diversification highlights the expanding role of QS into new areas such as data monetization, geographical service expansion, and strategic policy advisory. Exploration on BDA potentials demonstrate how big data is reshaping the QS profession's role, capacity, and value proposition within the digital construction ecosystem.

The potentials explored were derived through a multi-tier research design combining literature review, qualitative interviews, and focus groups with QS practitioners and industry experts. Data were analyzed using Grounded Theory methodology, supported by thematic coding in NVivo14, and triangulated with national

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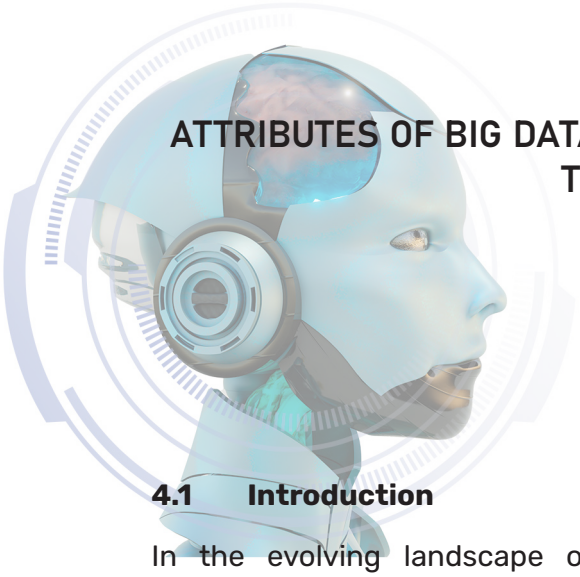


CHAPTER 4

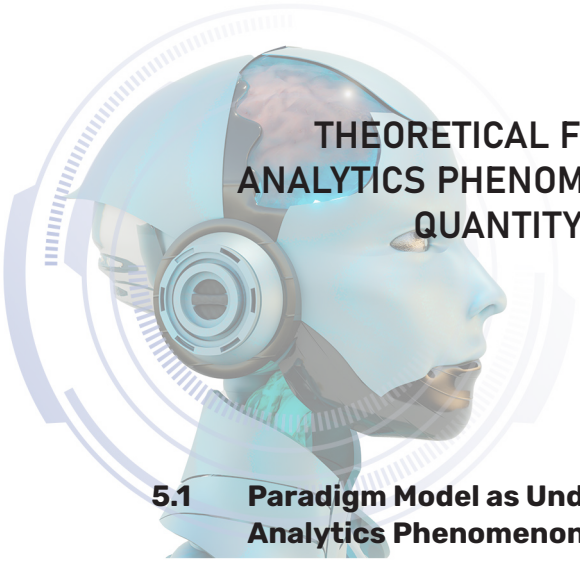
ATTRIBUTES OF BIG DATA ANALYTICS SUCCESS IN THE MALAYSIAN QUANTITY SURVEYING PROFESSION

4.1 Introduction

In the evolving landscape of the Malaysian construction industry, the integration of big data analytics has emerged as a pivotal force reshaping how QS navigate complexities and drive strategic advancements. Effective and strategic adoption of big data analytics (BDA) depends on a set of key attributes of data, people, technology, financial investment, power, and collaboration. The attributes represent what it takes for Quantity Surveyors to embed BDA successfully within professional practice. Robust data sourcing, quality, and privacy ensure reliability; people's technical, technological, statistical, and analytics skills translate raw data into meaningful outcomes; and technology through platforms, AI, and BIM provides the digital infrastructure for scalable analytics. Financial investment secures resources and sustainability, while power dynamics shape influence, authority, and boundaries in data governance. At the core, collaboration emerges as the defining attribute that accelerates BDA adoption by integrating expertise, aligning models, and building trust across the construction ecosystem. Collectively, these attributes form the foundation for QS professionals to harness BDA as a strategic tool in shaping data driven construction practices.

The attributes explored in this chapter were identified through review of existing literature, semi-structured interviews

Digital Turn in Malaysian Quantity Surveying Practices.indd 59 2/20/2026 8:16:32 AM



CHAPTER 5

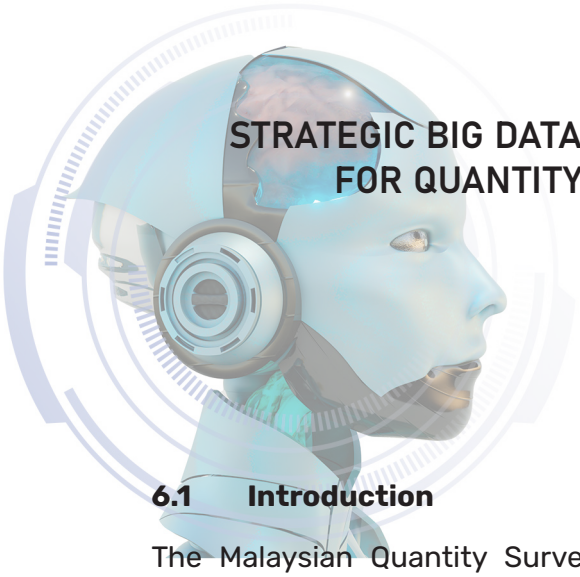
THEORETICAL FRAMING OF THE BIG DATA ANALYTICS PHENOMENON IN THE MALAYSIAN QUANTITY SURVEYING PROFESSION

5.1 Paradigm Model as Underpinning Theory for Big Data Analytics Phenomenon

The establishment of the big data analytics phenomenon function to deliver understanding on QS organization big data progression by outlining what QS organizations can expect when they fully embrace big data. Establishing the QS profession big data phenomenon is essential, and it is achieved through the systematic application of constructivist grounded theory and the paradigm model.

Paradigm model consists of context, conditions, intervening conditions and consequences of a phenomenon (Strauss & Corbin, 1998). The relationship between the context, conditions, intervening conditions and consequences creates an outline for a researcher to understand a phenomenon. Context is the core of the big data phenomena for the QS profession. Commonly, context represents main action or processes which is supported by certain conditions or intervening conditions, leading to certain consequences. In paradigm model, conditions are the pre-requisite dimensions to support any forms of actions or process to generate consequences. On the other hand, intervening conditions are the facilitative or intervening dimensions which impacts the phenomenon context and the phenomenon consequences (Strauss & Corbin, 1998). Figure 5.1 outlines of the QS profession big data phenomenon using the paradigm model.

Digital Turn in Malaysian Quantity Surveying Practices.indd 77 2/20/2026 8:16:33 AM



CHAPTER 6

STRATEGIC BIG DATA ANALYTICS FRAMEWORK FOR QUANTITY SURVEYING IN MALAYSIA

6.1 Introduction

The Malaysian Quantity Surveying profession is undergoing rapid transformation driven by evolving construction practices, digital technologies, and rising client expectations. Theoretical grounding establishes the big data analytics phenomena within the Malaysian construction industry and QS profession, providing the foundation for advancing a structured implementation pathway. Moving forward, this chapter introduces the Strategic Big Data Analytics Framework for Quantity Surveying in Malaysia.

The framework maps BDA progression maturity across three phases of: Creating Big Data Analytics, Big Data Analytics Buy-In, and Revolutionizing Through Big Data Analytics. Each phase is characterized by six interrelated attributes namely data, people, technology, financial investment, power, and collaboration which collectively shape the profession's ability to adopt and advance big data analytics.

Recognizing that QS organizations operate at varying levels of digital readiness, the framework offers a scalable roadmap that aligns big data capabilities with organizational priorities and Malaysia's broader digital transformation agendas. Grounded in the realities of QS practice, it provides a flexible yet practical guide for public and private sector organizations to assess maturity, plan BDA progression, and accelerate digital transformation journey. In doing so, the framework translates

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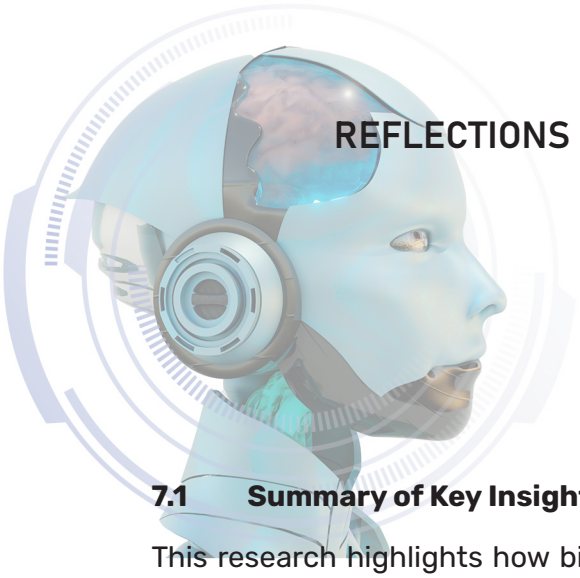

CHAPTER 7

REFLECTIONS AND FUTURE DIRECTIONS IN BIG DATA ANALYTICS

7.1 Summary of Key Insights

This research highlights how big data analytics can serve as a powerful catalyst for modernizing the Quantity Surveying (QS) profession, enabling a shift from traditional data handling and fragmented decision making to a more integrated, data-driven approach. Central to this transformation is the identification of eight big data analytics potentials, ranging from optimized data access and national cost data establishment to the automation of decision making and the diversification of professional services. These potentials underline the broad applicability of big data analytics in enhancing cost control management, project and development management and planning of strategic data driven decision making within the construction sector.

In tandem with these potentials, the study pinpoints six attributes including; data, people, technology, financial investment, power, and collaboration which collectively underpin successful big data analytics development, adoption and advancement. By delineating each attribute's role, the knowledge paints a comprehensive picture of how technical, organizational, and technological factors interlock to drive or hinder data analytics progress for the QS profession. For instance, data availability and quality provide the raw material for analytics, while technological infrastructure; particularly cloud based storage and AI-driven processes empowers QS professionals to convert vast datasets

Digital Turn in Malaysian Quantity Surveying Practices.indd 97 2/20/2026 8:16:36 AM

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Digital Turn in Malaysian Quantity Surveying Practices.indd 108 2/20/2026 8:16:36 AM

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Big Data Analytics Pathway for Forward Thinking Professionals

This book is written for Quantity Surveyors who recognise the need to evolve from conventional cost and measurement roles towards data driven strategic roles, yet remain unsure how to begin within the Malaysian construction landscape. Digital Turn in Malaysian Quantity Surveying Practices presents an in-depth exploration of how Big Data Analytics is redefining professional roles, competencies, and value. Blending local policy, industry practice, and case-based insight, it guides readers from cost analytics to digital data governance, empowering Quantity Surveyors as strategic decision makers.

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