

# Contents

<b>1</b>	<b>General Introduction</b> .....	<b>1</b>
	Introduction .....	1
	Objectives of the Book .....	4
	Contribution and Value .....	4
	Structure of the Book .....	5
	Summary .....	6
	References .....	6
<b>2</b>	<b>Digitalisation, Ethics, and Sustainability</b> .....	<b>9</b>
	Introduction .....	9
	The Road to the Fourth Industrial Revolution and Digitalisation .....	10
	Digitisation, Digitalisation, and Digital Technologies .....	12
	Digitisation .....	12
	Digitalisation .....	13
	Digital Technologies .....	13
	Ethics and Ethics of Technology: An Overview .....	14
	Understanding Sustainability .....	17
	Sustainability in Construction: The Triple Bottom Line .....	19
	Summary .....	22
	References .....	23
<b>3</b>	<b>Digitalisation in the Construction Industry</b> .....	<b>29</b>
	Introduction .....	29
	The Construction Industry .....	30
	Issues Facing the Construction Industry .....	32
	Digital Technologies in Construction .....	35
	Internet of Things .....	35
	Unmanned Aerial Vehicles .....	36
	Building Information Modelling .....	37
	Big Data Analytics .....	38
	Augmented and Virtual Realities .....	39
	Robotics and Automation .....	39

Cloud Computing . . . . .	39
Three-dimensional (3D) Printing . . . . .	40
Digital Twin . . . . .	42
Blockchain Technology . . . . .	42
Digitalisation in the Construction Industry . . . . .	43
Developed Countries Perspective . . . . .	43
Developing Countries Perspective . . . . .	44
Challenges and Measures for Improving Digitalisation in Construction . . . . .	46
Summary . . . . .	50
References . . . . .	51
<b>4 Sustainable Construction Practices in the Digital Era . . . . .</b>	<b>63</b>
Introduction . . . . .	63
Sustainable Construction . . . . .	63
Overview of Sustainable Practices in the Construction Industry . . . . .	65
Challenges Facing Sustainable Construction . . . . .	66
Sustainable Construction Practices . . . . .	67
Digitalisation and Sustainable Construction . . . . .	72
Understanding Digitalisation and Sustainable Construction from the Perspective of Past Studies . . . . .	74
Digital Technologies of Sustainable Construction . . . . .	78
Summary . . . . .	81
References . . . . .	81
<b>5 Ethical Practices in Digitalisation . . . . .</b>	<b>91</b>
Introduction . . . . .	91
The Concepts of Ethics . . . . .	92
Meta-ethics . . . . .	92
Normative Ethics . . . . .	93
Applied Ethics . . . . .	94
Ethical Practices in Construction . . . . .	94
Ethical Practices and Digitalisation . . . . .	94
Understanding Ethical Practices and Digitalisation from the Perspective of Past Studies . . . . .	95
Factors Influencing Ethics in Digitalisation . . . . .	99
Impact of Ethics on Digitalisation . . . . .	105
Improving Ethical Practices in Digitalisation . . . . .	106
Summary . . . . .	106
References . . . . .	107

<b>6</b>	<b>Ethical Practices Theories, Frameworks, and Models for Sustainable Digitalisation</b> . . . . .	111
	Introduction . . . . .	111
	Review of Related Digitalisation Ethical Practice Frameworks and Model . . . . .	112
	Deloitte's Technology Trust Ethics (TTE) Framework . . . . .	112
	Ethical AI Development Framework . . . . .	113
	Ethical Framework for AI and Digital Technologies . . . . .	114
	Framework for Ethical AI Development in Social Services . . . . .	115
	Charity Digital Ethics Framework . . . . .	116
	Telkom's Digital Ethics Framework . . . . .	116
	Digital Technology, Artificial Intelligence, and Health Equity Ethical Framework . . . . .	118
	Conceptual Framework for Solving Ethical Issues in Generative AI . . . . .	118
	Ethical Technology Assessment Checklist . . . . .	119
	Digital Technologies Ethical Concerns Assessment Framework . . . . .	120
	Framework for Ethical Learning Technology (FELT) . . . . .	121
	Summary of Reviewed Ethics of Technology Frameworks . . . . .	122
	Summary . . . . .	124
	References . . . . .	125
<b>7</b>	<b>Conceptualising Effective Ethical Practice for Sustainable Construction Digitalisation</b> . . . . .	127
	Introduction . . . . .	127
	Constituents of the Conceptualised Ethical Practice Framework for Sustainable Construction Digitalisation . . . . .	128
	Construction Digitalisation Dimensions . . . . .	128
	Ethical Considerations . . . . .	132
	Expected Success Outcomes of Ethical Use of Digital Technologies in Construction . . . . .	138
	Theorising the Conceptualised Ethical Practice Framework for Sustainable Construction Digitalisation . . . . .	139
	Summary . . . . .	141
	References . . . . .	141
<b>8</b>	<b>Conclusion</b> . . . . .	145
	Introduction . . . . .	145
	Conclusion . . . . .	145
	Contribution to Knowledge . . . . .	148
	Practical Contribution . . . . .	148
	Theoretical Contribution . . . . .	150
	Recommendations . . . . .	150