

Management in the Built Environment

Series editor

Low Sui Pheng

Department of Building, National University of Singapore, Singapore, Singapore
Singapore

The aim of this book series is to provide a platform to build and consolidate a rigorous and significant repository of academic, practice and research publications that contribute to further knowledge relating to management in the built environment. Its objectives are to:

- (1) Disseminate new and contemporary knowledge relating to research and practice in the built environment
- (2) Promote synergy across different research and practice domains in the built environment and
- (3) Advance cutting-edge research and best practice in the built environment.

The scope of this book series is not limited to “management” issues per se because this then begs the question of what exactly are we managing in the built environment. While the primary focus is on management issues in the building and construction industry, its scope has been extended upstream to the design management phase and downstream to the post-occupancy facilities management phase. Management in the built environment also involves other closely allied disciplines in the areas of economics, environment, legal and technology. Hence, the starting point of this book series lies with project management, extends into construction and ends with facilities management. In between this spectrum, there are also other management-related issues that are allied with or relevant to the built environment. These can include, for example cost management, disaster management, contract management and management of technology.

This book series serves to engage and encourage the generation of new knowledge in these areas and to offer a publishing platform within which different strands of management in the built environment can be positioned to promote synergistic collaboration at their interfaces. This book series also provides a platform for other authors to benchmark their thoughts to identify innovative ideas that they can further build on to further advance cutting-edge research and best practice in the built environment.

Editorial Advisory Board:

Abdul Rashid Bin Abdul Aziz (University Science Malaysia, Malaysia)

An Min (Salford University, UK)

Azlan Shah Ali (University of Malaya, Malaysia)

Faisal M. Arain (Niagara College, Canada)

Fang Dongping (Tsinghua University, China)

Gao Shang (University of Melbourne, Australia)

George Ofori (London South Bank University, UK)

Hamzah A. Rahman (University of Malaya, Malaysia)

Javier Cuervo (University of Macau, China)

Liu Junying (Tianjin University, China)

Oluwayomi Babatunde (University of the Witwatersrand, South Africa)

Oswald Chong (Arizona State University, US)

If you are interested in submitting a proposal for this series, please kindly contact the Series Editor or the Publishing Editor at Springer:

Low Sui Pheng (bdglowsp@nus.edu.sg) or

Ramesh Premnath (Ramesh.premnath@springer.com)

More information about this series at <http://www.springer.com/series/15765>

Leni Sagita Riantini Supriadi • Low Sui Pheng

Business Continuity Management in Construction

 Springer

Leni Sagita Riantini Supriadi
Department of Building
National University of Singapore
Singapore, Singapore

Low Sui Pheng
Department of Building
National University of Singapore
Singapore, Singapore

ISSN 2522-0047 ISSN 2522-0055 (electronic)
Management in the Built Environment
ISBN 978-981-10-5486-0 ISBN 978-981-10-5487-7 (eBook)
DOI 10.1007/978-981-10-5487-7

Library of Congress Control Number: 2017945380

© Springer Nature Singapore Pte Ltd. 2018

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Contents

1	Introduction	1
1.1	Background	1
1.1.1	BCM Overview	2
1.1.2	Tools for Decision Making Process During Crises	3
1.2	Motivation for Research	4
1.3	Research Problems	5
1.3.1	Knowledge Gap	7
1.3.2	Research Questions	9
1.4	Objectives	9
1.5	Scope	10
1.6	Research Process	10
1.7	Research Significance	11
1.8	Structure of the Book	11
2	The Management of Crisis	15
2.1	Introduction	15
2.2	Management	15
2.3	Organizational Management	18
2.3.1	Organization Overview	18
2.3.2	Traditional Organizational Theories	19
2.3.3	Systems Theory	22
2.3.4	Contingency Theory	24
2.3.5	Complexity Theory in Organizations	25
2.3.6	Change in Organization	27
2.4	Crisis Management	29
2.4.1	Definition of Crisis	30
2.4.2	History of Development	31
2.4.3	Main Concept of Crisis Management	32
2.5	Summary	38

3	Business Continuity Management (BCM)	41
3.1	Introduction	41
3.2	Background	41
	3.2.1 BCM Definition and Development	41
	3.2.2 BCM and Other Related Concepts	44
3.3	BCM as a Management System	47
3.4	Main Principles of BCM	50
3.5	Business Continuity Planning (BCP)	52
3.6	BCM Implementation	55
	3.6.1 Legislation and Standards Relating to BCM	55
	3.6.2 BCM Level of Preparedness	57
3.7	Reviews of BC Plan	62
	3.7.1 BC Plan from Financial Services Sector	62
	3.7.2 BC Plan from Education Institutions: A Case Study	64
	3.7.3 BC Plan for Influenza Pandemic: A Review	66
3.8	The Need for BCM	68
	3.8.1 Benefits of BCM	69
	3.8.2 Challenges in BCM	70
3.9	Summary	72
4	Organizational Culture and Institutional Forces	75
4.1	Introduction	75
4.2	Culture in Organization	75
	4.2.1 Culture Overview	75
	4.2.2 Definitions of Culture	76
	4.2.3 Organizational Culture Dimensions	77
	4.2.4 Managing Organizational Culture	93
	4.2.5 Benefits of Identifying Organizational Culture	94
4.3	Institutional Theory	94
	4.3.1 Defining Institutions	95
	4.3.2 Three Pillars of Institutions	96
4.4	Summary	100
5	Mainstream Theories: Implementation by Contractors	101
5.1	Introduction	101
5.2	Mainstream Theories for Implementation by Contractors	101
5.3	Organizational Management in Contractors	102
5.4	Traditional Organizational Theories	104
	5.4.1 Systems Theory	107
	5.4.2 Contingency Theory	108
	5.4.3 Complexity Theory	108
	5.4.4 Change in Organization	109
5.5	Crisis Management Implementation by Contractors	110
5.6	BCM in Construction Firms	111
5.7	Culture in Organization	112

5.8	Institutional Theory	115
5.9	Summary	116
6	The Indonesian Construction Industry	117
6.1	Introduction	117
6.2	Profile of Indonesia	117
6.2.1	Geography	117
6.2.2	Demography and Resources	118
6.2.3	Form of State	119
6.2.4	Economy	119
6.3	The Indonesian Construction Industry	127
6.3.1	Construction Activities and National Contribution	127
6.3.2	Role of Construction Administration by Government	130
6.3.3	Role of Construction Industry Associations	131
6.3.4	Regulation and Management Systems of Construction Projects	134
6.3.5	Technology	137
6.3.6	Research and Development	137
6.3.7	Lessons Learned and Future Developments	138
6.4	Indonesian Construction Firms	139
6.4.1	Types of Firms	139
6.4.2	Firms' Characteristics	140
6.4.3	Indonesian Contractors	142
6.4.4	Business Activities of Contractors	143
6.5	Review of Crises Faced by Indonesian Contractors	145
6.5.1	Crisis Overview	145
6.5.2	Possible Crises Faced by Contractors	146
6.5.3	Crises Experienced by Indonesian Contractors	148
6.5.4	Current Findings	152
6.6	Summary	154
7	Knowledge Based Decision Support System (KBDSS)	155
7.1	Introduction	155
7.2	Decision Making Process	155
7.3	Decision Making Tools	156
7.3.1	Decision Making Tools Using Fuzzy Approach	157
7.4	Decision Support System (DSS) Overview	158
7.4.1	Definition and Development of DSS	159
7.4.2	DSS Implementation	160
7.5	KBDSS Overview	163
7.5.1	KBDSS Concept	164
7.5.2	Review of KBDSS Implementation	166
7.6	KBDSS Development	167
7.6.1	Formulation	167
7.6.2	System Development	168

7.6.3	Validation	171
7.7	Summary	173
8	Conceptual Framework	175
8.1	Introduction	175
8.2	Indonesian Contractor's Knowledge About BCM	175
8.3	Relationships Between BCM, Organizational Culture and Institutional Forces	176
8.3.1	Defining Organizational Culture Dimensions	176
8.3.2	Relationships Between OC Dimensions and BCM Principles	179
8.3.3	Defining Institutional Forces Attributes	186
8.3.4	Relationships Between IF Attributes and BCM Principles	187
8.3.5	The Importance of Organizational Culture and Institutional Forces in Adopting BCM	188
8.4	Developing BCM for Indonesian Contractors	193
8.5	Development of KBDSS for BCM	199
8.5.1	Benefits of KBDSS for Management Process and Construction	199
8.5.2	The Application of KBDSS for BCM	201
8.6	Conceptual Framework	207
8.7	Summary	207
9	Research Design and Methodology	209
9.1	Introduction	209
9.2	Research Framework	209
9.2.1	Research Questions and Hypotheses	210
9.3	Research Design	212
9.3.1	Research Design for the Study	212
9.3.2	Sampling	213
9.4	Methods of Data Collection	215
9.4.1	Methods of Collecting Data	216
9.5	Methods of Data Analysis	217
9.6	Summary	219
10	Data Analysis: Surveys	221
10.1	Introduction	221
10.2	Pilot Study	221
10.3	Questionnaire Survey	222
10.3.1	Crises Response	225
10.3.2	BCM General Knowledge	227
10.3.3	BCM Principles	229
10.3.4	Institutional Forces (IF) that Support BCM Principles Implementation	229

- 10.3.5 Organizational Culture Attributes (OC) Implemented for BCM Principles 234
- 10.3.6 Perceived Importance and Implemented for OC Attributes 240
- 10.3.7 Survey Validation 240
- 10.4 Summary 252
- 11 Data Analysis: Case Studies 253**
 - 11.1 Introduction 253
 - 11.2 Case Studies 253
 - 11.2.1 Case Study 1: Firm A 253
 - 11.2.2 Case Study 2: Firm B 265
 - 11.2.3 BCM Preparedness 275
 - 11.3 Interviews with Experts on BCM Implementation 283
 - 11.3.1 The Benefits of Implementing BCM for Contractors 283
 - 11.3.2 The Drawbacks of Implementing BCM for Contractors 284
 - 11.3.3 The Need for BCM in Contractors’ Firms 285
 - 11.3.4 BCM Certification 286
 - 11.3.5 Important Elements (BUs, CBFs, MBCOs, and Significant Crises with High Impacts) in Contracting Firms that Relates Mostly with BCM 287
 - 11.3.6 Additional Recommendations for BCM Implementation by Indonesian Contractors 288
 - 11.4 BCM Implementation Guidelines Development 291
 - 11.4.1 BCM Implementation Guidelines Framework 291
 - 11.4.2 Levels of Preparedness Development 291
 - 11.4.3 Assessment Phase 292
 - 11.4.4 Action Plans per BCM Level of Preparedness 298
 - 11.5 Summary 299
- 12 Data Analysis: BCM-KBDSS Development 301**
 - 12.1 Introduction 301
 - 12.2 BCM-KBDSS Development 301
 - 12.2.1 Knowledge Base (KB) Development 301
 - 12.2.2 Rules and Logics for BCM-KBDSS 302
 - 12.2.3 Design User Interface and BCM-KBDSS Compilation 309
 - 12.2.4 BCM-KBDSS Prototype 311
 - 12.3 KBDSS Validation 314
 - 12.3.1 BCM-KBDSS Validation Results 322
 - 12.4 Summary 328

13 Findings and Discussion	329
13.1 Introduction	329
13.2 Findings and Discussion for RQ 1	329
13.2.1 Findings from Surveys	329
13.2.2 Findings from Case Studies	349
13.2.3 BCM Implementation Guidelines Development	361
13.3 Findings and Discussion for RQ 2	361
13.3.1 Findings from KBDSS Development	361
13.3.2 Findings from KBDSS Validation	362
13.4 Summary	362
14 Conclusions and Recommendations	365
14.1 Introduction	365
14.2 Summary	365
14.2.1 Research Problems	366
14.2.2 Knowledge Gap	367
14.2.3 Research Objectives and Research Designs Revisited	367
14.3 Conclusions of the Research Questions	369
14.3.1 Research Question 1	369
14.3.2 Research Question 2	375
14.4 Conclusions of the Research Hypotheses and Propositions	376
14.4.1 Testing Hypotheses H1, H2 and H3	376
14.4.2 Propositions for RO4 and RQ2	378
14.5 Academic Contributions	379
14.6 Practical Contributions	380
14.7 Limitations of the Research	380
14.8 Recommendations for Future Studies	381
Appendix A	383
Appendix B	387
Appendix C	417
Appendix D	435
Appendix E	445
Appendix F	465
Appendix G	505
References	511

List of Abbreviations

AHP	Analytical hierarchical process
BC	Business continuity
BCI	Business Continuity Institute
BCM	Business continuity management
BC	Plan business continuity plan
BCP1	Developing the detailed BC plan
BI	Business intelligence
BIA	Business impact analysis
BIA1	Conducting business impact analysis
BIA2	The involvement of experts, employees from related BUs and key staff members in BIA
BU	Business unit
CBF	Critical business function
CM Plan	Crisis management plan
CMT	Crisis management team
COA	Center of area
CSR	Corporate social responsibility
DML	Decision making logic
DRP	Disaster resources partnership
DSS	Decision support system
DW	Data warehousing
EFA	Exploratory factor analysis
EIA	Environmental impact assessment
EIS	Executive information system
EIU	Economist intelligence unit
EMS	Environmental management system
ENS	Emergency notification system
EOC	Emergency operations centre
EPC	Engineering, procurement and construction
ERRG	Emergency response resource group
FLS	Fuzzy logic systems

GDP	Gross domestic product
GLM	General linear model
GLOBE	Global leadership and organizational behaviour effectiveness
GSS	Group support systems
ICA	Indonesian Contractors Association
ICT	Information communication technology
IF	Institutional forces
I/O	Input/output
KB	Knowledge base
KBDSS	Knowledge based decision support system
LISP	List processing
MBCO	Minimum business continuity objective
MBMS	Model base management system
MIS	Management information systems
NBCSD	National Board of Construction Service Development
NSS	Negotiation support systems
OC	Organizational culture
OCAI	Organizational culture assessment instrument
PDCA	Plan-do-check-act
PDSS	Personal DSS
PM	Programme management
PM1	Analysing the ongoing efforts and activities to maintain the effectiveness of its BCM, including providing systematic training and awareness programmes to staff members
PM2	Conducting BCM training and awareness programmes for all staff and related external parties
PROLOG	Programming in logic
QSHE	Quality, Safety, Health and Environment
R&D	Research and development
RA	Risk analysis
RA1	Conducting risk analysis and cost benefit analysis
RA2	The involvement of experts and BCM committee in risk review
RA3	Conducting a detailed risk review that examines and assesses the availability of critical equipment, technology, and facilities for BU/CBF
RFI	Requests for information
RFP	Requests for proposals
RPO	Recovery point objective
RTO	Recovery time objective
RO1	Research objective 1
RO2	Research objective 2
RO3	Research objective 3
RO4	Research objective 4
RO5	Research objective 5
RQ1	Research question 1

RQ2	Research question 2
SA	Strategy analysis
S1	Conducting strategy analysis for maintaining the operations of CBFs that cover pre-incident preparedness, response and recovery
S2	Determining staff members to support the recovery strategy and providing training and awareness programmes
SAW	Simple additive weight
SIT	Site implementation team
SME	Small and medium-sized enterprise
SOC	Satellite Operations Center
SOP	Standard operating procedure
TE	Tests and exercises
TE1	Providing periodic tests and exercises to ensure that the BC plan is viable and workable

List of Figures

Fig. 1.1	Research process. Source: Adapted from Tan (2008)	10
Fig. 1.2	Relationships between the chapters	13
Fig. 2.1	The organization as an input-process-output system. Source: Adapted from Naoum (2001)	23
Fig. 2.2	Contingency model of management. Source: Adapted from Carlisle (1976)	25
Fig. 2.3	Three pillars to successful response to crises. Source: Adapted from Geraldi et al. (2009)	36
Fig. 3.1	Old and new BCM approach. Source: Adapted from Herbane et al. (1997)	44
Fig. 6.1	GDP growth of Indonesia. Source: SCA (2012)	120
Fig. 6.2	Annual end-period exchange rate Rupiah:\$1 (USD). Source: EIU (2012)	121
Fig. 6.3	Indonesia's population in selected years. Source: SCA (2012)	121
Fig. 6.4	Indonesia's annual current-account balance. Source: World Bank (2012)	122
Fig. 6.5	Indonesian construction industry: value. Source: SCA (2012)	128
Fig. 6.6	Indonesian construction industry: real growth. Source: SCA (2012)	129
Fig. 6.7	Indonesian construction industry: percentage of GDP. Source: SCA (2012)	129
Fig. 6.8	Total permanent workforce in the Indonesian construction industry. Source: SCA (2012)	130
Fig. 6.9	Indonesian construction industry support infrastructure. Source: Adapted from NBCSD (2004)	132
Fig. 6.10	Value of construction projects. Source: SCA (2012)	142
Fig. 7.1	DSS characteristics. Source: Adapted from Raymond (1990)	161

Fig. 7.2	Main components of KBDSS. Source: Adapted from Arain and Low (2006)	165
Fig. 8.1	Framework of IF–BCM–OC relationships	190
Fig. 8.2	BCM–IF variables	191
Fig. 8.3	BCM–OC variables	192
Fig. 8.4	BCM implementation guidelines framework	199
Fig. 8.5	KBDSS process: BCM level of preparedness assessment	203
Fig. 8.6	KBDSS components	204
Fig. 8.7	BCM–KBDSS framework	205
Fig. 8.8	Conceptual framework	206
Fig. 12.1	A fuzzy logic system. Source: Adapted from Mendel (1995) and Ahmed and Capretz (2006)	303
Fig. 12.2	BCM-KBDSS decision situation scenario flowchart	305
Fig. 12.3	Structured situation diagram (conceptual)	305
Fig. 12.4	Structured situation diagram (coding)	306
Fig. 12.5	BCM-KBDSS dependency diagram	306
Fig. 12.6	Linguistic variables	308
Fig. 12.7	Two-input and one output rule base	309
Fig. 12.8	BCM-KBDSS introduction page	311
Fig. 12.9	User information page	312
Fig. 12.10	BCM introduction page	312
Fig. 12.11	Assessment page—BCM principle 1	313
Fig. 12.12	Assessment page—BCM principle 2	313
Fig. 12.13	Assessment page—BCM principle 3	314
Fig. 12.14	Assessment page—BCM principle 4	314
Fig. 12.15	Assessment page—BCM principle 5	315
Fig. 12.16	Assessment page—BCM principle 6	315
Fig. 12.17	Assessment result page	316
Fig. 12.18	Level description page	316
Fig. 12.19	Recommended action plans page—BCM principle 1	316
Fig. 12.20	Recommended action plans page—BCM principle 2	317
Fig. 12.21	Recommended action plans page—BCM principle 3	317
Fig. 12.22	Recommended action plans page—BCM principle 4	318
Fig. 12.23	Recommended action plans page—BCM principle 5	318
Fig. 12.24	Recommended action plans page—BCM principle 6	319
Fig. 12.25	Additional recommendations page	319
Fig. 12.26	Summary page	320
Fig. 12.27	Feedback page	320
Fig. 12.28	End page	321
Fig. 12.29	BCM-KBDSS result of Firm A	322
Fig. 12.30	BCM-KBDSS result of Firm B	323
Fig. 13.1	Findings of the study	363

List of Tables

Table 3.1	Comparison between Risk Management and BCM [adapted from BCI (2005, p. 6)]	45
Table 3.2	The main aspects of BCM principles	58
Table 3.3	Marsh BCM preparedness level	61
Table 3.4	BCM distinction with other related concepts	70
Table 3.5	BCM benefits	71
Table 4.1	Characteristics of Hofstede’s cultural dimensions	81
Table 4.2	Cultural dimensions from other scholars related to Hofstede’s dimensions	84
Table 4.3	Organizational culture factors	89
Table 4.4	Strategic responses to environmental pressures	96
Table 4.5	The three pillars of institutions	97
Table 4.6	Institutional pillars and carriers	99
Table 5.1	Project management competence for construction in UK	105
Table 5.2	Research on cultures in construction industry	113
Table 6.1	The key functions of Indonesian construction industry support infrastructure	113
Table 6.2	Number of contractors in 33 provinces of Indonesia	143
Table 6.3	Value chain of contractor	144
Table 6.4	Unstructured list of crises	146
Table 6.5	Possible crises faced by contractors	149
Table 7.1	DSS framework subsystems	163
Table 8.1	BCM knowledge variables	177
Table 8.2	Organizational Culture (OC) dimensions	180
Table 8.3	Institutional Forces (IF) attributes	187
Table 8.4	BCM steps for developing implementation guidelines	194
Table 8.5	BCM preparedness criteria	196

Table 8.6	Firm Y—State owned: Relationships between business units and value chain	197
Table 8.7	Firm Z—Private owned: Relationships between business units and value chain	198
Table 8.8	Variables for BCM–KBDSS model	205
Table 10.1	Respondent details	222
Table 10.2	Respondent feedbacks	223
Table 10.3	Respondents’ job levels	225
Table 10.4	Years working in the company and construction sector	225
Table 10.5	Crises that occurred in the firm within 5 years	226
Table 10.6	Types of crises that occurred in the firm within the last 5 years	226
Table 10.7	Impacts from crises	227
Table 10.8	Crisis SOP elements	227
Table 10.9	Sources of BCM knowledge	228
Table 10.10	Reasons for implementing BCM	228
Table 10.11	Effectiveness of BCM implemented in a firm [based on their agree-disagree perspectives; Disagree-Agree (1–5)]	228
Table 10.12	BCM principle implementation in the firm (whether this principle has been implemented or not; Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree)	230
Table 10.13	Correlations between private and state-owned firms	231
Table 10.14	Most important institutional forces factors (IF) that support risk analysis and review (variable orders by size of loadings)	231
Table 10.15	Most important institutional forces factors (IF) that support Business Impact Analysis (variable orders by size of loadings)	231
Table 10.16	Most important institutional forces factors (IF) that support strategy analysis (variable orders by size of loadings)	232
Table 10.17	Most important institutional forces factors (IF) that support BC plan development and tests and exercises (variable orders by size of loadings)	232
Table 10.18	Most important institutional forces factors (IF) that support programme management (variable orders by size of loadings)	233
Table 10.19	Most implemented organizational culture attributes for risk analysis and review (variable orders by size of loadings)	235
Table 10.20	Least implemented organizational culture attributes for risk analysis and review (variable orders by size of loadings)	235
Table 10.21	Most implemented organizational culture attributes for business impact analysis (variable orders by size of loadings)	236

Table 10.22	Least implemented organizational culture attributes for business impact analysis (variable orders by size of loadings)	236
Table 10.23	Most implemented organizational culture attributes for strategy analysis (variable orders by size of loadings)	236
Table 10.24	Least implemented organizational culture attributes for strategy analysis (variable orders by size of loadings)	237
Table 10.25	Most and least implemented organizational culture attributes for BC plan development (variable orders by size of loadings)	237
Table 10.26	Most and least implemented organizational culture attributes for tests and exercises (variable orders by size of loadings)	238
Table 10.27	Most implemented organizational culture attributes for programme management (variable orders by size of loadings)	238
Table 10.28	Least implemented organizational culture attributes for programme management (variable orders by size of loadings)	239
Table 10.29	P-value range of OC attributes (between the perceived importance and implemented) for each BCM principle	240
Table 11.1	Documented suppliers in 2012 (Firm A, 2012)	257
Table 11.2	Firm A’s BUs and CBFs	258
Table 11.3	Firm A’s MBCO for each CBF	260
Table 11.4	Firm A’s internal and external coordination overview	261
Table 11.5	Firm A crises response	264
Table 11.6	Firm B’s BUs and CBFs	269
Table 11.7	Firm B’s MBCO for each CBF	271
Table 11.8	Firm B’s internal and external coordination overview	272
Table 11.9	Firm B crises response	274
Table 11.10	Practices that have been implemented in the initiation phase	276
Table 11.11	Hindrances in implementing the initiation phase (in the context of its current condition)	276
Table 11.12	Practices that have been implemented for risk analysis and review	277
Table 11.13	Hindrances in implementing risk analysis and review (in the context of its current condition)	277
Table 11.14	Practices that have been implemented for BIA	278
Table 11.15	Hindrances in implementing BIA (in the context of its current condition)	278
Table 11.16	Practices that have been implemented for BC strategy	279

Table 11.17	Hindrances in implementing BC strategy (in the context of its current condition)	279
Table 11.18	Practices that have been implemented for BC plan development	280
Table 11.19	Hindrances in implementing BC plan development (in the context of its current condition)	281
Table 11.20	Practices that have been implemented for tests and exercises . .	281
Table 11.21	Hindrances in implementing tests and exercises (in the context of its current condition)	281
Table 11.22	Practices that have been implemented for programme management	282
Table 11.23	Hindrances in implementing programme management (in the context of its current condition)	282
Table 11.24	BCM-KBDSS level of preparedness	293
Table 11.25	BCM practices for assessment (per BCM principle)	297
Table 12.1	Triangular membership function	308
Table 12.2	Truth value rules	309
Table 12.3	Results from questionnaire's criteria (11 criteria)	324
Table 12.4	Additional feedback (interviews)	327
Table 12.5	Questionnaire results from field testing	328
Table 13.1	The reasons and motivations for conducting risk analysis and cost benefit analysis	336
Table 13.2	The reasons and motivations for involving experts and BCM committee in risk review	337
Table 13.3	The reasons and motivations for conducting a detailed risk review	337
Table 13.4	The reasons and motivations for conducting BIA	337
Table 13.5	The reasons and motivations for involving experts, employees from related BUs and key staffs in BIA	338
Table 13.6	The reasons and motivations for conducting strategy analysis for maintaining the operations of CBFs	338
Table 13.7	The reasons and motivations for determining staff to support the recovery strategy and providing training and awareness programme	338
Table 13.8	The reasons and motivations for developing a detailed BC plan	339
Table 13.9	The reasons and motivations for providing periodic tests and exercises to ensure that the BC plan is viable and workable	339
Table 13.10	The reasons and motivations for conducting BCM programme management	339
Table 13.11	The reasons and motivations for conducting BCM training and awareness programmes for all staff and related external parties	340

Table 13.12	OC dimensions that have been implemented and support the BCM principles	344
Table 13.13	Organization characteristics of Firm A and Firm B	350
Table 13.14	Additional recommendations for Indonesian contractors to implement BCM	360