# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>i</td>
</tr>
<tr>
<td>Abstrak</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>v</td>
</tr>
<tr>
<td>Table of contents</td>
<td>vi</td>
</tr>
<tr>
<td>List of figures</td>
<td>xii</td>
</tr>
<tr>
<td>List of tables</td>
<td>xiv</td>
</tr>
<tr>
<td>List of abbreviations</td>
<td>xvi</td>
</tr>
</tbody>
</table>

## Chapter 1 – Introduction

1.1 Introduction

1.1.1 Coping with IT change

1.1.2 Towards flexible IT infrastructure

1.2 Problem statement

1.3 Aim and objectives

1.4 Research methodology

1.5 Research contributions

1.6 Research scope

1.7 Thesis layout summary

1.8 Conclusion

## Chapter 2 – Construction Industry and Information Technology

2.1 Introduction

2.2 The construction industry and IT
2.2.1 IT in construction context 19
2.2.2 How IT in construction is different? 20
2.3 Role of IT in construction 21
2.3.1 Benefits of IT usage for construction organizations 22
2.4 Understanding technology change 24
2.5 IT trends in construction 25
2.5.1 The revolution of IT: How fast it was? 27
2.5.2 IT investment trends 29
2.6 IT in Malaysian construction industry perspective 29
2.7 Implications of rapid IT changes for Malaysian construction industry 32
2.7.1 Current practices in coping with rapid IT change 33
2.7.2 Other proposed models in literature 40
2.8 Towards flexible IT infrastructure 42
2.9 Conclusion 43

Chapter 3 – Information Technology Infrastructure Flexibility (ITIF) 44
3.1 Introduction 44
3.2 Defining IT infrastructure flexibility 45
3.3 Benefit of IT infrastructure flexibility implementation 47
3.4 Dimensions of IT infrastructure flexibility 51
3.4.1 Components of IT infrastructure flexibility 51
3.5 IT infrastructure flexibility in Malaysian context 57
3.6 Maturity model 58
3.6.1 Critical success factors (CSF) and maturity model 59
3.6.2 Benefits of maturity model 59
3.7 IT infrastructure maturity model 61
3.7.1 Types of infrastructure maturity model

3.8 Conclusion

Chapter 4 – Research Methodology

4.1 Introduction

4.2 Research methodology

4.3 Preliminary data gathering
   4.3.1 Literature review
   4.3.2 Experts opinion

4.4 Critical success factors of IT infrastructure flexibility
   4.4.1 Pilot study

4.5 Questionnaire design
   4.5.1 Content validation
   4.5.2 Questionnaire pre-test
   4.5.3 Population
   4.5.4 Postal mail administration
   4.5.5 Response rate

4.6 Questionnaire data analyses

4.7 An initial maturity model establishment

4.8 Evaluating the preliminary ITIF Maturity Model through case studies
   4.8.1 Case selection
   4.8.2 Data collection protocol
   4.8.3 Data collection approaches and analysis

4.9 Conclusion
Chapter 5 – Critical Success Factors of IT Infrastructure Flexibility:

Questionnaire Data Analyses

5.1 Introduction

5.2 Respondent characteristic

5.3 Descriptive statistic

5.4 Data ranking

5.5 Conclusion

Chapter 6 – Development of the Initial IT Infrastructure Flexibility Maturity Model

6.1 Introduction

6.2 Purpose of the ITIF Maturity Model

6.3 Designing ITIF Maturity Model

6.3.1 Scope

6.3.2 Representation

6.3.3 Structure

6.3.4 Maturity levels

6.4 ITIF Maturity Model elements

6.5 What are being evaluated?

6.5.1 Technical dimension

6.5.2 People dimension

6.5.3 Management dimension

6.6 Conclusion

Chapter 7 – Model Evaluation: Case Studies

7.1 Introduction
8.4 Guidelines for implementation 235
8.5 Conclusion 237

Chapter 9 – Research Conclusion 238
9.1 Introduction 238
9.2 Chapters summary 238
9.3 Key findings 243
  9.3.1 Literature findings 243
  9.3.2 Survey findings 244
  9.3.3 Case studies findings 245
9.4 Revisiting research objectives 246
9.5 Limitations of the study 247
9.6 Future research 247
9.7 Closure 249

Supplementary Section 251
Appendix A 252
Appendix B 253
Appendix C 254
Appendix D 260
Appendix E 274
References 275
List of publications 294